Decision and Orders

Massachusetts Energy Facilities Siting Council

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APPROVED BY: RIC MURPHY, STATE PURCHASING AGENT

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Council

In the Matter of the Petition of the Massachusetts Municipal Wholesale Electric Company for Approval of its 1988 Long-Range Forecast of Electric Requirements and Resources	EFSC 88-1

FINAL DECISION

Robert D. Shapiro
Hearing Officer
February 9, 1990

On the Decision:

Robert J. Harrold

APPEARANCES: Robert M. Granger, Esq.
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One Milk Street
Boston, Massachusetts 02109
FOR: Massachusetts Municipal Wholesale Electric Company
Petitioner

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The Energy Facilities Siting Council hereby APPROVES the 1988 demand forecast and REJECTS the 1988 supply plan of the Massachusetts Municipal Wholesale Electric Company and its member systems.

I. INTRODUCTION

A. Background

MMWEC is a public corporation of the Commonwealth, created under Chapter 775 of the Acts of 1975. MMWEC provides a range of demand forecasting and supply planning services to 30 municipally-owned electric systems ("members" or "member systems") in Massachusetts. MMWEC's joint planning activities include: preparing demand forecasts for member systems; financing, owning, and operating generating resources; analyzing and assisting in the implementation of conservation and load management ("C&LM") programs; contracting for the sale and interchange of electric power among members and with other utilities; and providing coordination with the New England Power Pool ("NEPOOL") (Exh. HO-21, Attachment, pp. 1-2).

At the time of its filing in this matter, MMWEC provided services to 33 member systems, as follows: Ashburnham; Belmont; Boylston; Chicopee; Concord; Danvers; Georgetown; Groton; Hingham; Holden; Holyoke; Hudson; Hull; Ipswich; Littleton; Mansfield; Marblehead; Merrimac; Middleboro; Middleton; North Attleboro; Paxton; Peabody; Princeton; Reading; Rowley; Shrewsbury; South Hadley; Sterling; Templeton; Wakefield; West Boylston; and Westfield. However, during the course of this proceeding, three member systems -- Chicopee, Hudson, and Peabody -- terminated their agreements with MMWEC (Exhs. HO-88, HO-98, HO-99).

In 1987-1988, the 33 member systems experienced a non-coincident summer peak demand of 857 megawatts ("MW") and a non-coincident winter peak demand of 826 MW. MMWEC sells approximately 4,100,000 megawatt hours ("MWH") of electricity to about 220,500 customers in a non-contiguous service area (Exh. HO-30, pp. II-7 to II-9). MMWEC's members serve approximately ten percent of the electric load in Massachusetts.

In its review of MMWEC's previous filing, the Siting Council approved the Company's demand forecast and rejected its supply plan. Massachusetts Municipal Wholesale Electric Company, 16 DOMSC 95 (1987) ("1987 MMWEC Decision"). In that decision, the Siting Council found that MMWEC (1) could not establish that its supply plan was adequate in the long run, and (2) could not establish that its supply planning process ensured a least-cost supply for its customers.

B. Procedural History

On August 1, 1988, MMWEC filed its 1988 demand forecast and supply plan.[1]

On October 21, 1988, the Hearing Officer issued a Notice of Adjudication for the 1988 forecasts and supply plans and directed MMWEC to publish and post the Notice in accordance with 980 CMR 1.03(2). MMWEC subsequently submitted confirmation of publication and posting.

On November 9, 1988, the Massachusetts Institute of Technology ("MIT") filed a motion to intervene in the proceeding. On December 2, 1988, J. Makowski Associates ("Makowski") filed a petition to participate as an interested person.

On December 12, 1988, MMWEC filed its response in opposition to MIT's motion to intervene. On January 12, 1989, the Hearing Officer conducted a pre-hearing conference (1) to consider MIT's motion to intervene and Makowski's petition to participate as an interested person, and (2) to establish a procedural schedule for the remainder of the proceeding. At the conference, the Hearing Officer granted the motion of MIT and

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1/ The August 1, 1988 filing included MMWEC's system-wide demand forecast, MMWEC's system-wide supply plan, and the individual demand forecasts for 33 member systems. On October 7, 1988, MMWEC filed individual supply plans for 33 member systems.

the petition of Makowski. In granting MIT's motion, the Hearing Officer specifically rejected MMWEC's argument that the Siting Council's statute and regulations prohibit it from reviewing the individual demand forecasts and supply plans of the individual member systems that belong to MMWEC. At the same time, the Hearing Officer informed the parties that they would be afforded the opportunity to further address this issue in a future memorandum.[2]

On February 6, 1989, in response to a request from the Hearing Officer, MMWEC filed updated demand forecasts and supply plans. With this information the Siting Council is able to review MMWEC's demand forecast and supply plan which includes the most recent data, standards, and methodologies.

The Siting Council conducted six evidentiary hearings between May 1, 1989, and July 6, 1989. MMWEC presented three witnesses: Robert L. Stinson, forecasting manager, who testified regarding MMWEC's demand forecast; John J. Boudreau, manager of regulatory services and economic analysis, who testified regarding MMWEC's supply plan and supply planning process; and Douglas O. Short, former demand services manager, who testified regarding MMWEC's C&LM programs.

On June 14, 1989, MIT withdrew as an intervenor in the proceeding.

The Hearing Officer entered 101 exhibits in the record, largely composed of MMWEC's responses to information and record requests. MMWEC also entered 3 exhibits in the record.

Pursuant to a schedule established by the Hearing Officer, MMWEC filed a memorandum ("MMWEC Memorandum") on August 15, 1989.[3]

2/ The issue of whether the Siting Council may review the forecasts and supply plans of the individual member systems is discussed in Section I.C., below.

3/ The Hearing Officer initially set a deadline of August 4, 1989 for filing a memorandum, but granted MMWEC's motion to enlarge time to file.

C. Jurisdiction

MMWEC has argued that the Siting Council cannot review the individual demand forecasts and supply plans of the member systems. In support of this contention, MMWEC argues: (1) that review of individual member system forecasts conflicts with MMWEC's statutory purpose, authority, and organizational structure; (2) that review of individual member system forecasts conflicts with the Siting Council's statute, regulations, and decisional law; and (3) that review of MMWEC's joint forecast "accomplishes the Siting Council's mandate" (MMWEC Memorandum, pp. 5-14).

As part of this proceeding, the Hearing Officer has ruled that, as part of its review of MMWEC's joint forecast, the Siting Council can review the individual forecasts and supply plans of MMWEC's member systems. The Siting Council finds that the Hearing Officer's ruling is appropriate for the reasons set forth below.

1. The MMWEC Statute

In regard to MMWEC's first argument, the Siting Council notes that Chapter 775 of the Acts of 1975 ("the MMWEC statute") presents no provision or clause which exempts an individual member system from our annual reviews of electric company demand forecasts and supply plans. While MMWEC correctly notes that the legislature has established MMWEC as a joint action agency, it does not follow that the legislature intended such joint action to preclude a review of whether member systems are fulfilling their statutory obligation of presenting reliable demand forecasts and compiling adequate, least-cost, and least-environmental-impact resource plans for their customers.[4] The Siting Council agrees that MMWEC is authorized by the MMWEC statute to file a joint forecast and

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4/ It is significant that while Section 19(c) of the MMWEC statute specifically exempts member systems from certain statutes which are otherwise applicable to electric companies, Section 19(c) does not include the Siting Council statute among those statutes which are not applicable to member systems.

supply plan on behalf of its member systems. However, this authority cannot be interpreted as precluding the Siting Council from looking beyond a joint filing to determine whether individual member systems are fulfilling their important statutory responsibilities.

2. Siting Council Statute, Regulations, and Decisions

The Siting Council rejects the first part of MMWEC's second argument -- that review of individual member system forecasts conflicts with the Siting Council's statute -- and instead finds that the Siting Council statute clearly allows for the review of the demand forecasts and supply plans of individual member systems. While MMWEC correctly notes that G.L. c. 164, sec. 69I, allows for the filing of individual or joint filings, we again must raise the important distinction between filing and review. The efficiencies of a joint filing recognized by the Siting Council statute do not operate to obscure the importance of reviewing whether each member system individually is fulfilling its statutory obligations.

MMWEC further argues that the Siting Council statute includes "no requirement that companies that elect to participate in a joint filing must also file individual forecasts" (MMWEC Memorandum, p. 8). In its last decision, the Siting Council explicitly ordered MMWEC to include in its next joint filing sufficient information on member systems' forecasts and supply plans to enable the Siting Council to fully evaluate those forecasts and supply plans. 1987 MMWEC Decision, 16 DOMSC at 139. In setting forth this order, the Siting Council underscored the importance of its statutory mandate which requires it to ensure adequate, least-cost, and least-environmental-impact supply plans for the member systems while recognizing the efficiencies of reviewing all forecasts and supply plans in one joint proceeding.

The Siting Council also rejects MMWEC's argument that the Siting Council's regulations preclude review of member system demand forecasts and supply plans. MMWEC accurately states that

980 CMR 7.01(5)(c) provides for the filing of joint forecasts and supply plans (MMWEC Memorandum, p. 9). MMWEC also is correct in noting that 980 CMR 7.01(5)(c) states that "any company whose wholesale and retail sales exceeds two percent (2%) of total retail sales in the Commonwealth" need not file certain data separately "if it participates in a joint forecast." MMWEC also accurately notes that no individual member system has retail sales in excess of two percent of the Commonwealth's total retail sales (id., pp. 8-9).

However, the Siting Council can find no support for MMWEC's contention that 980 CMR 7.01(5)(c) precludes our review of individual member system demand forecasts and supply plans within the context of our review of a joint filing. In fact, it is important to note that 980 CMR 7.01(5)(c) also provides:

> In the event of a joint forecast or supplement, the Council may conduct a joint adjudicatory proceeding concerning the forecasts or supplements. In such a proceeding the Council may render separate and different decisions for different companies.

Thus, while 980 CMR 7.01(5)(c) may preclude the Siting Council from requiring MMWEC's 30 member systems to file separate data in 30 separate and distinct proceedings,[5] we find that 980 CMR 7.01(5)(c) does not preclude our review of member-specific forecasts and supply plans in the context of a joint forecast review. In fact, 980 CMR 7.01(5)(c) specifically

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5/ In its 1987 MMWEC Decision, the Siting Council, while rejecting MMWEC's supply plan, afforded member systems the opportunity to file individual supply plans in separate proceedings in support of any applications to construct jurisdictional facilities (16 DOMSC at 139, n. 24). An electric company cannot construct a jurisdictional "facility" unless said facility is consistent with an approved forecast and supply plan. G.L. c. 164, sec. 69I. Individual member systems, however, were not "required" to file separate supply plans in separate proceedings. Instead, a member system which proposed to construct a juridictional facility was able to choose between adjudicating its own supply plan in a separate proceeding or participating in MMWEC's next system-wide supply plan filing.

allows the Siting Council to render separate decisions for the separate companies included in a joint filing -- decisions which must be based on information and data specific to those separate companies. Therefore, we find that the Siting Council's review of member system forecasts and supply plans in this proceeding is entirely consistent with 980 CMR 7.01(5)(c).

Finally, we also reject the final portion of MMWEC's second argument -- that review of member system forecasts and supply plans is inconsistent with Siting Council decisional law. In support of this contention, MMWEC correctly notes that the Siting Council historically has applied different review standards to companies of different sizes (MMWEC Memorandum, pp. 10-12). However, the Siting Council is able to recognize the differences between electric companies of different sizes, as well as the different standards that should be applied, within the context of a joint forecast and supply plan review.

3. Efficacy of Joint Forecast Review

As its third argument, MMWEC contends that the Siting Council can fulfill its mandate through review of MMWEC's joint forecast (MMWEC Memorandum, p. 12). MMWEC argues that it is difficult for small systems to develop demand forecasts on their own. MMWEC also argues that its aggregate supply plan represents a more likely scenario of future supply than any individual supply plan viewed separately. MMWEC further contends that since G.L. c. 164, sec. 69H, directs the Siting Council to "cooperate" with other state agencies, a review of MMWEC's joint forecast would further the Siting Council's "mandate of cooperation." Finally, MMWEC argues that the Siting Council's review of individual members' forecasts and supply plans could prompt individual member systems to adjudicate their own forecasts, a prospect which MMWEC characterizes as "administratively impractical" (MMWEC Memorandum, pp. 12-14).

While the Siting Council agrees that a review of MMWEC's joint forecast and supply plan is an effective vehicle for fulfilling its statutory mandate, for such a review to be effective it must include consideration of the individual demand

forecasts and supply plans of member systems. First, the Siting Council is hard pressed to accept MMWEC's assumption that review of member system data and information in the context of a joint forecast review inevitably leads to a situation where 30 separate member systems file 30 separate forecasts and supply plans. At the same time, we consistently are baffled at MMWEC's insistence that review of a joint or aggregate forecast, without a further review of individual member systems, is sufficient to enable the Siting Council to determine whether MMWEC members are fulfilling their statutory responsibility.

Throughout this proceeding, MMWEC has noted that while MMWEC presents resource recommendations to member systems, it cannot require individual systems to make specific resource decisions (Exh. MM-1, p. 14; Exh. HO-21; Tr. 6, pp. 44-45). Therefore, even if MMWEC were to establish that its supply planning process presented exclusively least-cost, least-environmental-impact resource options to its member systems, it could not ensure that member systems actually would select these options. Consequently, under a scenario where member systems consistently rejected responsible resource options and instead selected more costly or less environmentally acceptable options, MMWEC would ask the Siting Council to ignore the resource decisions made by member systems. This type of approach is completely inconsistent with our statutory obligation and places the member systems' ratepayers at an unacceptable risk.

4. Conclusions

In sum, MMWEC's interpretation of both the MMWEC and Siting Council statutes is somewhat misguided and operates to contravene the purpose and spirit of the Siting Council's statutory responsibility. While the Siting Council concurs that a comprehensive review of 30 separate municipal forecasts and supply plans is unnecessary, unwieldy and inefficient, the administrative convenience of a joint system filing cannot operate to place individual member systems beyond the scope of Siting Council review. Further, the Siting Council's endorsement

of a joint planning process is meaningless if individual systems are not using that joint process as a means of identifying and selecting cost-effective resources that meet their individual needs.

The Siting Council statute requires that we review the resource choices of MMWEC's member systems and our regulations and decisions reflect that obligation. Any other interpretation is wholly inconsistent with our mandate to ensure an adequate, least-cost, and least-environmental-impact resource plan. The benefits and assurances of an adequate, least-cost, and least-environmental-impact resource plan should flow to all customers in the Commonwealth, irrespective of whether they are served by an MMWEC member system or an investor-owned utility. Therefore, the Siting Council must continue to consider the demand forecasts and supply plans of individual MMWEC systems in order to ensure that those member systems fulfill all statutory responsibilities, and requires MMWEC in all future proceedings to submit member system demand forecasts and supply plans as part of its joint filing.

II. ANALYSIS OF THE DEMAND FORECAST

A. Standard of Review

As part of its statutory mandate "to provide a necessary energy supply for the commonwealth with a minimum impact on the environment at the lowest possible cost" (G.L. c. 164, sec. 69H), the Siting Council determines whether "projections of the demand for electric power ... are based on substantially accurate historical information and reasonable statistical projection methods." G.L. c. 164, sec. 69J. To ensure that the foregoing standard is met, the Siting Council applies three criteria to demand forecasts: reviewability, appropriateness, and reliability.

A demand forecast is reviewable if it contains enough information to allow full understanding of the forecasting methodology. A forecast is appropriate if the methodology used to produce that forecast is technically suitable to the size and nature of the utility that produced it. A forecast is reliable if the methodology provides a measure of confidence that its data, assumptions, and judgments produce a forecast of what is most likely to occur. Boston Edison Company, 15 DOMSC 287, 294 (1987) ("1987 BECo Decision").

B. Previous Demand Forecast Review

In the 1987 MMWEC Decision, the Siting Council approved MMWEC's demand forecast subject to two orders:[6]

1. That MMWEC and its members disaggregate their industrial databases in compliance with the Siting Council's Rule 63.7(2)[7] and their commercial databases in a manner that captures electricity-consumption establishments.

2. That MMWEC, in its next filing, supply sufficient information on member towns' forecasts and supply plans to enable the Siting Council to fully evaluate the reviewability, appropriateness and reliability of MMWEC's demand forecast for each member.

6/ The numbers preceding each order correspond to their order of presentation in the 1987 MMWEC Decision.

7/ This rule is codified as 980 CMR 7.03(7)(b).

MMWEC's compliance with the foregoing orders is discussed in Sections II.C.4 and II.C.5, below.

C. Energy Forecast

MMWEC forecasted annual energy requirements by first preparing electricity price, demographic and employment forecasts, then applying those forecasts in a detailed end-use econometric model (Exh. HO-1, pp. II-1 to II-62). MMWEC forecasted energy requirements for each member in terms of the residential, commercial, and industrial sectors, as well as for streetlighting, municipal use, "other use," and losses.

MMWEC forecasted its system-wide energy requirements to increase at a compound annual growth rate of 2.3 percent over the forecast period (Exh. HO-4, p. III-68). In addition, MMWEC forecasted its non-coincident winter peak loads to increase at a compound annual growth rate of 2.2 percent and summer peak loads to increase at a compound annual growth rate of 2.3 percent over the forecast period (id.) (See Table 1).

1. Economic and Demographic Forecast

MMWEC retained the services of Data Resources, Inc., ("DRI") to forecast key economic factors (Exhs. HO-1, pp. II-25, II-53, II-60; HO-46, p. II-18). MMWEC has used DRI in the past for these services. 1987 MMWEC Decision, 16 DOMSC at 103. Factors forecasted by DRI include average real income, statewide commercial and industrial employment, and fuel prices (id.).

MMWEC stated that population forecasts for member systems were obtained from regional planning commissions (Exh. HO-1, p. II-10).[8] MMWEC has used regional planning commissions in the past for this information. 1987 MMWEC Decision, 16 DOMSC at

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8/ MMWEC stated that member population data were obtained from the following regional planning commissions: Lower Pioneer Valley Regional Planning Commission, Montachusett Regional Planning Commission, Merrimack Valley Regional Planning Commission, Central Massachusetts Regional Planning Commission, Metropolitan Area Planning Council, and the Southeastern Regional Planning and Economic Development District (Exh. HO-1, pp. II-11 to II-12).

102. In addition, MMWEC stated that household size projections were obtained from the U.S. Census Bureau (id., p. II-14). MMWEC has used U.S. Census Bureau in the past for these projections. 1987 MMWEC Decision, 16 DOMSC at 102.

For purposes of this review, the Siting Council accepts MMWEC's methodologies for forecasting economic and demographic factors.

2. Electricity Price Forecast

a. Description

MMWEC forecasted electricity price based on a trend factor methodology (Exh. HO-43).[9] MMWEC stated that the trend factor represented the compound annual growth rate of the price of electricity from the base year, 1987, to 1998 (Exh. HO-79). MMWEC stated that the trend factor was derived from each member's revenue requirements as projected by the Westinghouse Automatic Generation Planning Program ("AGP") production cost model (Exh. HO-43; Tr. 3, p. 6). Once derived, the trend factor was applied to a member system's base year electricity price, yielding the subsequent year's price, to which the trend factor was again applied, yielding the next year's price, and so on, producing a price forecast for each member system over the forecast period (Exh. HO-79). Major inputs to the AGP model included DRI's fuel price forecast, an assumed 5 percent rate of escalation for labor, administration, and general costs, and a schedule of resource additions (Exh. HO-43).

b. Analysis

The Siting Council notes that the major premise of MMWEC's electricity price forecast -- use of a trend factor to produce annual price estimates -- presents a serious weakness. While MMWEC's trend factor methodology quantifies the average

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9/ MMWEC's witness, Mr. Boudreau, stated that electricity price was forecasted by MMWEC for all member systems except Belmont, Merrimac, and Concord (Tr. 1, p. 33). Price forecasting for those member systems was based on a growth rate obtained from their respective wholesale suppliers (id., p. 34).

rate of growth in revenue requirements for the forecast period as a whole, it fails to reflect revenue requirements differences which are expected to occur on a year-to-year basis. Essentially, MMWEC's trend factor methodology spreads revenue requirements changes uniformly over the forecast period, regardless of their actual timing within the forecast period. For example, a revenue requirements increase -- due to the addition of a resource in the final year of the forecast period -- would be averaged into the trend factor and spread across the entire forecast period. Thus, the trend factor would greatly reduce the effect on the final year's price, while at the same time adding the effect to all other years' prices. The trend factor establishes a smooth and gradual rate of change in electricity price from the start of the forecast period to its end, whether or not this actually would be the case in terms of major resource additions. Since all MMWEC member systems intend to add generating resources -- sizable ones, in some instances -- and the proposed additions are scheduled to commence operations at a specific point in time known to MMWEC, MMWEC's trend factor methodology fails to accurately reflect the effects of these proposed additions on member systems' revenue requirements and price (Exh. HO-3). While trend factor methodologies simulate growth rates of systems which exhibit gradual and stable rates of growth over time, trend factors are not able to accurately simulate growth rates of systems which are subject to sizable and intermittent additions on a year-to-year basis.

The Siting Council notes that the electricity price forecast is a key component of a company's overall demand forecast. Each sector -- residential, commercial, and industrial -- relies on and is influenced by the effects of the electricity price forecast (Exhs. HO-1, pp. II-36, II-39, II-47, II-57; HO-81). By failing to project electricity price as a function of changes to revenue requirements on a year-to-year basis, MMWEC's price methodology fails to accurately reflect electricity price estimates of its members over the forecast period. Accordingly, the Siting Council finds that MMWEC has

failed to establish that its electricity price forecasting methodology is appropriate.

3. Residential Energy Forecast

MMWEC based its residential energy forecast on the assumption that total consumption is the sum of consumption of 20 residential appliance types within the member systems (Exh. HO-1, pp. II-7, II-9).[10] The basic premise underlying this forecast is that annual energy consumption of an appliance type is the product of the number of customers, the number of appliances per customer, and the average use per appliance (id., p. II-7).

Although MMWEC has enhanced some of the methodological aspects of its residential energy forecast, the basic structure of the residential energy forecast remains largely the same as the one approved by the Siting Council in the past. 1987 MMWEC Decision, 16 DOMSC at 95.

a. Number of Customers

MMWEC forecasted the number of customers within a member's service territory by assuming that the number of customers is equivalent to the total number of households (both single- and multi-family) (Exh. HO-1, p. II-9). MMWEC stated

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10/ MMWEC disaggregated its residential forecast into 20 types of appliances: dishwashers, clothes washers, clothes dryers, electric ranges, refrigerators, freezers, televisions, room air conditioners, electric space heaters, electric water heaters, central air conditioning, heat pumps, supplementary electric space heaters, well pumps, lighting, water beds, solar hot water heaters, humidifiers, dehumidifiers, and miscellaneous (Exh. HO-1, p. II-9). While MMWEC indicated that 21 appliances were considered in the residential forecast, MMWEC's appliance type list included water beds twice (id.). In addition to the foregoing identified appliance types, MMWEC established energy consumption quantities for microwave ovens, fans, heaters, and "fossil heat" (id., pp. III-102 to III-200).

that the number of households is determined from population estimates of each member system, estimates of average household size, and the proportion of single- and multi-family dwellings within each member's service territory (id., p. II-10). MMWEC stated that population data were obtained from regional planning commissions (id.) (see Section II.C.1, n. 8, above). Each member system's household size was established by dividing the member's 1987 population by the actual number of residential customers in the system as obtained from filings made to the Massachusetts Department of Public Utilities ("MDPU") (id., p. II-14). Members' household sizes were then assumed to change over the forecast period according to national trends projected by the U.S. Census Bureau (id.). Each member's proportion of single- and multi-family dwellings was determined from 1980 census data, and was held constant over the forecast period (id.).

For purposes of this review, the Siting Council finds that MMWEC's methodology for forecasting the number of residential customers is appropriate.

b. Number of Appliances Per Customer

MMWEC projected the number of appliances per customer by forecasting saturations (i.e., percent of customers owning each appliance type) (Exh. HO-1, p. II-7). Base year appliance type saturations were established using MMWEC's 1987 Consumer Energy Survey and member reports submitted to the MDPU (id., p. II-19).[11] Saturations beyond the base year were projected by applying growth rates to the base year estimates (id., pp. II-25, II-31).

11/ MMWEC stated that the 1987 Consumer Survey consisted of a random sample mail survey with telephone follow-up (Exh. HO-37). MMWEC stated that responses to its 1987 Consumer Survey represented about 11,000 households throughout the member systems, producing an overall response rate of 43 percent (Exh. HO-1, p. II-19).

MMWEC employed various methods to estimate saturation growth rates (id., pp. II-19 to II-31). Saturation/income functions were used to project growth levels for eight appliance types: electric ranges; refrigerators; freezers (frost-free); dishwashers; clothes washers; electric dryers; televisions; and room air conditioners (id., pp. II-26 to II-30, Exh. HO-41).[12] Due to statistical weakness, saturation growth rates for three appliance types -- central air conditioners, water heaters, and electric space heat -- were based on customer survey results as opposed to saturation/income functions (id., p. II-25; Exhs. HO-41, HO-78).[13] For similar reasons, saturation/income functions were rejected for freezers (standard) and a growth rate of 0.2 percent per year was assumed (Exh. HO-78). Five appliance types -- supplementary electric space heating, well pumps, lighting, water beds, and solar hot water heating -- were assumed to remain at 1987 saturation levels for the forecast period (Exh. HO-1, p. II-31). Heat pump saturation growth was projected based on NEPOOL's estimate (id.). Finally, growth rates for humidifiers and dehumidifiers were projected at various assumed rates (id.). MMWEC provided no explanation of the miscellaneous appliance type growth rate methodology (id., pp. II-19 to II-31).[14]

12/ MMWEC stated that prior to application of saturation income functions, the MMWEC member systems were stratified into five income groups based on 1985 per capita income data obtained from the Massachusetts Department of Revenue (Exh. HO-1, pp. II-19, II-23).

13/ MMWEC stated that saturations of central air conditioning, electric water heating, and electric space heating appliance types were projected based on ownership levels in new homes, i.e., those built over the period 1984-86 (Exh. HO-78). MMWEC stated that new home appliance saturation data were identified in the 1987 Customer Survey (id.; Exh. HO-1, p. II-25).

14/ While microwave ovens were not included in MMWEC's list of 20 identified residential appliance types, MMWEC stated that microwave oven saturations were projected to reach a saturation level of 90 percent by the end of the forecast period (Exh. HO-1, pp. II-19, II-31). Fans, heaters, and "fossil heat" were also omitted from the residential appliance type list, and MMWEC offered no explanation regarding saturation growth rates for these appliance types (id., pp. II-19, III-102 to III-200).

While MMWEC's appliance type saturation data is based largely on its 1987 Customer Survey, MMWEC failed to establish that customer response rates in several communities warranted use of that data for purposes of estimating appliance type saturation levels for those member systems. While customer response rates for most MMWEC communities achieved higher levels, the Siting Council notes that customer survey response rates for Holyoke, Peabody, and Hudson were below 35 percent (Exh. HO-37). In fact, Holyoke's survey registered the lowest response rate of any MMWEC member -- 26.9 percent -- while Peabody and Hudson registered rates of 30.7 percent and 31.5 percent, respectively (id.). When questionnaire response rates for some member systems are this low, the survey's ability to produce representative results for those member systems is suspect. The Siting Council notes that it has frequently articulated concerns regarding companies' forecasting data and has repeatedly requested actions which would lead to improvements in the quality of companies' data inputs. Eastern Utilities Associates, 18 DOMSC 87-88, 91-93 (1988) ("1988 EUA Decision"); 1987 MMWEC Decision, 16 DOMSC at 103-104; 1987 Boston Edison Company, 15 DOMSC at 295-296, 299; Eastern Utilities Associates, 14 DOMSC 44-45, 64, 67 (1986) ("1986 EUA Decision"); Massachusetts Electric Company, 12 DOMSC 221-222 (1985) ("1985 MECo Decision"). The Siting Council is not persuaded that response rates as low as those obtained in the 1987 survey of customers in Holyoke, Peabody, and Hudson form the basis for a reasonable statistical projection for establishing representative levels of residential appliance type saturations. Certainly, a company of MMWEC's size and resources can recognize the limited value of questionable customer survey results and the need to obtain more reliable data when determining and projecting appliance type saturations for those member systems. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to (a) examine its residential customer survey methodology to determine methods of increasing response rates in certain systems, and (b) demonstrate that appliance type saturation data used for all systems are representative of

appliance ownership decisions of residential customers in those systems.[15]

While MMWEC's methodology for determining the number of appliances is reviewable, MMWEC failed to provide several details which would have allowed for a more complete understanding of its methodology. MMWEC assumed saturation growth rates for three appliances -- freezers (standard), humidifiers, and dehumidifiers -- without providing any bases for these assumptions. Further, MMWEC assumed that saturations of supplementary electric space heaters, well pumps, lighting, water beds, and solar hot water heaters would remain at 1987 levels, but provided no information in support of this assumption. Finally, MMWEC offered no explanation of how miscellaneous appliance type saturations were forecasted. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to (a) provide a full explanation of all assumptions made regarding residential appliance type saturation growth rates, and (b) provide a full explanation of the methodology used to forecast miscellaneous appliance type saturations.

For purposes of this review, the Siting Council finds that MMWEC's methodology for forecasting the number of appliances is appropriate.

c. Average Use Per Appliance

To estimate average use per appliance type (i.e., kilowatt hours ("KWH") per appliance type per year), MMWEC established average use for a base year, 1987, calibrated the

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15/ During this proceeding, MMWEC stated that Peabody and Hudson had terminated their membership in MMWEC (Exhs. HO-RR-3, HO-RR-16). However, MMWEC indicated that Peabody and Hudson are considered members of MMWEC for purposes of this filing (id.).

base year use, and established growth rates which were used to project average use over the forecast period (Exh. HO-1, pp. II-32 to II-35).

MMWEC employed various methodologies to establish base year average use (id., pp. II-32 to II-43). Electric space heating and electric water heating average use were estimated based on MMWEC-derived data (id., pp. II-32 to II-33).[16]

Average use estimates for electric ranges, refrigerators (frost-free), and electric clothes dryers were based on interim results of the Joint Utility Monitoring Project ("JUMP") (id., p. II-34).[17] Solar hot water heating estimates were based on assumed operating hours and assumed pump horsepower ratings (id.). Miscellaneous appliance type average use was assumed to be six percent of the weather-insensitive load (id., p. II-35). However, MMWEC failed to provide any support for the assumed level of miscellaneous use, despite its significance as a component of residential load.[18]

16/ MMWEC stated that electric space heating data was obtained from MMWEC members using a separate rate structure for electric space heating, as follows: Groton, Hingham, Holden, Hudson, Ipswich, Marblehead, Middleboro, Paxton, Concord, South Hadley, Templeton, and Westfield (Exh. HO-1, pp. II-32 to II-33). MMWEC stated that electric water heating data was obtained from members using electric water heating metering, as follows: Groton, Hingham, Holden, Hudson, Marblehead, South Hadley, and Holyoke (id., p. II-33). For the remaining MMWEC members, average use estimates for electric space heating and electric water heating were based on an average calculated from the foregoing member-derived data after deleting the highest and lowest usages from the respective appliance groups (id., pp. II-32 to II-33).

17/ MMWEC described JUMP as a residential load research project undertaken jointly with five other Massachusetts utilities (Exh. HO-1, p. II-34). MMWEC stated that five of its member systems -- Littleton, Middleborough, North Attleboro, Reading, and Westfield -- participated in JUMP (id.).

18/ The Siting Council notes that MMWEC's "Residential Sales by Appliance, 1988-1998" included an entry for "Other" which was forecasted at higher KWH levels than lighting for 28 of MMWEC's 33 member systems (Exh. HO-1, pp. III-102 to III-200).

Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to fully explain and justify its assumption that miscellaneous appliance type average use consists of six percent of MMWEC's weather-insensitive load.

MMWEC stated that base year average use estimates for the remaining 13 appliance types were taken directly from NEPOOL (id., p. II-32). While MMWEC indicated that NEPOOL average use estimates were based on data from the Edison Electric Institute ("EEI") and other industry sources, MMWEC did not identify the vintages of these data (id.). In a previous Siting Council decision, a company was criticized for failure to identify the vintages of forecasting data. Massachusetts Electric Company, 18 DOMSC 308-310 (1989) ("1989 MECo Decision"). Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to fully identify the vintages of NEPOOL data which were used to establish MMWEC base year average use estimates.

Calibration, i.e., matching estimated residential energy levels to actual levels, was performed based on 1987 data (id., p. II-35). MMWEC applied a calibration ratio to 1987 average use estimates to produce a calibrated base year average use per appliance (id.). In addition, MMWEC reduced Ashburnham's and Hull's average use estimates by 15 percent and 25 percent, respectively, due to the alleged impacts of seasonal customers (id., p. II-36). However, MMWEC failed to explain the basis for selecting these specific reduction levels, and provided no data in support of these reduction levels. While the presence of significant numbers of seasonal customers may affect residential energy consumption within a company's service territory, the basis for major adjustments to a company's forecast cannot be understood in the absence of an adequate explanation. In addition, adjustments which are made following the calibration process raise questions regarding a possibile double counting of seasonal customer consumption effects. Accordingly, the Siting Council ORDERS MMWEC in its next filing to fully explain and justify (a) MMWEC's procedure for determining which member systems are subject to a significant level of seasonal customer

consumption effects, (b) the ability of MMWEC's calibration process to reflect the effects of seasonal customer consumption on appliance average use estimates, and (c) any adjustments to appliance average use which are designed to reflect the effects of seasonal customer consumption and which take place following calibration.

MMWEC identified two major factors affecting average use per appliance growth rate projections: (1) the price of electricity and its effect on consumption as transmitted through elasticity relationships; and (2) appliance efficiency trends (id., p. II-36) (for a discussion of MMWEC's price forecast, see Sections II.C.2.a. and II.C.2.b., above). MMWEC stated that each appliance type was assigned a specific short- and long-term elasticity obtained from NEPOOL's forecasting model (Exh. HO-44).[19] In response to a condition set forth by the Siting Council in its 1984 decision, MMWEC performed a residential price elasticity study to assess the validity of continued use of NEPOOL elasticity data.[20] 1987 MMWEC Decision, 16 DOMSC at 103.

MMWEC included the effects of appliance efficiency standards on estimates of appliance growth rates by (1) quantifying reductions in energy use based on selected efficiency standards, and (2) modifying these reductions based on a partial application of a behavioral response called the rebound effect (Exhs. HO-1, p. II-43; HO-39; HO-45).

19/ MMWEC stated that short-term elasticities were designed to reflect short-term intensity of use and long-term elasticities were designed to reflect appliance stock decisions, i.e., decisions regarding replacement and new ownership (Exh. HO-1, pp. II-36, II-41).

20/ In the 1987 MMWEC decision, the Siting Council found that MMWEC had complied with the condition to conduct such a study. 1987 MMWEC Decision, 16 DOMSC at 103.

For electric ranges, refrigerators, freezers, dishwashers, electric water heaters, room air conditioners, and central air conditioner appliance types, MMWEC applied national appliance efficiency standards described in U.S. House of Representatives Bill 5465, and for electric clothes dryers and televisions, MMWEC applied U.S. Department of Energy proposed rules for implementation of the Energy Policy and Conservation Act (Exh. HO-39).[21,22] MMWEC defined the rebound effect as a corollary to appliance efficiency gains, i.e., as the efficiency of an appliance improves, its operating costs decrease, resulting in increased levels of use by the appliance owners (Exh. HO-1, p. II-44). MMWEC stated that deployment of the rebound effect is controversial, uncertain, and empirically unsubstantiated (Exh. HO-45). Consequently, MMWEC dampened its rebound effect -- reducing it by 70 percent across all appliances -- and asserted that this dampening recaptured a substantial portion of the appliance efficiency gains which would otherwise be negated (id.).

For purposes of this review, the Siting Council finds that MMWEC's methodology for forecasting average use per appliance is appropriate. However, the Siting Council recognizes the theoretical and empirical uncertainty surrounding the rebound effect as it may apply to residential consumption.

21/ Due to the effect of appliance efficiency standards, MMWEC's appliance average use estimates were reduced by the following percentages (1986-98): electric range (0.8); refrigerator (frost-free) (9.4); refrigerator (standard) (18.2); freezer (15.4); dishwasher (11.2); electric clothes dryer (9.6); electric water heater (6.2); television (color) (42.8); television (black and white) (53.5); room air conditioner (10.6); central air conditioner (12.0); electric heating (2.6) (Exh. HO-1, p. II-43). MMWEC stated that electric space heating usage was modified based on the July 1, 1988 revision of the Massachusetts State Building Code (Exh. HO-39).

22/ MMWEC assumed that appliance manufacturers would follow national appliance efficiency standards due to uncertainty regarding enforcement of state appliance efficiency standards (Exh. HO-39).

The Siting Council notes that an active professional debate has emerged regarding the scope and magnitude of the rebound effect and its potential impact on energy consumption. As efficient appliances proliferate and greater knowledge develops regarding their impacts, the relative degree of uncertainty associated with the rebound effect could be reduced. However, confirmation of the rebound effect is currently subject to dispute and is not likely to be resolved without further research and analysis. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to present its analysis regarding the validity of the rebound effect. This analysis should be based on major studies and research projects which have addressed the rebound effect and drawn conclusions regarding its validity.

d. Conclusions on the Residential Energy Forecast

The Siting Council has found that MMWEC's methodologies for forecasting the number of customers, the number of appliances, and the average use per appliance for the 20 residential appliance types are appropriate. Accordingly, the Siting Council finds that MMWEC's methodology for forecasting residential energy requirements is reviewable, appropriate, and reliable.

4. Commercial Energy Forecast

a. Compliance With Order One

The basic structure of the commercial energy forecast has been changed from that of previous filings (Exh. HO-1, p. II-44). Previously, MMWEC forecasted commercial demand based on econometric relationships between commercial sector electricity sales and gross state product, real electricity price, and petroleum price variables. 1987 MMWEC Decision, 16 DOMSC at 105-107. Here, MMWEC forecasted commercial sector energy requirements with a disaggregated end-use methodology (Exh. HO-1, p. II-44). MMWEC stated that its current commercial forecast employed a modified version of the Commercial End-Use SAS Modeling System ("CUES") which was developed by Northeast Utilities ("NU") (Exh. HO-46, pp. S-1, I-2). CUES was used by

MMWEC to produce a commercial energy forecast for each member system (id., p. I-2).

MMWEC based its current forecasting methodology on the assumption that electricity use was represented by floor space (Exh. HO-1, p. II-45). MMWEC asserted that floor space is a reasonable proxy for energy consumption because major commercial end-use components are designed on the basis of floor space requirements (id.). The basic commercial forecasting equation described commercial energy consumption as the product of (1) the forecasted quantity of floor space, (2) the forecasted saturation of end-uses, and (3) the average intensity of the end-uses (id., pp. II-4, II-9). The basic equation was modified to account for (1) floor space additions and removals, (2) space heating fuel choices, and (3) economic factors such as price and employment elasticity (id., pp. II-46 to II-53).

In its previous decision, the Siting Council ordered MMWEC and its members to disaggregate their commercial database in a manner that captured electricity consumption differences among various categories of commercial establishments. 1987 MMWEC Decision, 16 DOMSC at 107, 140. MMWEC stated that its current forecasting methodology disaggregated commercial energy consumption into ten building types: office; retail; restaurant; warehouse; grocery; school; college; health; hotel/motel; and miscellaneous (Exh. HO-1, p. II-3). Further, MMWEC disaggregated commercial energy consumption within each building type by four end-uses: space heating; space cooling; lighting; and miscellaneous (id., p. II-4). Finally, MMWEC divided the commercial sector into (1) sales to existing floor space, and (2) sales to new floor space, and forecasted commercial consumption based on these two sales groups within the building type and end-use framework (id., pp. II-49 to II-50).[23]

Based on the foregoing, MMWEC has established that it has disaggregated its commercial sector database in a manner that

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23/ MMWEC defined existing floor space as that constructed prior to 1987 and new floor space as that constructed during and after 1987 (Exhs. HO-1, p. II-50; HO-46, p. II-6).

captures electricity consumption differences among various categories of commercial establishments. Accordingly, the Siting Council finds that MMWEC has complied with the Order to disaggregate its commercial sector database as set forth in the previous decision.

b. Floor Space

i. Description

The floor space component of MMWEC's commercial model produced annual estimates of floor space by building type for each member system (Exh. HO-46, p. II-8). Major data inputs to this component consisted of (1) base-year (1987) floor space estimates by building type, and (2) employment trends (id., Exh. HO-47).

MMWEC stated that base-year floor space estimates were determined by (1) calculating average-square-foot-per-employee ratios by building type on a system-wide basis, and (2) multiplying these employee ratios by base-year building type employment figures for each member system (Exhs. HO-1, pp. II-50 to II-51; HO-46, p. II-11).[24] MMWEC's system-wide employee ratios were based on its 1987 Commercial Mail Survey (Exh. HO-46, pp. II-11, II-13).[25] Once established, MMWEC assumed that the employee ratios would remain constant over the forecast period (id., p. II-10; Exh. HO-82). Employment figures were projected using statewide growth trends obtained from DRI (Exh. HO-46, p. II-19; Exh. HO-48).

24/ MMWEC stated that 1986 and 1987 one and two-digit SIC employment data obtained from the Massachusetts Division of Employment Security ("MDES") were used to establish base-year employment levels by building type and member system (Exh. HO-46, p. II-11). MMWEC stated that any remaining commercial employment was allocated to building types based on statewide proportions (Exh. HO-1, p. II-51).

25/ MMWEC stated that its Commercial Mail Survey consisted of 1,353 responses from 6,500 MMWEC commercial customers who were systematically selected from the MMWEC member systems (Exh. HO-28, pp. ES-4, II-3). MMWEC stated that its 1987 Commercial Mail Survey failed to produce a reasonable employee ratio for the hotel/motel building type, therefore MMWEC substituted NEPOOL's hotel/motel ratio (Exh. HO-46, p. II-13).

ii. Analysis

MMWEC has begun to accumulate disaggregated commercial sector data to support the forecasting requirements of the CUES model and to better represent the inherent diversity of the commercial sector. However, one weakness of MMWEC's floor space methodology is the use of a single year's data (1987) as the basis for its average-square-foot-per-employee ratios (Exhs. HO-46, p. II-2; HO-1, pp. II-51 to II-52). In addition, the assumption that the average-square-foot-per-employee ratios would remain constant over the forecast period was not substantiated by MMWEC. In past decisions, companies have been criticized by the Siting Council for failing to evaluate constant floor-space-per-employee assumptions. 1989 MECo Decision, 18 DOMSC at 313-314; 1985 MECo Decision, 12 DOMSC at 220. MMWEC offered no documentation indicating that it had validated this assumption. In addition, the Siting Council previously has articulated concerns regarding pertinent economic factors such as the costs of construction, real estate, and labor which may have an impact on commercial floor space growth and which may not be captured by floor-space-per-employee ratios alone. 1989 MECo Decision, 18 DOMSC at 313-314; Northeast Utilities, 17 DOMSC 14-15 (1988) ("1988 NU Decision"). Finally, the Siting Council recognizes that end-use modeling may represent a substantial undertaking for the electric utility industry and for individual companies. End-use modeling is data intensive and data requirements of the models may seem onerous, particularly at the outset. Nevertheless, companies are required to submit forecasts based on substantially accurate historical information and reasonable statistical projection methods. In addition, the Siting Council expects that the industry and companies within it will continue to demonstrate their commitment to improving the state of the art of end-use modeling, in part by testing previously accepted assumptions and supporting data in order to assess their continued validity. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to fully reevaluate its use of constant floor-space-per-employee ratios including justification of the use of these ratios with respect to other reasonable methods of

commercial floor space growth estimation. Still, the Siting Council again recognizes the marked improvement shown by MMWEC in initiating end-use modeling for its commercial sector.

For purposes of this review, the Siting Council finds MMWEC's floor space methodology to be appropriate.

c. Saturations

i. Description

MMWEC stated that end-use saturations (i.e., percent of floor space served by electricity) were determined using various methodologies (Exh. HO-28; Exh. HO-46, pp. II-13, II-17 to II-18). For existing floor space, MMWEC stated that end-use saturations were based on results of the 1987 Commercial Mail Survey (Exh. HO-46, p. II-13). For new floor space, MMWEC based end-use saturations on (1) a fuel choice model for electric space heating, and (2) assumed 100 percent saturation levels for lighting and miscellaneous (id., pp. II-17 to II-18; Exh. HO-28). MMWEC provided no explanation of the methodology used to determine space cooling saturation levels (Exhs. HO-28, HO-46, HO-48).

ii. Analysis

MMWEC has undertaken customer surveys to establish end-use saturations for several major commercial end uses. However, one weakness of MMWEC's saturation methodology is the breadth of the miscellaneous category, which represents the saturation of all commercial end-uses except for heating, cooling, and lighting. The Siting Council considers disaggregation to be a key component of an end-use model's forecasting capability, and therefore finds that consolidating numerous end-uses into a large miscellaneous category defeats the purpose of a disaggregated end-use model. Important characteristics of specific end uses could easily be obscured when the end uses are consolidated into a large miscellaneous category. In addition, the Siting Council notes that MMWEC omitted an explanation of the methodology used to project space cooling saturation levels. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to (a) identify

additional commercial end uses to be disaggregated, or to fully justify the present level of commercial end-use disaggregation, and (b) fully explain all methodologies used to determine commercial end-use saturations including space cooling saturations.

For purposes of this review, the Siting Council finds that MMWEC's methodologies for determining commercial end-use saturations are appropriate.

d. Energy Intensiveness

i. Description

MMWEC represented end-use energy intensiveness (i.e., KWH per square foot) with energy use indices ("EUIs") designated by building type (Exhs. HO-1, p. II-51; HO-46, p. II-8). MMWEC determined EUIs using various methodologies (Exhs. HO-1, pp. II-51, II-53; HO-46, p. II-13). Existing floor space EUIs were derived from NEPOOL's commercial model (Exh. HO-1, pp. II-51, II-53). New floor space EUIs were based on simulated prototypical building characteristics (Exhs. HO-29; HO-46, p. II-13). MMWEC stated that prototypical building parameters were developed from 1987 Commercial Mail Survey data (Exhs. HO-29; HO-1, p. II-53).

MMWEC asserted that intensiveness levels of its miscellaneous end use may have been significantly understated (Exh. HO-46, p. II-13). In support of this assertion, MMWEC provided a Southern California Edison Company study which claimed that a significant level of commercial miscellaneous end-use growth was taking place in its service territory (id., pp. II-13, II-17). Based on the Southern California Edison study, MMWEC increased its miscellaneous EUI at a rate of 2 percent per year (id., p. II-17).

ii. Analysis

The Siting Council finds that MMWEC's methodology for determining EUIs is appropriate.

However, the Siting Council notes its concern regarding the use of non-service-territory-specific data as the basis for projecting growth of miscellaneous EUIs. In previous decisions, the Siting Council has criticized companies for using non-service-territory specific end-use data. 1989 MECo Decision, 18 DOMSC at 319-322; 1985 MECo Decision, 12 DOMSC at 221. While miscellaneous growth may be increasing in various regions of the country, such growth does not necessarily support similar effects for the MMWEC service territories. In addition, MMWEC offered no evidence indicating that the results of the Southern California Edison study would be applicable to MMWEC's commercial sectors. Further, MMWEC's miscellaneous end-use category included all end-uses except for space heating, space cooling, and lighting. Unless the structure of Southern California Edison Company's miscellaneous end-use category is identical to MMWEC's -- that is, if it consists of three specific end-uses and a large residual miscellaneous category -- a comparison of the two companies' miscellaneous categories is unfounded and misleading. Accordingly, the Siting Council ORDERS MMWEC in its next filing to establish service-territory-specific miscellaneous EUI growth rates or to fully justify use of any miscellaneous EUI growth rates based on non-service-territory specific data.

d. Conclusions on the Commercial Energy Forecast

The Siting Council has found that MMWEC's methodologies for forecasting floor space, saturations, and energy intensiveness are appropriate. Accordingly, the Siting Council finds that MMWEC's methodology for forecasting commercial energy requirements is reviewable, appropriate, and reliable.

5. Industrial Energy Forecast

a. Compliance with Order Two

The basic structure of MMWEC's industrial energy forecast has been changed from that of previous filings (Exh. HO-1, p. II-57). 1987 MMWEC Decision, 16 DOMSC at 105-107.

Previously, MMWEC forecasted industrial demand based on econometric relationships between industrial sector electricity sales and gross state product, real electricity price, and petroleum price variables (Id.). Here, MMWEC forecasts industrial electricity demand based on forecasts of industrial employment and intensiveness of electricity use per employee (i.e., KWH per employee) (Exh. HO-1, p. II-57).

MMWEC based its industrial energy forecast on the assumption that total class consumption is represented by the consumption of 19 industries, as identified by two-digit Standard Industrial Classification ("SIC") codes (Exh. HO-1, pp. II-57 to II-58).[26] MMWEC forecasted industrial energy consumption for each member by including only those industries actually present within each member's service territory (Exh. HO-46, pp. III-4 to III-11).

Data requirements for the MMWEC industrial model consisted of (1) base year employment by two-digit SIC, (2) base year estimates of electric intensiveness, (3) forecasts of employment by two-digit SIC, and (4) a trend factor which modified electric intensiveness over the forecast period (id., pp. III-1 to III-2). MMWEC stated that 1987 was selected as the base year for employment and intensiveness variables (id., pp. III-2, III-4). MMWEC also stated that base year employment data for each SIC code was obtained from sources including the MDES, a Dun and Bradstreet manufacturers list, Hall's Directory of Manufacturers, and information derived from members (Exh. HO-1, p. II-59). Industrial employment forecasts were obtained from DRI (Exh. HO-46, p. III-3).

26/ The 19 SIC groups are: Food (SIC 20, 21); Textiles (22); Apparel (23); Lumber and Wood (24); Furniture (25); Pulp and Paper (26); Printing (27); Chemicals (28); Petroleum (29); Rubber (30); Leather (31); Stone, Clay, and Glass (32); Primary Metals (33); Fabricated Metals (34); Non-electric Machinery (35); Electric Machinery (36); Transportation (37); Instruments (38); and Miscellaneous (39) (Exh. HO-1, p. II-58).

MMWEC stated that base year energy intensiveness was calculated using the foregoing employment data and MMWEC billing data (Exhs. HO-46, p. III-2; HO-52). MMWEC stated that intensiveness trend factors, obtained from NEPOOL's industrial model, were used to reflect changes in electricity price, technological advances, and varying levels of production (Exh. HO-1, p. II-60). In addition, MMWEC stated that industrial forecasts were adjusted on a member-specific basis to account for additions or deletions of major industrial loads (id., pp. II-60, II-61).

In its previous decision the Siting Council ordered MMWEC and its members to disaggregate their industrial database in accordance with 980 CMR 7.03(7)(b) requiring that all electric utilities disaggregate their industrial sales by two-digit SIC code. 1987 MMWEC Decision, 16 DOMSC at 140. Based on the foregoing, MMWEC has established that it has disaggregated its industrial sector database in compliance with 980 CMR 7.03(7)(b). Accordingly, the Siting Council finds that MMWEC has complied with the Order to disaggregate its industrial database as set forth in the previous decision.

The Siting Council finds that MMWEC's methodology for forecasting industrial energy requirements is reviewable, appropriate, and reliable. MMWEC's methodology for forecasting industrial sector energy consumption represents a major improvement over previous aggregated forecasting methodologies, and is a reasonable one for a system of MMWEC's size and resources. In a previous case, the Siting Council found a methodology that relied upon factors of industrial employment forecasts and average energy intensiveness to be reviewable, appropriate, and reliable. 1988 EUA Decision, 18 DOMSC at 91-95. However, in that same 1988 EUA Decision, that company's methodology was criticized for establishing base year energy intensiveness estimates with as little as one year's data. Id., at p. 93. Here, the Siting Council once again notes that a single year's data is wholly inadequate to support base year energy intensiveness estimates. In addition, the Siting Council reiterates its concern regarding use of non-service-territory

category. Accordingly, the Siting Council finds that MMWEC has failed to establish that its municipal, streetlighting, and "other uses" energy forecast methodology is reviewable, appropriate, or reliable. Therefore, in its next forecast filing, the Siting Council ORDERS MMWEC to describe fully and justify its methodology for forecasting municipal, street lighting, and "other uses" energy requirements.

7. Conclusions on the Energy Forecast

The Siting Council has accepted MMWEC's methodologies for forecasting economic and demographic factors. However, the Siting Council has found that MMWEC's methodology for forecasting electricity price is inappropriate. The Siting Council has found that MMWEC's methodologies for forecasting energy requirements for the residential, commercial, and industrial sectors are reviewable, appropriate, and reliable. The Siting Council also has found that MMWEC failed to establish that its methodology for the municipal, streetlighting, and "other uses" category is reviewable, appropriate or reliable.

In reviewing the demand forecast as a whole, the Siting Council notes that MMWEC continues to demonstrate noteworthy advances in its forecasting methodology. For example, MMWEC has implemented a disaggregate end-use model for its commercial sector forecast, forecasted industrial sector consumption using disaggregated data, performed customer surveys, and has participated with several other utilities in the JUMP load research project. Accordingly, on balance, the Siting Council finds that MMWEC's methodologies for forecasting energy requirements are reviewable, appropriate, and reliable.

D. Peak-Load Forecast

MMWEC forecasted peak load for its members based on (1) each member's annual forecasted energy requirements, and (2) a load factor selected for each member (Exh. HO-54). MMWEC performed its peak load forecasting by first calculating each member's average hourly energy consumption during a year (i.e., the member's annual forecasted energy requirements divided by

8760, the number of hours in one year) and then dividing this by a selected load factor (id.).

MMWEC defined the selected load factor as an average historical load factor over a selected time period, which was 1982-87 for most systems (Exh. HO-54A). However, MMWEC substituted alternate time periods to account for major load changes, or because the alternate time period yielded a load factor with more stability than that of the 1982-87 period (id.).[27] Once determined, MMWEC assumed that a selected load factor would remain constant over the forecast period for a member system (Exh. HO-54).

In the past, the Siting Council has approved methodologies similar to MMWEC's peak load forecasting methodology. See 1986 EUA Decision, 14 DOMSC at 71; 1984 EUA Decision, 11 DOMSC at 82; Eastern Utility Associates, 8 DOMSC 219 (1982). However, more recent decisions have noted the relationship of peak load forecasting to the major components of peak load, and the acquisition of data necessary to support a disaggregated forecast. 1989 MECo Decision, 18 DOMSC at 329-335; Boston Edision Company, 18 DOMSC 201, 222-223 (1989) ("1989 BECo Decision"); 1988 NU Decision, 17 DOMSC at 17. Nonetheless, for purposes of this review, the Siting Council finds that MMWEC's methodology for forecasting peak load requirements is reviewable, appropriate, and reliable.

The Siting Council notes that MMWEC's peak load forecasting methodology exhibits significant limitations due to its inability to capture the underlying factors that contribute to peak load. For example, MMWEC's peak load forecast was not disaggregated into customer classes or end-uses, nor did it account for major peak load determinants such as weather effects

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27/ MMWEC stated that alternate time periods included the following: 1985-87 for Holden; 1983-87 for Hull, Merrimac, Peabody, and South Hadley; 1986-87 for Littleton; and the 1987 winter period only for Shrewsbury and Sterling (Exh. HO-54A).

and varying consumption patterns during different months, days, and hours.

Companies are required to file forecasts with the Siting Council that are based on substantially accurate historical information and reasonable statistical projections. G.L. c. 164, sec. 69J. In determining whether a statistical projection method is reasonable, the Siting Council may consider the size of the company, the state of art of forecasting, and the extent to which forecast methodology requirements are met. See 980 CMR 7.02(9)(b)(2). In addition, while a less sophisticated peak load methodology may be justified for relatively small electric companies with a minimum of expertise and resources, this is not the situation regarding MMWEC. In fact, a primary reason for Massachusetts municipal systems to participate in an organization like MMWEC is to support a higher level of forecasting as a group than any one of the systems could accomplish by itself.

Considerable advances in peak-load forecasting methodologies have been made in recent years. See, e.g., Northeast Utilities, 8 DOMSC 62, 108-109 (1982). Despite these advances, MMWEC's methodology remains aggregated and separated from the major factors which comprise peak load. Accordingly, the Siting Council ORDERS MMWEC to develop and present in its next forecast filing an analysis of alternative peak load forecasting methodologies, including (a) the ability of alternative peak load methodologies to reflect the major underlying factors of peak load such as weather effects and varying consumption patterns over different months, days, and hours, (b) the level of disaggregation achieved by each alternative methodology, and (c) a time schedule for implementing improvements to MMWEC's peak load forecasting methodology.

E. Conclusions on the Demand Forecast

The Siting Council has found that MMWEC has complied with Orders One and Two of its last decision.

The Siting Council has found that MMWEC's methodologies for forecasting energy requirements are reviewable, appropriate, and reliable. The Siting Council also has found that MMWEC's methodology for forecasting peak load is reviewable, appropriate, and reliable.

Accordingly, the Siting Council hereby APPROVES MMWEC's 1988 demand forecast.

III. ANALYSIS OF THE SUPPLY PLAN

A. Standard of Review

In keeping with its mandate in G.L. c. 164, sec. 69H, to "provide a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost," the Siting Council reviews two dimensions of an electric utility's supply plan: adequacy and cost.[28]

The adequacy of supply is a utility's ability to provide sufficient capacity to meet its peak loads and reserve requirements throughout the forecast period. Cambridge Electric Light Company, 12 DOMSC 39, 72 (1985); Boston Edison Company, 10 DOMSC 203, 245 (1984). The Siting Council has determined that different standards of review are appropriate and necessary to establish supply adequacy in the short run and the long run. Cambridge Electric Light Company, 15 DOMSC 125, 134 (1986) ("1986 CELCo Decision"). To establish adequacy in the short run, a company must demonstrate that it has an identified, secure, and reliable set of energy and power supplies. In essence, the company must own or have under contract sufficient resources to meet its capability responsibility under a reasonable range of contingencies. If a company cannot establish that it has adequate supplies in the short run, that company must then demonstrate that it operates pursuant to a specific action plan guiding it in being able to rely upon alternative supplies in the event of certain contingencies. 1987 BECo Decision, 15 DOMSC at 309-322; 1986 CELCo Decision,

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28/ Diversity, which in past Siting Council decisions has been discussed separately, now is treated within the discussion of least cost (see Section III.E, below).

15 DOMSC at 134-135, 144-150, 165-166.[29]

To establish adequacy in the long run, a company must demonstrate that its planning processes can identify and fully evaluate a reasonable range of resource options on a continuing basis while allowing sufficient time for the company to make appropriate supply decisions to ensure adequate, cost-effective energy and power resources over all forecast years. Generally, a supply plan that meets the least-cost standards set forth below is deemed adequate in the long-run.

The Siting Council next determines whether a supply plan minimizes the cost of power (that is, whether it ensures least-cost supply) subject to trade-offs with adequacy, diversity, and the environmental impacts of construction and operation of facilities. Nantucket Electric Company, 15 DOMSC 363, 384-390 (1987) ("1987 Nantucket Decision"). Recognizing that supply planning is a dynamic process carried out under circumstances which make it difficult for a company to identify with exactitude all the power resources it plans to rely upon in the latter years of its long-range forecast (1987 Nantucket Decision, 15 DOMSC at 378-379, 384, 390-391; 1987 BECo Decision, 15 DOMSC at 301, 322-323, 339-348; 1986 CELCo Decision, 15 DOMSC at 133-135; Fitchburg Gas and Electric Light Company, 13 DOMSC 85, 102 (1985)), the Siting Council's review of the long-run cost of the supply plan generally focuses on a company's supply planning methodology. 1987 BECo Decision, 15 DOMSC at 339-349; 1986 CELCo Decision, 15 DOMSC at 136-138.

The Siting Council reviews the company's processes of

29/ The Siting Council previously has defined the short run as a function of the time required to implement certain resource options. See 1987 BECo Decision, 15 DOMSC at 307-309. However, in Boston Edison Company, 18 DOMSC 21n, 41 (1989) ("1989 BECo Decision") the Siting Council defined the short run as four years. The four year period was measured from the time in a proceeding that (1) the final discovery or record response is submitted, or (2) the final hearing is held, whichever is later. Id., see also 1988 EUA Decision, 18 DOMSC at 31.

identifying and evaluating a variety of supply options. In reviewing a company's resource identification process, the Siting Council analyzes whether that company identified a reasonable range of resource options by (1) compiling a comprehensive array of available resource options, and (2) developing and applying appropriate criteria for screening its array of available resource options. In reviewing a company's resource evaluation process, the Siting Council determines whether that company (1) developed a resource evaluation process which fully evaluates all resource options, including the treatment of all resource options on an equal footing, and (2) applied its resource evaluation process to all of its identified resource options. 1989 BECo Decision, 18 DOMSC at 46-76; 1988 EUA Decision, 18 DOMSC at 36-55.

B. Previous Supply Plan Review

In the previous supply plan review of MMWEC, the Siting Council rejected MMWEC's supply plan. 1987 MMWEC Decision, 16 DOMSC at 95, 140. In that decision, the Siting Council included the following order:

> That MMWEC supply sufficient information on member towns' supply plans to enable the Siting Council to fully evaluate the adequacy, diversity, and cost of each member's supply plan.

Based on the record in this proceeding, the Siting Council finds that MMWEC has complied with the foregoing order.

C. Supply Planning Process

1. Introduction

MMWEC stated that the major goal of its supply planning process was to develop supply plans for the MMWEC members which would (1) achieve an appropriate balance of generation options and C&LM options sufficient to meet customer requirements, (2) minimize the long term cost of electric service, (3) minimize risks associated with cost and adequacy, and (4) diversify the

mix of fuels and generating units (Exh. MM-1, p. 3). MMWEC characterized supply plans which met the foregoing goals as "integrated resource plans" (Exh. HO-1, p. VI-24).

MMWEC stated that its supply planning process was subdivided into seven major activities (1) load forecasting and identification of future resource requirements, (2) identification of future resource options, (3) development of a base case generation expansion plan, (4) screening and analysis of future resource options, (5) development of an integrated resource plan, (6) implementation, and (7) contingency planning (id.) (for a discussion of MMWEC's load forecasting activities, see Sections II.A through II.E, above).

2. Cost

MMWEC stated that its principal screening and analysis tool was the avoided costs which were based on the base case generation expansion plan (Exh. MM-1, p. VI-21).

MMWEC stated that a base case expansion plan was performed for each member system using the Westinghouse Automatic Generation Planning Program ("AGP") model (Exh. HO-22). Inputs to the AGP model included data pertaining to the member's existing resource mix and that of generic combined cycle, gas turbine, and coal-fired units.[30] MMWEC claimed that the AGP was used to analyze a large number of possible resource combinations, leading to the optimal combination of existing and generic units which minimized the member's cost of power over the planning period (id.). MMWEC asserted that costs developed with the foregoing methodology would reasonably approximate power costs to be expected over the planning period (id.).

30/ MMWEC assumed certain operating characteristics such as capacity factors and heat rates (Exh. HO-22). MMWEC also assumed escalation rates for capital and operations and maintenance costs pertaining to generic units (id.).

Using costs developed from the optimal base case expansion plan, MMWEC established each member's avoided capacity and energy costs with the modified peaker methodology (Exh. HO-1, p. VI-22).[31] However, MMWEC indicated that the base case generation expansion plan was subject to additional iterations, adjustments, and recalculations of avoided costs (id., p. VI-24). If significant changes to a member's base case expansion plan resulted as an outcome of the supply planning process, then the base generation plan would be modified and new avoided costs calculated (id.). Overall, MMWEC contended that its avoided costs provided a consistent economic screening tool for generation and C&LM options (id., p. VI-22).

3. Development of the Integrated Resource Plan

MMWEC stated that an integrated resource plan consisted of all cost-effective C&LM and optimal amounts of generation which were combined to produce a "balance" between each member's capability responsibility and resources (Exh. HO-1, p. VI-24).

31/ MMWEC's modified peaker methodology consisted of the following: (1) for each member, a base case generation expansion plan was developed (with additions of generic proxy units on an as-needed basis) and the total power cost for each year of the planning horizon was calculated; (2) a zero cost unit, representing 5 percent of a member's peak load and assumed to operate at a 100% capacity factor, was added to the member's base case generation expansion plan, and the annual total power cost was recalculated; (3) the costs of step 2 were subtracted from the costs of step 1, and the remainder was divided by the total energy produced by the zero cost unit, yielding the system's annual avoided energy cost; and (4) avoided capacity costs were calculated from the annual cost of peaking capacity and added to the on-peak avoided energy costs (Exh. HO-22). MMWEC stated that its modified peaker methodology was analogous to a methodology adopted by the MDPU in DPU 84-276-B (Exh. MM-1, p. 9).

According to MMWEC, a member's integrated resource plan was compiled under the following hierarchical scheme: (1) all cost-effective C&LM options were selected for inclusion in the integrated plan; (2) short-term requirements were met with economic utility purchases;[32] (3) longer-term requirements were met with economic non-utility developer purchases (thereby minimizing construction and financial risks to members, and furthering fuel and unit diversification goals); and (4) new MMWEC- and municipally-owned generation options were held in reserve should non-utility developer generation fail to materialize as scheduled (Exh. MM-1, pp. 13-14).

MMWEC stated that cost-effective C&LM options were developed through its Demand Side Capacity Assessment ("DSCA") (Exh. HO-71). MMWEC further stated that its DSCA was undertaken to provide a systematic assessment of the C&LM potential within each member system and to make specific implementation recommendations regarding cost-effective C&LM options (id.). The DSCA was also designed to illustrate how C&LM planning activities could be incorporated into MMWEC's planning process, to raise utility managers' awareness of C&LM options, and to collect primary data for current and future C&LM analyses (Exh. HO-75; Tr. 5, pp. 13-14).

MMWEC stated that economic generating options were developed through its identification and screening process (Exh. HO-1, p. VI-24) (for a discussion of MMWEC's identification and screening process, see Sections III.E.1.a to III.E.1.c, below).

32/ Mr. Boudreau stated that utility purchases were selected in the short term "because that was what was available" (Tr. 2, p. 141). Mr. Boudreau stated that non-utility developers were not projecting availability until 1991, but that requirements were identified in the 1988-89 time period (id.). MMWEC stated that short-term utility sales and purchases between MMWEC members were given priority consideration by MMWEC (Exh. MM-1, pp. 13-14).

MMWEC maintained that the supply plans contained in this filing were the result of extensive collaboration between MMWEC and its individual members (Exh. HO-74). MMWEC indicated that the major collaborative mechanism used in the supply planning process was the MMWEC committee process (id.).[33] MMWEC stated that the committees were "purely advisory" and that their recommendations were subject to approval by the MMWEC Board of Directors (Tr. 3, pp. 16, 20).[34]

Mr. Boudreau stated that MMWEC's Energy Committee had "primary responsibility" for review of various options and proposals prior to offering recommendations to the MMWEC board (id., p. 15). In addition, MMWEC has periodically established "ad hoc" committees to assist in the evaluation of resource options (id.). For example, in the current filing, MMWEC established a Conservation and Load Management Committee to oversee C&LM evaluation and selection, and a Resource Development Committee was established to perform similar functions regarding generation options (Exh. HO-74).

However, Mr. Boudreau stated that resource option recommendations which were transmitted to committees came "primarily from the staff" (Tr. 3, p. 40). For example, Mr. Boudreau stated that the MMWEC staff provided the Resource Development Committee with information regarding non-utility proposals which led to development of the Coal Mix project (id., p. 30). Mr. Boudreau stated that the set of Coal Mix resource options offered to the Resource Development Committee "were selected by the staff as meeting the screening criteria and the

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33/ MMWEC stated that it has three major standing committees: the administrative; strategy; and energy committees (Exh. HO-90). Each committee consists of seven members appointed by the Chairman of the Board (id.).

34/ MMWEC stated that, by statute, its Board of Directors consists of nine members, made up of two members appointed by the governor and seven members elected by the MMWEC membership from the pool of member light department managers and light board commissioners (Exh. HO-90; Tr. 3, pp. 17-18).

cost criteria we had established" (id., p. 32). However, Mr. Boudreau also stated that the screening process and its components were "obviously items of discussion at the committees: what types of things were of importance, what things should we be looking at in screening those resources" (id.).

Mr. Boudreau stated that the results of the Resource Development Committee's Coal Mix review were sent to the Energy Committee, and that between these two committees specific projects were selected for inclusion in the final Coal Mix package (id., p. 24). Following committee review, the MMWEC Board endorsed the final Coal Mix package as a study project, i.e., a project to be evaluated and pursued further on behalf of the members (id., pp. 32-33).

Further processing of the Coal Mix project included staff recommendations to individual member systems and decisionmaking by member systems (id., pp. 30-31). Mr. Boudreau stated that the Coal Mix project was a base load option and that MMWEC's staff had "an idea" of members' requirements (id.). Based on this general information, MMWEC performed more discrete analyses which led to specific purchase recommendations to members (id., p. 31). Member participation in the project was subject to an affirmative vote by the members' respective elected light boards (id.).

Mr. Boudreau stated that a capacity purchase by MMWEC on behalf of its members required ratification by the MMWEC board, but that ratification could occur only after approved capacity contracts had been received from the respective light boards (id., pp. 47-48). Mr. Boudreau indicated that by itself MMWEC could not obligate a member to an action, in that "the individual municipal light departments are autonomous entities" governed by decisions of their respective elected light boards (Tr. 6, pp. 44-45). Further, MMWEC observed that the ultimate decisionmaking authority regarding resource implementation rested with the individual light boards (Exh. MM-1, p. 14; Exh. HO-21).

Mr. Boudreau also indicated that the scope of a member's

autonomy was not limited by MMWEC membership, in that individual members "have the ability to contract with each other, with other utilities, without going through MMWEC" (Tr. 3, p. 42). Nonetheless, Mr. Boudreau stated that "as a practical matter, the communities that make up the MMWEC membership take MMWEC staff recommendations. They do go forward with those projects that MMWEC recommends" (id., p. 50).

4. Risk Management

MMWEC addressed two aspects of risk management associated with supply planning (1) cost-based risks (i.e., the risk that costs of supply would not be minimized), and (2) adequacy-related risks (i.e., the risk that supply would not meet forecasted requirements) (Exh. MM-1, p. 3). In addition, MMWEC stated that it performed contingency planning to address reasonable uncertainties inherent to the integrated resource plans (Exh. HO-1, p. VI-25).

MMWEC stated that cost-based risks were minimized by the high priority placed on acquisition of non-utility development which offered performance-based contracts (id., p. VI-27; Tr. 3, p. 105). In addition, MMWEC contended that cost-based risks were decreased through diversification of fuels and generating units (Exh. HO-1, p. VI-26). For example, MMWEC claimed that its Coal Mix project will provide fuel and unit diversity, and that C&LM program development will further enhance member resource diversity (id.). Further, MMWEC claimed that cost-based risks were diminished through continuous monitoring of regional energy markets leading to economic short-term power purchase and/or sale opportunities, and retention of new MMWEC-owned generation as a last-resort option (id.).

Mr. Boudreau stated that adequacy was addressed in "the aggregate" because "if we have enough resources in the aggregate, we know we're going to have enough resources for the individual towns" (Tr. 3, p. 7). MMWEC stated that adequacy-related risks were reduced through a system of cooperative capacity transfers from excess MMWEC member systems to deficient MMWEC member systems (Exh. HO-1, p. VI-26).

MMWEC stated that the major mechanism used to transfer capacity was the Extended Weekly Studies ("EWS") program (Exh. HO-55). MMWEC stated that EWS was based on contracts between MMWEC and member participants, and that capacity and energy exchanges were authorized for periods ranging from one day to six months (id.). MMWEC stated that the EWS program basically was implemented by comparing simulated economic dispatch runs of available generating units until an optimal combination was realized for a member (id.).[35]

In addition to the EWS program, MMWEC's methodology for alleviating adequacy-related risks consisted of (1) careful screening of generating resources which included economic, technical, and institutional factors, (2) use of load and market research in C&LM program design, which allowed for more precision in estimating subsequent load reductions, (3) investigation of mobile turbine generators and completion of a siting study (for permanent facilities), with commensurate reductions in lead times, and (4) monitoring performance of existing units to maximize Performance Incentive Program ("PIP") benefits (Exh. HO-1, p. VI-27).[36]

35/ MMWEC stated that the basic operational objective of the EWS program is to duplicate New England Power Exchange ("NEPEX") dispatch procedures, and that EWS is based on computer programming similar to that of NEPEX (Exh. HO-55).

36/ MMWEC defined PIP as a NEPOOL program which requires adjustments (either increases or decreases) to a utility's capability responsibility based on generating unit performance (Exh. HO-1, pp. VI-6 to VI-7).

D. Adequacy of the Supply Plan

1. Adequacy of the Supply Plan in the Short Run

a. Definition of the Short Run

The Siting Council recently has defined the short run for all electric companies as four years. 1989 MECo Decision, 18 DOMSC at 343; 1989 BECo Decision, 18 DOMSC at 245. Although MMWEC filed its supply plan in this proceeding before the Siting Council set forth its new definition of the short run,[37] discovery and witness examination was based on the use of a four-year period (Exhs. HO-33, HO-34; Tr. 3, pp. 70-71, 78). Further, the memorandum filed by MMWEC in this proceeding addresses the issue of adequacy in terms of a short run of four years (MMWEC Memorandum, pp. 34-41). Under the current definition of short run, the four year period runs from the date of the final hearing or from the date of the response to the final record request, whichever is later. See 1989 BECo Decision, 18 DOMSC at 225, 245; 1988 EUA Decision, 18 DOMSC at 106. Therefore, in this proceeding, the short run extends from the summer of 1989 to the winter of 1992-1993.[38]

b. Base Case Supply Plan

The data shown in Table 2 compare the MMWEC system'sprojected resource capability to its peak load capability responsibility over the forecast period. These data indicate that MMWEC is projecting a short-run capability surplus

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37/ The Siting Council previously defined the short run as the time required to place into service the shortest-lead-time resource under a utility's direct control in sufficient quantities to meet the projected need for new capacity. See 1987 MECo Decision, 15 DOMSC at 308-309. Pursuant to that definition, MMWEC's initial supply plan indicated a short-run period of two years, the period of time required to place a peaking unit in service (Exh. HO-1, p. VI-14).

38/ The final MMWEC hearing was completed on July 6, 1989, and the final record request response was dated August 15, 1989 (Exh. HO-93).

of from 0.4 percent to 9.1 percent during summer peak periods and a surplus of from 2.5 percent to 17.9 percent for winter peak periods.

Accordingly, the Siting Council finds that MMWEC has established that its base case supply plan is adequate to meet requirements in the short run.

c. Short-Run Contingency Analysis

MMWEC stated that it developed its base case supply plan based on two contingency-related assumptions (1) omission of entitlements to the Seabrook 1 generating plant (132 MW), and (2) omission of entitlements to the Pilgrim generating plant (23 MW) (Exh. HO-33). Thus, MMWEC argued that its base case supply plan incorporated the effects of these two omissions at the outset, as opposed to a consideration of these effects at later stages of its supply planning process (id.). In addition, MMWEC asserted that if Seabrook 1 or Pilgrim commence operation during the forecast period, then MMWEC would receive entitlements which would augment its base capacity levels (id.).[39]

In order to establish adequacy in the short run, a company must establish that it can meet its forecasted needs under a reasonable range of contingencies. By omitting its entitlements in Seabrook 1 and Pilgrim from its base case supply plan, MMWEC has identified one set of possible contingencies. In addition, MMWEC has established that its base case supply plan is adequate in the event of continued absences of Seabrook 1 and Pilgrim. Nonetheless, the Siting Council is required to review a company's ability to meet forecasted requirements under a reasonable range of contingencies, including contingencies beyond the continued

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39/ MMWEC stated that if Seabrook 1 and Pilgrim begin to operate in the short run, then an additional 155 MW of capacity would be available to meet MMWEC's system requirements or to be offered for sale (Exh. HO-33).

absence of Seabrook 1 and Pilgrim entitlements.

Therefore, to evaluate the adequacy of MMWEC's short-run supply plan, the Siting Council analyzes MMWEC's base case supply plan with respect to the effects of (1) high load growth, (2) the double contingency of high load growth and delay of Hydro Quebec by one year, and (3) the double contingency of high load growth and a 50 percent reduction of non-utility development.

i. High Load Growth Contingency

Under its high load growth scenario, MMWEC assumed that its total system load would grow from 983 MW in summer of 1989 to 1234 MW in summer of 1992 (Exh. HO-33).[40] Under high load growth conditions, with all resources in its base case supply plan remaining available, MMWEC would incur a resource deficiency of 30 MW (2.6 percent) in summer of 1990 (id.) (see Table 3).

In the event of a high-load-growth-related resource deficiency, MMWEC identified an action plan consisting of extending PIP benefits at the 67 MW level beginning in summer of 1990, purchasing 24 MW of firm Hydro Quebec Phase I capacity beginning in summer of 1989, purchasing peaking capacity in 25 MW increments over a four-year period beginning in summer of 1990, and recapturing 25 MW of Stony Brook capacity that had been sold to out-of-state purchasers, beginning in 1989 (Exh. HO-33; Tr. 6, p. 25). Further, Mr. Boudreau stated that MMWEC would reconsider C&LM options which had failed previous cost-effectiveness tests (Exh. HO-33; Tr. 6, p. 83).

In reviewing MMWEC's action plan, the Siting Council notes its concerns regarding MMWEC's inclusion of PIP benefits.

40/ Although MMWEC is a non-coincident winter peaking system, MMWEC presented its high load growth scenario in terms of summer periods only (Exh. HO-33; Tr. 5, p. 10). However, MMWEC indicated that over the short run, greater amounts of resources are available during winter periods than summer periods (Exh. HO-4, pp. VI-2 to VI-3).

Here, PIP benefits account for nearly half of the capacity in MMWEC's action plan for the short-run period. While the Siting Council recognizes that PIP provides an important means of encouraging high levels of plant performance with subsequent benefits for utilities, we also recognize that PIP adjustments are difficult to predict.

In this proceeding, MMWEC has provided no documentation in support of its assertion that it is reasonably likely to achieve 67 MW of PIP benefits in the short run (Exh. HO-33). In fact, the inherent difficulty of forecasting a PIP adjustment is underscored by MMWEC's base case supply plan where MMWEC eliminates any PIP benefits as of October, 1990 -- citing the uncertainty regarding plant performance (Exh. MM-3, Attachment JJB-1, p. IV-2; Exh. HO-4, p. VI-2).

Accordingly, the Siting Council finds that MMWEC has failed to establish that PIP benefits can be relied on for purposes of an action plan to meet identified contingencies.

In addition, the Siting Council notes its serious concerns regarding that portion of MMWEC's action plan which calls for reconsideration and possible implementation of previously rejected C&LM options. As a rule, an action plan which relies on accelerated implementation of identified, cost-effective C&LM options is a more reasonable means of responding to contingencies in the short run, as opposed to a reconsideration of C&LM options which have failed previous cost-effectiveness tests.[41] Acceleration of C&LM offers advantages -- such as proven cost-effectiveness, largely completed analyses, and readiness for implementation -- that may not be provided through a reconsideration of previously rejected C&LM options. The Siting Council notes that other electric companies have included accelerated implementation of identified C&LM options as an integral part of their contingency action

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41/ The Siting Council also raises important questions regarding MMWEC's process for determining cost-effectiveness in Section III.E.2, below.

plans. 1989 MECo Decision, 18 DOMSC at 344; 1988 EUA Decision, 18 DOMSC at 109; 1985 MECo Decision, 12 DOMSC at 230.

However, the Siting Council notes that MMWEC's action plan is likely to provide a sufficient level of resources to address the high load growth contingency independent of PIP benefits. In addition, the Siting Council notes that MMWEC's entitlement in the Pilgrim generating unit, amounting to 23 MW, may provide resources which would further enable MMWEC to meet its requirements in the short run. Accordingly, the Siting Council finds that MMWEC has established that it has an action plan to meet a resource deficiency in summer of 1990 in the event of a high load growth contingency.

ii. Double Contingency of High Load Growth and Delay of Hydro Quebec by One Year

One possible combination of short-run contingencies would be high load growth and the delay of Hydro Quebec Phase II by one year. If all other resources in its base case supply plan remain available to MMWEC, this double contingency would produce short run resource deficiencies of 84 MW (7.4 percent) in summer 1990, 13 MW (1 percent) in summer of 1991, and 26 MW (2.3 percent) in summer of 1992 (Exhs. HO-4, HO-33) (see Table 3).

In the event of high load growth and a one-year delay of Hydro Quebec Phase II, MMWEC identified an action plan consisting of extending PIP benefits at the 67 MW level beginning in summer of 1990, purchasing 24 MW of firm Hydro Quebec Phase I capacity beginning in summer of 1989, purchasing peaking capacity in 25 MW increments over a four-year period beginning in summer of 1990, and recapturing 25 MW of Stony Brook capacity that had been sold to out-of-state purchasers, beginning in 1989 (Exh. HO-33; Tr. 6, p. 25). Further, Mr. Boudreau stated that MMWEC would reconsider C&LM options which had failed previous cost-effectiveness tests (Exh. HO-33; Tr. 6, p. 83).

The Siting Council's analysis of MMWEC's action plan for

the double contingency of high load growth and a one-year delay of Hydro Quebec Phase II is identical to our analysis of MMWEC's action plan for the high load growth contingency (see Section III.D.1.c.i, above). The Siting Council has found that MMWEC has failed to establish that PIP benefits can be relied on for purposes of an action plan to meet identified contingencies. Therefore, the Siting Council adopts the analysis and finding regarding MMWEC's action plan in the event of the double contingency of high load growth and one-year delay of Hydro Quebec Phase II. In addition, the Siting Council reiterates its serious concerns regarding a reconsideration of C&LM options which have failed previous cost-effectiveness tests.

However, the Siting Council notes that MMWEC's action plan is likely to provide a sufficient level of resources to address the high load growth and one-year delay of Hydro Quebec Phase II contingency independent of PIP benefits. Accordingly, the Siting Council finds that MMWEC has established that it has an action plan to meet resource deficiencies in summers of 1990, 1991, and 1992 in the event of high load growth and a one-year delay of Hydro Quebec Phase II.

iii. Double Contingency of High Load Growth and 50 Percent Reduction of Non-utility Development

A second possible combination of short-run contingencies would be high load growth and a reduction of planned non-utility development -- consisting of the ANR, Coal Mix, Aquidneck, and Newbay projects -- by 50 percent.[42] If all other resources in its base case supply plan remain available to MMWEC, this double contingency would produce short run resource deficiencies of 52 MW (4.5 percent) in summer of 1990, 18 MW (1.5 percent) in

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42/ In the short run, a 50 percent reduction of planned non-utility development would decrease resources by the following amounts: 22 MW in 1990; 59 MW in 1991; and 74 MW in 1992 (Exh. HO-4, pp. VI-2 to VI-3).

summer of 1991, and 46 MW (3.7 percent) in summer of 1992 (Exh. HO-33) (see Table 3).

In the event of high load growth and a 50 percent reduction of non-utility development, MMWEC identified an action plan consisting of extending PIP benefits at the 67 MW level beginning in summer of 1990, purchasing 24 MW of firm Hydro Quebec Phase I capacity beginning in summer of 1989, purchasing peaking capacity in 25 MW increments over a four-year period beginning in summer of 1990, and recapturing 25 MW of Stony Brook capacity that had been sold to out-of-state purchasers, beginning in 1989 (Exh. HO-33; Tr. 6, p. 25). Further, Mr. Boudreau stated that MMWEC would reconsider C&LM options which had failed previous cost-effectiveness tests (Exh. HO-33; Tr. 6, p. 83).

The Siting Council's analysis of MMWEC's action plan for the double contingency of high load growth and a 50 percent reduction of non-utility development is identical to our analysis of MMWEC's other action plans (see Sections III.D.1.c.i and III.D.1.c.ii, above). The Siting Council has found that MMWEC has failed to establish that PIP benefits can be relied on for purposes of an action plan to meet identified contingencies. Therefore, the Siting Council adopts the analysis and finding regarding MMWEC's action plan under the double contingency of high load growth and a 50 percent reduction of non-utility development. In addition, the Siting Council reiterates its serious concerns regarding a reconsideration of C&LM options which have failed previous cost-effectiveness tests.

However, the Siting Council notes that MMWEC's action plan is likely to provide a sufficient level of resources to address the double contingency of high load growth and a 50 percent reduction of non-utility development independent of PIP benefits. Accordingly, the Siting Council finds that MMWEC has established that it has an action plan to meet resource deficiencies in the summers of 1990, 1991, and 1992 in the event of high load growth and a 50 percent reduction of non-utility development.

iv. Conclusions on the Short-Run Contingency Analysis

The Siting Council has found that MMWEC has established that it has (1) an action plan to meet a resource deficiency in summer of 1990 in the event of a high load growth contingency, (2) an action plan to meet resource deficiencies in summers of 1990, 1991, and 1992 in the event of high load growth and a one-year delay of Hydro Quebec Phase II, and (3) an action plan to meet resource deficiencies in summers of 1990, 1991, and 1992 in the event of high load growth and a 50 percent reduction of non-utility development.

Accordingly, the Siting Council finds that MMWEC has established that its supply plan is adequate to meet its system capability responsibility in the short run under a reasonable range of contigencies.

2. Adequacy of the Supply Plan in the Long Run

MMWEC's long-run planning period is the remaining forecast horizon beyond the short run; this extends from the summer of 1993 through the winter of 1997-98. MMWEC's base case supply plan would satisfy its capability responsibility through winter of 1997-98 (see Table 2).

As previously discussed in Section III.A, above, the Siting Council requires an electric company to establish adequacy in the long run by demonstrating that its planning process can identify and fully evaluate a reasonable range of resource options. The ability of MMWEC's supply planning process to identify and fully evaluate a reasonable range of resource options is fully discussed from the perspective of least-cost supply planning in Section III.E, below.

As indicated in Section III.E, below, MMWEC has failed to establish that it identified and fully evaluated a reasonable range of resource options. Accordingly, the Siting Council finds that MMWEC has failed to establish that its supply planning process ensures adequate resources to meet requirements in the long run.

3. Conclusions on Adequacy of the Supply Plan

The Siting Council has found that MMWEC has established (1) that its base case supply plan is adequate to meet requirements in the short run, and (2) that its supply plan is adequate to meet its capability responsibility in the short run under a reasonable range of contigencies. The Siting Council also has found that MMWEC has failed to establish that its supply planning process ensures adequate resources to meet requirements in the long run. However, the Siting Council notes that MMWEC's base case supply plan would satisfy capability responsibility through winter of 1997-98 of the long-run planning period (see Section III.D.2, above).

Accordingly, the Siting Council finds that, on balance, MMWEC has established that its supply plan ensures adequate resources to meet projected requirements.

E. Least-Cost Supply

In this section, the Siting Council reviews MMWEC's processes for identifying and fully evaluating resource options.

1. Identification of Resource Options

MMWEC identified both generation and C&LM options for evaluation. The Siting Council focuses its review on whether MMWEC identified a reasonable range of resource options by (1) compiling a comprehensive array of available resource options, and (2) developing and applying appropriate criteria for screening its array of resource options.

a. Available Resource Options

In order to determine whether MMWEC compiled a comprehensive array of available resource options, the Siting Council must determine whether MMWEC compiled adequate sets of available resource options for each type of resource identified during this proceeding.

i. Types of Resource Sets

During this proceeding, MMWEC identified five types of resource sets for consideration in its supply planning process: (1) purchases of power from other utilities; (2) purchases from non-utility developers; (3) new MMWEC- and municipally-owned generation; (4) C&LM options; and (5) emerging technologies (Exh. HO-1, pp. VI-19 to VI-21).[43] MMWEC stated that it had not identified candidates for life extension since none of its generating units were scheduled for retirement over the forecast period (Exh. HO-17).

Accordingly, the Siting Council finds that MMWEC has identified a reasonable range of resource sets.

ii. Compilation of Resource Sets

MMWEC stated that it compiled its set of purchases of power from other utilities by remaining in close contact with utilities in Canada and the New England region (Exh. HO-1, p. VI-19). MMWEC stated that as a result of this contact a 15 MW purchase was nearly completed and that another 117 MW purchase was under consideration (id.; Exh. MM-1, p. 6). In developing its current supply plan, MMWEC claimed to have considered purchases of power from such utilities as Central Maine Power, Eastern Utilities Associates, Green Mountain Power, Hydro Quebec, New Brunswick Power, NU, the Taunton Municipal Light Plant, the Washington Electric Co-op in Vermont, and Citizens Utilities (Exh. HO-23; Tr. 2, pp. 51-52). In that MMWEC has included a wide range of potential purchases of power from other utilities, including sources from diverse geographical locations, the Siting Council finds, for purposes of this

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43/ Mr. Boudreau stated that overlap takes place within the identified resource sets (Tr. 2, pp. 46-47). For example, a photovoltaic project could be considered as a purchase of non-utility generation, as new-MMWEC or municipally-owned generation, or as an emerging technology (id., pp. 46-47).

review, that MMWEC compiled an adequate resource set of purchases from other utilities.[44]

In developing its current supply plan, MMWEC claimed to have had preliminary discussions with approximately 60 non-utility developers who were marketing about 3,000 MW of capacity (Exhs. HO-1, p. VI-19; HO-23).[45] Mr. Boudreau stated that developers sought MMWEC out because its needs for additional capacity were well known (Tr. 2, p. 55). MMWEC stated that non-utility development projects included cogeneration, small power production, and alternative energy sources such as hydro-power, landfill gas, wood, wind, and solid waste (Exh. MM-1, p. 7).

In addition, Mr. Boudreau stated that MMWEC addressed the potential for cogeneration by including steam use questions in its Commercial/Industrial Survey, and that municipal light department managers were knowledgeable in this regard as well (Tr. 6, pp. 69-70, 80-81; Exh. HO-28). However, Mr. Boudreau stated that the survey information had not lead to identification of any cogeneration project within the current supply plan (Tr. 6, p. 81).

The Siting Council notes two weaknesses in MMWEC's process for compiling non-utility development projects. First, MMWEC failed to utilize survey and member manager information which could have been used to identify potential cogeneration projects in member systems' service territories in addition to those offered by developers. Here, MMWEC's set of non-utility

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44/ Mr. Boudreau stated that a contract of more than three years duration between an MMWEC member and an entity other than MMWEC was subject to review by the MDPU (Tr. 6, p. 107).

45/ Mr. Boudreau indicated that MMWEC's standard offer contract had been replaced by negotiations with non-utility developers (Tr. 6, pp. 68-69). Mr. Boudreau stated that although MMWEC's standard offer contract was designed to preclude the need for detailed negotiations, non-utility developers were unwilling to enter agreements without such negotiations (id.).

projects was based entirely on sources external to MMWEC, despite independent information obtained by MMWEC in its Commercial/Industrial Survey. Second, Mr. Boudreau stated that MMWEC did not utilize a Request for Proposals ("RFP") process in compiling its non-utility development resource set (Tr. 6, p. 68; Exh. HO-65). Mr. Boudreau stated that an RFP was determined to be unnecessary based on the large number of non-utility developers who had approached MMWEC with projects (id.).

Based on the foregoing, the Siting Council is concerned regarding MMWEC's approach to non-utility development compilation. Essentially, MMWEC has relied on a compilation process which appears to be completely informal. In previous supply plans reviewed by the Siting Council, electric companies have used formal mechanisms, such as solicitations, to initiate purchases of power from other utilities. 1989 MECo Decision, 18 DOMSC at 351; 1989 BECo Decision, 18 DOMSC at 256. In previous decisions, the Siting Council has found that a formal methodology -- the Request for Proposals ("RFP") process -- constituted an appropriate means of compiling a set of available Qualifying Facilities ("QF") purchases. 1989 BECo Decision, 18 DOMSC at 258; 1988 EUA Decision, 18 DOMSC at 115. Here, MMWEC has indicated that capacity purchases are necessary to ensure adequacy over the forecast period, and that purchases of power from non-utility developers, including QFs, are expected to provide major amounts of such capacity (Exh. HO-4, pp. VI-2 to VI-3). Yet, MMWEC's procedure for compiling this resource set is based largely on discussions and informal contacts, without a recognizable framework. The Siting Council is not persuaded that an electric company's capacity purchase objectives are well served by a process which is so largely unstructured. The Siting Council notes that a more formal process, such as an RFP, would communicate MMWEC's needs to the development community, could be more efficient for MMWEC in terms of time and resources invested, and could provide a level of preliminary screening that is not now found in MMWEC's compilation process.

Finally, the Siting Council notes that MMWEC's consultant, Synergic Resources Corporation ("SRC"), recommended that MMWEC consider implementation of all-source bidding (Exh. HO-75, p. ES-21). While the SRC recommendation was designed to facilitate additional consideration of C&LM options, the Siting Council notes that all-source bidding would by definition encompass purchases of power from other utilities and purchases from non-utility developers, and that such a bidding scheme would necessitate an organized, structured format. In sum, the Siting Council makes no finding regarding whether MMWEC has compiled an adequate resource set of purchases from non-utility developers.

With respect to new MMWEC-owned generation, MMWEC stated that its readiness was maintained through actions such as the siting study, but that MMWEC supply plans did not rely on this option (Exh. HO-73).[46] MMWEC stated that new-MMWEC owned generation was included in the supply plans primarily as a contingency response to less than anticipated non-utility development, and that municipally-owned generation was included mainly in terms of peaking capacity (id.; Tr. 6, pp. 67-68). MMWEC stated that it compiled the new MMWEC-owned and municipally-owned generation resource set by performing evaluations of (1) diesel generating technologies, (2) gas turbine generating technologies, (3) rentals of mobile turbine generators, and (4) suitable sites for base load and intermediate generating units such as a 150 MW fluidized bed coal-fired unit and a 225 MW or smaller gas/oil-fired combined

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46/ MMWEC stated that the basic objectives of its siting study were to identify and evaluate sites for new generating facilities in Massachusetts (Exh. HO-73). MMWEC stated that the siting study also was designed to provide detailed site and technical data, allow scheduling flexibility, and reduce lead time (Exh. HO-20).

cycle unit (Exh. HO-1, p. VI-20).[47] MMWEC also indicated that construction of small diesel units or gas turbines would be considered at MMWEC's Stony Brook Energy Center and at unspecified sites in member service territories (id., p. VI-13). In the past, the Siting Council has found that an adequate set of company-owned generation resources included a wide range of capacity factors, size increments, fuel types, and technologies. 1989 BECo Decision, 18 DOMSC at 257-258. In that MMWEC has compiled a resource set representing a range of base, intermediate, and peak load units, with a range of construction lead times, fuel types, and locations, the Siting Council finds, for purposes of this review, that MMWEC has compiled an adequate resource set of new MMWEC-owned generation.

MMWEC stated that 57 technologies were identified for consideration in its C&LM resource set (Exhs. HO-1, p. VI-20; HO-75, p. II-10).[48] MMWEC stated that these C&LM options were identified in its DSCA, a 1987-1988 study specifically designed to identify cost-effective C&LM options for each MMWEC member system (Exhs. HO-27; HO-75, p. I-1).[49] MMWEC stated that its C&LM options encompassed six load shape objectives, as follows: peak clipping, valley filling, load shifting, strategic

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47/ MMWEC stated that prior to development of the supply plan included in the current filing, the following MMWEC- and municipally-owned technologies were identified: fluidized-bed coal, oil/gas combined cycle, diesel peaking, mobile turbine generators, additional joint ownership in nuclear units, wind turbines, photovoltaics, conventional coal units, compressed air storage, fuel cells, and refuse-fired generation (Exh. HO-94). MMWEC did not indicate how these identified resource options were considered in the current filing (id.).

48/ MMWEC stated that the 57 C&LM options consisted of 23 residential programs and a total of 34 commercial and industrial programs (Exh. HO-30, p. II-3).

49/ MMWEC stated that its DSCA was performed by SRC (Exh. HO-27).

conservation, strategic load growth, and flexible load shape (Exh. HO-30, p. II-1). MMWEC stated that its load shape objectives were derived from load shape strategies proposed by the Electric Power Research Institute ("EPRI") (id., p. II-3).

Other sources of information used to identify and develop the 57 C&LM options included New England utilities, industry publications and research findings, product literature, discussions with industry experts, and SRC's data base (Exh. HO-30, pp. I-3 to I-4, II-3, II-18, V-5, XI-12). MMWEC stated that the DSCA also incorporated survey information based on responses obtained from MMWEC's residential, commercial and industrial customers, along with input from MMWEC member managers (Exhs. HO-30, p. II-3; HO-75, pp. II-1 to II-8).

In addition, Mr. Boudreau stated that MMWEC's Energy Service Performance Program was initiated as a pilot program, and that MMWEC currently is pursuing grant funding of a residential Electrical Thermal Storage ("ETS") pilot program (Exhs. HO-68, HO-97; Tr. 4, p. 54, Tr. 6, p. 37).[50]

Finally, Mr. Boudreau stated that MMWEC intends to monitor new C&LM technologies and programs with the objective of augmenting the set of C&LM options identified by the DSCA (Tr. 6, pp. 40, 55). Mr. Boudreau also stated that when individual members have successfully implemented a C&LM option, such as Hudson's residential light bulb program and Sterling's ETS program, MMWEC obtains that data with the objective of promoting that option in other members' service territories (id., pp. 14, 38-39).

In that MMWEC has presented an extensive number of C&LM options for this resource set, and has based these on a wide range of sources including those internal and external to MMWEC,

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50/ MMWEC stated that Boylston, Middleborough, Holden, Pascoag, Paxton, Sterling, and Templeton have agreed to participate in the proposed ETS pilot project (Exh. HO-68).

the Siting Council finds, for purposes of this review, that MMWEC has compiled an adequate set of C&LM resources.

Finally, MMWEC included five technologies in its emerging technologies resource set: circulating fluidized bed coal ("CFBC"), photovoltaics, fuel cells, wind power, and landfill gas (Exhs. HO-1, p. VI-21; HO-23; Tr. 2, p. 50). MMWEC asserted that compilation of this resource set was based on periodic evaluation of the viability of emerging technologies, and that these evaluations resulted in the inclusion of CFBC in MMWEC's Coal Mix project and siting study (Exh. HO-1, p. VI-21). In addition, Mr. Boudreau stated that a photovoltaic project was referred to MMWEC through the Massachusetts Executive Office of Energy Resources ("MEOER") (Tr. 2, p. 54). Finally, Mr. Boudreau stated that MMWEC "keeps track" of the emerging technologies by consulting industry literature, and that periodically MMWEC performs on-site evaluations of emerging technology projects (id., pp. 55, 57). Accordingly, the Siting Council finds, for purposes of this review, that MMWEC compiled an adequate set of emerging technologies. However, the Siting Council notes that more complete documentation of MMWEC's emerging technology identification processes would have lead to a greater understanding of MMWEC's methodology. While literature searches and on-site evaluations were mentioned by MMWEC, neither examples nor descriptions of searches and evaluations were provided.

iii. Conclusions on Available Resource Options

The Siting Council has found that MMWEC has identified a reasonable range of resource sets. In addition, the Siting Council has found that MMWEC has compiled adequate sets of purchases of power from other utilities, new MMWEC- and municipally-owned generation, C&LM options, and emerging technologies. The Siting Council makes no finding regarding whether MMWEC has compiled an adequate resource set of purchases from non-utility developers.

Accordingly, on balance, the Siting Council finds that MMWEC has demonstrated that it compiled a comprehensive array of available resource options.

b. Development and Application of Screening Criteria

To determine whether MMWEC developed and applied appropriate criteria for screening its array of available resource options, the Siting Council reviews the criteria developed and applied to each of MMWEC's resource sets. Thus, the Siting Council reviews the criteria which were developed and applied to MMWEC's five identified resource sets: (1) purchases of power from other utilities; (2) purchases of power from non-utility developers; (3) new MMWEC- and municipally-owned generation; (4) C&LM options; and (5) emerging technologies.

In general, MMWEC's screening process considered cost and non-cost aspects of available resource options (Exh. MM-1, p. 9). MMWEC stated that its major cost criterion was avoided cost, and that this criterion was applied to both generation and C&LM options (id.). MMWEC stated that it calculated avoided capacity and energy costs separately for each member, and that these costs were developed with a consistent set of economic assumptions such as inflation rates and fuel costs (Exh. HO-75). MMWEC stated that avoided capacity costs of members were calculated for each year of a 20-year period, and that energy costs were calculated for summer and winter peak and off-peak periods, and on a levelized basis over 10-year, 15-year, and 20-year periods (Exh. HO-64). However, MMWEC stated that inherent differences between generation and C&LM options necessitated separate sets of non-cost criteria for these options (Exh. MM-1, p. 9).

The following non-cost criteria were used for generating options: (1) status of the proposed development; (2) consistency with the planning horizon; (3) security and risk, (4) technical feasibility; (5) reliability; and (6) fuel supply and deliverability (Exh. HO-24) (a discussion of MMWEC's C&LM

option non-cost criteria is set forth below).

The preceding criteria were disaggregated by MMWEC, and additional information compiled based on more specific components of each non-cost criterion (Exh. HO-24). For example, under the non-cost criterion of reliability, MMWEC reviewed a proposal's capacity factor, dispatchability, and the proponent's track record (id.). Under the fuel supply and deliverability criterion, MMWEC reviewed the project's fuel acquisition status, transportation arrangements, and fuel cost assumptions (id.).

MMWEC has set forth criteria which address both cost and non-cost aspects of generation options, and has addressed specific underlying components of the non-cost criteria which describe important attributes of generation options. Accordingly, based on the foregoing, the Siting Council finds, for purposes of this review, that MMWEC developed appropriate criteria for screening generation resource options.

MMWEC indicated that purchases of power from other utilities were to be obtained by monitoring excess capacity in the region (Exh. MM-1, p. 6). MMWEC stated that its monitoring lead to consideration of several options, including an extension of its Point Lepreau contract, a purchase from NU, and a 15 MW purchase from Cleary 9 (id., pp. 6-7; Exh. HO-1, p. VI-19).

Mr. Boudreau stated that the Point Lepreau, NU, and Cleary 9 options were evaluated using avoided costs (Tr. 2, pp. 40-41). However, MMWEC provided no evidence demonstrating that these purchases were screened using its non-cost criteria (id., pp. 40-42; Exh. HO-1, pp. VI-14; Exh. MM-1, pp. 6-7, 9-14). While Mr. Boudreau testified in general terms regarding an application of MMWEC's screening process to the Point Lepreau contract extension, stating "if you go through the screening criteria, (the Point Lepreau generating plant) had a lot of things going for it," and that Point Lepreau had demonstrated "very good" availability, and that it posed few concerns in terms of "uncertainties" and "delays," Mr. Boudreau did not

provide any specific references to screening procedures based on an application of MMWEC's six non-cost criteria (Tr. 6, p. 112). Similarly, MMWEC provided no evidence demonstrating that the NU or Cleary purchases had been screened using the identified non-cost criteria (id.).

While general statements can provide background information regarding an application of a company's screening process, the Siting Council requires specific testimony and/or documentation which clearly demonstrate that the procedures set forth by a company have been applied to screening identified resource sets. 1989 MECo Decision, 18 DOMSC at 360-361; 1988 EUA Decision, 18 DOMSC at 122. Here, MMWEC failed to provide specific documentation demonstrating that its non-cost criteria had been applied to purchases of power from other utilities (Exh. HO-1, pp. VI-14; Tr. 2, pp. 40-42; Exh. MM-1, pp. 6-7, 9-14).

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has failed to establish that it applied appropriate criteria for screening its set of available purchases of power from other utilities. In making this finding, the Siting Council recognizes that in some cases pressing time constraints may preclude a formal application of criteria, but that does not excuse the lack of a proper screening process. The Siting Council is aware that purchases from other utilities may also consist of longer term transactions -- which are not as constrained -- and that these purchases are fully eligible for consideration under all aspects of a company's supply planning process, including a full application of its screening criteria.

MMWEC stated that purchases of power from non-utility developers were screened with the same criteria that had been applied to purchases of power from other utilities and to new MMWEC- and municipally-owned generation (Exh. HO-24). MMWEC stated that its criteria were applied on a qualitative basis, and that its screening criteria were not assigned weights (id.; Tr. 3, p. 100).

The ANR project -- a non-utility development project in Springfield -- was purchased by 24 members following MMWEC's recommendation (Exh. HO-95). MMWEC provided a series of memoranda as evidence of the process it applied in evaluating the ANR project (id.). The minutes from the February 11, 1987 meeting of MMWEC's Power Planning and Operations Committee identified "advantages" of the ANR project such as (1) its proximity to MMWEC, which would facilitate monitoring of the project, (2) collaboration between a municipality -- Springfield -- and the municipalities represented by MMWEC, and (3) the performance standards set for this project, which established a strong precedent for future third-party development transactions (id.). In a series of memoranda (dated April 2, May 5, and June 3, 1987) between MMWEC's Power Management Division and the Power Planning and Operations Committee, MMWEC emphasized the below-avoided-cost aspects of the ANR transaction, but made no mention of the project's attributes in terms of non-cost criteria (id.). In a September 17, 1987 memorandum to members -- which recommended the project for purchase -- MMWEC indicated that criteria for selecting third-party projects had included economic benefit, minimum risk, and a "high probability of the unit going commercial in the anticipated time frame" (id.). In addition, the September 17 memorandum reemphasized the avoided cost benefits of the ANR project (id.).

The Siting Council notes its concern regarding MMWEC's lack of application of non-cost criteria to the ANR project. MMWEC's documentation regarding this project included only one reference to the stated non-cost criteria, and this was a very brief reference to risk- and timing-related issues only (id., Exh. HO-24). MMWEC provided no evidence demonstrating that the six non-cost criteria specified by MMWEC had been used to accomplish a full, straightforward assessment of the ANR project (id). Further, several of the "advantages" listed in the February 11, 1987 memorandum included factors which were outside

the scope of MMWEC's stated criteria (id.). The inclusion of unrelated advantages is no substitute for a systematic evaluation based on a company's stated criteria and, in fact, calls into question the integrity of a company's process. While Mr. Boudreau stated that the ANR project was selected based on an application of the company's non-cost criteria, MMWEC has failed to establish that its non-cost criteria were applied to the ANR project (Tr. 2, p. 95).

Despite MMWEC's claim that numerous discussions took place with non-utility developers, MMWEC provided no documentation indicating how many or what types of projects had been screened out with an application of its non-cost screening criteria (Exhs. HO-1, pp. VI-9 to VI-13; HO-4, pp. VI-3 to VI-4). In addition, MMWEC failed to provide examples of matrices, project rankings, or other evidence indicating that qualitative scoring based on the non-cost criteria had actually been performed (Exhs. HO-1, HO-24; Exh. MM-1).

In previous decisions, the Siting Council has found that electric companies developed and applied appropriate criteria for screening non-utility QF projects based on RFP and negotiations processes as overseen by the MDPU. 1989 MECo Decision, 18 DOMSC at 351; 1989 BECo Decision, 18 DOMSC at 259-260; 1988 EUA Decision, 18 DOMSC at 118. Here, serious concerns are raised regarding MMWEC's failure to demonstrate that it is following a well-defined process.

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has failed to establish that it applied appropriate criteria for screening its set of available non-utility development projects.

MMWEC stated that the same non-cost criteria applied to other generating options were applied to new MMWEC- and municipally-owned generation options (Exh. HO-73).[51]

However, Mr. Boudreau stated MMWEC considered MMWEC-owned generation as a "last-resort" due to its level of risk to MMWEC members (Tr. 2, p. 61). Mr. Boudreau stated that MMWEC-owned generation requires "take-or-pay, hell-or-high water" contracts which obligate participating members for payment regardless of the project's actual performance (Tr. 3, p. 105). Nonetheless, MMWEC included new-MMWEC owned generation as a contingency option in the event of an unsatisfactory rate of non-utility development (Exh. HO-73).

Mr. Boudreau stated that MMWEC neither encouraged nor discouraged municipally-owned generation (Tr. 6, p. 67). However, Mr. Boudreau stated that non-utility developers were not offering peaking resources to members, and that depending on location, a municipally-owned project could provide benefits to a member faced with transmission constraints (id., p. 68; Tr. 2, pp. 92, 94).

MMWEC indicated that four municipally-owned peaking units were included in its current supply plan: the Peabody and Ipswich gas turbines, and the Hudson and Littleton diesels

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51/ MMWEC stated that 12 MMWEC- and municipally-owned generation options were identified prior to development of the supply plan filed with the Siting Council, and that these 12 options were screened with the following criteria (1) maturity of the technology, (2) cost competitiveness, (3) ability to finance and reasonableness of financing rates, (4) overall risk, in terms of project performance, (5) environmental, in terms of ability to permit and environmental impacts (Exh. HO-94). Based on this screening, seven resource options were eliminated from consideration in the base generation expansion plan, including: additional joint ownership in nuclear units, construction of wind turbines, participation in a proposed photovoltaic unit, conventional coal-fired generation, compressed air storage, fuel cells, and refuse-fired generation (Exh. HO-94).

(Exh. HO-4).[52] Mr. Boudreau stated that these projects were proposed by their respective light departments, and that MMWEC had screened them with its process (Tr. 2, pp. 91, 94-95). Mr. Boudreau stated that in the instance of the municipally-owned Peabody turbine, MMWEC reviewed the project's technical feasibility, time frame, reliability, fuel source, siting, and financing (id., p. 91).

Again, however, the Siting Council notes that MMWEC failed to demonstrate that its screening criteria were applied to the foregoing municipally-owned projects. Mr. Boudreau's general remarks about the Peabody turbine were not supported with any specific information, nor did MMWEC provide any evidence that the Ipswich, Hudson, or Littleton projects had been rated based on an application of MMWEC's identified criteria (Exh. HO-4, p. VI-3).

MMWEC has established a reasonable set of criteria for assessing the relative merits of individual generation projects. A consistent application of these criteria would provide MMWEC with a sound basis for analyzing each project's non-cost attributes. The Siting Council notes that a company is obligated to demonstrate that it has applied its screening criteria as part of a comprehensive supply planning process. 1989 MECo Decision, 18 DOMSC at 338; 1989 BECo Decision, 18 DOMSC at 250-260; 1988 EUA Decision, 18 DOMSC at 111-123. MMWEC repeatedly has failed to provide persuasive evidence that its criteria are consistently applied. For example, in addition to the foregoing instances, when asked to describe how MMWEC systematically applied its screening criteria, Mr. Boudreau offered general references to industry literature and brief comments regarding risk-related concerns (Tr. 2, pp. 70-71). When asked to provide a written description of its screening

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52/ MMWEC indicated that the Peabody, Ipswich, Hudson, and Littleton generating projects are scheduled to commence operating during summer of 1990 (Exh. HO-4).

process, MMWEC described screening which took place "prior to development of the supply plan filed with the Siting Council" and which was based on a set of criteria different from its six non-cost criteria (Exhs. HO-1, pp. VI-22 to VI-23; HO-24, HO-94; Exh. MM-1, pp. 9-12) (see Footnote 51, above).

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has failed to establish that it applied appropriate criteria for screening new MMWEC- and municipally-owned generation options. In addition, the Siting Council notes that inclusion of a criterion regarding transmission benefits would have strengthened MMWEC's screening process by recognizing the transmission benefits attributable to certain local generating alternatives.

MMWEC developed its non-cost C&LM screening criteria based on a two primary inputs (1) member system input, and (2) analysis of customer and load characteristics (Exh. HO-30, p. II-1).

As part of the DSCA, MMWEC members qualitatively assessed (1) the relative importance of MMWEC's six load shape objectives, (2) the applicability of 12 criteria proposed for

screening C&LM options,[53] and (3) the applicability of each of the 57 C&LM options to the member's system.[54]

In addition, as part of the DSCA, customer characteristics (such as end use saturations; the numbers of residential, commercial, and industrial customers; sales per customer) and load characteristics (such as peak load growth rates and load factors) were compiled for each member and on a system-wide basis (id., pp. II-1, II-3, II-9). Residential customer characteristics were obtained from existing MMWEC survey data, while commercial and industrial customer characteristics were based on preliminary data from MMWEC's 1988 MMWEC Commercial and Industrial Survey (id., p. II-8).

Using the preceding inputs, six screening criteria were selected: (1) proven performance (efficacy based on field testing and load research); (2) MMWEC member rating (the overall qualitative rating a C&LM option received from members); (3) estimated cost-effectiveness (from the utility's perspective);[55] (4) marginal impact (the difference between utility sponsorship and natural market activity); (5) customer acceptance (no negative effects on safety, reliability, or convenience); and (6) load impact (persistence of impacts, and

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53/ The 12 criteria proposed for C&LM screening included: consistency with utility objectives, customer acceptance potential, regulatory concerns, targeting significant market segments, load shape objectives, magnitude of load impact, load factor impact, reliability of load impact, customer service objectives, targeting competitive markets, resource requirements, and type of market (Exh. HO-30, p. II-4). MMWEC stated that 21 members rated the foregoing criteria (id.).

54/ Qualitative ratings were recorded on a scale of 1 to 10, with 1 representing "not important" and 10 representing "very important" for criteria ratings, and with 1 representing "not applicable" and 10 representing "very applicable" for load shape and C&LM option ratings (Exh. HO-30, Tables 1-3).

55/ MMWEC stated that cost-effectiveness was calculated using general cost and load impact estimates (Exh. HO-66). MMWEC stated that more precise cost-effectiveness tests were performed later under member-specific screening (Exh. HO-76).

partiality toward technological/contractural measures as opposed to behavioral measures) (id., pp. II-3, II-8 to II-10; Exh. HO-66; Exh. MM-1, p. 12).

MMWEC's consultant, SRC, stated that MMWEC member preferences were represented fully by the six screening criteria (Exh. HO-30, p. II-10). SRC claimed that (1) since the members had rated customer acceptance as the most important factor it became a separate criterion, (2) that MMWEC member ratings of individual C&LM options were explicitly considered, and (3) that utility objectives and resource requirements were included in the cost-effectiveness criterion (id.).

Next, the selected criteria were applied to the set of 57 identified C&LM options according to a qualitative scoring scheme (Exh. HO-30, pp. II-10 to II-11).[56] MMWEC contended that the costs of fully evaluating all 57 C&LM were prohibitive, thus the DSCA was designed to select the 20 most highly ranked options (Exhs. HO-66; HO-75, p. ES-3). MMWEC stated that the 37 measures remaining were screened out because they did not rank high enough based on an application of the six criteria (Exh. HO-66).

The 20 highly ranked options were then subjected to further screening on a member-specific basis (Exh. HO-76). SRC asserted that major differences between the member systems, such as their customer and load characteristics, marginal costs, and rates warranted separate analyses of the 20 options for each member (Exh. HO-75, pp. ES-3, ES-11).

The foregoing member-specific screening provided major outputs including (1) a technical performance estimate, and (2)

56/ For each criterion, each C&LM option was was scored with one of the following ratings: much above average, above average, much below average, or below average (Exh. HO-30, pp. II-10 to II-11).

a cost-effectiveness estimate (Exh. HO-76).[57] Technical performance estimates were based on MMWEC load shape data as refined by SRC (Exhs. HO-29; HO-75, pp. II-12 to II-17).[58] SRC reported that a series of building type and end use load shapes were developed and calibrated to match the individual load characteristics of each MMWEC member (Exhs. HO-29, p. I-7; HO-75, p. II-14).[59] Load impacts of C&LM options were simulated based on calibrated load shapes, using engineering simulations, econometric rate response models, data from utilities with comparable load characteristics, and load impact studies conducted by EPRI and MMWEC (Exhs. HO-29, p. IV-1; HO-75, p. II-17).[60]

57/ Outputs also included estimated participation rates, energy savings, peak demand reductions, program costs, and rate impacts (Exh. HO-76).

58/ SRC stated that load shapes were developed for eight end uses: heating, cooling, ventilation, lighting, water heating, refrigeration, cooking, and miscellaneous (Exh. HO-29, pp. II-3 to II-4). Load shapes also were developed for 11 building types: residential single family; commercial office, restaurant, retail, grocery, warehouse, school, hospital, nursing home, hotel/motel; and industrial assembly/light manufacturing (id.). In addition, load shapes were developed for both new and existing building types (id., p. II-5). Data sources for load shape development included other utilities, MMWEC forecasting assumptions, and national studies (Exh. HO-75, p. II-14).

59/ SRC stated that calibration was designed to ensure the reasonableness of its load shape simulations, and that its simulations were adjusted to conform with actual load and sales data (Exh. HO-29, p. III-1).

60/ MMWEC stated that it now has base case and C&LM case load shapes for each member system, and that these load shapes are available for use in future planning efforts (Exh. HO-75, p. II-17).

A C&LM option's cost-effectiveness was determined in terms of: (1) the utility test, and (2) the participant test (Exh. HO-31).[61] The utility test compared the option's avoided fuel and capacity benefits to its program costs, establishing any economic advantage to the utility (Exh. HO-76). The participant test established participant benefits, including decreased energy, demand, and equipment costs (id.).

The utility test and the participant test were expressed in terms of net present value ("NPV") and the benefit/cost ("B/C") ratio (id.). MMWEC stated that to be considered cost effective for a member's system, an option had to achieve a B/C ratio greater than or equal to 1.0 for both tests (id.). MMWEC's witness, Mr. Short, stated that if an option passed both the utility test and the participant test it would be included in the member's and MMWEC's supply plans (Tr. 4, p. 41). Mr. Short also stated that if an option passed the foregoing cost-effectiveness tests, then MMWEC assumed that the member system would implement that option (id.). Overall, MMWEC indicated that from 2 to 4 C&LM options were rated cost effective for 10 member systems, from 5 to 7 options were cost effective for 19 members, and that from 8 to 9 options were cost effective for 4 members (South Hadley omitted) (Exh. HO-76).

61/ Cost-effectiveness also included (1) the non-participant test, which estimated the effects of a C&LM option on non-participants, and (2) the all-ratepayer test, which estimated effects on rates and net revenue (Exh. HO-76).

C&LM program designs were based on market research data obtained from customer surveys (Exh. HO-75, pp. II-20 to II-21).[62] MMWEC stated that market research data was used to design programs which would achieve optimal levels of participation (id., p. II-20).

MMWEC claimed that implementation of cost effective C&LM options would achieve MMWEC-wide reductions of 262 gigawatt hours ("GWH") of energy, 60 MW of non-coincident winter peak load, and 66 MW of non-coincident summer peak load by the year 2009 (id., p. ES-11).

While MMWEC's C&LM criteria development process exhibits significant strengths, the Siting Council notes one weakness -- the use of MMWEC member ratings of the C&LM options. Mr. Boudreau stated that MMWEC members may not be experts in C&LM, but that members were knowledgeable in terms of customers and what they considered to be applicable to their respective systems (Tr. 2, pp. 100-101). In addition, Mr. Boudreau stated that a low member rating would not exclude a C&LM option from consideration, and that the MMWEC member rating was considered to be the least important factor in the rating scheme (id., pp. 99, 107). However, the Siting Council notes that a constraint within the DSCA was that member utility managers were relatively uninformed regarding C&LM programs and that the managers had to be guided through the analysis procedures (Exh. HO-75, p. ES-3). In fact, one of the stated goals of the DSCA process was to increase the member managers' awareness of C&LM applications, benefits, and analytical techniques (id., p. ES-4). In addition, while Mr. Boudreau testified that member ratings were the least important criterion, there is no evidence of weighting or ranking of any criteria and in fact, there is

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62/ SRC stated that market penetration of C&LM options were forecasted using its COMPASS model, and that COMPASS was also used to calculate B/C ratios and program costs (Exh. HO-75, pp. IV-3 to IV-4).

evidence that member ratings were given explicit consideration. While the Siting Council recognizes the major improvement that the DSCA represents over previous MMWEC planning efforts, the Siting Council is of the opinion that MMWEC member ratings are of limited value to the C&LM criteria development process in the absence of sufficient expertise to perform such ratings.

Nonetheless, the Siting Council notes that MMWEC developed its C&LM screening criteria based on consideration of internal factors such as load shape objectives and customer characteristics, and that MMWEC received information from sources external to MMWEC such as SRC. The Siting Council further notes that MMWEC's screening criteria were generally well-founded in terms of their ability to assess the attributes of C&LM options, with the previously noted exception of the member rating criterion. In addition, MMWEC applied its criteria in conjunction with an identified scoring scheme, yielding a matrix of rated C&LM options. Finally, the Siting Council notes that following preliminary screening more refined assessments of C&LM options were performed using additional technical and economic thresholds and market research.

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has developed and applied appropriate criteria for screening its set of available C&LM options.

Finally, MMWEC stated that emerging technologies were evaluated with respect to their viability (Exh. HO-1, p. VI-21). Mr. Boudreau stated that technology alone is not the basis for deciding whether a project is "viable choice," but that MMWEC's screening process considers "the technological viability of particular proposals" (Tr. 2, p. 59). Mr. Boudreau offered no definition of viability, but mentioned viability in a discussion of cost, timing, maturity of a technology, risk, financing, and size (id., pp. 59, 60, 68, 69, 71).

Mr. Boudreau stated that with one exception, MMWEC's emerging technology projects "were either eliminated through some form of screening or the projects didn't go forward" (id., p. 56). Mr. Boudreau stated that the exception -- the Gull

Mountain landfill gas project -- was still undergoing evaluation (id.).

While Mr. Boudreau's comments indicated that MMWEC had undertaken some type of screening, MMWEC provided no supporting evidence to demonstrate screening. In addition, no matrices or project rankings were provided to indicate that MMWEC's non-cost criteria had been applied in any screening activities of emerging technology options.

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has failed to establish that it applied appropriate criteria for screening its set of emerging technology options.

The Siting Council has found that MMWEC developed appropriate criteria for screening all generation options and that MMWEC developed and applied appropriate criteria for screening C&LM options. However, the Siting Council has also found that MMWEC has failed to establish that it applied these screening criteria to screening purchases of power from other utilities, purchases of power from non-utility developers, new MMWEC- and municipally-owned generation, and emerging technologies. Therefore, while the Siting Council finds that MMWEC has developed appropriate criteria for screening its array of available resource options, on balance we find that MMWEC has failed to establish that it applied these criteria for screening its array of available resource options.

In making this finding, the Siting Council notes that MMWEC repeatedly failed to demonstrate that it had applied its stated non-cost criteria in the screening of generating resources. The Siting Council is of the opinion that non-cost factors have become increasingly important to electric utility planning decisions, and as a consequence the process which applies these factors must be dynamic and applied in a thoroughly consistent manner. Although MMWEC developed appropriate non-cost criteria for screening generating resources, virtually no evidence was submitted to indicate that these non-cost criteria had been applied in screening. In a

previous decision, the Siting Council has criticized a company for failure to implement a major component of its supply planning process. 1987 BECo Decision, 15 DOMSC at 344, 347. Here, we find that MMWEC's failure to apply an otherwise improving process for screening resource options continues to deprive ratepayers of potentially valuable resource opportunities. Clearly, MMWEC's supply planning process will benefit from a reexamination of the application phase of its non-cost screening process to determine what steps are necessary to achieve a full level of implementation.

c. Conclusions on Identification of Resource Options

The Siting Council has found that MMWEC has demonstrated that it compiled a comprehensive array of available resource options. The Siting Council also has found that while MMWEC has established that it developed appropriate criteria for screening its array of resource options, it failed to establish that it applied these criteria.

While we recognize the significant strides that MMWEC has made in developing and applying appropriate criteria for C&LM options, we also note that MMWEC's failure to establish that it applied appropriate criteria to generating options is a serious flaw affecting every aspect of its supply planning process. Accordingly, on balance, the Siting Council finds that MMWEC has failed to identify a reasonable range of resource options.

2. Evaluation of Resource Options

The Siting Council reviews MMWEC's resource evaluation process to determine whether MMWEC (1) developed a resource evaluation process which fully evaluates all resource options, including the treatment of all resource options on an equal footing, and (2) applied its resource evaluation process to all of the resource options identified in Section III.E.1, above. This review addresses MMWEC's evaluation process described in Section III.C, above, as it was applied in development of MMWEC's integrated resource plans.

a. Objectives of the Resource Evaluation Process

As part of its statutory mandate "to provide a necessary energy supply for the commonwealth with a minimum impact on the environment at the lowest possible cost" (G.L. c. 164, sec. 69H), the Siting Council determines whether "projections ... of the capacities for existing and proposed facilities ... include an adequate consideration of conservation and load management." G.L. c. 164, sec. 69J. In addition, the Siting Council reviews a company's supply plan to determine whether it is the result of an adequate consideration of potential risks. See 1989 BECo Decision, 18 DOMSC at 270-278.

MMWEC has stated that the major objectives of its supply planning process are to minimize the long term costs of providing electric service, minimize risks in terms of cost and adequacy, and to achieve diversity in terms of fuels and units (Exh. MM-1, p. 3). Thus, in reviewing MMWEC's resource evaluation process, the Siting Council addresses MMWEC's supply plan in terms of its cost, risk minimization, and diversity objectives.

i. Cost

MMWEC stated that its supply planning process was designed to treat all resource options on an equal basis (Exh. HO-1, p. VI-17). In particular, MMWEC contended that its avoided cost methodology allowed for an evaluation of resource options on an equal footing (Exh. HO-22). In support of this contention, MMWEC claimed that its economic analyses were consistent because the same avoided costs were used to evaluate the economic benefits of both C&LM and generating options (id.). In addition, MMWEC stated that its avoided costs were developed under a single set of assumptions, including assumed inflation rates, fuel prices, and discount rate (Exh. HO-1, p. VI-21). Finally, MMWEC claimed that avoided costs were used to test the economic performance of resource options, and that

resource options which would increase long run costs based on avoided cost tests were eliminated (id., p. VI-22).[63]

While MMWEC's avoided cost methodology per se exhibited notable strengths, significant differences occured in the actual evaluation of resource options based on an application of MMWEC's avoided costs. For example, MMWEC's cost analysis of C&LM options was based on an application of the B/C ratio criterion. A C&LM option was required to achieve a B/C ratio of 1.0 or greater (i.e., show that its addition does not increase long-run power supply costs), or it would be rejected (Exh. HO-76). For example, Marblehead's "Industrial Lighting Retrofit Program for New and Existing Customers" -- a C&LM option -- was excluded from Marblehead's supply plan based on its B/C ratio of 0.94 (id.).[64]

Yet, generating options with cost characteristics similar to the Marblehead C&LM option received more favorable treatment than the Marblehead option. For example, analyses of the Point Lepreau generating plant contract extension -- which involved several scenarios including the base case and the base case "recommended amount" -- showed that the addition of this generating option would increase long-run power supply costs. If subjected to the cost analysis applied to C&LM options, the Point Lepreau contract extension option -- particularly under the "recommended amount" scenario -- would fail the B/C ratio

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63/ MMWEC stated that resource options which exceeded avoided costs were excluded from integrated resource plans (Exh. HO-1, p. VI-23). However, the record indicates that such resource options generally were retained for future consideration (id.).

64/ MMWEC's C&LM cost-effectiveness tests required a B/C ratio of 1.0 or greater for both the utility test and the participant test (Exh. HO-76). Marblehead's "Industrial Lighting Retrofit Program for New and Existing Customers" achieved a B/C ratio of 0.94 for the utility test and 2.59 for the participant test (id.).

cost-effectiveness test because its addition to the supply plan would increase the long-run cost of supply (Exh. MM-3, Attachment JJB-2, pp. 8-13). While the Siting Council notes that the Point Lepreau extension would achieve a B/C ratio slightly below 1.0, it is clear that its B/C ratio would nonetheless fall short of meeting this cost-effectiveness threshold. However, while Marblehead's Industrial Lighting option fell short of that threshold and was rejected, the Point Lepreau extension fell short and was recommended for purchase by MMWEC (id.; see also Tr. 6, p. 120).

While MMWEC acknowledged that the Point Lepreau extension would increase long-run power supply costs under several important scenarios, MMWEC claimed that Point Lepreau offered offsetting benefits. For example, MMWEC argued that the contract extension provided: (1) "insurance" against high oil prices; (2) high availability, which lowered members' capability responsibility; and (3) a continued relationship with New Brunswick Power, an entity which could be a source of capacity and energy at some point in the future (Exh. MM-3, Attachment JJB-2, pp. 10-11). However, the Siting Council notes that C&LM options also would reduce utility exposure to fuel price shocks, provide benefits in terms of reduced capability responsibility, and could provide capacity and energy savings in the future.[65] Yet, C&LM options with cost characteristics similar to Point Lepreau -- that is, B/C ratios below 1.0, such as Marblehead's Industrial Lighting option -- were not afforded an opportunity to present their offsetting non-cost benefits.

MMWEC stated that its avoided costs included an added $12.00/kW year to account for transmission capacity charges

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65/ MMWEC indicated that C&LM options which reduced peak load provided the added benefit of reducing capability responsibility by a greater amount, due to decreased reserve requirements (Exh. MM-3, Attachment JJB-1, p. IV-1). MMWEC stated that for every 1 kW of C&LM-derived peak load reduction, 1.22 kW of capacity reduction would be realized for a member system (id.).

(Exhs. HO-75, p. II-21; HO-96). Thus, C&LM options which would defer transmission capacity investments effectively were credited with that amount of savings (Exh. HO-96). However, the Siting Council notes that MMWEC also identified member-specific transmission capacity costs, which ranged ranged from a low of $3.08/kW year for Peabody to a high of $25.09/kW year for Hull (Exh. HO-22, Attachment 8A). Thus, the Siting Council notes its concern regarding MMWEC's use of $12.00/kW year, an amount which may not reflect the real avoided cost of transmission capacity of member systems, and which could lead to misleading economic evaluations. Accordingly, the Siting Council ORDERS MMWEC, in its next forecast filing, to fully explain and justify the avoided transmission capacity costs assigned to member systems for economic evaluation purposes, including (a) a complete discussion of the methodology used to derive avoided transmission capacity costs, and (b) a full explanation of how transmission capacity cost differences between members were taken into account by the methodology.

MMWEC also asserted that implementation of C&LM options would offer no significant savings to member systems' distribution capacity costs (Exh. HO-96). While MMWEC stated that C&LM-derived reductions in peak load were significant in the aggregate, MMWEC argued that savings at the individual customer level were trivial (id.). Thus, MMWEC claimed that C&LM-derived reductions in peak loads were unlikely to produce any significant capital cost savings to distribution systems (id.). In addition, MMWEC stated that distribution components were available only in standard sizes which would not accomodate down-sizing due to C&LM effects (id.).

The Siting Council accepts MMWEC's major argument that utility distribution systems may not lend themselves to easily identifiable cost savings when considering the economic effects of C&LM options. Yet, the Siting Council recognizes that electric service provided by utilities is dynamic, and that distribution systems are subject to expansion, upgrade, and modification with subsequent cost impacts to customers. The

Siting Council also is aware that other electric utilities in the region have assigned positive economic value to distribution capacity deferrals due to the effects of company-sponsored C&LM options. Accordingly, the Siting Council ORDERS MMWEC in its next forecast filing to review methodologies which evaluate the economic benefits of C&LM options on utility distribution systems, and to report to the Siting Council on the findings of its review.

MMWEC claimed that the benefits of transmission line loss reductions due to C&LM programs were reflected in MMWEC's avoided costs (id.). However, while MMWEC conceded that distribution line loss reductions attributable to C&LM options were important, MMWEC stated that its current methodology left these out, and that future C&LM cost analyses will include these benefits (id.). While MMWEC acknowledged that the omission of these benefits was inadvertent and would be rectified, the Siting Council notes that omission of distribution line loss benefits in the economic evaluation of C&LM options has potentially serious consequences. Line losses are proportionally greater at the distribution system level than the transmission system level, so this omission unquestionably denied a positive economic benefit to C&LM options, effectively placing C&LM options at a further competitive disadvantage in relation to other alternatives under consideration in the current supply plan.

SRC -- MMWEC's DSCA consultant -- stated that although the cost analysis of C&LM options was based on a single set of avoided costs, the economics of C&LM options were sensitive to costs (Exh. HO-75, pp. ES-21 to ES-22). SRC therefore recommended that MMWEC evaluate C&LM options with more than one set of avoided costs (id.). Mr. Boudreau stated that MMWEC intends to evaluate C&LM options with more than one set of avoided costs "soon" (Tr. 6, pp. 124-125). The Siting Council notes that a more complete evaluation of C&LM options would have included sensitivity testing and economic assessments under a number of avoided cost scenarios. By basing its C&LM cost

analysis on a single set of avoided costs, MMWEC unduly limited the scope of its resource evaluation efforts and therefore raised the question of whether additional cost-effective C&LM options were excluded.

Finally, the Siting Council notes that limitations placed on MMWEC's DSCA may have omitted potentially cost-effective C&LM options. By restricting the DSCA to an evaluation of 20 C&LM options, MMWEC constrained C&LM's potential contribution to supply plans. In fact, SRC indicated that some of the C&LM options that were excluded due to the 20-option limit may have represented significant C&LM potential for MMWEC and member systems (Exh. HO-30, p. II-1).

Based on the foregoing points -- the rejection of C&LM options with B/C ratios below 1.0, while including generating options in supply plans when those options increased long-run power supply costs; the failure to consider non-cost benefits of C&LM options while considering these benefits in evaluations of generating options; the omission of distribution line loss benefits to C&LM options; the lack of sensitivity testing of C&LM options; and the establishment of a somewhat arbitrary limit of 20 C&LM options for review leading to potential exclusion of cost-effective C&LM options -- the Siting Council finds that MMWEC's methodology for achieving its cost objective is not appropriate. In addition, due to the rejection of C&LM options with B/C ratios below 1.0, while including in some instances generating options in supply plans when the addition of those options increased total power supply costs, and due to the omission of distribution line loss benefits to C&LM options, the Siting Council finds that MMWEC has failed to establish that its methodology treats all resource options on an equal footing.

ii. Risk Minimization

In developing the current supply plans, MMWEC focused on two areas of risk (1) minimizing cost-based risk, and (2) minimizing adequacy-based risk.

Mr. Boudreau stated that MMWEC presently has no formal

risk analysis procedures in place (Tr. 2, p. 35). However, Mr. Boudreau stated that MMWEC intends to add risk analysis procedures "within the next year or so" (id.). Although MMWEC asserted that adequacy-based risks were addressed by its contingency planning process, it conceded that its evaluation of the likelihood of an adequacy-based contingency, as well as the level of such contingencies, would be more fully identified with improved risk analysis procedures (Tr. 3, p. 4) (For a description of MMWEC's present approach to contingency planning, see Section III.D.1.c., above). The Siting Council notes that other large electric companies have implemented systematic risk analysis procedures using quantitative and/or scenario-based methodologies. 1989 MECo Decision, 18 DOMSC at 341-342; 1989 BECo Decision, 18 DOMSC at 238-245. In addition, electric company forecasts have addressed adequacy issues and forecasting uncertainty with a band-width approach, i.e., development of a plausible range of forecasts around a base case forecast. 1989 MECo Decision, 18 DOMSC at 341-342; 1989 BECo Decision, 18 DOMSC at 238-239, 271-272.

MMWEC's major cost-based risk minimization strategy was based on acquisition of performance-based contracts from non-utility developers. Mr. Boudreau stated that MMWEC had a "bias" in favor of non-utility development because their performance-based contracts reduced financial risk to members (Tr. 2, p. 61). By contrast, new MMWEC-sponsored projects would require members to assume higher risks due to "take-or-pay, hell-or-high-water contracts" (Exh. MM-3, Attachment JJB-1, p. I-2; Exh. HO-73).

The Siting Council notes that performance-based contracts are an appropriate and reasonable means of minimizing cost-based risk. However, an analysis of non-utility project success rates would have allowed MMWEC to approach its objective of minimizing cost-based risks on a more comprehensive basis. Analytic information would have provided MMWEC with a more substantial basis for pursuit of an appropriate level of non-utility development projects, bolstering MMWEC's ability to secure the

benefits of performance-based contracts in light of individual project contingencies. In addition, to the extent that MMWEC will add non-utility development capacity over the forecast period, an analysis of non-utility project success rates is entirely consistent with the MMWEC objective of minimizing adequacy-based risks.

Under the current configuration, MMWEC's primary response to failure of non-utility development projects would be to undertake new MMWEC-owned construction.[66] Yet, this response offers no performance-based safeguards, and instead would impose burdensome take-or-pay obligations on members. While new-MMWEC-owned construction may present a possible solution to system adequacy concerns, it offers little in terms of alleviating cost-based risk concerns.

While the Siting Council has found that MMWEC's action plan is sufficient to ensure adequacy in the short run, here the Siting Council notes its serious concerns regarding the effect that new MMWEC-owned generation could have on stated risk-minimization objectives. The Siting Council notes that combinations of additional C&LM and increased levels of non-utility development also would provide a reasonable response to contingencies while ensuring that members would not be exposed to unnecessary levels of risk. In fact, Mr. Boudreau identified specific advantages available from C&LM options including rapid start-up and flexibility (Tr. 2, p. 63). The Siting Council has consistently endorsed supply planning that included C&LM options as a response to contingencies. 1989 MECo Decision, 18 DOMSC at 345-346; 1989 BECo Decision, 18 DOMSC at 244-245, 247; 1988 EUA Decision, 18 DOMSC at 109; 1985 MECo Decision, 12 DOMSC at 230-231. In addition, the Siting

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66/ The Siting Council notes that MMWEC's hierarchical scheme considers purchases from utilities prior to purchases from non-utility developers -- an approach which runs counter to MMWEC's stated "bias" in favor of non-utility development.

Council notes that electric companies have included increased amounts of non-utility generation as a response to contingencies. 1989 MECo Decision, 18 DOMSC at 345-346; 1989 BECo Decision, 18 DOMSC at 244-245, 247.

Accordingly, based on the foregoing points -- lack of risk analysis procedures, absence of a band-width approach to forecasting, lack of analysis of non-utility development project success rates, and the additional risk presented by new MMWEC-owned generation options -- the Siting Council finds that MMWEC has failed to establish that its methodology for achieving its risk minimization objective is appropriate. The Siting Council notes its concern that a company of the size and resources of MMWEC has taken only limited steps in terms of addressing risks. While MMWEC has articulated reasonable risk-minimization objectives, MMWEC has not developed a commensurate response mechanism which actually would identify, analyze, and propose reasonable methods of reducing identified risks. MMWEC's present strategy to avoid cost-based risk -- acquisition of non-utility generation performance-based contracts -- is effective only to the extent that MMWEC's selected non-utility projects move forward. Yet, the informality of MMWEC's non-utility development project identification process calls into question MMWEC's stated emphasis on obtaining these projects, and raises questions regarding MMWEC's ability to identify and screen projects with a high likelihood of success. To the extent that MMWEC relies on new MMWEC-owned generation to satisfy its adequacy-based concerns, it compromises its stated objective of minimizing cost-based risk. While MMWEC has promised to develop a more substantial risk analysis methodology in the future, its supply plans are currently developed without the safeguards that such a methodology would provide.

iii. Diversity

MMWEC stated that it sought to develop supply plans for each member system from a diverse set of generating and C&LM

options (Exh. HO-1, p. VI-26). MMWEC asserted that one benefit of diverse supply plans was a reduced exposure to the possibility of contingency occurrence (id.).

MMWEC asserted that diversity objectives were furthered by (1) the technologies within the Coal Mix project, (2) the fuel diversity represented by the Coal Mix project, and (3) inclusion of C&LM options in supply plans (id.).

The Siting Council notes that coal-fired capacity represents a contribution to MMWEC's fuel diversification. In addition, MMWEC's planned generating additions, including the Coal Mix project, consist mainly of moderate-sized increments from non-utility developers, other electric utilities, and MMWEC members themselves (Exh. HO-4). Inclusion of moderate-sized purchases from a broad range of suppliers is a reasonable approach to furthering diversity objectives.

However, the Siting Council cannot similarly conclude that MMWEC's projected addition of C&LM options over the forecast period enables MMWEC to further achieve its diversity objectives. C&LM options are projected to provide 55 MW out of a total capacity requirement of 1235 MW in 1997-98, or 4.5 percent of MMWEC's total requirements (id., p. VI-2). Thus, by 1997-98, MMWEC's resources would consist of about 95.5 percent generation and about 4.5 percent C&LM. While inclusion of this level of C&LM offers a measure of diversity that would not be achieved otherwise, the great preponderance of MMWEC's resource mix will continue to consist of generation resources. In terms of MMWEC's diversity objective alone, the Siting Council cannot determine whether the 55 MW of C&LM proposed for implementation over the forecast period compares favorably or unfavorably to the 311 MW of generation additions scheduled for that time period (Exh. HO-4). Without clearly defined diversity goals and a reasonable methodology for achieving those goals, the Siting Council simply cannot determine that the C&LM levels projected by MMWEC -- or for that matter, that any of the resource levels projected by MMWEC -- are of a sufficient magnitude to further MMWEC's diversity objective over the forecast period.

Accordingly, based on the foregoing, the Siting Council finds that MMWEC has failed to establish that the methodology for achieving its diversity objective is appropriate. In addition, the Siting Council again notes that while MMWEC has articulated a reasonable objective -- that is, achieving diversity -- MMWEC has provided scant evidence that it has set any real diversity targets or goals or has established a methodology specifically designed to achieve these goals. MMWEC provided no evidence indicating that objective criteria were employed to evaluate the diversity attributes of resource options, and in addition provided no evidence indicating that it had determined what level of diversity it should achieve with respect to fuels or technologies. While MMWEC has added coal-fired projects and C&LM options, such additions were not based on a comprehensive process designed to evaluate the contribution that these resource options would make to MMWEC's diversity objective.

b. Conclusions on the Resource Evaluation Process

The Siting Council has found that MMWEC's methodologies for achieving its cost, risk minimization, and diversity objectives are not appropriate.

Based on the foregoing, the Siting Council finds that MMWEC has failed to establish that it has (1) developed a resource evaluation process which fully evaluates all resource options, including the treatment of all resource options on an equal footing, and (2) applied its resource evaluation process to all resource options.

In addition, as part of our review of a company's resource evaluation process, we consider whether a company has attributed environmental impacts or benefits to different resource options. See 1989 BECo Decision, 18 DOMSC at 270. In this proceeding, despite its claim to the contrary, MMWEC has not demonstrated that it attributes environmental impacts or benefits to resource options.

MMWEC contended that C&LM options were included in supply

plans in part because these options were environmentally benign (Exh. MM-1, p. 13). Yet, MMWEC provided no evidence that it had developed and/or applied a systematic evaluation process which took into account the environmental attributes of available resource options, including C&LM options. MMWEC provided no documentation indicating that resource options, including C&LM options, had been scrutinized based on an application of objective environmental criteria relating to impacts such as air emissions, wetlands impacts, or noise impacts. While the Siting Council may agree with MMWEC's claim that C&LM options offer measurable environmental benefits, MMWEC provided no indication that these benefits made any difference in MMWEC's evaluation of C&LM options or to their rate of implementation.

MMWEC's witness, Mr. Boudreau, stated that MMWEC considered environmental impacts in terms of the ability of a project to obtain permits, particularly with respect to the standards of state agencies which review these projects (Tr. 3, p. 103). Mr. Boudreau stated that MMWEC "assumes that if the project is able to obtain permits" based on standards set forth by the various environmental agencies, then the project is eligible to be screened for possible inclusion in the supply plan (id., pp. 103-104; see also Tr. 2, pp. 137-138). The Siting Council considers permitting of projects to be an important element in the development of least-environmental-impact resources, but by itself permitting offers an insufficient basis for a comprehensive evaluation of a resource option's environmental impacts. First, the Siting Council notes that environmental standards vary from jurisdiction to jurisdiction. MMWEC purchases power from a variety of sources, including suppliers in other states and Canada, yet no evidence was presented indicating that any comparisons were performed to address varying environmental standards and the relative environmental impacts of projects located within the various permitting jurisdictions. Second, if a comprehensive assessment of environmental effects could be based on permitting, such an assessment still would require a

company to compare actual impacts -- such as air emissions, water use, and noise -- to determine the environmental superiority of projects located within the same permitting jurisdiction. Based on the record in this proceeding, MMWEC has developed no such information regarding impacts. Finally, permitting in and of itself would not address the environmental benefits of C&LM options, nor would it include environmental issues such as visual impacts or land use. Accordingly, the Siting Council rejects this approach as a basis for evaluating the environmental impacts of resource options.

Our enabling statute directs us to balance the economic considerations with environmental impacts in ensuring that the Commonwealth has a necessary supply of energy. G.L. c. 164, sec. 69H. The Siting Council's standard of review for supply plans explicitly requires utilities to evaluate new supply options in a manner that ensures an adequate supply of least-cost, least-environmental-impact power (see Section III.A, above). Therefore, the Siting Council ORDERS MMWEC in its next forecast filing to implement a methodology which includes an adequate consideration of the environmental impacts of resource options.[67]

3. Conclusions on Least-Cost Supply

The Siting Council has found that MMWEC has failed to identify a reasonable range of resource options. The Siting Council has found that MMWEC has failed to establish that it (1) developed a resource evaluation process which fully evaluates all resource options, including the treatment of all resource options on an equal footing, and (2) applied its resource evaluation process to all resource options.

67/ In our review of MMWEC's next supply plan filing, the Siting Council will review the ability of MMWEC's evaluation process to achieve its environmental objective. This review will display the same level of scrutiny that we have applied to other supply planning objectives, such as cost, risk minimization, and diversity.

Accordingly, the Siting Council finds that, on balance, MMWEC has failed to establish that its supply plan ensures a least-cost energy supply.

F. Conclusions on the Supply Plan

The Siting Council has found that MMWEC has established that its supply plan ensures adequate resources to meet projected requirements. The Siting Council has also found that MMWEC has failed to establish that its supply plan ensures a least-cost energy supply.

Accordingly, on balance, the Siting Council hereby REJECTS the 1988 supply plan of MMWEC.

In reaching this decision, the Siting Council recognizes that MMWEC has achieved marked improvement in certain important aspects of supply planning. MMWEC has undertaken its most ambitious C&LM program to date -- the DSCA -- and as consequence has enhanced its ability to identify and screen C&LM as a resource option within member supply plans. In addition, MMWEC has continued to provide members with the benefits of its EWS program, leading to an impressive record of adequacy.

At the same time that the Siting Council acknowledges some improvements in the current filing, the Siting Council also has noted that MMWEC's supply planning process still contains some serious flaws.

First, MMWEC has not demonstrated that its non-cost criteria are applied consistently in assessments of resource options. While MMWEC has recognized that these criteria are essential to a comprehensive supply planning process, evidence of a full, systematic process of application has not been provided by MMWEC.

Second, while MMWEC states that C&LM options were selected ahead of all other options for inclusion in its integrated resource plans, our review in this proceeding revealed that MMWEC's process: (1) favored generating options over C&LM options in making determinations regarding cost-effectiveness; (2) credited generation options with

non-price benefits without offering similar treatment to C&LM options; and (3) may have arbitrarily limited the number of C&LM options that reached the evaluation stage. While MMWEC's professed inclination towards C&LM looks promising on its face, it is apparent that MMWEC's process still does not treat these options on an equal footing with generation options.

Third, our review has raised some serious questions regarding MMWEC's process for identifying and evaluating generating options. Here, while MMWEC consistently emphasizes its commitment to cost-effective performance-based non-utility generation contracts, it has failed to present a reasonable process or approach to achieving this objective.

Finally, despite references to new MMWEC-owned generation as a "last resort," MMWEC's approach to supply planning -- and, in particular, its processes for evaluating C&LM and non-utility generating options -- may in fact raise this option to a higher likelihood of implementation. While the Siting Council recognizes that comprehensive supply planning should include full examination of potential new company-owned generation resources, we are concerned that MMWEC's limited development of both C&LM and non-utility options could lead to premature implementation of what is a potentially less desirable option, and one that stands at odds with MMWEC's stated objectives regarding the protection of its ratepayers. In this proceeding, MMWEC has asserted that it has "maintained its construction options in order to fulfill its public service obligation" (MMWEC Memorandum, p. 56). The Siting Council must remphasize that an electric company's public service obligation can be met equally well through aggressive and responsible implementation of cost-effective C&LM and non-utility development options.

In its 1987 MMWEC Decision, the Siting Council rejected MMWEC's joint supply plan and noted that the record in that proceeding raised serious questions about the adequacy and cost of some members' supply plans (p. 139). However, the Siting Council also stated that the record in that proceeding was insufficient to make specific findings regarding each member's forecast and supply plan (Id.).

In today's decision, we previously have addressed the issue of the Siting Council's jurisdiction over MMWEC's member systems, affirming our ability to review all information and data relative to the member systems' demand forecasts and supply plans, and, if appropriate, to render separate decisions regarding those demand forecasts and supply plans. See Section I.C, above. In fact, the information and data submitted in this adjudication relative to member systems has played an integral part in this review. Still, as in our 1987 MMWEC Decision, we once again refrain from making specific findings or rendering separate decisions on the demand forecasts and supply plans of member systems.[68]

However, unlike our ruling in the 1987 MMWEC Decision, the Siting Council's decision here to refrain from making member-specific findings or rendering separate decisions does not stem from insufficient evidence. On the contrary, our findings in this decision relative to MMWEC as a whole would be sufficient to warrant rejection of the supply plans of individual member systems as well. Certainly, the findings herein that MMWEC failed to apply appropriate screening criteria to generation options, and that MMWEC failed to develop or apply an appropriate evaluation process to all resource options, would lead to the conclusion that the member systems' supply plans

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68/ The Siting Council's decision to refrain from making findings regarding member system supply plans is significant in light of G.L. c. 164, sec. 69I, which states that a "company shall not commence construction of a facility at a site unless the facility is consistent with the most recently approved long-range forecast or supplement thereto." Therefore, the Siting Council's decision in the instant proceeding would not preclude an MMWEC member system from seeking the Siting Council's approval to construct a jurisdictional facility. However, consistent with our decisions in Middleborough Gas & Electric Department, 17 DOMSC 197 (1988), and Braintree Electric Light Depatment, 18 DOMSC 1 (1988), the member system would be required to establish that its proposed facility was consistent with an approved member-specific supply plan.

that result from MMWEC's system-wide supply planning process similarly do not achieve the appropriate balance between cost and environmental impacts.

Yet, it is equally clear that the Siting Council's mandate is not advanced at this time by rejecting the supply plans of individual member systems. First, until such time that MMWEC is able to establish that its supply planning process results in least-cost, least-environmental impact resource options for consideration by the member systems, it remains difficult for those member systems to establish that their individual supply plans fulfill the Siting Council's requirements.

Second, our concerns relative to member systems should focus more directly upon the implementation by a member system of an adequate, least-cost, and least-environmental-impact supply plan. As MMWEC has noted throughout this proceeding, the authority to implement any planning decision rests with the manager of a member system's municipal light department and its elected municipal light board (Tr. 6, pp. 44-45; MMWEC Memorandum, p. 59). Therefore, we find that review of a member system's implementation actions, i.e., its actual planning decisions, is far more meaningful when considered against the backdrop of an acceptable system-wide supply planning process.

Finally, in making a determination to refrain from issuing specific findings or rendering separate decisions relative to member systems, we are in no way suggesting that member systems are more likely to achieve least-cost, least-environmental impact supply plans without MMWEC's assistance. On the contrary, we are convinced that MMWEC remains a viable and valuable entity for ensuring that member systems achieve adequate, least-cost, least-environmental-impact supply plans. The Siting Council is confident that the extensive expertise and inherent efficiencies of the MMWEC system, coupled with a continuation of the supply planning process improvements recognized in this decision, can operate to effectively fulfill each member's and the Commonwealth's planning objectives.

IV. DECISION AND ORDER

The Siting Council hereby APPROVES the 1988 demand forecast of the Massachusetts Municipal Wholesale Electric Company, and hereby REJECTS the 1988 supply plan of the Massachusetts Municipal Wholesale Electric Company.

The Siting Council ORDERS the Massachusetts Municipal Wholesale Electric Company in its next forecast filing:

(1) to (a) examine its residential customer survey methodology to determine methods of increasing response rates in certain systems, and (b) demonstrate that appliance type saturation data used for all systems are representative of appliance ownership decisions of residential customers in those systems.

(2) to (a) provide a full explanation of all assumptions made regarding residential appliance type saturation growth rates, and (b) provide a full explanation of the methodology used to forecast miscellaneous appliance type saturations.

(3) to fully explain and justify its assumption that miscellaneous appliance type average use consists of six percent of MMWEC's weather-insensitive load.

(4) to fully identify the vintages of NEPOOL data which were used to establish MMWEC base year average use estimates.

(5) to fully explain and justify (a) MMWEC's procedure for determining which member systems are subject to a significant level of seasonal customer consumption effects, (b) the ability of MMWEC's calibration process to reflect the effects of seasonal customer consumption on appliance average use estimates, and (c) any adjustments to appliance average use which are designed to reflect the effects of seasonal customer consumption, and which take place following calibration.

(6) to present its analysis regarding the validity of the rebound effect. This analysis should be based on major studies and research projects which have addressed the rebound effect and drawn conclusions regarding its validity.

(7) to fully reevaluate its use of constant floor-space-per-employee ratios including justification of the use of these ratios with respect to other reasonable methods of commercial floor space growth estimation.

(8) to (a) identify additional commercial end uses to be disaggregated, or to fully justify the present level of commercial end-use disaggregation, and (b) fully explain all methodologies used to determine commercial end-use saturations including space cooling saturations.

(9) to establish service-territory-specific miscellaneous EUI growth rates or to fully justify use of any miscellaneous EUI growth rates based on non-service-territory specific data.

(10) to justify any further use of NEPOOL intensiveness trend factors, and to demonstrate that NEPOOL intensiveness trend factors are reasonable predictors of MMWEC's industrial sector consumption characteristics.

(11) to describe fully and justify its methodology for forecasting municipal, street lighting, and "other uses" energy requirements.

(12) to develop and present an analysis of alternative peak load forecasting methodologies, including (a) the ability of alternative peak load methodologies to reflect the major underlying factors of peak load such as weather effects and varying consumption patterns over different months, days, and hours, (b) the level of disaggregation achieved by each alternative methodology, and (c) a time schedule for implementing improvements to MMWEC's peak load forecasting methodology.

(13) to fully explain and justify the avoided transmission capacity costs assigned to member systems for economic evaluation purposes, including (a) a complete discussion of the methodology used to derive avoided transmission capacity costs, and (b) a full explanation of how transmission capacity cost differences between members were taken into account by the methodology.

(14) to review methodologies which evaluate the economic benefits of C&LM options on utility distribution systems, and to report to the Siting Council on the findings of its review.

(15) to implement a methodology which includes an adequate consideration of the environmental impacts of resource options.

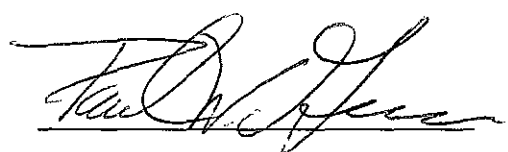
The Siting Council further ORDERS Massachusetts Municipal Wholesale Electric Company to file its next forecast on April 1, 1991.

Robert D. Shapiro

Robert D. Shapiro
Hearing Officer

Dated this 9th day of February, 1990

UNANIMOUSLY APPROVED by the Energy Facilities Siting Council at its meeting of February 9, 1990 by the members and designees present and voting. Voting for approval of the Tentative Decision as amended: Paul W. Gromer (Commissioner of Energy Resources); Barbara Kates-Garnick (for Mary Ann Walsh, Secretary of Consumer Affairs and Business Regulation); Joellen D'Esti (for Alden S. Raine, Secretary of Economic Affairs); Joseph Freeman (for John P. DeVillars, Secretary of Environmental Affairs); Joseph Joyce (Public Labor Member); Sarah Wald (Public Environmental Member); Michael Ruane (Public Electricity Member); and Kenneth Astill (Public Engineering Member).



Paul W. Gromer
Chairperson

Dated this 9th day of February, 1990

TABLE 1

MMMWEC Aggregate System
Demand Forecast by Customer Class

	Annual Energy Requirements (GWH) 1988	1998	Average Annual Compound Growth Rate 1988-1998
Residential	1,665	1,891	1.3 %
Commercial	1,424	1,886	2.9 %
Industrial	1,105	1,554	3.5 %
Streetlighting	39	39	0.0 %
Losses	359	451	2.3 %
Other	37	37	0.0 %
Municipal	171	171	0.0 %
Total	4,799	6,029	2.3 %

	Peak Capacity Requirements (MW) 1988	1998	Average Annual Compound Growth Rate 1988-1998
MMWEC Winter	911	1,138	2.2 %
MMWEC Summer	900	1,127	2.3 %

Notes:

a. Energy and peak data based on base case.

b. Peak load is the aggregate non-coincident peak demand of the MMWEC member systems excluding loads of Belmont, Concord, and Merrimac which are all-requirements customers of investor-owned utilities.

Sources: Exhs. HO-1, p. VI-1; HO-4, p. III-68

TABLE 2

MMWEC
Consolidated Base Case Demand Forecast and Supply Plan

Summer and Winter Peaks (MW)

Year	Capability Responsibility	Existing Capability	Base Case Surplus/(Deficit)	Percent
		Short Run		
S 1988	941	944	3.0	.3%
W 1988-89	1032	1036	4.0	.4%
S 1989	974	999	25.0	2.6%
W 1989-90	1065	1092	27.0	2.5%
S 1990	1127	1131	4.0	.4%
W 1990-91	1127	1230	103.0	9.1%
S 1991	1144	1238	94.0	8.2%
W 1991-92	1144	1337	193.0	16.9%
S 1992	1157	1262	105.0	9.1%
W 1992-93	1157	1365	208.0	17.9%
		Remaining Forecast Period		
S 1993	1171	1226	55.0	4.7%
W 1993-94	1171	1329	158.0	13.5%
S 1994	1185	1186	1.0	0%
W 1994-95	1185	1287	102.0	8.6%
S 1995	1203	1204	1.0	0%
W 1995-96	1203	1308	105.0	8.7%
S 1996	1216	1217	1.0	0%
W 1996-97	1216	1322	106.0	8.7%
S 1997	1235	1236	1.0	0%
W 1997-98	1235	1339	104.0	8.4%

Notes:
a. Capability responsibility consists of peak load reduced by C&LM options and firm purchases, a reserve requirement of 20 percent, and reductions due to PIP and normalization.
b. Existing capability includes existing resources, planned resources, planned purchases, and proposed additions/purchases.

Source: Exh. HO-4, pp. VI-2 to VI-3

TABLE 3
MMWEC
Short-Run Contingency Analysis
Summer Peak Load (MW)

High Load Growth Contingency

Year	High Load[a] Growth	Total Supply	Contingency Surpl/(Def)
S 1990	1161	1131	(30)
S 1991	1197	1238	41
S 1992	1234	1262	28

High Load Growth and Delay of Hydro Quebec Phase II[b]

Year	Base Cap. Res.	Base Rsc.	H.Gr.& Delay of H-Q	Contingency Surpl/(Def)
S 1990	1127	1131	(88)	(84)
S 1991	1144	1238	(107)	(13)
S 1992	1157	1262	(131)	(26)

High Load Growth and 50 Percent Reduction of Non-utility Development[c]

Year	Base Cap. Res.	Base Rsc.	50 % Rdctn	Contingency Surpl/(Def)
S 1990	1161	1131	(22)	(52)
S 1991	1197	1238	(59)	(18)
S 1992	1234	1262	(74)	(46)

Notes:
a. See Table 2 for short-run base case surplus/deficit.
b. MMWEC assumed it would receive its Hydro Quebec Phase II entitlement of 54 MW beginning in summer of 1990.
c. Non-utility development projects consisted of ANR (27 MW), Coal Mix (59 to 89 MW), Aquidneck (16 MW), and Newbay (16 MW).

Sources: Exhs. HO-4, HO-33

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

Such petition for appeal shall be filed with the Siting Council within twenty days after the date of services of the decision, order or ruling of the Siting Council or within such further time as the Siting Council may allow upon request filed prior to the expiration of 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. (See. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Council

In the Matter of the Petition of The Berkshire Gas Company for Approval of its Application to Construct an 11.5-Mile, 12-Inch Diameter, Natural Gas Pipeline with a Maximum Operating Pressure of 500 Pounds Per Square Inch and Related Meter Station	EFSC 89-29 (Phase II)

FINAL DECISION

Sue Munis Nord
Hearing Officer
March 16, 1990

On the Decision:

William Febiger

APPEARANCES:

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FIGURES:

The Energy Facilities Siting Council hereby CONDITIONALLY APPROVES the petition of The Berkshire Gas Company to construct: (1) an 11.5 mile, 12-inch diameter, natural gas pipeline with a maximum operating pressure of 500 pounds per square inch along the proposed route described herein; and (2) a meter station at the proposed site described herein.

I. INTRODUCTION

A. Summary of the Proposed Project and Facilities

The Berkshire Gas Company ("Berkshire" or "Company") distributes and sells natural gas to residential, commercial, and industrial customers in 19 communities in Berkshire, Franklin and Hampshire Counties. In the split-year 1986-87, the Company had an average of 27,719 firm service customers. The Company's total normalized firm sendout for the split-year 1987-88 was 4,997 million cubic feet ("MMCF").[1]

Berkshire receives pipeline gas and underground storage return gas from the Tennessee Gas Pipeline Company ("Tennessee") at its Stockbridge, Pittsfield, North Adams and Northampton gate stations. Berkshire also receives, under transportation arrangements with Tennessee, pipeline gas from Boundary Gas Incorporated and supplemental liquified natural gas ("LNG") supplies from Bay State Gas Company and Distrigas Corporation. Finally, Berkshire has auxiliary propane facilities in Stockbridge, Pittsfield, North Adams, Hatfield and Greenfield.

The Company's most recent forecast filing was an amended Forecast which requested approval to construct pipeline and meter

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1/ One MMCF of natural gas equals roughly one thousand Dekatherms (MDth) or one billion Btus ("BBtu"). For purposes of this review, the Energy Facilities Siting Council assumes that one MMCF is equivalent to one MDth.

station facilities.[2] After reviewing the Company's most recent forecast filing, the Energy Facilities Siting Council ("Siting Council") approved Berkshire's sendout forecast and approved, upon compliance with conditions, Berkshire's supply plan (Berkshire Gas Company, EFSC 89-29 (Phase I) (1990) ("1990 Berkshire Forecast Decision")).[3]

The Company has proposed to construct an 11.5 mile, 12-inch diameter, natural gas pipeline with a maximum operating pressure of 500 pounds per square inch ("psi") from the Tennessee main transmission line ("Tennessee main line") in the Town of Richmond to the Altresco, Inc. cogeneration project ("Altresco project") on the General Electric Company's industrial site in the City of Pittsfield (Exh. HO-1, Tab 1, pp. 1-5). The Company also has proposed to construct a meter station in the Town of Richmond to interconnect with the Tennessee main line and provide for receipt of gas volumes for transportation on the proposed pipeline (id.).

The Siting Council previously approved the petition of Altresco-Pittsfield, Inc. to construct the 156 megawatt combustion turbine, combined cycle cogeneration facility in Pittsfield (Altresco-Pittsfield, Inc., 17 DOMSC 351 (1988),

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2/ On January 30, 1990, the Hearing Officer severed the forecast portion of the filing ("Forecast Application") from the facilities portion of the filing ("Facility Application"). The Forecast Application was denominated as EFSC 89-29 (Phase I) and this decision on the Facility Application is denominated as EFSC 89-29 (Phase II). The Siting Council issued a decision in EFSC 89-29 (Phase I) on February 9, 1990.

3/ In the 1990 Berkshire Forecast Decision, the Siting Council approved the Company's supply plan upon compliance with conditions relating to the Company's conservation and load management activities. As noted in that Decision, the Siting Council staff must verify that the Company's responses to the conditions are complete and adequate before the Company's supply plan is approved (1990 Berkshire Forecast Decision at 71-74). Accordingly, the Company cannot commence construction of jurisdictional facilities, as defined in G.L. c. 164, sec. 69G, until the Siting Council staff has verified that the Company's responses to the conditions set forth in the 1990 Berkshire Forecast Decision are complete and adequate.

("Altresco Decision")). Construction of the Altresco project began in November, 1988, and is expected to be completed by June 1990 (Exh. HO-N-1S1). The primary fuel for the Altresco project will be natural gas, although the facility will be capable of burning distillate oil, subject to air emissions regulations (Altresco Decision, 17 DOMSC at 354).

Berkshire's proposed meter station and pipeline, which will be owned and operated by the Company, will be capable of transporting the 36,000 Dth per day of natural gas required by the Altresco project (Exh. HO-1, Tab 1, p. 3). Additionally, Berkshire will acquire rights to optional transportation of 5,000 MMBtu of natural gas per day along the proposed pipeline (Exh. B-1, pp. 12-13).

The Company identified four routes for the proposed pipeline: the primary route, Company Alternative 1, Company Alternative 2, and Company Alternative 3 (Exhs. HO-1, Tab 3, pp. 5-7, HO-2). The Company identified two sites for the proposed meter station: the primary site in the Town of Richmond and an alternative site in the southern part of the Town of Lee (Exh. HO-2).

The primary route for the proposed pipeline begins at the primary meter station site on Dublin Road in the Town of Richmond (Exhs. HO-1, Tab 3, pp. 6-7, HO-2). From this point, the primary route travels in a generally northeasterly direction through the Town of Richmond along Dublin Road, Sleepy Hollow Road, East Road, and Swamp Road. At the Pittsfield city line, Swamp Road becomes Barker Road, and the proposed pipeline follows Barker Road, South Mountain Road, and Route 7/20 (id.). From this point, the proposed route crosses the Pittsfield Country Club, and then travels along Holmes Road, William Street, and Adelaide Avenue, across Elm Street and along Lillian Street and Dillon Avenue, from which it crosses Brattle Brook Park (id.). After exiting Brattle Brook Park, the proposed route travels along Longview Terrace and Parkside Avenue, from which it crosses the Housatonic River (id.). The proposed route than travels along East Street and Commercial Street, across the Conrail right-of-way, and along Merrill road to the Altresco

project site (id.).

Company Alternative 1 also begins at the primary meter station site on Dublin Road in the Town of Richmond (Exhs. HO-1, Tab 3, pp. 5-6, HO-2). From this point, Alternative 1 travels in a northwesterly direction to the Conrail right-of-way, which it then follows in a generally northeasterly direction through Richmond and into Pittsfield (id.). Alternative 1 exits the Conrail right-of-way near the intersection of Merrill Road and New York Avenue, where it crosses Merrill Road and enters the Altresco project site (id.).

Company Alternative 2 begins at the alternative meter station site south of the intersection of the Tennessee main line and Route 102 in South Lee (Exhs. HO-1, Tab 3, pp. 6-7, HO-2). Alternative 2 then travels in a generally northeasterly direction along Pleasant Street (Route 102), the Massachusetts Turnpike, Greylock Street, Bradley Street, and Woodland Road, which becomes October Mountain Road at the Lenox town line (id.). From this point, Alternative 2 follows October Mountain Road and East New Lenox Road into Pittsfield (id.). Alternative 2 continues along New Lenox Road to William Street, from which it follows the same route as the primary route (id.).

Finally, Company Alternative 3 begins at the primary meter station site on Dublin Road in Richmond, from which it follows the primary route to the intersection of Barker Road and South Mountain Road in Pittsfield (Exh. HO-2). From this point, Alternative 3 travels along Barker Road, West Housatonic Street (Route 20), Hawthorne Avenue, and Mill Street to the Conrail right-of-way (id.). Alternative 3 then joins the Conrail right-of-way, and follows the same route as Alternative 1 to the Altresco project site (id.).

B. Procedural History

On February 1, 1988, Berkshire filed its 1987 Long Range Forecast of Natural Gas Requirements and Resources ("Forecast"). On October 6, 1988, the Company filed an amendment to the Forecast requesting approval to construct pipeline and metering station facilities in order to connect the

Tennessee main line in Richmond, Massachusetts, to the Altresco project in Pittsfield. The Facility Application set forth a description of the pipeline route and meter station site, as well as alternate pipeline routes and an alternate meter station site. Subsequently, the Company filed additional information to amend or supplement its Facility Application.

On January 26, 1989, shortly after the Company's Forecast and Facility Application were deemed complete, the Hearing Officer issued a Notice of Adjudication and Public Hearing and directed the Company to publish and post the Notice in accordance with 980 CMR 1.03(2).

A public hearing was held in the City of Pittsfield on February 23, 1989.

Four petitions to intervene and one request to participate as an interested person in the proceeding were received by the Hearing Officer. On March 31, 1989, the Hearing Officer conducted a pre-hearing conference and granted intervenor status to Altresco-Pittsfield, Inc. ("Altresco"), the Town of Richmond ("Richmond"), Zelda Brandon ("Brandon"), and Jeffrey and Marion Grant. Interested person status was granted to Donald and Ingrid MacGillis. The Hearing Officer conducted additional pre-hearing conferences on May 10, 1989 and May 31, 1989.

Among the motions made and ruled on prior to the commencement of hearings on the facilities portion of the Company's filing was Richmond's motion of May 24, 1989 for an Additional Notice of Public Hearing and Adjudication for Alternate Routes. In its motion, Richmond requested that the Siting Council issue an additional notice of public hearing and adjudication in order to include in the proceeding pipeline routes proposed by Richmond as alternatives to the Company's preferred route. On May 31, 1989, Brandon filed a motion in support of the Richmond motion. On June 2, 1989, Berkshire and Altresco filed separate responses in opposition to the Richmond motion. On June 5, 1989, Donald and Ingrid MacGillis filed a letter in support of Richmond's motion. On June 7, 1989, Richmond submitted a letter in rebuttal to Altresco's response.

On June 16, 1989, the Hearing Officer issued a Procedural Order denying the motion on the basis that the Siting Council statute does not provide the Siting Council with the authority to propose its own route or to approve a route not contained in a petitioner's application.

The Siting Council conducted twenty days of evidentiary hearings during the proceeding. Berkshire presented five witnesses: Les H. Hotman, Director of Planning for the Company, who testified regarding the Company's update to the Forecast and Supply Plan and involvement in the Altresco project; Donald P. Atwater, Director of Distribution for the Company, who testified regarding the engineering and site selection process for the pipeline; David M. Haines, a consultant with Haines Hydrogeologic Consulting, who testified regarding the impact of the pipeline on public and private water supplies; Terry A. Tattar, Ph.D, a professor of plant pathology with the University of Massachusetts Shade Tree Laboratory, who testified regarding impacts and recommendations for mitigation of impacts of pipeline construction to trees along the pipeline route; and James Philip Scalise, President of Scalise-Knysh Associates, Inc., who testified regarding initial design, route selection process, engineering, permitting,and environmental concerns for the pipeline.

Altresco presented two witnesses: Barry Curtiss-Lusher, President of EnerProbe Consulting, who testified regarding the status of the Altresco project and Altresco's selection of the Berkshire pipeline proposal; and Dr. Robert Ingram, Senior Environmental Scientist with the Daylor Consulting Group, who testified regarding the results of an independent review of the Berkshire site selection process.

Richmond presented six witnesses: Richard L. Boyce, a member of Richmond's Conservation Commission, who testified regarding the impact of pipeline construction on trees along the primary and alternate routes; K. Jerry Morray, a member of Richmond's Planning Board, who testifed regarding Richmond's scenic roadways and zoning requirements; David W. Morrison, a member of Richmond's Board of Selectmen and Chief Executive,

Hazardous Materials Response Team, who testified regarding the potential impact of construction blasting and public safety concerns; Thomas L. Sherer, a member of Richmond's Planning Board, who testified regarding the impact of pipeline construction on domestic water supply and sewage disposal systems; Holly Stover, a member of Richmond's Conservation Commission, who testified regarding various impacts of the proposed pipeline routes in the Town of Richmond; and Peter Walsh, who testified regarding his assessment of the qualifications of Scalise-Knysh Associates, Inc.

None of the other intervenors presented witnesses.

The Hearing Officer entered 195 exhibits into the record, largely composed of responses to information and record requests, which included a response to a Staff supplemental information request which was moved into evidence after the close of the hearings. Berkshire entered 87 exhibits into the record. Altresco entered 16 exhibits into the record. Richmond entered 90 exhibits into the record. Brandon entered one exhibit into the record.

The Initial Briefs of Brandon and Richmond were filed on August 15 and 16, 1989, respectively. On August 18, 1989, Jeffrey and Marion Grant submitted a letter in support of the Richmond Brief. On August 19, 1989, Donald and Ingrid MacGillis submitted a letter in support of the Richmond Brief. On August 28, 1989, Initial Briefs were submitted by Berkshire and Altresco. Intervenors Richmond and Brandon submitted reply briefs on September 5, 1989. Additional reply briefs were filed by Berkshire and Altresco on September 11, 1989.

After briefs were filed, on December 22, 1989, Richmond and Brandon filed a Joint Motion to Re-Open Hearings for the limited purpose of receiving new information regarding safety issues. On January 19, 1990, the Hearing Officer denied this motion.

On January 11, 1990, Richmond and Brandon filed a Supplemental Joint Motion to Re-Open Hearings ("Supplemental Joint Motion") in order to raise an issue relating to the construction of the Altresco project. On January 22, 1990,

Altresco submitted a response in opposition to the Supplemental Joint Motion, and Richmond and Brandon submitted a joint motion to strike Altresco's response in opposition to the Supplemental Joint Motion. On January 23, 1990, Berkshire submitted a response in opposition to the Supplemental Joint Motion, and on January 24, 1990, Richmond and Brandon submitted a joint motion to strike Berkshire's response in opposition to the Supplemental Joint Motion. On March 6, 1990, the Hearing Officer denied the Supplemental Joint Motion.

On January 29, 1990, Richmond filed a Motion for Administrative Notice and Further Hearings in regard to an issue relating to a revised Massachusetts Natural Heritage Program map regarding the location of an endangered or rare species habitat along the route of Berkshire's proposed pipeline. On January 30, 1990, Altresco submitted a response in opposition to Richmond's Motion for Administrative Notice and Further Hearings. On February 7, 1990, Brandon submitted a response in support of Richmond's Motion for Administrative Notice and Further Hearings. On March 6, 1990, the Hearing Officer denied Richmond's Motion for Administrative Notice and Further Hearings.

As stated above, on January 30, 1990, the Hearing Officer severed the Forecast Application (denominated as EFSC 89-29 (Phase I)) from the Facility Application (denominated as EFSC 89-29 (Phase II)) and issued a Tentative Decision on the Forecast Application. The Siting Council issued a decision in EFSC 89-29 (Phase I) on February 9, 1990.

On February 2, 1990, Richmond filed a Motion for Official Notice of Department of Environmental Protection Decision Denying Berkshire's Appeal of Richmond Conservation Order Prohibiting Work. On March 6, 1990, the Hearing Officer granted Berkshire's Motion for Official Notice.

C. Jurisdiction

The Company's Facility Application is filed in accordance with G.L. c. 164, sec. 69H, which requires the Siting Council to ensure a necessary energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost,

and G.L. c. 164, sec. 69I, which requires gas companies to obtain Siting Council approval for construction of proposed facilities at a proposed site before a construction permit may be issued by any other state or local agency.

The Company's proposal to construct an 11.5 mile pipeline operating at a pressure up to 500 psi falls squarely within the fifth definition of "facility" set forth in G.L. c. 164, sec. 69G:

> (5) any new pipeline for the transmission of gas having a normal operating pressure in excess of one hundred 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.

The Company's proposal to construct the related meter station falls squarely within the third definition of "facility" set forth in G.L. c. 164, sec. 69G:

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

Furthermore, the Siting Council previously established a two-part standard for determining whether a structure is a facility in Commonwealth Electric Company (17 DOMSC 249, 263 (1988) ("1988 ComElectric Decision")). In the 1988 ComElectric Decision, the Siting Council stated that a structure is a facility under G.L. c. 164, sec. 69G, if (1) the structure is subordinate or supplementary to a jurisdictional facility, and (2) the structure provides no benefit outside of its relationship to the jurisdictional facility (id.). The meter station proposed in this proceeding clearly is subordinate to the proposed pipeline, and provides no benefit outside of its relationship to the proposed pipeline.

In accordance with G.L. c. 164, sec. 69H, before approving an application to construct facilities, the Siting Council requires applicants to justify facility proposals in

three phases. First, the Siting Council requires the applicant to show that additional energy resources are needed (see Section II.A, below). Next, the Siting Council requires the applicant to present plans that address the previously identified need and that are superior to alternative plans in terms of cost and environmental impact (see Section II.B, below). Finally, the Siting Council requires the applicant to show that the proposed site for the facility is superior to alternative sites in terms of cost, environmental impacts, 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, sec. 69H, the Siting Council is charged with the responsibility for implementing energy policies to provide a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In carrying out this statutory mandate with respect to proposals to construct energy facilities in the Commonwealth, the Siting Council evaluates whether there is a need for additional energy resources to meet reliability or economic efficiency objectives.[4] The Siting Council therefore must find that additional energy resources are needed as a prerequisite to approving proposed energy facilities.

In evaluating the need for new energy facilities to meet reliability objectives, the Siting Council has evaluated the reliability of supply systems in the event of changes in demand or supply or in the event of certain contingencies. With respect to changes in demand or supply, the Siting Council has found that new capacity is needed where projected future capacity available to the system is found to be inadequate to satisfy projected load and reserve requirements. Altresco Decision, 17 DOMSC at 359-369; Northeast Energy Associates, 16 DOMSC 335, 344-360 (1987) ("NEA"); Cambridge Electric Light Company, 15 DOMSC 187, 211-212 (1986) ("1986 CELCo Decision"); Massachusetts Electric Company, 13 DOMSC 119, 137-138 (1985) ("1985 MECo Decision"); New England Electric System, 2 DOMSC 1, 9 (1977). With regard to contingencies, the Siting Council has found that new capacity is needed in order to ensure that

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4/ In this discussion, "additional energy resources" is used generically to encompass both energy and capacity additions including, but not limited to, gas transmission lines, synthetic natural gas facilities, liquefied natural gas facilities, propane facilities, gas storage facilities, energy or capacity associated with gas sales agreements, and energy or capacity associated with conservation and load management.

service to firm customers can be maintained in the event that a reasonably likely contingency occurs. Middleborough Gas and Electric Department, 17 DOMSC 197, 216-219 (1988) ("Middleborough"); Boston Edison Company, 13 DOMSC 63, 70-73 (1985) ("1985 BECo Decision"); Taunton Municipal Lighting Plant, 8 DOMSC 148, 154-155 (1982) ("Taunton"); Commonwealth Electric Company, 6 DOMSC 33, 42-44 (1981); Eastern Utilities Associates, 1 DOMSC 312, 316-318 (1977).

The Siting Council also has determined in some instances that utilities need to add energy resources primarily for economic efficiency purposes. The Siting Council has found that a utility's proposed energy facility was needed principally for providing economic energy supplies relative to a system without the proposed facility. 1985 MECo Decision, 13 DOMSC at 178-179, 183, 187, 246-247; Boston Gas Company, 11 DOMSC 159, 166-168 (1984) ("1984 Boston Gas Decision").

While G.L. c. 164, sec. 69H, requires the Siting Council to ensure an adequate supply of energy for Massachusetts, the Siting Council has interpreted this mandate to encompass not only evaluations of specific need within Massachusetts for new energy resources (Massachusetts Electric Company, 18 DOMSC 383, 396-403 (1989) ("1989 MECo Decision"); Commonwealth Electric Company, 17 DOMSC 249, 266-279 (1988) ("1988 CELCo Decision"); Middleborough, 17 DOMSC at 216-219; 1985 BECo Decision, 13 DOMSC at 70-73), but also the consideration of whether proposals to construct energy facilities within the Commonwealth are needed to meet New England's energy needs. Turners Falls Limited Partnership, 18 DOMSC 141, 151-165 (1988) ("Turners Falls"); Altresco Decision, 17 DOMSC at 359-365; NEA, 16 DOMSC at 344-354; Massachusetts Electric Company, 15 DOMSC 241, 273, 281 (1986); 1985 MECo Decision, 13 DOMSC at 129-131, 133, 138, 141. In so doing, the Siting Council has fulfilled the requirements of G.L. c. 164, sec. 69J, which recognizes that Massachusetts' generation and transmission system is interconnected with the region's and that reliability and economic benefits flow to Massachusetts from Massachusetts utilities' participation in the New England Power Pool

("NEPOOL").

Here, the Siting Council is presented with a proposal by a gas utility to construct a jurisdictional gas pipeline that would transport gas to a cogeneration plant constructed by a non-utility developer. The proposal to construct the cogeneration plant has been approved by the Siting Council (see Altresco, 17 DOMSC at 351). The Siting Council previously has approved a proposal by a gas utility to construct a jurisdictional gas pipeline that would provide a new fuel source to an existing generating plant owned by an electric utility. 1984 Boston Gas Decision, 11 DOMSC at 159. The Siting Council also previously has approved proposals by both electric companies and non-utility developers to construct jurisdictional electric transmission lines that would connect non-jurisdictional cogeneration plants to the regional transmission system.

In all such cases, whether the proponent is a utility or a non-utility developer, the proponent first must establish that the power from the cogeneration facility is needed on either reliability or economic efficiency grounds. If it can be established that the cogeneration plant is needed, the proponent then must show that the existing system is inadequate to support this new power source and that additional energy resources are necessary to accommodate the new power source. 1989 MECo Decision, 18 DOMSC at 383; Turners Falls, 18 DOMSC at 141.

In applying this standard, the Siting Council emphasizes that our review of need is not limited to the need for a physical connection between the cogeneration plant and its fuel source or its end-users. To address the need issue in such cases so narrowly would be inconsistent with our need analysis for other facilities, as well as inconsistent with our statutory mandate.

Richmond argues that the Siting Council has employed a more stringent standard of review in the 1984 Boston Gas Decision, in which Boston Gas Company ("Boston Gas") proposed to build a pipeline facility primarily intended to serve an

electric generating facility, and the Turners Falls Decision, in which Turners Falls Limited Partnership sought approval for a transmission line which would connect a non-jurisdictional cogeneration facility to the New England power grid (Richmond Brief, pp. 43-47). Richmond asserts that under the more rigorous standard it is not sufficient for Berkshire to demonstrate that the cogeneration facility to be served by the proposed gas pipeline needs a supply of gas. According to Richmond, Berkshire also must demonstrate that the proposed pipeline would meet an identified need of Berkshire's existing customers based on reliability or economic efficiency grounds (Richmond Brief, pp. 43-47).

In support of its argument, Richmond asserts that, in the 1984 Boston Gas Decision, the Siting Council considered benefits to retail gas customers as a basis for approving construction of a Boston Gas pipeline to serve the Boston Edison Company's ("BECo") New Boston generating facility. According to Richmond, the benefits recognized by the Siting Council in that decision included $8,700,000 in fuel savings and long-term enhancements to Boston Gas' system reliability (id., pp. 44-45). Richmond further asserts that in the Turners Falls Decision, the Siting Council required petitioners to establish the need for an electric transmission line serving a cogeneration plant through a showing of specific, quantified benefits to Massachusetts, independent of the economic or reliability benefits that the cogeneration plant would provide to the New England region as a whole. Therefore, Richmond asserts that Berkshire should show that its customers receive specific, quantified benefits, independent of the benefits that the Altresco project would provide to Massachusetts or New England as a whole (id., pp. 46-47).

In response, Altresco argues that the 1984 Boston Gas Decision does not support Richmond's argument (Altresco Brief, pp. 26-27). Altresco states that that case, in which a temporary interconnection was justified on the basis of increased system reliability and short-term savings, presented a different set of facts (id.). Altresco asserts that nothing

in the 1984 Boston Gas Decision requires that every proposed pipeline be justified in the same manner, regardless of circumstances (id.).

Altresco further argues that Richmond's application of the Turners Falls case is misleading (id.). Altresco states that the Siting Council's finding in Turners Falls, that a petitioner must show specific benefits to Massachusetts independent of benefits to the region as a whole, differs from the finding that Richmond would have the Siting Council make in this case -- that specific benefits would flow to Berkshire's customers as a result of the proposed pipeline (id.).

In reaching its decision in the 1984 Boston Gas Decision, the Siting Council considered the total costs and benefits of a planned conversion of BECo's New Boston plant from oil to natural gas, not just the costs and benefits to Boston Gas and its customers associated with the supporting gas pipeline. In particular, in that case, the Siting Council considered preliminary estimates of BECo's investment cost, and an estimate of the "total margin between the reference price and the cost of gas" (11 DOMSC at 168). Further, the Siting Council found that the proposed conversion project would provide other benefits similarly unrelated to Boston Gas and its customers, including reductions in sulfur emissions in the area of the New Boston plant and diversification of the Commonwealth's fuel mix for production of electricity. Id.

Accordingly, although the Siting Council considered the benefits and risks to Boston Gas customers in the 1984 Boston Gas Decision, the Siting Council did not require a separate showing of net benefits to Boston Gas' customers, independent of the showing of overall energy supply and environmental benefits, as a basis for approving the gas pipeline in that case.

Further, the Siting Council rejects Richmond's interprepation of our standard as set forth in the Turners

Falls Decision.[5] While the Siting Council requires that a petitioner establish that Massachusetts benefits from a proposed new generating plant, we have not required an independent showing of Massachusetts benefits for a transmission line or natural gas pipeline that would serve a generating plant. See Turners Falls, 18 DOMSC at 151-165; 1989 MECo Decision, 18 DOMSC at 396-397. And, even when a petitioner must establish that Massachusetts benefits from proposed additional energy resources, we have not held that a proponent must establish that benefits accrue to a particular utility's customers, a geographic subarea of the state, or any subgroup of the state's residents.

Accordingly, the Siting Council rejects Richmond's argument that the Siting Council has employed a more stringent standard of review in reviewing other proposed facilities which would serve a generating plant. Further, the Siting Council rejects Richmond's position that benefits to existing customers must be shown to establish the need for the proposed pipeline.

2. Need for the Jurisdictional Cogeneration Plant

The Siting Council previously has found that the region needs the power from the Altresco cogeneration plant and that Massachusetts is likely to receive reliability, economic efficiency, and environmental benefits from the additional energy resources produced by the Altresco cogeneration plant (Altresco, 17 DOMSC at 369).[6] Accordingly, the Siting Council finds that the need for the additional energy resources from the Altresco cogeneration plant has been established.

5/ In the Turners Falls Decision, the Massachusetts benefits test was applied to the non-jurisdictional facility because the non-jurisdictional generating facility was selling its entire output to out-of-state customers (Turners Falls, 18 DOMSC at 156).

6/ The Company provided a status report and schedule for completion of the cogeneration plant, which is presently under construction by Altresco (Exh. HO-N-1S1). Altresco stated that it expects to commence "hot testing" by April 1990 and to commence commercial operations no later than June 1990 (Exh. A-1).

3. Need for Additional Pipeline Capacity

a. Standard of Review

As noted previously, Berkshire proposes construction of a gas pipeline primarily intended to transport gas owned by a non-utility user to that user's cogeneration plant located in Berkshire's service area. While this is the first case in which the Siting Council has reviewed such a proposal from a gas utility, the standard of review for need as applied in previous electric transmission and gas pipeline facility cases remains essentially unchanged. In the final analysis, the need for energy resources in the form of additional pipeline capacity hinges upon the adequacy of the existing system to accommodate its current system needs, including anticipated system growth, as well as the new source of supply.

b. Description of the Existing System

Berkshire introduces gas into its distribution system from two types of facilities -- Tennessee's meter delivery stations and Berkshire's propane plants. Tennessee transports gas to Berkshire's service territory via its principal interstate pipeline supplying Massachusetts, the Tennessee main line. The Tennessee main line enters the Commonwealth from New York state, passes to the south of Pittsfield through the nearby towns of Richmond, Stockbridge and Lenox, and continues eastward to the Connecticut River valley. From a tap point on the Tennessee main line in Richmond, a lateral delivery pipeline ("North Adams lateral") extends northward on a separate right-of-way 10.01 miles to a spur line ("Pittsfield spur line") (Exh. HO-RR-26). The Pittsfield spur line extends westward on a separate right-of-way 0.55 miles to the delivery meter station operated by Tennessee to serve Berkshire's Pittsfield market area ("Pittsfield meter station") (Exh. R-9, Tr. 18, pp. 85-86). The Altresco plant is located approximately 3,000 feet from the Pittsfield meter station (Tr. 18, pp. 85-86). The North Adams lateral continues from the intersection of the Pittsfield spur line to another meter station in North Adams.

Berkshire also operates a propane storage and injection facility in the Pittsfield area, with a storage capacity of 28.1 MMCF and a maximum daily design capacity of 5.4 MMCF (Exh. HO-1, Tab 2, Table G-14).

Berkshire stated that Tennessee is contractually obligated to supply to Berkshire up to 17,442 Dth in daily volumes on the existing North Adams lateral (Exh. HO-R-28). Berkshire further indicated its understanding that, to maintain the current pressure at which the North Adams lateral is operated, the volume transported by Tennessee along the North Adams lateral cannot exceed 21 to 22 MMCF per day (id., p. 110).

c. Adequacy of the Existing System to Supply the Altresco Plant

The Siting Council has found that the Company's supply plan is adequate for the Company's projected sendout over the forecast period (1990 Berkshire Forecast Decision, EFSC 89-29 (Phase I) at 52-57).

Berkshire's supply plan provides for continued use of existing resources, including: (1) pipeline gas supplied by Tennessee, (2) additional pipeline gas and peaking supplies transported by Tennessee, and (3) propane delivered by truck and stored in Berkshire's service territory (id., pp. 49-51). With respect to planned resource additions included in the Company's supply plan, Berkshire indicated that Tennessee's planned NOREX project will provide Berkshire with additional daily volumes of up to 4,976 mcf beginning in 1990-91 (Exh. HO-1, Tab 1, p. 31; Exh. HO-R-7).

In addition to providing increased volumes for the overall Berkshire system, the Company indicated that the FERC-approved NOREX project includes expansion of capacity on the North Adams lateral to allow enhanced delivery capabilities at the Pittsfield meter station and elsewhere along the lateral. Berkshire stated that the NOREX project will provide an increase of 2,050 Dth in the daily contracted volumes Tennessee is obligated to supply to Berkshire at the Pittsfield

meter station (Exh. HO-R-28).[7]

The Altresco plant would use approximately 36,000 Dth of gas per day, and Altresco requested transportation service for up to 40,000 Dth of gas per day on a firm basis, according to the Company (Exh. HO-1, Tab 2, p. 3; Exh. HO-1, Tab 3, p. 3). Thus, Altresco's requirements are nearly double the existing capacity of the North Adams lateral (see Section II.A.3.b, above). The Company stated that it has no excess firm capacity on its existing distribution system (Exh. HO-1, Tab 3, p. 3). The Company further stated that neither Tennessee nor the Company could provide gas supplies to meet Altresco's requirement via the North Adams lateral (Tr. 5, p. 110).[8]

Based on the foregoing, the Siting Council finds that the Company has established that the existing pipeline system is inadequate to accommodate both its current system needs, including anticipated system growth, and the requirements of the Altresco plant. Further, the Siting Council finds that, even with the planned expansion of Tennessee's North Adams lateral, the Company has established that the planned pipeline system is inadequate to accommodate its current system needs, anticipated system growth, and the the requirements of the Altresco plant.

Accordingly, the Siting Council finds that the Company has established that there is a need for additional energy

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7/ Of Berkshire's maximum daily contractual take of 17,442 mcf on the North Adams lateral, Tennessee is obligated to provide up to 10,000 mcf to the Pittsfield meter station (Tr. 5, p. 109).

8/ The Company stated that Altresco previously had requested that Tennessee supply the cogeneration plant as part of another proposed Tennessee expansion project, the proposed NORTRAN project, which Tennessee filed with FERC in January 1988 (Exh. HO-A-1). To meet Altresco's requirements as part of the NORTRAN project or a similar future project, the Company stated that Tennessee would need to construct looping and compression facilities and replace one or both of the existing North Adams lateral pipelines (id.). The Company stated that Tennessee had not agreed to include a gas supply for the Altresco plant as part of the NORTRAN filing (Tr. 4, pp. 27-29).

resources to meet the fuel supply requirements of the Altresco plant.

B. Comparison of the Proposed Project and Alternative Approaches

1. Standard of Review

G.L. c. 164, sec. 69H, requires the Siting Council to evaluate proposed projects in terms of their consistency with providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. In addition, G.L. c. 164, sec. 69I, requires a project proponent to present "alternatives to planned action" which may include (a) other methods of generating, manufacturing, or storing, (b) other sources of electrical power or gas, and (c) no additional electrical power or gas.[9]

In implementing its statutory mandate, the Siting Council has required a petitioner to show that, on balance, its proposed project is superior to alternative approaches in terms of cost, environmental impact, and ability to meet the previously identified need. Turners Falls, 18 DOMSC at 171-172; Braintree Electric Light Department, 18 DOMSC 1, 27 (1988) ("Braintree"); 1988 CELCo Decision, 17 DOMSC at 279-288; Middleborough, 17 DOMSC at 219-225; 1986 CELCo Decision, 15 DOMSC at 212-218; 1985 MECo Decision, 13 DOMSC at 141-183; 1985 BECo Decision, 13 DOMSC at 67-68, 73-74. The Siting Council also has considered reliability impacts in comparing

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9/ G.L. c. 164, sec. 69I, also requires a petitioner to provide a description of "other site locations."

proposed and alternative project approaches.[10] 1989 MECo Decision, 18 DOMSC at 404-405, 410-412, Boston Edison Company/ Massachusetts Water Resources Authority, EFSC 89-12A, pp. 13-14 (1989) ("BECo/MWRA").

2. Project Approaches

The Siting Council considers two project approaches to meet the identified need: (1) the Company's proposed project; and (2) the alternative project approach of a Tennessee expansion of the North Adams lateral.

a. Berkshire's Proposed Project Approach

Berkshire's proposed project approach consists of: (1) construction of the proposed meter station along the Tennessee main line in the Town of Richmond or in the Town of Lee to receive gas on behalf of Altresco and Berkshire, and (2) construction of the proposed 12-inch diameter pipeline between the meter station and the Altresco plant in Pittsfield to provide Altresco with firm transportation of up to 40,000 MMBtu per day to supply its cogeneration plant, and to provide Berkshire with firm transportation of up to 5,000 MMBtu per day to supply its Pittsfield market area (Exh. HO-1, Tab 1,

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10/ In the 1989 MECo Decision, the Siting Council stated that in future facility proposal reviews, we would require a petitioner to consider reliability of supply as part of its showing that its proposed project is superior to alternative approaches (1989 MECo Decision, 18 DOMSC at 412). The Siting Council recognizes that gas facility proposals differ significantly from electric facility proposals with respect to issues of reliability, and that a comparison of the reliability of alternative project approaches generally will not be applicable in gas facility reviews. The Siting Council does not analyze project level differences in reliability in the instant review.

pp. 4-5; Exh. HO-N-4; Exh. B-1, pp. 12-13).[11] The Company identified four possible routes for the proposed pipeline (see Section III, below).

b. Tennessee Expansion Alternative

The Company indicated that it considered, in conjunction with Altresco, a Tennessee expansion project as an alternative approach to meet the identified need ("Tennessee expansion alternative") (Exh. HO-1, Tab 1, p. 7; Exh. HO-1, Tab 3, p. 4). The Company presented an analysis of the Tennessee expansion alternative based on: (1) installing a new 10-inch loop line along the route of Tennessee's North Adams lateral and the Pittsfield spur line to the Pittsfield meter station, and (2) constructing a new meter station in Pittsfield (Exh. R-9). In addition, the Tennessee expansion alternative would require construction by Berkshire of a connection line

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11/ The Company did not include the proposed project, which provides Berkshire with only transportation capacity, as a supply resource in its current forecast of resources and requirements (see 1990 Berkshire Forecast Decision, EFSC 89-29 (Phase I), pp. 49-51). However, the Company estimated potential savings of $443,970 per year for its firm customers by utilizing its transportation rights in the proposed pipeline, rather than requesting Tennessee to transport the same volumes to Pittsfield via the North Adams lateral (Exh. HO-N-2S; Exh. HO-R-28; Tr. 4, p. 142).

The Company did not support its estimate of potential annual cost savings with an analysis of a system dispatch scenario that either has been experienced or is expected consistent with the Company's sendout forecast. Further, the Company did not identify the incremental construction cost and environmental impact, if any, of designing the pipeline to include firm capacity of 5,000 MMBtu per day for Berkshire.

The Siting Council notes that the inclusion of firm capacity rights for Berkshire in the proposed project may be beneficial in delaying any future need for another Tennessee expansion project on the North Adams lateral -- with its associated costs and environmental impacts. While the inclusion of Berkshire's capacity rights as part of the proposed project may require a slightly larger pipe or higher operating pressure for the proposed project, any costs and environmental impacts associated with design differences for this increment of capacity would be minor.

between the Altresco plant and the new meter station.[12]

3. Ability to Meet the Identified Need

Before reviewing the proposed and alternative project approaches on the basis of cost and environmental impact, the Siting Council must determine whether the different project approaches are capable of meeting the identified need. Boston Gas Company, 17 DOMSC 155 at 169.

The Company stated that the proposed pipeline, designed to operate at a maximum pressure of 500 psi, would accommodate Altresco's request to receive 1700 mcf per hour at a minimum delivery pressure of 350 psi, as well as the Company's desire to receive up to 200 mcf per hour for its distribution system (Exh. HO-N-3). The Company stated that timely installation of the proposed project is a viable way to supply gas to the Altresco plant by the planned on-line date (Exh. HO-1, Tab 1, p. 8).

With regard to the ability of the Tennessee expansion alternative to meet the identified need, the Company provided a memorandum from Tennessee which describes facilities that would be capable of transporting 45,500 mcf per day to Altresco and a smaller cogeneration project at Pfizer Chemical Company ("Pfizer project") in Adams (Exh. R-9; Tr. 5, pp. 93-94).[13] Altresco has requested deliveries of up to 40,000 mcf per day, and the requirements of the Pfizer project would have been slightly more than 1,000 mcf per day (Tr. 5, pp. 93-96).

12/ Although construction of facilities by Berkshire was not included in the Company's description of the Tennessee expansion alternative, the Company stated that Tennessee has indicated it does not intend to bypass local distribution companies (Tr. 4, pp. 35, 64-65). Further, Altresco stated its belief that Berkshire would need to construct a 2700-foot connection line from the Tennessee expansion alternative to the Altresco plant in order for the Tennessee expansion alternative to be a possibility (Altresco Brief, p. 34).

13/ At the time of the Tennessee memorandum, Pfizer Chemical Company had expressed interest in receiving gas for its planned cogeneration facility via Tennessee's North Adams lateral (Tr. 5, pp. 14-15, 93-94).

However, the Company stated that installation of the Tennessee expansion alternative would be more time-consuming than the proposed project (Exh. HO-1, Tab 1, p. 7). The Company stated that the Tennessee expansion alternative would require approval by FERC, and the lengthy process this would entail would significantly delay the timely startup of the Altresco plant (id.).[14] Additionally, the Company stated that in order to loop or replace the North Adams lateral, Tennessee would need to purchase additional adjoining right-of-way and seek legislative approval to traverse state-owned land and a wildlife sanctuary (id.).

In response, Richmond argues that there is a real potential that it could take several years for Berkshire to obtain the necessary permits to construct the proposed project along the primary route (id., p. 66). In addition to the state and local permits identified by the Company, Richmond argues that the approval of the U.S. Department of the Interior, Bureau of Outdoor Recreation, would be required for the pipeline right-of-way across Brattle Brook Park, since the park was purchased in part with a federal grant (id., pp. 58-66).[15]

Further, Richmond argues that the Altresco plant could operate on oil and interruptible gas, without the proposed pipeline, for longer than Berkshire assumes (Richmond Brief, p. 68). Richmond notes the testimony of Mr. Curtiss-Lusher, Altresco's witness, that the NOREX project would allow Tennessee to transport sufficient gas via the North Adams

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14/ The Company noted that in March 1988, when Altresco initially considered and developed options to meet its fuel requirements, FERC released a four and one-half year timetable for reviewing various proposed competitive gas supply projects for the northeastern United States in its "Open Season" proceeding (Exh. B-1, p. 11). However, Altresco stated that it now expects that Tennessee could obtain the necessary approvals to construct the Tennessee expansion project, realistically, by 1991 (Tr. 10, pp. 110-111).

15/ The proposed project approach also would require Massachusetts legislative approval to allow the alignment across Brattle Brook Park (Tr. 8, pp. 25, 32-33; Exh. R-32)

lateral to allow operation of the Altresco plant at full capacity for six months of the year, and at 30 to 50 percent of capacity for another three or four months (id., p. 68).

However, Altresco argues that, even with completion of the NOREX project, reliance on oil and interruptible gas to operate the cogeneration plant throughout the heating season would not allow for any operation of the cogeneration plant for 12 days per year and would require the plant to operate at no more than one-half capacity for another four months per year (Altresco Brief, p. 33).[16]

The record reasonably demonstrates that both the proposed project approach and the Tennessee expansion alternative are technically capable of meeting the identified need. With respect to the parties' arguments concerning timing, both project approaches appear to require lengthy permitting reviews and a potentially lengthy process for acquiring rights-of-way.[17] However, there is no basis to conclude that the timing requirements of either project approach renders it incapable of meeting the identified need.

Accordingly, the Siting Council finds that the proposed project approach and the Tennessee expansion alternative are capable of meeting the identified need.

16/ Altresco assumed that it could burn oil for no more than 50 days per heating season (Altresco Brief, p. 33). However, while testifying that its air quality permit limits oil burning to 50 days per year, Altresco noted that a new 50-day allowance would begin on January 1 of each year (Tr. 10, pp. 195-196). Thus, with regard to the 1990-91 heating season, Altresco stated that the new 50-day allowance on January 1, 1991 should "get us through the winter" (id., p. 196).

17/ While Berkshire has been proceeding with right-of-way acquisition and permitting for its proposed project approach for more than a year, the Siting Council does not attribute an advantage to a petitioner's proposed project or proposed site, relative to an alternative, merely because the petitioner elected to exclusively pursue permitting for its proposal and not for the alternative.

4. Cost

The Company estimated total budget costs for the proposed project ranging from a low of $9,555,000 for the primary route to a high of $14,202,000 for Company Alternative 1, which follows a Conrail right-of-way.[18]

The Company provided a memorandum prepared by Altresco estimating the cost of the Tennessee expansion alternative to be $14,598,020 on a total-budget basis (Exh. R-9). The estimate reflected direct costs estimated by Tennessee in 1987 to supply both the Altresco plant and the proposed Pfizer project.[19] The estimate also included cost adjustments developed by Berkshire and Altresco to account for the following: (1) full cost of a take station, land, and other requirements not addressed in Tennessee's 1987 cost estimate, including the cogeneration plant interface and permitting and legal costs; (2) allowances for project management, overhead, and interest during construction; and (3) cost of compression at the Altresco plant required to assure adequate delivery pressure during the heating season (id.).

Richmond argues that the cost estimate provided by the Company for the Tennessee expansion alternative is a limited analysis that contains flaws and is of little probative value (Richmond Brief, p. 71). With regard to the direct costs of the pipeline estimated by Tennessee, Richmond argues that: (1) the direct cost was based on a 12.9-mile length of pipeline along the North Adams lateral, exceeding the 10-mile distance between the Tennessee main line and the Pittsfield spur; and (2) the direct cost was not adjusted to remove any amounts attributable to the Pfizer project (id., pp. 71-72). With regard to site costs, Richmond argues that the Company's

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18/ To compare the costs of the proposed and alternative project approaches, the Siting Council will use the cost of the primary route as the cost of the proposed project.

19/ The Company provided no updated cost estimate by Tennessee, and no Tennessee representative appeared during the course of this proceeding as a witness.

allowance of $600,000 to acquire land for the meter station was much greater than similar allowances for meter station sites under the proposed project (id., p. 74). Richmond argues that corrections for the length of pipeline and the meter station site acquisition cost would reduce the total budget cost to $11,406,870 (id., p. 75).

With respect to other cost adjustments made by the Company, Richmond argues that: (1) an upward adjustment to reflect a 21 percent "A & G charge"[20] was unsubstantiated; (2) a $1,020,000 allowance for construction interest was unsubstantiated and apparently reflects double counting of the allowance for funds used during construction ("AFUDC") included in the A & G charge; (3) an upward adjustment in Tennessee's per-mile direct cost for pipeline was unsubstantiated; (4) a 100 percent cost overrun allowance for the direct cost of the meter station was unsubstantiated; and (5) an allowance for compression was unsubstantiated (id., pp. 72-76). Richmond argues that corrections for these adjustments are impossible to calculate, but may produce substantial reductions in the cost of the Tennessee expansion alternative (id., p. 75). In sum, Richmond argues that the Company has failed to show that the primary route of the proposed project approach is superior to the Tennessee expansion alternative with respect to cost (id., p. 76).

Altresco argues that the Company's estimate of the cost of the Tennessee expansion alternative is conservative for the following reasons: (1) an allowance for right-of-way cost and contingencies to allow pipeline construction across private land is not included; (2) an allowance for Tennessee cost overruns, such as Berkshire has experienced in connection with past Tennessee projects, is not included; and (3) the allowance that the Company included for compression capacity at the Altresco plant was an intentionally conservative estimate of $1,500,000, rather than the $3,000,000 cost Altresco actually

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20/ Berkshire's estimate of Tennessee's "A & G" charge refers to administrative and general costs (Tr. 5, p. 23).

would expect (Altresco Brief, pp. 36-37). Altresco further argues that, because Tennessee representatives familiar with the original estimate of direct costs were not available to explain the basis for the 12.9-mile length of pipeline in the estimate, no adjustment should be made to base the pipeline length on a 10.07-mile distance (id., pp. 37-38). Finally, Altresco argues that, even if the Company's estimate is adjusted to base the pipeline cost on a 10.07-mile length rather than a 12.9-mile length, and is adjusted to remove the $1,020,000 interest allowance that was disputed by Richmond, the estimated cost of the Tennessee expansion alternative still would exceed the cost of the proposed project primary route by $1,700,000 (id., pp. 38-39).

The Siting Council notes that the Company's estimate specifically includes AFUDC as part of Tennessee's 21 percent overhead allowance (Exh. R-9), and therefore the Company has not established any basis for the additional $1,020,000 allowance to cover interest during construction. With respect to the length of pipeline to be built along the North Adams lateral, it is clearly the Company's burden to establish that the original Tennessee estimate of direct costs is appropriate in this review. The record shows that the Tennessee estimate was based on transporting gas for the Pfizer project as well as the Altresco project, and that the Company did not reduce the estimate to account for any facilities in the Tennessee estimate that may have been attributable to the Pfizer project (id.; Tr. 5, pp. 93-96). Further, the record shows that the length of the North Adams lateral between the Tennessee main line and the Pittsfield spur is 10.01 miles (Exh. HO-RR-26). Thus, the Company has not established that the Tennessee cost estimate, based on a 12.9-mile length of pipeline along the

North Adams lateral, is appropriate.[21]

With regard to Richmond's other arguments concerning the cost of the Tennessee expansion alternative, we find no basis to adjust or reject outright amounts estimated by the Company. The Company estimated the direct costs for the Tennessee expansion alternative to be $650,000 per mile, a figure somewhat higher than the corresponding costs for the proposed project along two of the routes for the proposed project -- the primary route and Company Alternative 2.[22] However, the $650,000 figure is reasonable in light of: (1) the need to account for right-of-way costs and contingencies and possible cost overruns as part of a Tennessee project; and (2) the costs of more diffcult overland construction along sections of the Tennessee route, including numerous traverses of wetlands totalling over a mile in length (see Section II.B.5, below), and areas of steep terrain in the vicinity of South Mountain (Exh. HO-2). The Company's estimate of $600,000 to acquire land for a meter station under the Tennessee expansion alternative, based on a site in a built-up section of Pittsfield, is not unreasonable simply because it is substantially larger than the identified costs of corresponding sites under the proposed project, which are located in rural areas. Finally, although the Company did not substantiate that an expenditure of $1,500,000 for compression facilities is warranted, it is reasonable that some new facilities -- whether compression or pipeline or both -- would be required to deliver

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21/ An additional length of pipeline extending north from the Pittsfield spur tap toward the North Adams meter station would represent a means of providing additional capacity to serve Pfizer. The Siting Council notes that the difference between the 12.9 mile length of pipeline included in Tennessee's estimate and the 10.01 mile distance between the Tennessee main line and the Pittsfield spur may include facilities originally intended by Tennessee to serve Pfizer.

22/ Based on the Company's estimates of cost for pipeline installation and materials, the direct costs of the primary route would be $6,200,000, or $539,130 per mile, while the direct cost of Company Alternative 2 would be $7,548,000, or $539,143 per mile (Exh. HO-RR-30).

gas to operate the Altresco plant, given the pressure requested by Altresco and the 2,700-foot distance from the meter station site to the plant.[23]

Accordingly, the Siting Council finds that, based on the record in this proceeding, the most reasonable estimate of the cost of the Tennesee expansion alternative is $11,352,020. This figure represents: (1) a reduction of Berkshire's estimate by $1,020,000 to remove the extra allowance for interest during construction, and (2) a reduction by $2,226,000 such that the direct cost of the pipeline and the 21 percent overhead factor reflect the actual 10.01-mile length of the North Adams lateral from the Tennessee main line to the Pittsfield spur. The adjusted cost of the Tennessee expansion alternative, $11,352,020, is 19 percent greater than the cost of the proposed project primary route.

23/ The record in this proceeding includes different forms of cost information about the Company's proposal and various alternatives, including estimates of: (1) initial installation costs, such as direct construction costs, interest during construction, engineering costs, permitting costs and contingencies; and (2) life-cycle costs, such as operating and maintenance cost, throughput charges and other annual charges, expressed in either current-year or present-value terms. In determining whether a petitioner's proposal or an alternative is least-cost, however, the Siting Council focuses on "real" costs to society -- that is the cost to actually install, operate and maintain facilities -- and normally does not require refinement of cost estimates to reflect differing rates of return or profit associated with respective alternatives, or other economic differences that are essentially redistributive in nature. Further, in the absence of significant differences between a proposal and alternatives with respect to either (1) the overall type or design of project or (2) the timing or phasing of facility elements, the Siting Council may limit its cost review to installation costs, and not explicitly address life-cycle costs in any way. In short, specific attention to life-cycle costs is clearly warranted only in those situations where there is reason to expect significantly disproportionate relationships between installation costs and real life-cycle costs, as part of comparing a proposal to alternatives. In the instant case, the Company's proposal and the Tennessee expansion alternative are conceptually similar -- each consisting of a high pressure gas pipeline and a meter station to be installed at one time and to be largely dedicated to meeting Altresco's need. Accordingly, the Siting Council limits its review of project costs to installation costs, and does not consider life-cycle costs.

While more detailed analysis of the cost allowances and factors in the Company's estimate of the cost of the Tennessee expansion alternative could result in further refinement of that cost estimate, the cost advantage of the proposed project as currently estimated is significant.[24]

Based on the adjusted cost of the Tennessee expansion alternative and the Company's estimated cost for the proposed project primary route, the Siting Council finds that the proposed project is superior to the Tennessee expansion alternative with respect to cost.

5. Environmental Impact

The Company stated that the overall environmental impacts of the proposed project constructed along the primary route would be minimal, limited to generally temporary and localized disturbances (Exh. HO-1, Tab 1, p. 6).[25] The Company further stated that construction of the proposed project along the primary route, principally under state and local

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24/ Although the Siting Council has in this record sufficient information to make a finding regarding the relative cost of the Tennessee expansion alternative, the Siting Council acknowledges the inherent lack of precision which necessarily accompanies any comparison of the cost of jurisdictional natural gas pipeline facilities with that of non-jurisdictional natural gas pipeline facilities. When the potential developer of a non-jurisdictional facility does not appear before the Siting Council to provide information either through the discovery process or during the course of evidentiary hearings, the ability of the Siting Council to determine precisely what actions that developer may or may not take, or the costs of those actions, may be restricted. Nonetheless, in cases such as this where a petitioner has decided expressly to construct jurisdictional facilities rather than non-jurisdictional facilites, the Siting Council expects the petitioner to provide all available documentation to support that decision. In an instance where the petitioner failed to provide necessary documentation, the Siting Council would, of course, have the authority to subpoena witnesses as necessary to receive that documentation.

25/ To compare the environmental impacts of the proposed and alternative projects, the Siting Council will compare the environmental impacts of the proposed project primary route with those of the Tennessee expansion alternative.

roads, could entail traffic disruption and disturbance of soil, vegetation, and fences in the immediate vicinity (id.). The Company also stated that the proposed pipeline would pass within 50 feet of approximately 84 residences if constructed along the primary route (Exh HO-E-13).

The Company maintained that expansion of Tennessee's North Adams lateral would have the potential for a more significant impact on the environment than construction of the proposed project along the primary route (Exh. HO-1, Tab 3, p. 4). The Company stated that construction along the North Adams lateral would require clearing of trees, and would traverse four streams and a number of wetlands (Exh. R-12; Tr. 8, p. 60). The Company stated that the North Adams lateral traverses the Canoe Meadows Wildlife Sactuary and a wetland identified by the Massachusetts Natural Heritage Program as containing two plant "species of concern" in Massachusetts (Exh. R-12). The Company also provided a copy of the Environmental Assessment prepared by FERC for Tennessee's NOREX project, which overlaps in part the route of the Tennessee expansion alternative (Exh. R-13). The Environmental Assessment for NOREX indicates that the six-mile segment of the North Adams lateral to be expanded as part of NOREX, extending from near the Richmond-Pittsfield city line to the Pittsfield spur, includes 10 traverses of wetlands totalling over one mile in length and two traverses of public landholdings -- the city-owned Brattlebrook Park and a state-owned wildlife management area (id., pp. 45, 47-48, 144). The NOREX route also crosses property of the South Mountain Concert Hall, which is listed on the National Register of Historic Places (id., p. 57). With respect to residential impacts, the Environmental Assessment indicates that there are six residences that will be located within 50 feet of the edge of the right-of-way, when widened as part of NOREX, along the same six-mile segment of the North

Adams lateral (id., p. 50).[26]

Richmond argues that the Company has failed to provide any empirical analysis that addresses the environmental impacts of the Tennessee expansion alternative (Richmond Brief, pp. 35-37; Richmond Reply Brief, p. 11). Richmond argues that Altresco's witness, Mr. Ingram, testified as to the high level of environmental sensitivity Tennessee employs in its construction, even in situations where a right-of-way must be expanded (Richmond Reply Brief, p. 11).

Berkshire responds that, absent much more costly reconstruction of an existing pipeline, use of the North Adams lateral route would require some expansion of the right-of-way, which raises significant environmental concerns (Berkshire Reply Brief, p. 8). Altresco argues that the record demonstrates that Tennessee, under all scenarios, would need to install an entirely new pipeline on expanded right-of-way,[27] and that the Tennessee expansion alternative would have far more adverse environmental impacts than the proposed project primary route (Altresco Brief, p. 40).

As suggested by arguments of the parties, a significant component of the environmental concerns raised by the Tennessee expansion alternative is based upon the possible need for an expanded permanent right-of-way. In addition to greater impacts on trees and other environmental features, right-of-way expansion would entail a significant land use impact associated with acquiring new permanent rights to a 10-foot strip of land, as well as temporary construction easements, along the entire route (Exh. R-13).

26/ Based on aerial photographs in the record, there appear to be few if any residences located within 50 feet of the North Adams right-of-way along the remaining four miles of the Tennessee expansion alternative in southwestern Pittsfield and Richmond (Exh. HO-E-1S).

27/ To supply Altresco, the Company stated that it assumed Tennessee would place a new pipeline ten feet from one of the two existing pipelines on the North Adams lateral, regardless of whether the new line was intended to loop the existing pipelines or replace one of the pipelines (Exh. R-12).

Although the Company stated that Tennessee would need to acquire ten feet of additional permanent right-of-way to construct the Tennessee expansion alternative, the record remains unclear as to the necessity of expanding the North Adams right-of-way to accommodate a new line under the Tennessee expansion alternative. The Company has assumed that a parallel loop line or replacement line would be required without consideration of the possibility of replacing one of the existing pipelines in the same trench ("same-trench replacement") (Exh. R-12).[28] Nonetheless, significant environmental impacts would remain even under same-trench replacement -- notably excavation through wetlands and acquisition and clearing of temporary construction easements.

By comparison, the proposed project approach raises its own land use and safety concerns, associated with its proximity to numerous residences and its potential for disrupting traffic during construction. However, the proposed project approach has far fewer impacts on wetlands and trees than the Tennessee expansion alternative.[29]

The Siting Council notes that the relative environmental impacts of an overland pipeline route and an on-street route will vary according to the specific characteristics of the proposed routes. In this proceeding, the Tennessee alternative overland approach along the North Adams right-of-way traverses extensive sensitive environmental areas including wetlands,

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28/ The environmental impacts of the proposed project vary according to which of the routes is utilized, but in general the proposed routes all avoid clearing new rights-of-way or trenching through wetlands (see Section III.E, below).

29/ Under the approach of a parallel replacement project, the land use impact of the Tennessee expansion alternative could be reduced by allowing land to revert back to the landowner on the side of the right-of-way containing the pipeline to be abandoned. Further, under either a parallel replacement or looping approach, the tree clearing impact can be reduced along part of the route by constructing on the same side of the right-of-way along which the six-mile NOREX project, with its associated tree clearing requirements, is planned.

wooded areas, and a wildlife sanctuary. While there may be some flexibility as to the design of the Tennessee expansion project, including the alignment of the pipeline, any design for pipeline construction along the North Adams lateral would have significant environmental impacts, exceeding those of the proposed project approach.

Based on the foregoing, the Siting Council finds that the proposed project is superior to the Tennessee expansion alternative with respect to environmental impacts.

6. Conclusions: Weighing Need, Cost, and Environmental Impacts

The Siting Council has found that: (1) the proposed project and the Tennessee expansion alternative are capable of meeting the identified need; (2) the proposed project is superior to the Tennessee expansion alternative with respect to cost; and (3) the proposed project is superior to the Tennessee expansion alternative with respect to environmental impacts.

Accordingly, the Siting Council finds that the proposed project is superior to the Tennessee expansion alternative.

III. Analysis of the Proposed and Alternative Facilities

A. Standard of Review

G.L. c. 164, sec. 69I, requires a facility proponent to provide information regarding "other site locations." In implementing this statutory mandate, the Siting Council requires the petitioner to show that its proposed facility siting plans are superior to alternatives. Specifically, a petitioner must demonstrate that its proposed facilities are sited at locations that minimize costs and environmental impacts while ensuring supply reliability.

In previous cases, once the Siting Council has determined: (1) that new energy resources are needed, and (2) that the applicant has proposed a project that is, on balance, superior to alternative approaches in terms of costs, environmental impacts, reliability impacts and addressing identified need, the Siting Council has required the petitioner to show: (1) that it has examined a reasonable range of practical facility siting alternatives, and (2) that the proposed site for the facility is superior to the alternative site(s) on the basis of a balancing of cost, environmental impact, and reliability of supply. BECo/MWRA, EFSC 89-12A, p. 27; Turners Falls, 18 DOMSC at 171; 1988 Braintree Decision, 18 DOMSC at 31; 1988 ComElectric Decision, 17 DOMSC at 298-303; 1988 Boston Gas Decision, 17 DOMSC at 172; NEA, 16 DOMSC at 381-409; 1986 CELCo Decision, 15 DOMSC at 195-196; 1985 MECo Decision, 13 DOMSC at 183-184, 190-248. In past cases, in order to determine that a facility proponent has considered a reasonable range of practical alternatives, the Siting Council typically has required the proponent to establish that: (1) it has developed and applied a reasonable set of criteria for identifying and evaluating alternatives, and (2) it has identified at least two practical sites with some measure of geographic diversity. BECo/MWRA, EFSC 89-12A, pp. 34-38; Turners Falls, 18 DOMSC at 175-178; 1988 Braintree Decision, 18 DOMSC at 31-40; 1988ComElectric Decision, 17 DOMSC at 301-303; 1988 Boston Gas Decision, 17 DOMSC at 155, 176-181; NEA, 16 DOMSC at 385-388; 1986 CELCo Decision, 15 DOMSC at 228-229; 1986

Hingham Decision, 14 DOMSC at 22; 1985 MECo Decision, 13 DOMSC at 190-191; 1985 BECo Decision, 13 DOMSC at 76-77.

1. Evolution of the Practicality Standard

The Siting Council's review of whether a petitioner has considered a reasonable range of practical facility alternatives has evolved over the course of several Siting Council decisions. In the 1985 MECo Decision, the Siting Council set forth a two-part process, in which we would review: (1) whether the petitioner identified a reasonable range of alternatives; and (2) whether the petitioner's alternative is practical, first, in light of the petitioner's process for identification of alternatives, and second, based upon the reliability, environmental, and cost characteristics of the selected alternative(s). 1985 MECo Decision, 13 DOMSC at 190-198.

Following the 1985 MECo Decision, the Siting Council's decisions in facility cases included findings regarding whether petitioners: (1) developed and applied a reasonable set of criteria for identifying possible alternatives; and (2) considered a reasonable range of practical facility siting alternatives. 1988 ComElectric Decision, 17 DOMSC at 301-303; 1988 Middleborough Decision, 17 DOMSC at 227-228; 1988 Boston Gas Decision, 17 DOMSC at 177-181.

In more recent cases, the Siting Council adopted its current two-prong test for determining whether an applicant has considered a reasonable range of practical facility alternatives. This two-prong "practicality" test requires a petitioner to establish that: (1) it has developed and applied a reasonable set of criteria for identifying alternatives, and (2) it has identified at least two practical sites with some measure of geographic diversity. BECo/MWRA, EFSC 89-12A, p. 27; Turners Falls, 18 DOMSC at 171-179; 1988 Braintree Decision, 18 DOMSC at 31-40.

While the Siting Council's "practicality" standard has evolved over the course of several decisions, there remain some questions regarding the interpretation and application of this standard. In the instant case, the "practicality" of

Berkshire's alternative routes has been the subject of lengthy testimony and argument. For these reasons, the Hearing Officer required all parties in this proceeding to include in their briefs a discussion of what constitutes a practical alternative, as well as what constitutes a reasonable range of practical siting alternatives.

2. Arguments of Parties

In response to the Hearing Officer's request, Richmond argues that an option which is theoretically possible but practically impossible cannot be said to be a practical alternative (Richmond Brief, p. 19). Richmond argues that the Siting Council's standard must incorporate a threshold of practicality and a standard of good faith on the part of a petitioner, and that the petitioner must not suggest alternatives as practical that it knows have some major flaw or unresolved problem (id., pp. 19-20). Accordingly, Richmond asserts that alternatives must be shown to be capable of accomplishing the desired objectives in a manner consistent with whatever constraints exist in the specific circumstances (id., p. 20). Richmond further argues that a petitioner's filing is deficient on its face if a petitioner cannot demonstrate that it would be able to construct any alternative other than the proposed facilities, should such an alternative be approved (id., pp. 15-16, 20).

In contrast, Altresco argues that the term "practical" must be viewed as a relative term, one that is defined in the context of what options are available to meet the identified need. Consistent with this view, Altresco avers that "practical" should mean the best options available under the circumstances of the case (Altresco Brief, p. 49). Altresco asserts that it is difficult to formulate a minimum set of criteria that an alternative must meet in every case to be considered practical (id.). Altresco states that the second or third best options for meeting the identified need are the practical alternatives, regardless of how good they may be in comparison to the first choice (id., p. 50). Altresco notes

that while the Siting Council currently requires petitioners to identify at least two practical alternatives, the logic of this requirement is not compelling (id., pp. 46-49). Nonetheless, for purposes of this proceeding, Altresco argues that the proposed facility is appropriately judged in light of the findings and policies expressed in current Siting Council decisions (id., p. 51).

Berkshire argues that matters that would make any alternative unfeasible in relation to the proposed route, whether discovered by a petitioner prior to or subsequent to its filing, are not determinative in judging whether the petitioner has assessed a range of practical alternatives (Berkshire Brief, p. 65).

3. Analysis and Conclusions

In recent cases, the Siting Council has addressed a number of issues as part of our review of whether a petitioner has considered a reasonable range of practical facility alternatives. In the 1988 Middleborough Decision, 17 DOMSC at 227-228, we addressed concerns regarding the petitioner's failure to develop a reasonable set of criteria for identifying possible facility sites. In the 1988 Altresco Decision, 17 DOMSC at 393-394, we addressed the question of whether, in some circumstances, the proponent of a cogeneration facility can establish that a practical alternative facility site with a measure of geographic diversity does not exist. In the 1988 Braintree Decision, 18 DOMSC at 38-40, we reviewed a proposal in which concerns were raised due to the failure of a petitioner to identify geographically diverse alternatives.

Here, however, we are presented for the first time with a case where important questions have been raised regarding the practicality of a petitioner's alternative facility routes. In addressing these questions, we consider our recent facility decisions as well as the arguments presented by parties in this case.

Our previous reviews shed some light on the meaning of the term "practical." In the 1985 MECo Decision, the Siting

Council found that various transmission line alternatives were practical because they would use existing rights-of-way (13 DOMSC at 191-192). In other cases, the Siting Council has relied upon the evaluation in a site selection process of the relative cost, environmental impacts, and reliability of alternatives, as opposed to evidence of mere physical ability to construct alternatives at a given site, in determining whether a reasonable range of practical alternatives has been considered. 1988 Boston Gas Decision, 17 DOMSC at 180-181; 1986 CELCo Decision, 15 DOMSC at 228-229; 1985 BECo Decision, 13 DOMSC at 76.

Therefore, while the Siting Council agrees with Richmond that an alternative must be more than theoretically or physically possible in order to be practical, we expressly reject the notion that the alternative facility sites included in a petitioner's filing must exceed some "threshold of practicality." On an operational level, the concept of applying some "threshold of practicality" to particular routes or sites raises two immediate problems. First, establishing a single, explicit threshold to be applied in all settings and for all types of projects would be virtually impossible. Second, while a particular alternative facility route or site might exceed some "threshold of practicality" at an early stage of the siting process, any number of events could take place subsequent to the filing of a petition at the Siting Council -- events which could adversely affect the ability of the alternative facility route or site to continue to meet that threshold. In such cases, a "threshold of practicality" could operate to penalize a petitioner for initially pursuing facility alternatives which subsequently proved to be of questionable practicality.

Yet, the Siting Council shares Richmond's concern that facility applicants must evaluate practical alternatives which are more than theoretically or physically possible. Therefore, consistent with recent cases, the Siting Council's requirement that petitioners consider a reasonable range of practical alternatives must focus upon the petitioner's site selection process in order to ensure that applicants have considered

practical alternatives, not from the standpoint of mere physical ability to construct, but from the standpoint of cost, environmental impact and reliability.

In some measure, several questions regarding our review of whether a petitioner has considered a reasonable range of practical alternatives revolve around the concept of "noticed" alternatives. When a facility proposal is submitted to the Siting Council, the petitioner is required to present: (1) its preferred facility route or site; and (2) at least one alternative facility route or site. These routes and sites often are described as the "noticed" alternatives because these are the only routes and sites described in the notice of adjudication published at the commencement of the Siting Council's review.[30]

However, a facility proponent also is required to present to the Siting Council a description of its site selection process, including a full explanation of the criteria developed and applied in making siting decisions. It is through a comprehensive review of a petitioner's site selection process, as opposed to the review of the practicality of each noticed alternative, that the Siting Council is able to determine whether a reasonable range of practical alternatives has been considered.

The Siting Council's continued emphasis on a petitioner's site selection process, rather than on the practicality of particular noticed alternatives, is fundamental and consistent with our mandate. Our concern cannot be whether a particular noticed facility alternative is feasible or practical. On the contrary, our primary concern is that in developing and applying its site selection criteria, the petitioner has not overlooked

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30/ In reaching a decision in a facility case, the Siting Council can approve a petitioner's preferred route or site, approve an alternative route or site, or reject all routes and sites. The Siting Council, however, may not approve any site, route, or portion of a route which was not included in the petitioner's filing, and therefore which was not included in the notice of adjudication published at the commencement of the proceeding.

or eliminated any alternative route or site -- irrespective of whether it has been included in a published legal notice -- which clearly is superior to the petitioner's preferred route or site.[31]

In sum, we are convinced that our two-prong test for determining whether a reasonable range of practical alternatives has been considered remains both viable and appropriate. At the same time, the arguments presented in this case, as well as our more recent facility decisions, persuade us that we must continue to emphasize the first "prong" of our test -- the requirement that petitioners develop and apply a reasonable set of criteria in making siting decisions -- as the best means available to ensure that practical alternatives are considered. It is only through a detailed review of whether a petitioner developed a reasonable set of siting criteria and applied those criteria in a consistent and appropriate manner that the Siting Council can determine whether facility applicants have consistently employed a site selection process which is comprehensive, robust, and responsive to both community and project needs.

Recent Siting Council decisions also have relied on the second "prong" of our practicality test which requires petitioners to consider practical alternatives with some measure of geographic diversity.[32] BECo/MWRA, EFSC 89-12A, pp. 34-38;

31/ In making this distinction, the Siting Council does not mean to invite parties to present an exhaustive list of possible alternative routes and sites which must then be evaluated in our proceeding relative to the preferred route or site. Instead, through a comprehensive review of the petitioner's site selection process, i.e., a consideration of how specific criteria were developed and applied, the Siting Council can determine whether clearly superior routes or sites have been overlooked or eliminated.

32/ Our discussion in this section also has persuaded us that inclusion of the term "practical" in the second prong of our practicality test is redundant and should be deleted. Deletion of this term will not adversely affect parties to this case or future cases in that the requirement that petitioners consider practical alternatives with some measure of geographic diversity will be evaluated as part of our review of the site selection process.

Turners Falls, 18 DOMSC at 175-177; 1988 Braintree Decision, 18 DOMSC at 36-40. Clearly, our comprehensive review of a petitioner's site selection process enables us to determine whether geographically diverse alternatives have been considered, and more importantly, whether any geographically diverse alternatives which clearly are superior to the preferred route or site have been overlooked or eliminated.

Although we have acknowledged here for the first time that inordinate concern regarding the practicality of particular noticed alternatives is misplaced, it is important to note that this acknowledgement does not signal a departure from our statutory mandate, or current practices and procedures.

First, G.L. c. 164, sec. 69I, which requires a petitioner to provide a description of "other site locations," can be fulfilled through a discussion of alternatives considered in a site selection process or through noticed alternatives filed in a petition.

Second, we are in no way eliminating the requirement that petitioners include noticed alternatives as part of all facility applications,[33] including at least one noticed alternative with some measure of geographic diversity. Instead, our discussion above underscores the importance of including the "best" alternatives in an initial filing, alternatives which are both responsible and feasible. In fact, all parties are well served when a petitioner presents the Siting Council with those alternatives which best achieve the appropriate balance between cost, environmental impact and reliability. During the course of a Siting Council proceeding, additional information may come

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33/ In the 1988 Altresco Decision, the Siting Council found that under certain circumstances, the proponent of a cogeneration facility can establish that a practical alternative with some measure of geographic diversity does not exist (17 DOMSC at 391-394). In such a case, noticed site alternatives need not be included in an initial filing. While there may be other situations where a petitioner's site selection process indicates that no practical alternatives exist for proposed generating facilities, the Siting Council can envision few, if any, instances where such circumstances would exist in gas pipeline and electric transmission line cases.

to light, or events may take place, which adversely affect the ability of the petitioner's preferred route or site to meet the identified need while achieving the appropriate balance between cost, environmental impact and reliability. In such an instance, the Siting Council will be able to proceed most expeditiously if alternative routes, which may now be clearly superior to the petitioner's preferred route, already have been included in the notice of adjudication.

Therefore, in order to determine whether Berkshire has considered a reasonable range of practical alternatives, the Siting Council first reviews Berkshire's site selection process to evaluate whether the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternatives (see Sections III.C.2 and III.C.3, below). Next, we consider whether that process included consideration of route alternatives with some measure of geographic diversity (see Section III.C.4, below).

Finally, if a petitioner can establish that it has considered a reasonable range of practical siting alternatives, the Siting Council still must review whether the preferred site or route is superior to noticed alternative sites and routes. This finding remains essential because it is at this stage that the Siting Council determines whether sites or routes are acceptable, i.e., whether they achieve the appropriate balance between cost, environmental impact and reliability. Further, because we expect petitioners to present in their filings alternatives that are, in fact, responsible and reasonable, this more detailed analysis of the noticed alternatives enables the Siting Council to determine which route or site is superior in terms of achieving the appropriate balance between cost, environmental impact and reliability.

B. Description of the Proposed and Alternative Facilities

1. Proposed Facilities

Berkshire's proposal consists of: (1) a 12-inch diameter, 500 psi pressure natural gas pipeline of approximately 11.5 miles in length to be constructed along the primary route, as described below, extending from the Tennessee main line in Richmond to the Altresco project in Pittsfield, and (2) a new meter station to be constructed on a site on Dublin Road in Richmond along the south side of the Tennessee main line right-of-way. From the primary meter station site in Richmond, the primary route extends in a generally northeasterly direction along segments of Dublin Road, Sleepy Hollow Road, East Road and Swamp Road in Richmond and along segments of Barker Road and South Mountain Road in Pittsfield. The primary route then continues in a southeasterly direction through Pittsfield along a short segment of Route 7/20 and along a private access road on an easement across the Pittsfield Country Club. From this point, the primary route travels in a generally northeasterly direction along segments of Holmes Road, Williams Street, Adelaide Avenue, Lillian Street, Dillon Avenue, and an easement across Brattle Brook Park. After exiting Bratle Brook Park, the primary route travels along Longview Terrace, crosses the Housatonic River, and continues along segments of East Street and Commercial Street. From Commercial Street, the primary route crosses the Conrail tracks, and then continues across Merrill Road to the cogeneration plant (Exhs. HO-1, Tab 3, pp. 6-7, HO-2, HO-3).

The estimated cost of Berkshire's proposal is $9,555,000. (Exh. HO-RR-30).

2. Alternative Facilities

a. Company Alternative 1

Company Alternative 1, a noticed alternative, includes the primary meter station site, but extends along an alternative pipeline route approximately 10 miles in length, which does not overlap any portion of the primary route. From the primary meter station site on Dublin Road in Richmond, Company

Alternative 1 extends approximately 100 feet west to the abutting Conrail right-of-way, then continues in a generally northeasterly direction along the Conrail right-of-way through Richmond and Pittsfield to a point near the interesection of Merrill Road and New York Avenue in Pittsfield. From this point, Company Alternative 1 leaves the Conrail right-of-way and crosses Merrill Road to the cogeneration plant (Exhs. HO-1, Tab 3, pp. 5-6, HO-2, HO-3).

Although the pipeline route included in Company Alternative 1 generally would parallel the Conrail tracks, the Company indicated that engineering constraints would preclude aligning the pipeline route directly adjacent to the Conrail tracks at road underpasses and overpasses, thus requiring deviations onto embankments and abutting lands at such road crossings (Exhs. HO-A-3S3, B-9, p. 8).

The estimated cost of Company Alternative 1 is $14,202,000, which is 49 percent greater than the cost of the Company's proposal (Exh. HO-RR-30).

b. Company Alternative 2

Company Alternative 2, also a noticed alternative, includes an alternative meter station site located at or near Mead Paper Company on Route 102 in South Lee, and extends along a 14-mile route through Lee, Lenox and Pittsfield, a route which partially overlaps the primary route in Pittsfield. From the alternative meter station site, Company Alternative 2 extends northeasterly along Pleasant Street (Route 102) in Lee to the Massachusetts Turnpike, which it passes under, then continues in an easterly direction along the Turnpike right-of-way to Greylock Street. From this point, Company Alternative 2 continues in a generally northerly direction along segments of Greylock Street, Bradley Street, and Woodland Road in Lee, along October Mountain Road in Lenox, and along New Lenox Road in Pittsfield to the intersection of Williams Street and Adelaide Avenue, where it joins the primary route and continues to the cogeneration plant (Exhs. HO-1, Tab 3, p. 6).

The Company stated that it initially developed Company Alternative 2 primarily to allow consideration of opportunities to share gas transportation facilities with other cogeneration projects in the area (Exhs. HO-1, Tab 3, p. 9, HO-N-5; Tr. 5, p. 111).[34] The Company indicated it was uncertain whether Mead Paper Company would make available a site for a meter station to serve the Altresco project, unless such a facility were developed in conjuntion with a cogeneration project at Mead Paper Company (Tr. 5, p. 111).

As part of our review of Company Alternative 2, the Siting Council considers potential benefits due to the possibility of sharing facilities included in this alternative with the O'Brien Energy and Tenaska projects.[35]

The estimated cost of Company Alternative 2 is $11,556,000, which is 21 percent greater than the cost of the Company's proposal (Exh. HO-RR-30). The Company did not provide cost estimates for the larger project that would include common facilities for Altresco and the two other cogeneration projects in the area.

c. Company Alternative 3

Company Alternative 3, another noticed alternative, includes a pipeline route of approximately 9 miles in length, which incorporates portions of the primary route and Company Alternative 1, and which includes the primary meter station site. From the primary meter station site on Dublin Road in

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34/ The two potential other cogeneration projects identified by the Company are the O'Brien Energy Project at the Mead Paper Company in South Lee and the Tenaska Project at the Kimberly Clark Paper Company in Lee (Exh. HO-N-5).

35/ The facilities which possibly could be shared with the O'Brien Energy and Tenaska Projects are: (1) a common pipeline along a portion of the route included in Company Alternative 2 to transport gas for both the Tenaska project and the Altresco project; and (2) a common meter station at or in the vicinity of the Mead Paper Company to recieve gas for the Altresco project, the Tenaska project, and the O'Brien Energy Project.

Richmond, Company Alternative 3 follows the primary route through Richmond and Pittsfield as far as the intersection of Barker Road and South Mountain Road in Pittsfield. From this intersection, Alternative 3 deviates north from the primary route and continues in a generally northeasterly direction through Pittsfield along Barker Road, West Housatonic Street (Route 20), Hawthorne Avenue, and Mill Street to the crossing of the Conrail right-of-way, where it joins and follows Company Alternative 1 for the remaining distance through Pittsfield along the Conrail right-of-way and across Merrill Road to the cogeneration plant (Exhs. HO-2, HO-3).

As with Company Alternative 1, Berkshire indicated that engineering constraints on that portion of Company Alternative 3 which runs along the Conrail right-of-way would require deviations of the alignment onto embankments and abutting lands at road crossings (Exh. B-RR-R-20) (see Section III.B.2.a, above).

The estimated cost of Company Alternative 3 is $11,270,000, which is 18 percent greater than the cost of the Company's proposal (Exh. HO-RR-30).

C. Site Selection Process

1. Overview of the Siting Process

The Company stated that it developed its primary and alternative routes in conjunction with its consultants, Scalise-Knysh Associates and Smith Norrington Company, by identifying a wide variety of possible routes from which the primary and alternative routes were developed (Exhs. HO-1, Tab 3, p. 5, B-9, p. 4; Tr. 16, pp. 82-84). According to the Company, after it had developed its primary and alternative routes, these routes were refined in response to community input, easement acquisition difficulties, and new residential development (Exh. B-9, pp. 3-4; Tr. 16, pp. 79-85). Further, as part of its comprehensive analysis of the identified primary and alternative routes, the Company stated that it conducted on-site investigations (Exh. B-9, p. 7). Finally, the Company continued to develop and refine its analysis of design requirements, cost,

and environmental impacts of the identified routes prior to and during the Siting Council proceeding (id.; Exh. R-64; Tr. 15, p. 163).

The Company provided a map of the routes that were identified before the routes were screened and the noticed primary and alternative routes were chosen (Exh. HO-1, attached map). The map identifies the primary route and Company Alternatives 1 and 2, as well as additional routing possibilities which were not noticed. These additional routes include substantially different routes between the Tennessee main line and the Altresco project, and shorter route segments interconnecting the major route alternatives at intermediate points (id.).

The Company explained how it eliminated various routes as part of the screening process (Tr. 16, pp. 128-142). The Company's witness, Mr. Scalise, stated that he understood that the Siting Council would require identification of "three or four or five clear-cut, north-south routes" to get from the Tennessee main line to Altresco (id., p. 142).

To select its primary and alternative routes, the Company stated that it considered the following criteria: (1) environmental impact; (2) cost; (3) construction details; and (4) reliability of service (Exh. B-2, pp. 6-7).

With respect to environmental impact, the Company stated that avoidance of impact to pristine land, flood plains, wetlands and other similar sensitive areas was the primary concern (Exh. B-9, p. 5). Because the proposed pipeline was not designed to supplement the Company's existing distribution system, and therefore would not connect to numerous distribution laterals, Mr. Scalise stated that the Company favored use of secondary roads and country roads rather than major arterial roads or minor streets (Tr. 16, pp. 123-128). Further, Mr. Scalise indicated that the Company's preference was to avoid routing along minor streets (id., pp. 125-126).

With respect to the construction process, the Company indicated that it reviewed: (1) the degree to which possible contractors would be experienced with a particular sort of

route; and (2) the complexity of the engineering procedures that would be required with respective routes (id., pp. 6-7).

The Company stated that it considered pipeline safety in conjunction with its review of the reliability of different routes (Exh. B-9, p. 6).

Finally, the Company stated that it evaluated the ease of permitting and the need to acquire right-of-way easements (Exh. B-9, p. 11).

The Company indicated that prior to filing with the Siting Council it made a number of refinements to its primary route, thereby changing the specific streets and abutters affected by the primary route (Exhs. B-3, p. 11, B-9, p. 4). The Company stated that route changes were necessitated by: (1) an inability to acquire an initially identified meter station site on Swamp Road in Richmond; (2) concerns about roadside trees that provide a "cathedral effect" along a segment of Swamp Road in Richmond; (3) an inability to obtain an easement to traverse the Canoe Meadows Wildlife Sanctuary in Pittsfield; and (4) construction of a new home blocking Berkshire's initially planned egress from Birchgrove Street to Brattlebrook Park in Pittsfield (Exh. HO-A-3S3; Tr. 18, pp. 107-108, 114-123; Tr. 16, pp. 85-93). The Company provided a map depicting the route segments that were eliminated during this refinement process (Exh. HO-2). In response to public concern about the refined primary route near Brattlebrook Park, which would enter the park via Dillon Road, the Company also provided a comparison of land use impacts for three route options -- the proposed route and two variations -- between Williams Street and the Park (Exh. HO-A-3S1).

2. Development of Siting Criteria

As stated above, Berkshire indicated that its siting criteria included environmental impact, cost, construction constraints, and reliability (Exh. B-2, pp. 6-7).

Richmond argues that the criteria identified by Berkshire as part of its route selection process appear to be adequate, but that the Company did not apply these criteria in a

consistent and even-handed manner (Richmond Brief, p. 31). Altresco asserts that Berkshire developed and applied a reasonable set of siting criteria, and utilized a reasonable site selection process (Altresco Brief, p. 57).

With respect to public input, Brandon argues that public meetings conducted by the Company did not provide opportunities for the public to recommend changes in routing, but rather only provided opportunities for input of an editorial or fine-tuning nature (Brandon Reply Brief, p. 2). Richmond argues that the Company's efforts to solicit community input occurred largely after routes had been selected, and did not provide local officials and residents with a meaningful role in the selection process (Richmond Brief, p. 40). However, Altresco argues that the Company went to extraordinary lengths to solicit public input and make responsive route changes -- efforts not required by Siting Council precedent (Altresco Brief, p. 57).

The site selection criteria identified by the Company -- environmental impact, cost, construction constraints and reliability -- generally are appropriate for the siting of a natural gas pipeline. However, these criteria raise two concerns.

First, the Company's criteria are very broad, and therefore they do not provide insight into how potentially conflicting concerns within these criteria were addressed. For instance, within the criterion of environmental impacts, the Company does not specify how consideration of wetlands impacts was balanced against land use impacts such as proximity to residential development.

The second, related concern is that the Company has not established weights which were assigned to its identified criteria in order to balance potentially competing concerns among the criteria, such as weighing cost and environmental impacts. In our recent BECo/MWRA decision, the Siting Council stated that a petitioner's weighting of its chosen screening criteria clearly has a direct and significant impact on the final site selection (BECo/MWRA, EFSC 89-12A at 38). Further, in that decision, the Siting Council stated that without a

showing of how the weights were assigned, the Siting Council could not conclude that the site selection process was unbiased and consistent with achieving a balance between necessary energy supplies, cost and environmental impacts (id.). The BECo/MWRA decision was issued after hearings in this proceeding concluded and is not directly applicable to this matter. In the BECo/MWRA decision, the Siting Council stated that, in future cases, petitioners should demonstrate how the weighting of site selection criteria was developed and how their weights ensure that the Commonwealth's siting objectives are achieved (id.). The Siting Council reiterates that all petitioners are put on notice that they must demonstrate how weights were applied to their siting criteria.

In regard to arguments concerning the extent to which Berkshire included community input in its site selection process, the Siting Council cannot require a minimum level of community involvement, such as a minimum number of meetings with local residents and officials. However, it is quite clear that the development of siting criteria is greatly assisted by community input. Thus, the Siting Council strongly encourages developers to incorporate community input into their site selection process. In particular, information gathered from the community can provide a valuable basis for determining the weight which should be given to each site selection criterion.

Based on the foregoing, the Siting Council finds that the Company developed a reasonable set of criteria for siting the proposed pipeline.

3. Application of Siting Criteria

Berkshire has established that it developed a reasonable set of siting criteria. However, as discussed in Section III.A, above, in order to meet the first prong of the Siting Council's practicality test, a petitioner also must establish that it has applied its siting criteria in a consistent and appropriate manner which ensures that no clearly superior routes or sites were overlooked or eliminated. Therefore, we examine whether Berkshire applied its siting criteria consistently and

appropriately, ensuring that alternative routes or sites which are clearly superior to the Company's primary route and meter station site were not overlooked or eliminated.

a. The Company's Options

The Company presented a map of all the possible pipeline routes it initially considered in order to select a smaller number of routes for more detailed analysis (Exh. HO-1, attached map). See Section III.C.1, above.

The Company stated that it appeared, during the tentative route selection process, that along with the Company's primary route, the pipeline route included in Company Alternative 1 (along the Conrail right-of-way) and the pipeline route included in Company Alternative 2 (the Lee-Lenox route) both had the attributes of a likely preferred route (Exh. HO-1, Tab 3, pp. 8-9). The Company stated that it had assumed that Company Alternative 1 would be a low-cost alternative, and indicated that Company Alternative 2, although it included a longer and thus more costly pipeline route than the primary route or Company Alternative 1, would pass near two other cogeneration projects in early developmental stages (id.).

However, the Company stated that detailed review of Company Alternative 1 indicated the need to traverse a pristine swamp -- a more severe environmental impact than initially expected (id., p. 8). Allowing for an access road in the swamp, the Company then estimated a $6,000,000 direct cost for the pipeline and meter station included in Company Alternative 1 -- identical to that of the Company's proposal at the time (Exhs. HO-1, Tab 1, p. 5, Tab 3, p. 11, HO-C-2). When the Company contacted Conrail in late September or early October, 1988, as part of its review of Company Alternative 1, it was informed that an application for similar pipeline construction along a railroad had been awaiting action by Conrail for five years (Tr. 18, p. 171). The Company stated that it "may have been too late to withdraw" Company Alternative 1 before the October 21, 1988 filing with the Siting Council, and during the proceeding conducted additional design investigations and

provided updated cost estimates, including engineering, permitting, and contingency costs, which eventually reached $14,202,000 for Company Alternative 1.

With respect to Company Alternative 2, the Company stated that developmental and regulatory time-frames for the two other cogeneration projects differed from that of the Altresco project, and that discussions to share facilities had not yet occurred (Tr. 5, pp. 111-122).

The Company identified and discussed two other major route options that it had considered as part of its site selection process, including: (1) a route which originates at a possible alternative meter station site near Stockbridge Bowl (Lake Mahkeenac) in Stockbridge, and which extends along sections of Route 183 in Stockbridge and Lenox, Routes 7A and 7/20 in Lenox, and Holmes Road in Lenox and Pittsfield to the vicinity of the Pittsfield Country Club, where it joins the primary route ("Stockbridge alternative"), and (2) a route which originates at the primary meter station site and extends through Richmond and Pittsfield along state and municipal roads to the northwest of Company Alternative 1 ("Northwest alternative") (Exh HO-1, attached map; Tr. 16, pp. 128-140).

The Company indicated that the Stockbridge alternative, although comparable in length to the primary route, would involve three miles of construction on Route 7/20, which would be difficult and expensive and which would cause serious traffic impacts (Tr. 16, pp. 132-134). The Company stated that the Massachusetts Department of Public Works has placed a moratorium on issuance of new curb cut and street opening permits which would allow new development in this area (Tr. 20, pp. 200-201, 209-211). The Company further indicated that the Stockbridge alternative would pass a number of sensitive receptors, including a day care center and the Stockbridge Bowl, and cross through downtown Lenox (id., p. 200). However, the Company stated that the Stockbridge alternative would be less expensive than Company Alternative 1, based on current cost estimates (Tr. 16, p. 135). The Company's witness, Mr. Scalise, stated that he would have recommended eliminating Company Alternative 1

and retaining the Stockbridge alternative during the initial route screening analysis if he had known about the locations of telecommunications cables along the Conrail right-of-way and other problems associated with Company Alternative 1 (id., pp. 135-137).

With regard to the Northwest alternative, the Company stated that it runs circuitously around the north end of Pittsfield and extends through a densely populated area (Tr. 16, p. 139). In addition to citing its greater length relative to the primary route, the Company stated that construction would be fairly difficult along the portion of the Northwest alternative which follows Route 20 (id., pp. 139-140). Accordingly, the Company did not include the Northwest alternative among its ultimately selected routes.

The Company also evaluated a number of routes which combined elements of other routes considered by the Company. One such route, Company Alternative 3, is a combination of the primary route and Company Alternative 1, linked by a separate three-mile segment (Exh. HO-A-6). The Company stated that Company Alternative 3 has all the attributes of the primary route until it reaches the Conrail right-of-way (id.). With respect to engineering, due to construction difficulties along the Conrail right-of-way, however, the Company ranked Company Alternative 3 behind the primary route and Company Alternative 2 (id.). The Company further indicated that Company Alternative 3 would involve difficult bridge crossings and pass through populated areas, and that it would not be superior to either the primary route or Company Alternative 2 with respect to environmental impacts (id.; Tr. 16, p. 154-158).

Finally, the Company made a number of refinements to its primary route (see Section III.C.1, above). Among those refinements were: (1) a shift from the Canoe Meadows Wildlife Sanctuary in Pittsfield to Holmes Road and Williams Street in response to a request of the Massachusetts Audubon Society, owner of the wildlife sanctuary; and (2) a shift from a portion of Swamp Road to Sleepy Hollow Road and East Road in Richmond, to avoid potential environmental impacts associated with trees

along Swamp Road. Brandon argues that Berkshire has not met the requirement of presenting substantially different and practical routes (Brandon Brief, p. 1). Brandon questions the depth to which the Company pursued options before selecting its primary and alternative routes, suggesting that the Company quickly discarded the option of having the primary route traverse Canoe Meadows Wildlife Sanctuary based on only an initial contact with the landowner (id., pp. 6-7).

Richmond argues that none of Berkshire's three alternatives included in its Facilities Application satisfies the Siting Council's requirement that a reasonable range of practical alternatives be considered (Richmond Brief, p. 30). In support of its position, Richmond argues that: (1) Altresco has the unilateral option to terminate the project with Berkshire if a set project budget is exceeded by 20 percent ("cost cap") or if certain time lines are not met (id., pp. 20-21); (2) both Company Alternative 1 and Company Alternative 2 exceed the cost cap (id., pp. 25, 28-29); and (3) the timing of Company Alternative 2 is "off the mark" (id., pp. 25-28). With respect to Company Alternative 1, Richmond further argues that: (1) Berkshire did not consider delaying its Siting Council filing or developing another alternative after contacting Conrail in Fall 1988 about Company Alternative 1; (2) Berkshire did not review, prior to evidentiary hearings, factors necessary to ascertain the feasibility of Company Alternative 1; and (3) Berkshire has not disproved the statement by Conrail that construction of the pipeline along the Conrail right-of-way north of Route 20 is "virtually impossible" (id., pp. 28-29, 31).

Richmond argues that Berkshire's rejection of feasible routes and route segments, such as the alternatives identified by Richmond (see Section III.C.3.b, below) which provide siting flexibility, demonstrates the weakness of the Company's proposed alternatives and its entire process (id., pp. 23, 30). Richmond further asserts that Berkshire expended greater resources on its analysis of its proposal than on its analysis of alternatives, and thus failed to analyze all of its own alterantives on an equal basis (id., pp. 38-40).

Richmond asserts that Berkshire rejected without justification, or never considered, a number of possible routes, including an existing power line right-of-way on the west bank of the Housatonic River, the Stockbridge alternative, the Northwest alternative, and route cross-over options to allow use of Company Alternative 1 in Richmond and the primary route in Pittsfield (id., pp. 32-35). With respect to refinements of the primary route, Richmond argues that the change from Swamp Road to East Road was not discussed with local officials prior to Berkshire's filing with the Siting Council (id., p. 41). However, Richmond witness Ms. Stover stated that, environmentally, the refinement from Swamp Road to East Road results in a trade-off of similar impacts (Tr. 20, pp. 94, 150-153).

Berkshire argues that it has satisfied the Siting Council's requirement to identify at least two practical sites with some measure of geographic diversity (Berkshire Brief, p. 66). Berkshire argues that additional street-route alternatives would have provided the Siting Council with the "same essential types of issues and merely transplanted them to someone else's backyard" (id., p. 67).

Altresco argues that Berkshire has identified alternatives that are fully capable of transporting gas to the Altresco plant and that, if for some reason the first choice were not available, Altresco would take the second-best option (Altresco Brief, pp. 58-62). Altresco further argues that: (1) Berkshire developed an initial list of 10 to 12 realistic routes; (2) additional alternatives analyzed during the proceeding help demonstrate, consistent with Siting Council precedent, that Berkshire identified practical alternatives; and (3) there is no evidence in the record that any other superior alternative has not been considered (id., pp. 54, 58).

The Siting Council examines whether Berkshire consistently and appropriately applied its siting criteria to the Company's route and site options in a manner which ensured that no clearly superior routes or sites were overlooked or eliminated in Section III.C.3.c, below.

b. Richmond's Options

In the course of the proceeding, Richmond identified an alternative meter station site and two alternative routes which extend from that meter station to the cogeneration plant (Exh. R-85).

The alternative meter station site ("Richmond meter station") is located in Richmond on the north side of Sleepy Hollow Road abutting the west side of the Conrail right-of-way (id., p. 18). Richmond stated that the owner of the site of Richmond's meter station is receptive to selling land to Berkshire (id.). Richmond stated that the site would provide ample distance from any wetlands, easy egress to pipeline routes along the Conrail right-of-way, and convenient ingress from the Tennessee main line west of the Conrail right-of-way (id., pp. 19-20). Both Richmond and the Company provided photographs indicating that the Richmond meter station site is wooded, requiring tree clearing to allow construction of the meter station there (Exh. HO-E-1S, Primary Route Photos 1 and 2; Exh. R-87, Photos A-2 and A-4).

Regarding the two alternative routes, Richmond identified as its preferred route a variation of Company Alternative 1 that extends along the Conrail right-of-way to just south of Route 20. This alternative then extends along Route 20 and other smaller streets in southwestern Pittsfield and then rejoins the Conrail right-of-way ("Richmond Alternative 1"). More specifically, Richmond Alternative 1 follows Company Alternative 1 from the Richmond meter station site through Richmond and Pittsfield to Cloverdale Street, then extends in a generally northeasterly direction along segments of Cloverdale Street and Route 20, then returns from Route 20 to the Conrail right-of-way along either Britton, Greenway or South Merriam Streets, and then follows the remainder of Company Alternative 1 to the cogeneration plant (Exh. R-88).

Richmond's second alternative route ("Richmond Alternative 2") is identical to Richmond Alternative 1 in its use of segments of Company Alternative 1, leaving and rejoining the Conrail right-of-way at the same points as Richmond

Alternative 1. However, Richmond Alternative 2 predominantly follows Barker Road, rather than Route 20 in southwestern Pittsfield, and thereby overlaps segments of the primary route and Company Alternative 3. More specifically, after leaving the Conrail right-of-way at Cloverdale Street, Richmond Alternative 2 extends in a southeasterly direction along Cloverdale Street to Barker Road, then continues in a northeasterly direction along Barker Road to Route 20, and then returns to the Conrail right-of-way via Route 20 and either Britton, Greenway or South Merriam Streets (Exh. R-88).

The Company estimated the cost of Richmond Alternative 1, including the cost of the Richmond meter station, to be $11,983,000, which is 25 percent greater than the cost of the Company's proposal (Exh. HO-RR-30). The Company estimated the cost of Richmond Alternative 2, also including the cost of the Richmond meter station, to be $12,139,000, which is 27 percent greater than the cost of the Company's proposal (id.). In determining the costs of the Richmond alternatives, the Company estimated that the cost of boring under the railbed from the Richmond meter station site, which is west of the Conrail right-of-way, to connect with possible pipeline alignments along the east side of the Conrail right-of-way, would be $500,000 (Tr. 18, p. 142). The Company stated that the $500,000 cost reflects construction difficulties related to the high embankment on both sides of the tracks near the Sleepy Hollow Road overpass (id., pp. 136-142). The Company stated that the cost might be reduced to some extent by crossing at a location 1,500 feet further north, but not enough to be worthwhile (id., p. 142). The Company's cost estimates for Richmond Alternatives 1 and 2 include $360,000 for casing, based on 3,000 feet of casing south of Route 20 and 6,000 feet of casing through the built-up section of Pittsfield (Exhs. HO-RR-29, HO-RR-30). The Company's cost estimates also include $700,000 for sheeting (Exh. HO-RR-30).

The Company provided an analysis of the potential environmental impacts of the Richmond alternatives which focused particularly on potential wetlands impacts and compatability

with existing land use.

With respect to wetlands, the Company stated that both of the Richmond alternatives require construction along the portion of the Conrail right-of-way, south of Route 20, which passes through a "pristine" swamp and abuts other wetlands (Exh. B-RR-R-11; Tr. 15, pp. 59-60). The Company stated that 6,000 feet of wetlands would be "exposed" in this area, including work within wetland buffer zones and the possible need to traverse wetlands (Exh. B-RR-R-11).

However, during the course of the proceeding, the Company acknowledged that Conrail plans to have removed, by December 1989, its eastbound track along all but the last two miles of its right-of-way approaching the cogeneration plant through Pittsfield (Exh. HO-RR-32). The Company indicated that the eastbound and westbound tracks are approximately 13 feet apart (Exh. B-RR-R-12). The Company stated that, south of Route 20, there is a minimum of 34 feet of space between the centerline of the remaining westbound track, and a two to four foot buffer zone that the Company would expect to leave undisturbed adjacent to any wetland areas bordering the Conrail route (Tr. 15, pp. 92, 97). The Company provided a map depicting the Conrail right-of-way south of Route 20, which indicates that an existing access road extends outward laterally 18 to 28 feet from the former eastbound track into the wetlands and other areas that abut the tracks (Exh B-RR-R-12).

With respect to existing land use, the Company stated that, north of Route 20, both of Richmond's alternatives, like Company Alternatives 1 and 3, would follow the Conrail right-of-way through urbanized portions of Pittsfield, including densely populated areas and the downtown business district (Exh. B-RR-R-11). The Company identified a number of sensitive receptors along this portion of the Conrail right-of-way, including five housing complexes, a nursing home and a day care center (id.). The Company also indicated that, depending on where the Richmond alternatives rejoin the Conrail right-of-way, five or more businesses employing a total of 75 or more people are located within 50 feet of the proposed alignment through the

urbanized section of Pittsfield (Exh. HO-E-13).

Finally, the Company cited several constraints which would affect placement of the pipeline along the Conrail right-of-way, including requirements to: (1) leave six feet of clearance between the pipeline and the Sprint communications cable; (2) encase the pipeline if it is within 25 feet of the centerline of a track; (3) provide steel sheeting between the pipeline and tracks if the pipeline is within the "live load influence" of a track; and (4) clear the work area of workers and equipment when trains pass if the work area is within 20 feet of the centerline of the affected track (Exh. B-RR-R-11; Tr. 15, pp. 82, 84-85, 96-97). As an additional constraint, the Company stated that it could be liable for claims if the Sprint communications cable were damaged as a result of pipeline construction activities (Tr. 15, p. 89).

With respect to the street portions of the Richmond alternatives, the Company stated that Richmond Alternative 1 would require difficult construction along Route 20, due to the presence of existing utilities (Exh. HO-RR-R-11). Further, the Company stated that the segment of Richmond Alternative 2 along Cloverdale Street, linking the Conrail right-of-way and Barker Road (primary route), would pass approximately 30 residences in that medium-density area (id.).

Richmond raises several arguments in response to Berkshire's analysis of the Richmond alternatives.

With respect to cost, Richmond argues that, while Berkshire speculates that Conrail still might require sheeting, the Company has failed to establish the need for either sheeting or casing based on Conrail's specifications or on any consultation between Berkshire and Conrail's Chief Engineer (Richmond Brief, p. 97). Richmond asserts that if the Company's allowances for sheeting and casing are removed, the costs of Richmond Alternatives 1 and 2 each are reduced by $1,040,000 (id., p. 81). Richmond further argues that, because the Company estimated that construction at the Richmond meter station site would cost $100,000 more than construction at the primary meter station site, the Company's cost estimates for Richmond

Alternatives 1 and 2 could be reduced an additional $100,000 by substituting the primary meter station site for the Richmond meter station site (id.). Finally, Richmond argues that the Company failed to include in its estimated cost for the primary route $145,000 for mitigation measures recommended by Berkshire's tree consultant, Dr. Tattar, and Berkshire's hydrogeological consultant, Mr. Haines (id.). Richmond argues that, with the above adjustments, the costs of Richmond Alternatives 1 and 2 would be $10,823,000 and $10,979,000, respectively, compared with $9,690,000 for the Company's proposal (id.).

With respect to wetlands, Richmond argues that where the Conrail right-of-way traverses wetland areas south of Route 20, the pipeline could be aligned in an area outside the wetlands and more than 25 feet from the centerline of any track (id., pp. 96-97).

Finally, with respect to construction constraints, Richmond argues that Berkshire could install the pipeline along the Conrail right-of-way without placing workers and equipment in areas required to be cleared for passing trains, and that it would not be necessary to backfill the pipeline trench with each passing train even if workers and equipment were in such areas (id., p. 97). Further, Richmond witness Ms. Stover stated that "I was standing on the South Merriam Street Bridge facing north, and it's a clear shot, and it looks like there's more room" (Tr. 20, p. 164).

Berkshire responds that it is possible, and indeed likely, that portions of the pipeline alignment along the Conrail right-of-way would fall within the "live load influence" of the tracks (Berkshire Brief, p. 116). Berkshire further argues that, even if casing and sheeting are not required by Conrail's specifications, the costs are justified because sound pipeline engineering practices might dictate such measures (id.).

Altresco argues that the Company's cost estimate for casing along portions of the Conrail alignments may be understated, because Conrail may require that a pipeline carrying natural gas be cased for the entire length of

alignments within the Conrail right-of-way regardless of distance from the track (Altresco Brief, p. 69). With regard to the costs of recommendations made by Dr. Tattar and Mr. Haines, Berkshire argues that it would expect to require the services of these experts for any of the alternative routes, including the Richmond alternatives, as well as for the primary route (Berkshire Brief, p. 116).

The Siting Council examines below whether Berkshire applied its identified siting criteria to the Richmond alternatives in such a manner that no clearly superior routes or sites were overlooked or eliminated.

c. Analysis

In this section we examine whether Berkshire applied its siting criteria to its own siting options, as well as the Richmond alternatives, in a consistent and appropriate manner which ensured that no clearly superior routes or sites were overlooked or eliminated.

Richmond and Brandon have raised a number of issues relating to whether the Company applied its siting criteria to identified routes in a manner which led it to eliminate inappropriately certain routes. Therefore, we review the Company's decision to eliminate certain of its own siting options, as well as the Richmond alternatives, to determine whether the Company appropriately and consistently applied its siting criteria to these options.

i. Stockbridge Alternative

In its review of the Stockbridge alternative, the Company determined that this option was comparable to its primary route in terms of overall length of the route, and in terms of the type of route, i.e., following existing roadways. However, the Company determined that the three mile segment of the Stockbridge alternative along a heavily traveled state highway would be difficult and expensive to construct. Further, the Company determined that, with regard to environmental impacts, the Stockbridge alternative would raise significant concerns

with respect to compatibility with existing land use due to its routing through the Lenox business district and past several sensitive receptors.

Accordingly, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to the Stockbridge alternative.

ii. Northwest Alternative

In reviewing the Northwest alternative, the Company determined that this option: (1) is longer than the primary route, which increases its cost; (2) presents construction difficulties where it follows Route 20; and (3) traverses a densely populated area, thus raising significant concerns regarding compatibility with existing land use.

Accordingly, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to the Northwest alternative.

iii. Richmond Alternatives

The Company included considerations of cost, environmental impact, and construction constraints in its decision to eliminate Richmond Alternative 1 and Richmond Alternative 2. The Siting Council examines Richmond's arguments that Berkshire did not apply its siting criteria in a "consistent and even-handed" manner to these options.

With respect to cost, Richmond argues that once appropriate adjustments are made to Berkshire's cost estimates for Richmond Alternative 1 and Richmond Alternative 2, as well as the Company's proposal, the difference between the Richmond options and the Company's proposal is significantly reduced (see Section III.C.3.b, above).

However, in presenting evidence with respect to Berkshire's ability to construct Richmond Alternative 1 and Richmond Alternative 2 along the Conrail right-of-way without extensive and costly measures such as sheeting and casing, Richmond focused only on the portions of these routes south of Route 20. Further, Berkshire and Altresco correctly indicate

that Conrail may require sheeting and casing at any point along the Conrail right-of-way, and that such requirements cannot be fully known pending actual receipt of Conrail's permission to construct a pipeline in the right-of way. Finally, Berkshire correctly states that sound engineering practices might require sheeting and casing along the Conrail right-of-way, regardless of whether Conrail specifically requires such measures. Thus, while Berkshire may have allowed for more sheeting and casing than Conrail would require to construct Richmond Alternative 1 and Richmond Alternative 2 south of Route 20, any such requirements for construction along either of the routes as a whole are uncertain, and, in fact, could be higher than the Company's allowances. Finally, the Siting Council notes that even with the full cost adjustments recommended by Richmond, including the removal of the total allowance for sheeting and casing, Richmond Alternative 1 and Richmond Alternative 2 each remains more than $1,000,000 more costly than the Company's proposal.

With respect to environmental impacts, the Company stated that Richmond Alternative 1 and Richmond Alternative 2 raise concerns due to wetlands impacts and compatibility with existing land use. As correctly argued by Richmond, the record does not demonstrate that construction of Richmond Alternative 1 or Richmond Alternative 2 south of Route 20 necessarily would require encroachment into adjacent wetlands. Further, there is a possibility that the Company's proposal would involve some encroachment into wetlands at the primary meter station site (see Section III.E.1.iii, below), while the Richmond alternatives would require no such encroachment at the Richmond meter station site. However, the Richmond alternatives would require a deviation of the pipeline onto embankments or abutting lands at one road crossing -- Summit Road -- along the Conrail right-of-way south of Route 20. More importantly, the record demonstrates significant concerns regarding the compatibility with existing land use of the portions of Richmond Alternative 1 and Richmond Alternative 2 along the Conrail right-of-way north of Route 20. In particular, this section of Richmond

Alternative 1 and Richmond Alternative 2 would require construction through urbanized portions of central Pittsfield. Further, the Conrail right-of-way through this urbanized area north of Route 20 passes numerous overpasses and underpasses, where the pipeline would have to leave the existing right-of-way.

Finally, with respect to construction constraints, the record demonstrates the presence of high embankments, numerous underpasses and overpasses, and more than one track along the Conrail right-of-way north of Route 20. Despite Richmond's argument that Conrail intends to remove at least a portion of the eastbound track, the Siting Council notes that there is no evidence as to whether, or when, the eastbound track in central Pittsfield will be removed. A Richmond witness merely stated that "it's a clear shot, and it looks like there's more room." Indeed, this is the portion of the Conrail right-of-way regarding which Conrail stated that a pipeline alignment would be "virtually impossible."

In sum, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to Richmond Alternative 1 and Richmond Alternative 2.[36]

iv. Variations and Refinements of the Company's Options

Richmond asserts that the Company never considered, or rejected without justification, two additional siting options: a potential variation of Company Alternative 2 which would follow a powerline right-of-way along the west bank of the Housatonic River, and "route cross-overs" to combine Company Alternative 1 in Richmond and the Company's primary route in Pittsfield. Additionally, Richmond and Brandon have raised concerns

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36/ We note that the Siting Council cannot expressly find that Berkshire applied its siting criteria to the Richmond alternatives prior to filing its primary route in this case. However, this is largely irrelevant. Consistent with our standard, the critical issue is whether Berkshire overlooked or eliminated clearly superior routes, not when Berkshire decided to eliminate those alternatives.

regarding refinements the Company made to its primary route.

With respect to the variation of Company Alternative 2, the record demonstrates that this variation would affect sizeable wetland areas along the west bank of the Housatonic River, as well as the built-up areas of Lee and Pittsfield included in Company Alternative 2. Accordingly, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to this variation.

With respect to "route cross-overs" which would combine Company Alterantive 1 with the Company's primary route, the record demonstrates that such variations would avoid possible construction impacts on wells, septic systems, and trees along the Company's primary route in Richmond. However, the record does not support a conclusion that any such impacts would raise significant concerns along the primary route (see sections III.E.1.a.i and III.E.1.a.ii, below). Further, although these variations would pass fewer residences in Richmond than the Company's primary route, depending on the particular site of the cross-over between Company Alterantive 1 and the Company's primary route, the total number of residences affected by such a variation is not likely to be significantly less than the Company's primary route, and could be even greater than the Company's primary route (Tr. 20, pp. 153-159, 170-171, 175-179). In addition, the cost of constructing along the Conrail right-of-way likely is higher than the cost of constructing along the primary route in Richmond. Accordingly, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to the "route cross-overs" between Company Alternative 1 and the Company's primary route.

Finally, concerns have been raised regarding two refinements made by the Company to its primary route before filing with the Siting Council.

Brandon questions the Company's decision to traverse Holmes Road and Williams Street in Pittsfield rather than the Canoe Meadows Wildlife Sanctuary. Additionally, Richmond questions the Company's decision to align its primary route

along East Road rather than a section of Swamp Road in Richmond.

The Siting Council notes that both refinements appear to increase the number of affected residences.[37]

In regard to the Canoe Meadows Wildlife Sanctuary, the record indicates that the original route segment would have traversed upland fields currently used for corn and hay, rather than any environmentally sensitive or wooded areas (Tr. 16, pp. 89-92). Thus the Company's primary route passes near more residences as a result of this refinement, while the environmental benefits of avoiding the Canoe Meadows Wildlife Sanctuary remain unclear.

In regard to the shift from a portion of Swamp Road to East Road, it appears the pipeline could have been aligned nearer the center of Swamp Road to avoid any damage to trees (Tr. 18, pp. 115-116). Further, the record indicates that there are similar concerns about trees, including a cathedral effect, along the revised route segment following Sleepy Hollow Road and East Road (Exh. R-49, p. 4; Tr. 11, pp. 183-185). Again, the record demonstrates that the Company's refinement of its primary route increased the number of affected residences while achieving questionable environmental benefits.

Given the importance the Siting Council places on minimizing all environmental impacts, it is incumbent on petitioners to carefully identify and balance all cost, environmental, and reliability factors underlying route refinements. Where the justification for a route refinement is unclear or cannot be adequately documented, the filing of minor

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37/ Of the four residences within 50 feet of the proposed pipeline in Richmond, three are located on East Road (Exh. HO-E-13). Of the 80 residences within 50 feet of the proposed pipeline in Pittsfield, three are located on the portion of Williams Street affected the the route refinement (id.). Additionally, maps of the street layouts and intersecting driveways along the primary route (Exh. HO-E-1S, primary route, Drawings 4, 5, 26, 27), as well as photographs of the primary route (id., Photos 6 to 11, 45), indicate that there are additional residences that abut the two affected route segments and are not within 50 feet of the pipeline, particularly along Williams Street and Holmes Road in Pittsfield.

route options helps ensure that the proper balancing can be achieved through consideration of complete evidence developed in the Siting Council's review.

Nonetheless, in the two instances where the justification for local route refinements is unclear, the possible differences in overall cost and environmental impact between the primary route, before the refinements were made, and the primary route, as filed with the Siting Council, are minor. With respect to the change from Swamp Road to Sleepy Hollow Road and East Road, Richmond's own witness, Ms. Stover, indicated that there is no environmental difference between the routes. With respect to the change from Canoe Meadows Wildlife Sanctuary to Holmes Road and Williams Street, while there are numerous residences along the revised route segment along Holmes Road and Williams Street, the pipeine would be aligned more than 50 feet from all but a few of these residences.

Accordingly, the Siting Council finds that Berkshire consistently and appropriately applied its siting criteria to these route refinements.

d. Conclusions on Application of Siting Criteria

The record demonstrates that based on the Company's identified criteria -- environmental impact, cost, construction constraints, and reliability -- none of the above-described route and site options, variations, or refinements is clearly superior to the Company's proposal.

Richmond argues that the Company inappropriately expended far more time and resources on its analysis of its proposal than on its analysis of any of the alternatives. However, it is logical that a petitioner will analyze its tentatively selected preferred siting option in more detail than it will analyze alternatives before completing Siting Council and other regulatory reviews. The Siting Council emphasizes that this does not diminish a petitioner's responsiblity to provide adequate documentation regarding possible alternatives to establish that clearly superior alternatives have not been eliminated. The Siting Council finds that Berkshire has

provided adequate documentation regarding potential alternatives to determine whether any of these alternatives is clearly superior to its proposal.

Accordingly, the Siting Council finds that the Company has applied its siting criteria consistently and appropriately in a manner which ensures that it has not overlooked or eliminated any siting options which are clearly superior to its proposal.

4. Geographic Diversity

In this section the Siting Council considers the second prong of our practicality test -- whether the Company's site selection process included consideration of route alternatives with some measure of geographic diversity.

The record demonstrates that Berkshire considered in detail three alternative routes. Company Alternative 1 differs entirely from the primary route and Company Alternative 2 differs from most of the primary route. Company Alternative 3, a hybrid route which combines the primary route and Company Alternative 1, differs from the northern half of the primary route. Further, Company Alternative 2 incorporates a meter station site that differs from the primary meter station site included in the Company's proposal. The Company also has considered, as part of its site screening analysis, two additional routes -- the Stockbridge alternative and the Northwest alternative -- which differ from most or all of the primary route. Accordingly, the Siting Council finds that Berkshire's site selection process included consideration of at least two pipeline routes and meter station sites with some measure of geographic diversity.

However, the Company appears to have miscomprehended the Siting Council's geographic diversity standard. During the course of this proceeding, the Company's witnesses indicated an understanding that the Siting Council should be provided with only those alternatives that are geographically clear-cut and conceptually different from one another. Although the Siting Council requires that an applicant submit at least one

geographically diverse noticed alternative and that the site selection process includes consideration of alternatives with some measure of geographic diversity, there is no basis to conclude that the Siting Council discourages the filing of conceptually similar routes, partial-route alternatives, hybrid-route alternatives or variations where such alternatives present viable siting options. In fact, we previously have stated that a petitioner is well served when it includes the "best" alternative in its initial filing. Because additional information and analyses produced during the course of the Siting Council review may bring to light problems associated with the petitioner's proposal, the petitioner is equally well served by submitting a number of noticed alternative routes and/or route variations.

5. Conclusions on Site Selection Process

In order to demonstrate that it has considered a reasonable range of practical siting alternatives, the Siting Council requires a petitioner to demonstrate that: (1) it has developed and applied a reasonable set of criteria in making siting decisions; and (2) it has considered alternatives with some measure of geographic diversity.

The Siting Council has found that Berkshire: (1) developed a reasonable set of criteria for siting the proposed pipeline; (2) provided adequate documentation regarding potential alternatives; and (3) applied its criteria consistently and appropriately in a manner which ensures that it has not overlooked or eliminated any siting options which are clearly superior to its proposal. In light of the above, the Siting Council finds that Berkshire has developed and applied a reasonable set of criteria for identifying and evaluating alternatives.

The Siting Council also has found that Berkshire's site selection process included consideration of at least two pipeline routes and meter station sites with some measure of geographic diversity.

Accordingly, the Siting Council finds that Berkshire considered a reasonable range of practical siting alternatives.

D. Cost Analysis of the Proposed and Alternate Facilities

The Company initially provided estimates of the costs to install the pipeline and meter station -- including separate estimates for construction, materials, engineering, permitting and contingencies -- under the Company's proposal and each of the Company's alternatives (Exhs. HO-1, Tab 3, p. 5, HO-C-2). During the hearings, the Company provided revised cost estimates for the primary route and the Company's alternatives which showed a further breakdown of costs for construction, materials and engineering and incorporated higher cost expectations based on additional design analysis (Exh. HO-RR-30). Berkshire also provided corresponding cost estimates for each of the Richmond alternatives (id.). The Company's revised cost estimates are as follows:

Company proposal	$9,555,000
Company Alternative 1	14,202,000
Company Alternative 2	11,556,000
Company Alternative 3	11,270,000
Richmond Alternative 1[38]	11,983,000
Richmond Alternative 2	12,139,000

Richmond argues that the Company's initial cost estimates were far off the mark, and that the Company was obliged to correct numerous errors it made in the process of revising and expanding its cost estimates (Richmond Brief, pp. 76-77). Richmond argues that there are remaining flaws in the Company's revised cost estimates including: (1) inclusion of unreasonable or erroneous allowances for sheeting and casing in the costs of

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38/ In Section III.C.2.c, above, the Siting Council considered Richmond Alternative 1 and Richmond Alternative 2 to determine whether either of these routes was clearly superior to the Company's preferred route. Such a determination would have demonstrated a flaw in the Company's site selection process. The Siting Council, however, found that neither of the Richmond alternative routes was clearly superior to the Company's preferred route. Accordingly, the Siting Council does not further consider these routes.

construction along the Conrail right of way; (2) failure to include the cost of $145,000 for environmental mitigation measures recommended by Dr. Tattar and Mr. Haines with respect to the primary route; (3) failure to include the cost of wetland replication and ledge problems related to use of the primary meter station site; (4) inconsistencies in the Company's A & G allowances; and (5) an unsubstantiated assumption that five-sixths of the assessed valuation of facilities under each alternative would apply to facilities to be located in Pittsfield (id., pp. 77-78, 83).

Berkshire and Altresco both defend the Company's allowances with respect to sheeting and casing along the railroad right-of-way (Berkshire Brief, p. 116; Altresco Brief, p. 69). With respect to the costs of recommendations made by Dr. Tattar and Mr. Haines, Berkshire argues that it would expect to require the additional costs to address similar concerns under any of the alternative routes, as well as under the primary route (Berkshire Brief, p. 116).

Regarding wetlands replication, Mr. Scalise stated that the overall budget for the meter station encompasses costs for such replication (Tr. 16, p. 164). Regarding ledge problems, the Company included an allowance of $20,000 to $30,000 under each route except Company Alternative 1, for which no allowance was provided (Exh. HO-RR-30). The Company stated that much of the equipment used for installation of a pipeline of the length proposed is capable of "ripping" portions of ledge, and that it cannot be known if blasting is required until the trench is dug (Exh. HO-E-17).

The Siting Council addressed Richmond's arguments with respect to sheeting and casing along the Conrail right-of-way in Section III.C.2.c, above. In sum, the Siting Council found that Richmond did not establish that sheeting and casing costs should be removed from the Company's estimates, particularly with respect to portions of the Conrail right-of-way north of Route 20. Even if sheeting and casing costs were totally removed, Company Alternative 1 still would be approximately $2,500,000 more costly than the primary route, while Company Alternative 3

would be $975,000 more costly (Exh. HO-RR-30).

The Siting Council notes that the recommendations of Dr. Tattar and Mr. Haines relate largely to special issues along the rural portions of the primary route in Richmond, including scenic roadside trees, wells and septic tanks. Thus, while there may be related costs under alternative routes, they likely would be somewhat less than the $145,000 figure estimated for the primary route. However, adjustments to reflect these various costs would have only minor impacts on the relative costs of alternatives.

Although Berkshire failed to provide a separate cost estimate for wetlands replication, the Company's estimate is an adequate preliminary effort which would encompass such costs. The Siting Council further addresses, below, as part of the environmental analysis, Berkshire's expectations with regard to wetlands alteration and related mitigation at the primary meter station site (see Section III.E.1.a.iii, below).

With regard to ledge problems, Berkshire may have failed to provide adequate allowances under Company Alternative 1, which would deviate from the Conrail right-of-way at numerous road crossings -- including the Sleepy Hollow Road crossing at which Richmond maintains ledge is present (Exh. HO-R-85, pp. 19-21). However, the record does not support the conclusion that costs to address ledge problems would vary significantly from the $20,000 to $30,000 included for other routes, including the primary route.

With regard to Berkshire's treatment of A & G allowances and assessed valuation, Richmond has not argued persuasively that the Company's treatment has led to a significantly erroneous estimation of costs for the alternative routes.

Based on the foregoing, the Siting Council finds that the Company's proposal, based on the primary pipeline route and meter station site, is preferable to each of the Company's alternatives with respect to cost.

E. Environmental Analysis of the Proposed and Alternate Facilities

1. Environmental Impacts of the Primary Route and Meter Station

a. Water and Land Resources

i. Trees

The Company indicated that there are wooded areas and shade trees along portions of the roadways and open space areas traversed by the primary route (Exh. HO-1, Tab 3, p. 33). However, the Company stated that the proposed pipeline would have minimal impact on roadside trees, and that no trees would be removed in order for the pipeline to be constructed along the primary route (Exh. HO-E-18; Tr. 8, p. 61).[39] The Company asserted that overhanging branches are sufficiently high within roadways along the primary route that it is unlikely that construction would cause injury to trees (Tr. 9, p. 14). The Company further stated that the roadways traversed by the primary route are highly compacted, and that tree roots likely would not be encountered in such roadways (Tr. 12, pp. 74-75). Finally, the Company indicated that blasting, if required, would not damage trees and could be beneficial to root growth in that it would loosen and aerate soil (Tr. 9, pp. 15-16).

The Company's witness, Dr. Tattar, stated that his inspection of the primary route revealed no large buttress roots beneath the expected alignment of the pipeline, except for one location on Adelaide Avenue in Pittsfield (Exh. HO-E-18; Tr. 12, p. 86).[40] He stated that smaller absorber and extender roots

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39/ A former Tree Warden of the Town of Richmond and Dr. Tattar, Berkshire's witness, both suggested that eight trees in poor health along the primary route be removed (Tr. 9, pp. 170-171). The Company has agreed to comply with any recommendations of the present Tree Warden regarding tree removal (id., p. 170).

40/ Dr. Tattar recommended that the pipeline alignment be moved from the sidewalk to the edge of the roadway in order to avoid the large tree roots noted on Adelaide Avenue in Pittsfield (Exh. HO-E-18). The Company has agreed to move the pipeline into the roadway (Tr. 20, p. 198; Exh. B-6, p.7).

are not usually found beneath pavement or heavily compacted roads, but will grow in other directions toward air and moisture (Exh. HO-E-18; Tr. 9, pp. 81, 116). Dr Tattar noted that roots predating the roadways are unlikely to have survived beneath the existing roadways or to have extended across existing roadways (Tr. 12, pp. 101-102).

The Company asserted that it would alter the alignment of the pipeline where necessary to avoid tree removal (Tr. 5, p. 144; Exh. B-6, App. D, pp. 2-3). Dr. Tattar will train construction crews and will be present during construction to instruct work crews as to the proper methods to protect any roots that are encountered, to perform trench inspections, and to provide general guidance (Exh. B-2, p. 13; Tr. 20, pp. 83, 198, 206-207). In addition, the Company agreed to adopt a number of mitigation measures recommended by Dr. Tattar (Exh. HO-E-18; Tr. 20, p. 198, 207).[41]

Richmond notes that the Town has designated all Town roads as scenic roads under state legislation intended to protect roadside trees and stone walls (Richmond Brief, pp. 103-104). Richmond argues that construction along the primary route would cause substantial harm to roadside trees (id., pp. 2, 103). Additionally, Richmond argues that blasting will be injurious to trees (id., p. 102). Richmond notes that Dr. Tattar agreed that trees may take several years to display the effects of construction injuries, that possible gas leaks

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41/ Measures recommended by Dr. Tattar in written and oral testimony include: (1) hand cutting of roots one inch or more in diameter (Exh. HO-E-18); (2) boring under roots three inches or more in diameter (Tr. 9, p. 126); (3) use of barriers to keep construction-related activites confined to the construction site (Tr. 12, p. 83); (4) use of smaller equipment in areas where roots may be encountered (id., p. 85); (5) use of small earth-moving equipment with low clearance in areas where there are low overhangs of branches (Tr. 9, p. 134); (6) wrapping exposed roots with damp burlap (Exh. HO-E-18); (7) pruning overhead branches of trees that are damaged by construction or whose roots are cut (id.; Tr. 12, p. 91); (8) boring test holes ahead of mainline crew to determine the best location for the pipe (HO-E-18); and (9) placement of spoils away from tree roots (Tr. 9, p. 110).

could have adverse effects on trees and that trees in poor condition are particularly susceptible to stress caused by construction (id., p. 101). Finally, Richmond questions the adequacy of the construction workspace within Town roadways, and argues that construction would take place in roadway shoulders which are not heavily compacted (id., p. 85; Richmond Reply Brief, p. 17).

Richmond's witnesses, Ms. Stover and Mr. Boyce, asserted that there are a number of trees within twelve feet of the side of the road where the pipeline is proposed (Exh. R-85, pp. 31-32; Tr. 11, pp. 113, 116, 127, 132, 133, 138). Mr. Boyce indicated there are areas where buttress roots extend toward the roadway and Ms. Stover stated that the gravel roadways along the primary route are extremely muddy, especially in winter, and are bordered by loose shoulders and ditches (Tr. 11, p. 127; Tr. 20, pp. 18-19).

The record does not support a conclusion that construction of the pipeline under streets, such as those along the primary route, would be harmful to trees located alongside such streets. Although portions of the roadways along the primary route are not heavily travelled, there is no evidence that tree roots exist beneath these roadways to a greater extent than other roadways. Additionally, due to the limited traffic on the less-travelled roads in Richmond, the Company would have maximum flexibility to align the pipeline within such roadways in such a manner as to minimize tree impacts, subject to local requirements regarding minimum access along roads during construction.

The Company indicated that the proposed meter station would involve construction of a 2,900 square foot building and an entrance road on a wooded site, thereby requiring some tree clearing (Exhs. HO-E-1S, Primary Route Photos 1 and 2, HO-A-3S3). The Company further indicated that the meter station would receive gas from the Tennessee main line via a new interconnection line -- expected to extend approximately 450 feet through existing woods on the meter station property, including a 275-foot segment across a vegetated wetland

(Exhs. HO-A-3S2, HO-A-3S3).

In sum, the primary route would extend along public roadways and across limited open space areas, and would require no removal of trees except at the meter station site. Where located in existing public or private roadways bordered by woods or shade trees, the pipeline would be aligned on the same side of the trees as the existing travelled way. The Company has agreed to significant mitigation measures to minimize any damage to trees.

The interconnection line between the Tennessee main line and the meter station, which the Comapny expects would traverse a vegetated wetland on the meter station property, is further addressed in Section III.E.1.a.iii, below.

Based on the foregoing, the Siting Council finds that the construction of the proposed facilities along the primary pipeline route and at the primary meter station site, with the utilization of mitigation measures, will have an acceptable impact on trees.

ii. Groundwater and Wells

The Company indicated that pipeline construction along the primary route would have potential hydrogeological impacts but that any impacts would be limited, temporary and/or correctable (Exh. HO-E-43, p.4). The Company acknowledged that blasting has the potential to impact the quality and output of individual wells along the primary route by temporarily introducing sediment into the groundwater in the area of the well, and by shifting underground rocks and closing fractures through which groundwater flows (id.). However, the Company asserted that the amount of ledge along the primary route that potentially would require blasting is minimal, and that mechanical methods of ledge removal likely would be sucessful in constructing the five-foot deep trench (Exh. HO-E-17; Exh. HO-E-43). The Company also indicated that smaller charges would be used in initial attempts to clear ledge by blasting, thereby reducing blasting impact (Exh. HO-1, Tab 3, pp. 19-20). The Company asserted that vibrations from blasting would be

expected to travel no more than 400 feet, but has agreed to comply with the recommendations of Berkshire's hydrogeological witness, Mr. Haines, that all wells within 800 feet of any blasting activity be tested prior to and after blasting and that all wells be cleaned or replaced where necessary (Exh. B-5; Tr. 7, pp. 110-111, p. 4; Tr. 20, p. 199).

Additionally, Mr. Haines indicated that construction could affect shallow wells down-gradient from the pipeline by stirring up sediment or by disrupting the flow of water to those wells, and could interfere with existing drainage patterns in groundwater (Tr. 7, pp. 10, 11). The Company agreed to comply with Mr. Haines' suggestion that all shallow wells 200 feet down-gradient from construction be tested for water quality and quantity before and after construction, and that anti-seepage collars be installed in certain locations along the pipeline to maintain existing drainage patterns (id., pp. 9-11; Tr. 20, p. 199).

Richmond argues that potential construction impacts on groundwater along the primary route would be significant and that blasting and earth movement from heavy construction equipment could fracture well casings and damage septic systems, thereby leading to contamination of wells (Richmond Brief, p. 107). Richmond further argues that such contamination might not be discovered by inspection immediately following construction (id.).

Richmond's witness, Ms. Stover, asserted that there are many wells within 200 feet of the primary route, and that there are many springs, as well as shallow and deep wells, in close proximity to rock ledge formations (Exh. R-85, p. 24, 25). Richmond witness, Mr. Sherer, stated that the majority of the septic systems along the primary route are not properly designed, and therefore are not capable of withstanding construction impacts (Tr. 12, pp. 21-25, 44-45).

The record indicates that, although pipeline construction along the primary route potentially could affect groundwater, any adverse impacts would be limited to individual wells in the area. In addition, the Company's agreement to keep blasting to

the absolute minimum extent required for constructing the pipeline would minimize possible hydrogeological effects. Further, any damage that might occur to individual wells by blasting or to shallow wells down-gradient from construction could be corrected by the Company. The record does not support a conclusion that heavy equipment, temporarily operating in public ways as part of constructing the pipeline, would impact well casings and septic systems located on private property adjoining the public way.

Accordingly, the Siting Council finds that construction of the proposed facilities along the primary pipeline route and at the primary meter station site, with the utilization of mitigation measures, would have an acceptable impact on groundwater and wells.

iii. Wetlands and Surface Waters

Berkshire asserted that the only location where the Company's proposal would directly affect wetlands was near the proposed meter station. At that location, construction of a 275-foot segment of an interconnection line between the meter station and the Tennessee main line,[42] and construction of an access road along the interconnection, would directly alter one-tenth of an acre of vegetated wetlands located on the meter station property adjoining the Tennessee right-of-way (Exh. HO-A-3S2, Tr. 14, p. 36). According to Berkshire, the access road would be 15-feet wide with a gravel bed and would parallel the interconnection line through the wetland (id.). The Company stated that it would replicate the altered wetlands at another location on the meter station site, thereby fulfilling the requirements of the Wetlands Protection Act (id.). The Company stated that realignment of the

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42/ The record does not reveal whether this interconnection line -- expected to extend a total distance of approximately 450 feet within the meter station property -- would be constructed by Tennessee, presumably giving the Federal Energy Regulatory Commission authority over the line, or whether Berkshire would construct the line. The interconnection line was not specifically noted in the Siting Council's public notice.

interconnection line into Dublin Road would avoid alteration of wetlands, but may be inconsistent with interstate pipeline policy (Tr. 18, p. 10).

The Company indicated that along the primary route it would install the pipeline largely in municipal rights-of-way and use existing rights-of-way for construction workspace (Exh. HO-A-3S2; Tr. 14, p. 155). The Company further stated that, although wetlands and buffer zones do exist in the vicinity of the primary route, impacts will be avoided or minimized by: (1) positioning the pipeline on the side of the existing public right-of-way opposite that of wetland areas where possible; (2) using appropriate sediment and erosion control measures; and (3) constructing within roadways, where mitigation measures are more effectively conducted (Exhs. HO-1, Tab 3, p. 47, HO-E-42, p. 2, B-9, p. 5).

With respect to surface waters, the Company stated that the primary route includes two principal river crossings -- the Housatonic River at Holmes Road in Pittsfield and the East Branch of the Housatonic River near a footbridge in the Longview Terrace area of Pittsfield (Exh. HO-E-20). The Company stated that the pipeline would be attached to the Holmes Road bridge over the Housatonic River, but would be bored under the East Branch of the Housatonic River in the Longview Terrace area (id.; Exh. B-9). The Company provided information with respect to concentrations of polychlorinated biphenyls ("PCBs") in the bottom sediment of the East Branch of the Housatonic River near the proposed pipeline crossing, and stated that the concentrations are very low and would present minimal environmental problems related to construction of the pipeline (Exhs. HO-E-19, HO-E-41).

The Company identified smaller stream crossings along the primary route, and asserted that there will be no long-term interruption of such streams because the pipeline will be installed above or below existing culverts. The Company stated that it may cut some culverts in order to construct the pipeline underneath the culverts, but that such construction would take place at a time of low water flow and would not disrupt stream

flow for more than one day (Exh. HO-E-43). The Company further asserted that such cutting of a culvert is not categorized as wetland alteration under the Wetlands Protection Act (Tr. 14, pp. 39-40, 42-43).

Brandon notes that Berkshire now plans to bore the pipeline under the East Branch of the Housatonic River instead of attaching the pipeline to the nearby footbridge as the Company originally planned, and argues that a waiver of environmental impact report requirements granted by the Executive Office of Environmental Affairs predates the change in plans and thus may have been invalidated by this change (Brandon Reply Brief, pp. 10-11).

Richmond argues that the Company understated the impact on wetlands by construction of the pipeline along the primary route and downplayed the wetlands concerns associated with culvert crossings (Richmond Brief, pp. 95-96). Additionally, Richmond argues that the Siting Council should take special care to assure that the best route is chosen because the Siting Council's jurisdiction precludes the Richmond Conservation Commission from pursuing alternate routes (Richmond Reply Brief, p. 14).

Ms. Stover asserted that the Company's Notice of Intent to the Richmond Conservation Commission and its wetlands maps contained errors and omissions (Exh. R-85, pp. 13-16; Tr. 20, pp. 35, 40-42, 45-46). Ms. Stover also asserted that there may not be sufficient cover below grade to place the pipeline above culverts, and the Company has not addressed the problem of water flow where pipeline construction beneath culverts requires the cutting of culverts (Tr. 20, pp. 122-126).

The record indicates that pipeline construction along the primary route, apart from the meter station area, will not require placement of the pipeline or pipeline construction within wetland areas. While wetlands and buffer zones do exist in the vicinity of the primary route, appropriate state and local agencies can require mitigation measures under the Wetlands Protection Act to help ensure minimal impact to these areas. The Company also has the flexibility to adjust alignment

of the pipeline within the public way in order to minimize any adverse impact on sensitive areas along the route. With regard to culverts, the record indicates that if pipeline installation requires cutting of a culvert, it will be replaced within a reasonable timeframe, thus minimizing potential surface water impacts. The Siting Council expects the Company to comply with all requirements of the the Richmond Conservation Commission, in order to ensure minimal impacts on wetlands along the primary route.

Construction of an interconnection line between the Tennessee main line and the meter station is a necessary part of the Company's proposal (assuming the meter station is located at the Company's primary site). However, as a result of the uncertainty in the record as to who would own the interconnection line, as well as the lack of specific reference to this line in the Siting Council notice, the Siting Council does not consider the interconnection line, nor any particular alignment thereof, to be a specific part of the Company's proposal before the Siting Council. Nonetheless, the Siting Council has reviewed the potential wetlands impacts of the interconnection line.

The record suggests that the pipeline segment that would connect the meter station with the Tennessee main line could be built in compliance with the Wetlands Protection Act by replicating wetland areas that would be altered by construction of the interconnection line. However, it would be possible and preferable to avoid any alteration of wetlands. Therefore, the Siting Council notes that any interconnection line between the Tennessee main line and Berkshire's proposed meter station at the primary meter station site can and should be installed within the shoulder or roadway of Dublin Road rather than in wetlands on the meter station site. In the event that construction of the interconnection line in any wetlands on the meter station site was unavoidable, the Siting Council notes that specialized construction techniques and equipment can and should be used in order to avoid construction of an access road

within such a wetland.[43]

Pursuant to the above, the Siting Council also specifically notes that its review in this proceeding does not preclude the Richmond Conservation Commission and/or the Department of Environmental Protection from pursuing alternate alignments for the interconnection line and/or other mitigation measures under the Wetlands Protection Act, provided any such alternate alignments are consistent with any meter station site that the Siting Council approves in this proceeding.

Based on the foregoing, and with the qualifications noted, the Siting Council finds that construction of the proposed facilities along the primary pipeline route and at the primary meter station site would have an acceptable impact on wetlands and surface waters.

b. Land Use, Traffic and Safety

The Company stated that the primary route would pass near residential, commercial and industrial areas, but would not require removal of any houses or other structures (Exh. HO-1, Tab 3, p. 62). The Company stated that the impact of the pipeline on residential, commercial and industrial uses would be moderate and short-term, stemming primarily from construction activities (id.). The Company stated that use of the primary meter station site, which currently is vacant, would require conversion to commercial use (id., p. 65). However, the Company indicated that the meter station would be designed to resemble a residential house (id., Appendix H).

As part of its analysis of land use, the Company provided estimates of the extent of residential and other sensitive land uses along the route (Exhs. HO-E-13, HO-E-38). The Company indicated that, under the primary route, the pipeline would pass

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43/ The Siting Council notes that Tennessee has specialized construction equipment and techniques for pipeline installation within wetlands in order to minimize construction activity within wetland areas and that Tennessee can use existing roads or access roads for movement of construction machinery rather than construction of new access roads within wetland areas (Exh. R-13, p. 13).

one school on Holmes Road in Pittsfield, and would be aligned within 50 feet of 84 residences along the overall route (id.). The Company identified the affected residences by street, indicating that 44 of these residences -- more than half of the total -- would be within the two-block segment of the route between Williams Street and Brattlebrook Park in Pittsfield, extending along Adelaide Avenue, across Elm Street and along Lillian Street (Exh. HO-E-13). The Company indicated that there would be four residences in Richmond within 50 feet of the pipeline along the primary route (id.).

With regard to construction impacts, the Company stated that the normal flow of traffic may be disrupted in the vicinity of ongoing construction, but that the Company would minimize disruption and ensure resident and emergency access (Exh. HO-1, Tab 3, p. 63). The Company stated that, in general, the construction of the proposed pipeline would result in minor and short-term noise impacts (id., p. 59). The Company stated that, because the public rights-of-way along the primary route generally are not adjacent to high density urban areas, relatively few people will be exposed to construction noise (id.).

With regard to pipeline safety, the Company stated that the most common type of pipeline accident is the rupture of a line, caused most frequently by outside parties operating construction equipment, as well as by natural disasters such as landslides (id., p. 54). However, the Company asserted that the risk of an accident associated with a natural gas pipeline is small, compared with corresponding risks associated with other modes of fuel transportation (id.). The Company provided the Transportation Research Board report Pipelines and Public Safety, which presents national statistics on pipeline mileage and annual number of pipeline-related casualties for different classes of pipelines (Exh. HO-RR-22b).

The Company also stated that, in Massachusetts, notification requirements under the "Dig-Safe" program are a safeguard against pipeline ruptures by outside-party construction equipment (Exh. HO-SD-7). As further safety

precautions, the Company stated it would: (1) install a buried plastic tape over the pipeline and place above-ground markers at regular intervals along the alignment; (2) inspect the pipeline route regularly to detect any leaks and monitor any construction activity in the vicinity; and (3) install a 24-hour flow monitoring and automatic shut-off valve system (Exhs. HO-SD-1, HO-SD-5, HO-SD-7). The Company stated that its proposed pipeline design has been reviewed and approved by the Department of Public Utilties ("DPU") (Exh. B-3, p. 13).

The Company provided an analysis of design options for supplying the Altresco plant under lower operating pressures than the proposed 500 psi -- a 375-psi option and a 275-psi option (Exh. HO-SD-9). The Company stated that the 375-psi option would require a 16-inch diameter pipe rather than the proposed 12-inch diameter pipe, increasing the cost of constructing the pipeline along the primary route by $1,005,000 (id.). The Company stated that the 275-psi option would require an 18-inch diameter pipe and provisions for compression facilities at the cogeneration plant, together increasing project costs by $3,185,000 (id.).

Both Richmond and Brandon argue that it is unusual for high pressure pipelines to be sited longitudinally along public streets or ways (Richmond Brief, p. 112; Brandon Reply Brief, p. 1). Richmond argues that the Company has failed to develop an emergency response plan for the densely populated primary route and, in particular, for certain sections of the route in Richmond where intersecting dead-end streets could complicate evacuation (Richmond Brief, pp. 113-116). Richmond further argues that the DPU, in granting a waiver to allow Berkshire to install the proposed high pressure pipeline under streets, did not conduct any review of evacuation plans or the potential impacts of any accidents (Richmond Reply Brief, p. 19). Brandon argues that Berkshire has not evaluated the long-term effects of the pipeline on people, and suggests that abutters aware of the presence of the pipeline may be subject to stress whenever news reports mention pipeline accidents (Brandon Brief, p. 8).

With respect to urban density, Brandon argues that the

Pittsfield portion of the route would traverse a congested area, as evidenced by daily traffic volumes reported by the Company for Holmes Road and Williams Street (Brandon Brief, p. 5). Brandon further argues that, contrary to Berkshire's statement that only a rather short residential area would be traversed by the primary route, the proposed pipeline would pass numerous residences on most of the Pittsfield streets along the route including some residences at close distances (id., pp. 5-6).

For the Richmond portion of the primary route, Ms. Stover stated that there are a total of 19 homes within 100 feet and a total of 33 homes within 200 feet of the travelled ways along which the pipeline would run (Exh. R-85, p. 26). Richmond witness Mr. Morrison also testified that use of the primary route would pose a threat to the safety of a large number of families whose homes are on dead-end streets that exit only to the section of Swamp Road along the primary route (Exh. R-46, p. 5).[44]

Altresco argues that the safety features incorporated by Berkshire with respect to the design and operation of the pipeline essentially eliminate concerns about public safety (Altresco Brief, p. 87). Altresco further argues that the DPU has found that the proposed pipeline would pose no threat to the public safety (id.).

The fundamental issue the Siting Council must address is the acceptability and reasonableness of siting an 11.5-mile, 500-psi pipeline largely along public streets, including streets in urbanized sections of Pittsfield. The Company was unable to point to an instance in which a Massachusetts utility had sited a natural gas pipeline of the pressure proposed -- well over the 200 psi maximum usually allowed for distribution lines -- with longitudinal in-street segments as extensive as those proposed along the primary route in this proceeding.

44/ Mr. Morrison specified several public and private roads, indicating that they provide access to 207 year-round or seasonal homes, a church, a boys camp, and a girls camp (Tr. 11, pp. 33-34).

The record does reflect that interstate gas pipeline companies have sited segments of pipeline operating at high pressure -- including pressures of 500 psi and higher -- longitudinally along public streets in Massachusetts for at least some distance (Exh. HO-RR-23). Further, the Siting Council notes that the DPU has granted Berkshire permission to site its pipeline, with the design features proposed, and at the pressure proposed, in the public streets. Given these facts, as well as the national data indicating that natural gas pipelines are a relatively safe means of fuel transportation, there is no basis to reject, as a threshold matter, the siting of a 500-psi natural gas pipeline along public streets.

However, to accept that particular project circumstances can at times warrant siting high pressure gas pipelines longitudinally in public streets, given the right pipeline design features, is not to accept that it is appropriate to route such pipelines along streets of all types and for unlimited distances. Installation and operation of a new pipeline always poses some risk of accident. Further, it is reasonable to assume that the degree of risk bears some relationship to the length of pipeline and the extent of human exposure along the route. Accordingly, the Siting Council must evaluate the safety of proposed high pressure pipelines not only in the context of design and engineering features, but also in the context of siting considerations. Thus, the Siting Council evaluates proposed and alternative routes for high pressure pipelines based on, among other factors, the degree to which such pipeline routes minimize human exposure to possible accidents and are compatible with established land use.

The record demonstrates that the primary route passes numerous residences, particularly through the built-up portions of Pittsfield that extend from the vicinity of the Canoe Meadows Wildlife Sanctuary to the cogeneration plant. However, the record also demonstrates that, at different points in the route development process, the Company utilized siting approaches and considered routing options aimed at minimizing human exposure to possible pipeline accidents, including: (1) aligning portions of

the primary route in Pittsfield on easements through open space areas; (2) considering siting alternatives that would utilize the Conrail right-of-way; and (3) considering minor routing variations in the area between Williams Street and Brattlebrook Park (see Section III.C, above).

With respect to any evacuation concerns relating to dead-end streets in Richmond and the proposed project as a whole, the likelihood of a pipeline accident that would obstruct all evacuation routes for particular residents appears to be small. Nonetheless, the Company should cooperate with the appropriate officials in Richmond and Pittsfield to develop emergency response plans prior to operation of the proposed pipeline.

Although the Company suggested that existing fields could be traversed if evacuation from a dead-end street is blocked by a pipeline accident (Tr. 15, pp. 24-26), any such fields may at times contain deep snow or mud, or may become overgrown or developed during the life of the pipeline. Additional options may be available, and should be considered. For example, existing dead-end streets in the Richmond Pond area closely abut the Conrail right of way in places, where access may exist or be developed to allow an emergency evacuation route in the event of a pipeline accident on Swamp Road.

Based on the foregoing, the Siting Council finds that construction of the proposed facilities along the primary pipeline route and at the primary meter station site, with the utilization of mitigation measures, is acceptable with respect to land use, traffic and safety.

2. Environmental Impacts of Alternative Routes

a. Company Alternative 1 and Company Alternative 3

Two of the Company's three "noticed" alternatives that the Company has evaluated in detail during this proceeding -- Company Alternative 1 and Company Alternative 3 -- partially or fully utilize the Conrail right-of-way. The two alternatives utilize a common route following the Conrail right-of-way in the

central area of Pittsfield, but utilize different routes following either the Conrail right-of-way or public streets in Richmond and southwestern Pittsfield.

The Company provided correspondence from Conrail indicating that use of the Conrail right-of-way for the pipeline would be "virtually impossible" along portions of the right-of-way from the Route 20 crossing in southwestern Pittsfield north to the cogeneration plant (Exhs. HO-A-6, B-R-RR-20). The Company also stated that engineering constraints would prevent construction within road underpasses and overpasses along the Conrail right-of-way, requiring deviations of the pipeline alignment onto embankments and abutting lands at these locations (Exhs. HO-A-3S3, B-9, p. 8). Although the Company did not provide layouts for such deviations, the Company indicated that they would raise concerns with respect to tree removal as well as residential and other land use impacts (id.; Tr. 9, pp. 171-172). The Company indicated that there are 15 road crossings along the Conrail right-of-way between the primary meter station site and the cogeneration plant, of which two are located south of Route 20 and the remainder are located from Route 20 north to the cogeneration plant (Exhs. HO-2, HO-A-3S3).

The Company stated that sensitive wetlands abut the Conrail right-of-way -- notably a pristine swamp in Richmond and several brooks and their tributaries between Route 20 and Gale Street in southwestern Pittsfield (Exh. HO-1, Tab 3, p. 8; Exh. HO-A-3S3). The Company stated that such wetlands may be altered by construction of an access road as part of pipeline installation along the Conrail right-of-way (Exh. HO-A-3S3; Exh. B-R-RR-11).

The Company indicated that Company Alternative 1 and Company Alternative 3 would cross the West Branch of the Housatonic River, while Company Alternative 3 also would cross the Southwest Branch of the Housatonic River (Exhs. HO-2, HO-E-20; Tr. 16, pp. 155-158). The Company stated that the pipeline probably would be attached to the existing bridges at such crossings, but could require a separate support structure

or be bored under the waterway (Exh. HO-E-20; Tr. 16, pp. 157-158).

With respect to land use, the Company identified several sensitive receptors located near Company Alternative 1 and Company Alternative 3 -- principally housing projects along the Conrail right-of-way in central Pittsfield -- and provided compilations of the extent of residential and business uses, including employment levels, located within 50 feet of each alternative (Exhs. HO-E-13, HO-E-45). The Company indicated that Company Alternative 1 would be aligned within 50 feet of six residences and seven businesses, while Company Alternative 3 would be aligned within 50 feet of 99 residences (id.).

Further, at bridge crossings along the Conrail right-of-way in southwestern Pittsfield -- locations at which the pipeline alignment would deviate onto embankments or abutting land -- maps indicate the presence of a number of residences (Exh. HO-2). Given that easements over private land also might be required at these locations, the residential and land use impacts of Company Alternative 1 are likely to be as great as those of an on-street route in southwestern Pittsfield.

In Section III.C.4, above, the Siting Council reviewed in detail additional evidence and arguments of the parties concerning portions of the Conrail right-of-way included in the two alternative routes presented by Richmond for consideration in this proceeding. Focusing on the portion of the Conrail right-of-way south of Route 20, Richmond contended that the pipeline could be constructed along an existing access road without encroaching on adjacent wetland areas, while still conforming to Conrail's specifications with respect to distance from active tracks. The Siting Council concluded that the likely environmental impacts of pipeline construction along the Conrail right-of-way south of Route 20 are not a significant concern.

In general, the same conclusion is applicable to Company Alternative 1 and Company Alternative 3. However, in southwestern Pittsfield, Company Alternative 1 would extend along sections of the Conrail right-of-way north of Route 20

where there is little cleared space abutting the Conrail trackbed and where numerous deviations around road crossings would be required (see Exh. HO-E-1S, Company Alternative 1 Photos 13 through 32; Exh. R-87, Photos A-19, A-21, A-22, A-24, P-6, P-7, P-20, P-21). Thus, Company Alternative 1 -- the only alternative that would utilize this portion of the Conrail right-of-way -- could require considerable tree clearing. Further, the flexibility to meet Conrail's specifications with respect to distance from active tracks, while at the same time avoiding encroachment into adjacent wetlands, would be significantly less than that along the segment of the Conrail right-of-way south of Route 20.

For the portion of the Conrail right-of-way extending through central Pittsfield, the Siting Council concluded, in its review of the Richmond alternatives in Section III.C.4, above, that the residential and land use impacts of pipeline construction would be significant. Company Alternative 1 and Company Alternative 3, which would utilize the same route through central Pittsfield as the Richmond alternatives, likewise would involve significant residential and land use impacts.

Nonetheless, the Company failed to provide layouts of the proposed pipeline within the Conrail right-of-way and, more notably, at road crossings where the alignment would be expected to deviate onto embankments or abutting lands. Thus, while the Company provided sufficient evidence to conclude that the residential and land use impacts of routing the pipeline along the Conrail right-of-way through central Pittsfield would be significant, the record leaves some uncertainty as to the exact extent to which the pipeline might encroach on properties abutting the right-of-way, and to which nearby land uses and public ways would be exposed to the effects of pipeline construction and possible pipeline accidents.

In sum, construction of Company Alternative 1 and Company Alternative 3 would involve a significant residential and land use impact in central Pittsfield. Company Alternative 1 also would require potentially significant tree clearing, as well as

encroachment on abutting properties at road crossings, along the Conrail right-of-way in southwestern Pittsfield. Nonetheless, the Company could install Company Alternative 1 or Company Alternative 3 predominantly along existing transportation rights-of-way, and, with the utilization of mitigation measures, could minimize environmental impacts related to such installation.

Based on the foregoing, the Siting Council finds that Company Alternative 1 and Company Alternative 3 are acceptable with respect to environmental impacts.

b. Company Alternative 2

The Company indicated that Company Alternative 2 would have minimal environmental impact, but noted the possibility of effects on nearby waterways (Exh. HO-1, Tab 3, p. 9). The Company stated that Company Alternative 2 would primarily follow public road layouts, but would require two private easements (id.).

With respect to water and land resources, the Company stated that Company Alternative 2 would border October Mountain State Forest, a watershed area for the Housatonic River, for approximately five miles, and closely parallel the river itself for approximately seven miles (id.). The Company stated that the route is less than 100 feet from the river in places, and that possible siltation of waterways is a concern (id.). The Company stated that pipeline construction would extend along a wooded "logging-type" road through the area of October Mountain State Forest, and thus result in considerable impacts on trees (Exh. B-6).

Altresco presented a report on the Company's selection of alternatives prepared by by Daylor Consulting Group, indicating that Company Alternative 2 traverses or is adjacent to several areas delineated as habitat for state-listed rare wetlands wildlife (Exh. A-4).

With respect to residential and land use impacts, the Company indicated that the pipeline would be aligned within 50 feet of 102 residences under Company Alternative 2

(Exh. HO-E-13). With respect to sensitive receptors, Company Alternative 2 would pass one school -- Lee High School on Greylock Street (Exh. HO-E-38).

Citing the potential impacts on waterways and trees in wooded areas, Altresco argues that Company Alternative 2 is environmentally inferior to the other routes filed by the Company (Altresco Brief, pp. 88-89).

In sum, Company Alternative 2 would extend through a large natural area in and near a state forest and the Housatonic River. Company Alternative 2 also would extend through significant built-up areas in Lee and Pittsfield, and would overlap the primary route through the densely populated area of Pittsfield between Williams Street and Brattlebrook Park, as well as along Longview Terrace. Nonetheless, the Company could install Company Alternative 2 predominantly along existing roads, and, with the utilization of mitigation measures, could minimize environmental impacts related to such installation.

Based on the foregoing, the Siting Council finds that Company Alternative 2 is acceptable with respect to environmental impacts.

3. Conclusions on Environmental Impacts

With respect to water and land resources, the record contains evidence regarding various issues, among them: (1) possible impacts of the primary route and Company Alternative 3 on roadside trees, wetlands, wells and septic tanks; (2) possible impacts of Company Alternative 1 on trees and wetlands; and (3) possible impacts of Company Alternative 2 on water resources, trees and wildlife habitat. However, with reasonable mitigation measures, many of these potential impacts are of minor concern.

In two areas, however, the likely impacts on water and land environments would be more significant and more difficult to mitigate. First, Company Alternative 1 would require potentially significant tree-clearing and encroachment on lands abutting the Conrail right-of-way, particularly in sections of southwestern Pittsfield north of Route 20. Second, as a result

of its proximity to the Housatonic River and its alignment along a logging-type road in and near October Mountain State Forest for a distance of several miles, Company Alternative 2 would potentially affect trees and surface waters in a significant section of a remote, natural area including state-owned lands. Thus, Company Alternative 1 and Company Alternative 2 would have potentially greater impacts on water and land resources than the primary route. Company Alternative 3 and the primary route would have comparable impacts on water and land resources.

With respect to residential and land use impacts, Company Alternative 2 and Company Alternative 3 would pass within 50 feet of more residences than the primary route. In addition, Company Alternative 3 would affect significant non-residential land uses in the vicinity of the Conrail right-of-way in central Pittsfield. Thus, the residential and land use impacts of Company Alternative 2 and Company Alternative 3 would be greater than those of the primary route.

Company Alternative 1 would pass within 50 feet of six residences, well below the number so affected under the primary route. However, as discussed in Section III.E.2.a above, the routing of the proposed pipeline through central Pittsfield would involve a substantial residential and land use impact. Further, the exact alignment of Company Alternative 1, and thus the proximity of construction activity and any potential pipeline accidents to land uses abutting the Conrail right-of-way, was not specified. The potentially affected area, including areas extending beyond 50 feet from the Conrail right-of-way, is densely populated and includes multi-family housing as well as land developed for non-residential use.

Nonetheless, the primary route also would be aligned through relatively built-up areas in Pittsfield -- extending from the vicinity of the Pittsfield Country Club to the cogeneration plant -- and thus would involve a sizable residential and land use impact. Based on the record, then, neither the primary route nor Company Alternative 1 is clearly preferable to the other with respect to residential and land use impacts.

In sum, the primary route is preferable to Company Alternative 1 and Company Alternative 2, and comparable to Company Alternative 3, with respect to impacts on water and land resources. The primary route is preferable to Company Alternative 2 and Company Alternative 3, and comparable to Company Alternative 1, with respect to residential and land use impacts.

Based on the foregoing, the Siting Council finds that the Company's proposal is preferable to Company Alternative 1, Company Alternative 2 and Company Alternative 3 with respect to environmental impacts.

F. Reliability

The Company stated that "semi-restrictive zoning and permitting regulations" limit the likelihood of development, and thus related construction in roadways, along the primary route in Richmond (Exh. HO-1, Tab 3, p. 11). The Company further stated that, because the pipeline would be sited in a quiet, low-density area in Richmond and would not be vibrated by heavy truck or railcar traffic, the primary route is more reliable than alternatives (Tr. 16, pp. 149-150).

Richmond argues that the primary route is, in fact, more densely populated than routes utilizing the Conrail right-of-way (Richmond Brief, p. 121). Richmond argues, therefore, that the Company has not established that the primary route is more reliable (id., pp. 121-122).

The record in this proceeding establishes that the primary route is reliable but no more so than the noticed alternatives. The Company appears to have identified reliability advantages for its proposal that are limited to rural portions of the primary route in Richmond, and not considered the more urbanized portions of the route in Pittsfield. Additionally, the Company has acknowledged that excavation by outside parties, which may be expected along portions of the primary route, is the predominant cause of pipeline ruptures (Exh. HO-1, Tab 3, p. 54) (see Section III.E.1.d, above).

The alternative routes appear to have comparable reliability attributes. While vibration from passing trains or excavation projects -- for example, installation and repair of communications cables -- could occur along portions of the Conrail right-of-way followed by Company Alternative 1 and Company Alternative 3, there is no evidence that the risk of pipeline ruptures there would be greater than that along streets, particularly in areas with significant traffic or development activity. Company Alternative 2, which is similar to the primary route in largely utilizing public streets, also passes through several miles of wooded land in and near a state forest, which helps to minimize the risk of pipeline ruptures that might result from traffic vibration or excavation by outside parties along that route.

Finally, with respect to the Siting Council's standard for reviewing reliability, Berkshire argues that the Siting Council's reliability standard should not include consideration of the relative difficulty, under various alternatives, of obtaining permits that may be necessary to construct needed facilities (Tr. 16, pp. 69-70).

In our opinion, each noticed route is acceptable and comparable with respect to reliability. We are not presented here with the stark contrast in reliability encountered in the 1988 ComElectric Decision. In that case, the Siting Council found that one possible site for an electric transmission line, utilizing an existing right-of-way, would be more reliable than another site, utilizing a new overland right-of-way, based on generic differences between the two sites with respect to the expected extent and complexity of permitting and right-of-way acquisition (17 DOMSC at 339-341). In this case, the differences in the types of routes are not great in the sense of permitting. In addition, the Siting Council notes that, to the extent that the Siting Council has authority to override state and local permit requirements, it may be premature for the Siting Council to make findings as to the expected extent of permit review by other agencies. Consistent with the above, the Siting Council intends to limit its consideration of permitting

issues in our reviews of the reliability of various alternatives to those instances in which alternatives present inherent and significant differences in the number and complexity of applicable permits.

Accordingly, the Siting Council finds that the Company's proposal and the Company's alternatives are acceptable and comparable with respect to reliability.

G. Conclusions on the Proposed and Alternate Facilities

The Siting Council has found that the Company considered a reasonable range of practical alternatives.

The Siting Council has found that the Company's proposal, Company Alternative 1, Company Alternative 2 and Company Alternative 3 all are acceptable with respect to cost, environmental impact and reliability.

The Siting Council has found that the Company's proposal is preferable to Company Alternative 1, Company Alternative 2 and Company Alternative 3 with respect to cost. The Siting Council has found that the Company's proposal is preferable to Company Alternative 1, Company Alternative 2 and Company Alternative 3 with respect to environmental impacts. The Siting Council has found that the Company's proposal is comparable to Company Alternative 1, Company Alternative 2 and Company Alternative 3 with respect to reliability.

Accordingly, the Siting Council finds that the Company's proposal is preferable, on balance, to Company Alternative 1, Company Alternative 2 and Company Alternative 3.

However, in order to ensure that the Company's proposal is implemented in a manner consistent with the Siting Council's standard that there be a minimum impact on the environment, the Siting Council ORDERS Berkshire:

(1) in locations where the pipeline would extend along a public way or private road where trees border the route, align the pipeline either in the roadway or between the trees and the roadway;

(2) consult with the tree warden or other appropriate officials in Richmond and Pittsfield to determine the

appropriate alignment of the pipeline within public ways such as to minimize any tree impacts;

(3) based on the consultation in Order 2, above, and based on Berkshire's inspections of the route, align the pipeline as necessary to avoid any removal of trees, to minimize any damage to branches, and to minimize construction in locations where roots of one inch or more in diameter may be expected, consistent with public safety needs and reasonable cost and reliability constraints associated with the design, construction and operation of the pipeline;

(4) utilize the following mitigation measures during construction of the pipeline in order to minimize impacts to trees along the pipeline route: (a) supervision of construction by Dr. Tattar or a similarly qualified expert; (b) hand cutting of any roots one inch or more in diameter; (c) boring under any roots three inches or more in diameter; (d) use of barriers to keep construction-related activities confined to the construction site; (e) use of smaller equipment in areas where roots may be encountered; (f) use of small earth moving equipment with low clearance in any areas where there is a low overhang of branches; (g) wrapping of any exposed roots with damp burlap; (h) pruning of trees as necessary to remove any damaged branches or respond to any root damage related to pipeline construction; (i) boring of test holes ahead of the pipeline construction crew to determine the best location for the pipeline; and (j) placement of spoils away from any tree roots;

(5) replace any trees seriously damaged by construction of the pipeline, as determined by the tree warden or other appropriate official, and restore all landscaping, shrubbery and driveways along the pipeline route to pre-construction condition;

(6) repave streets where excavation for pipeline construction occurs within the street, and repair any potholes or pavement failures that develop as a result of pipeline construction, unless otherwise directed by responsible officials;

(7) notify abutting property owners and residents at least 48 hours prior to any blasting required for construction

of the pipeline;

(8) perform repairs or reimburse any expenses incurred by property owners to correct any damage to existing utility, water or sewer lines or pipes caused by construction of the pipeline;

(9) with the permission of property owners, test with respect to water quality and water quantity all wells within 800 feet of the location of any expected blasting, and similarly test all shallow wells within 200 feet down-gradient from any location of pipeline construction, up to three times, including: (a) once prior to construction of the pipeline, (b) once within one month after construction of the pipeline, and (c) as requested by respective property owners, one additional time up to one year after construction of the pipeline;

(10) provide an emergency potable water source where construction of the pipeline results in any temporary or permanent damage to wells or contamination of well water;

(11) repair or replace any wells adversely affected by construction of the pipeline utilizing the same design and materials, or a different design and materials as agreed to by the property owner, such that the quality and quantity of the well water is equal to or superior to its quality and quantity prior to construction;

(12) install anti-seepage collars in the pipeline trench as necessary in order to maintain groundwater drainage patterns existing prior to construction;

(13) in consultation with property owners, (a) review the age and condition of septic systems within 800 feet of the location of any expected blasting prior to construction of the pipeline, and (b) monitor the operation of such systems for one year after construction of the pipeline;

(14) repair or replace any septic systems adversely affected by construction of the pipeline;

(15) install the proposed pipeline at least twenty feet from all residences and other structures normally occupied by humans;

(16) in cooperation with appropriate federal, state and local officials, develop appropriate emergency response plans

for possible accidents or related contingencies resulting from operation of the pipeline, and provide a copy of such plans to the Siting Council prior to operation of the pipeline;

(17) publish emergency response plans and procedures in a brochure to be mailed or delivered to all property owners and residents abutting the route, and, if requested, hold public educational forums, prior to operation of the pipeline;

(18) implement the pipeline safety features as presented in the record, including: (a) the installation of pipeline warning tape and above-ground markers; (b) the installation of a 24-hour flow monitoring and automatic shut-off valve system; and (c) the performance of regular inspections of the pipeline route to detect any leaks and to monitor construction activity by outside parties;

(19) after consultation with appropriate local officials, select a style, material and color for above-ground pipeline markers that is aesthetically acceptable, and provide vegetative screening on all sides of all above-ground valve facilities;

(20) make available for public inspection at Berkshire's offices a plan of the exact location of the pipeline, indicating the depth of the pipeline and showing locations of abutting property lines and existing utility, water and sewer lines; and

(21) Berkshire shall submit a comprehensive report every 60 days, in a form acceptable to the staff, detailing progress or compliance with the conditions set forth in this order. This condition shall commence as of the date of this order, and shall continue until one year after the date of initial operation of the facilities. Each progress report is to be filed with the Siting Council staff, its Public Gas Member, all intervenors, and any other interested person.

IV. DECISION AND ORDER

The Siting Council finds that: (1) the construction of an 11.5 mile, 500 pound per square inch natural gas pipeline along the primary route, and (2) the construction of a meter station at the primary site are consistent with providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Accordingly, the Siting Council hereby APPROVES the petition of Berkshire Gas Company to construct (1) an 11.5 mile, 500 pound per square inch natural gas pipeline along the primary route, and (2) a meter station at the primary site, subject to the following CONDITIONS:[45]

(1) In locations where the pipeline would extend along a public way or private road where trees border the route, Berkshire shall align the pipeline either in the roadway or between the trees and the roadway;

(2) Berkshire shall consult with the tree warden or other appropriate officials in Richmond and Pittsfield to determine the appropriate alignment of the pipeline within public ways such as to minimize any tree impacts;

(3) Based on the consultation in Order 2, above, and based on Berkshire's inspections of the route, Berkshire shall align the pipeline as necessary to avoid any removal of trees, to minimize any damage to branches, and to minimize construction in locations where roots of one inch or more in diameter may be expected, consistent with public safety needs and reasonable cost and reliability constraints associated with the design,

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45/ While the Siting Council approves herein the Company's proposed facilities, the Siting Council has approved the Company's most recently filed forecast and supply plan in the 1990 Berkshire Forecast Decision only upon compliance with certain conditions (separate from the conditions in this Order). As stated above, the Company cannot commence construction of jurisdictional facilities, as defined in G.L. c. 164, sec. 69G, until the Siting Council staff has verified that the Company's responses to the conditions set forth in the 1990 Berkshire Forecast Decision are complete and adequate.

construction and operation of the pipeline;

(4) Berkshire shall utilize the following mitigation measures during construction of the pipeline in order to minimize impacts to trees along the pipeline route: (a) supervision of construction by Dr. Tattar or a similarly qualified expert; (b) hand cutting of any roots one inch or more in diameter; (c) boring under any roots three inches or more in diameter; (d) use of barriers to keep construction-related activities confined to the construction site; (e) use of smaller equipment in areas where roots may be encountered; (f) use of small earth moving equipment with low clearance in any areas where there is a low overhang of branches; (g) wrapping of any exposed roots with damp burlap; (h) pruning of trees as necessary to remove any damaged branches or respond to any root damage related to pipeline construction; (i) boring of test holes ahead of the pipeline construction crew to determine the best location for the pipeline; and (j) placement of spoils away from any tree roots;

(5) Berkshire shall replace any trees seriously damaged by construction of the pipeline, as determined by the tree warden or other appropriate official, and restore all landscaping, shrubbery and driveways along the pipeline route to pre-construction condition;

(6) Berkshire shall repave streets where excavation for pipeline construction occurs within the street, and repair any potholes or pavement failures that develop as a result of pipeline construction, unless otherwise directed by responsible officials;

(7) Berkshire shall notify abutting property owners and residents at least 48 hours prior to any blasting required for construction of the pipeline;

(8) Berkshire shall perform repairs or reimburse any expenses incurred by property owners to correct damage to existing utility, water or sewer lines or pipes caused by construction of the pipeline;

(9) With the permission of property owners, Berkshire shall test with respect to water quality and water quantity all wells within 800 feet of the location of any expected blasting, and similarly test all shallow wells within 200 feet down-gradient from any location of pipeline construction, up to three times, including: (a) once prior to construction of the pipeline, (b) once within one month after construction of the pipeline, and (c) as requested by respective property owners, one additional time up to one year after construction of the pipeline;

(10) Berkshire shall provide an emergency potable water source where construction of the pipeline results in any temporary or permanent damage to wells or contamination of well water;

(11) Berkshire shall repair or replace any wells adversely affected by construction of the pipeline utilizing the same design and materials, or a different design and materials as agreed to by the property owner, such that the quality and quantity of the well water is equal to or superior to its quality and quantity prior to construction;

(12) Berkshire shall install anti-seepage collars in the pipeline trench as necessary in order to maintain groundwater drainage patterns existing prior to construction;

(13) In consultation with property owners, Berkshire shall (a) review the age and condition of septic systems within 800 feet of the location of any expected blasting prior to construction of the pipeline, and (b) monitor the operation of such systems for one year after construction of the pipeline;

(14) Berkshire shall repair or replace any septic systems adversely affected by construction of the pipeline;

(15) Berkshire shall install the proposed pipeline at least twenty feet from all residences and other structures normally occupied by humans;

(16) In cooperation with appropriate federal, state and local officials, Berkshire shall develop appropriate emergency response plans for possible accidents or related contingencies resulting from operation of the pipeline, and provide a copy of

UNANIMOUSLY APPROVED by the Energy Facilities Siting Council at its meeting of March 16, 1990 by the members and designees present and voting. Voting for approval of the Tentative Decision as amended: Paul W. Gromer (Commissioner of Energy Resources); Barbara Kates-Garnick (for Mary Ann Walsh, Secretary of Consumer Affairs and Business Regulation); Joellen D'Esti (for Alden S. Raine, Secretary of Economic Affairs); Robert Roach (for John P. DeVillars, Secretary of Environmental Affairs); Sarah Wald (Public Environmental Member); Dennis LaCroix (Public Gas Member); and Kenneth Astill (Public Engineering Member).

Paul W. Gromer
Chairperson

Dated this 16th day of March 1990

Figure 1
Berkshire's Routes in
Richmond and Pittsfield

Berkshire Gas Company

Altresco Pipeline

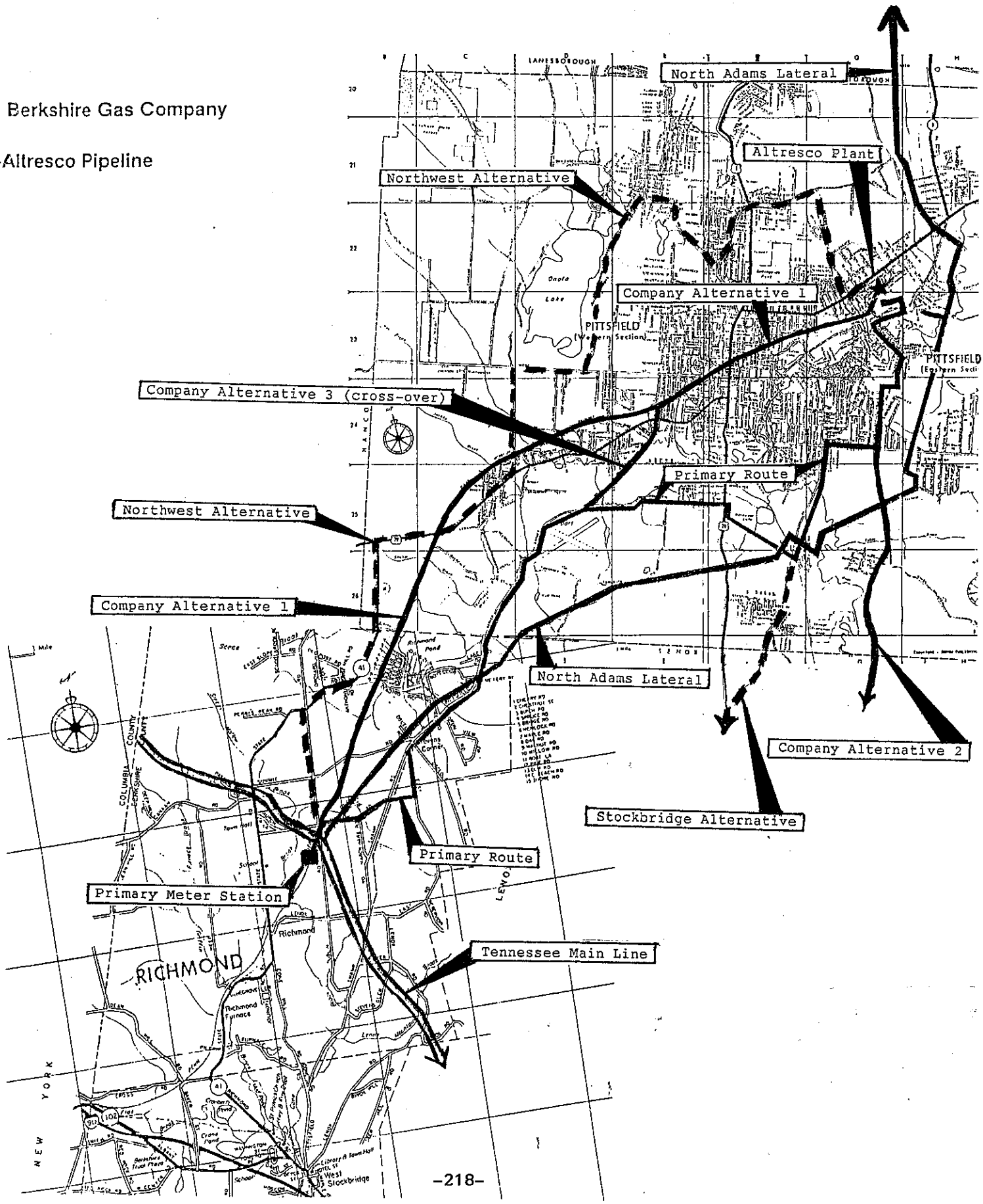


Figure 2
Berkshire's Routes in
Stockbridge, Lenox and Lee

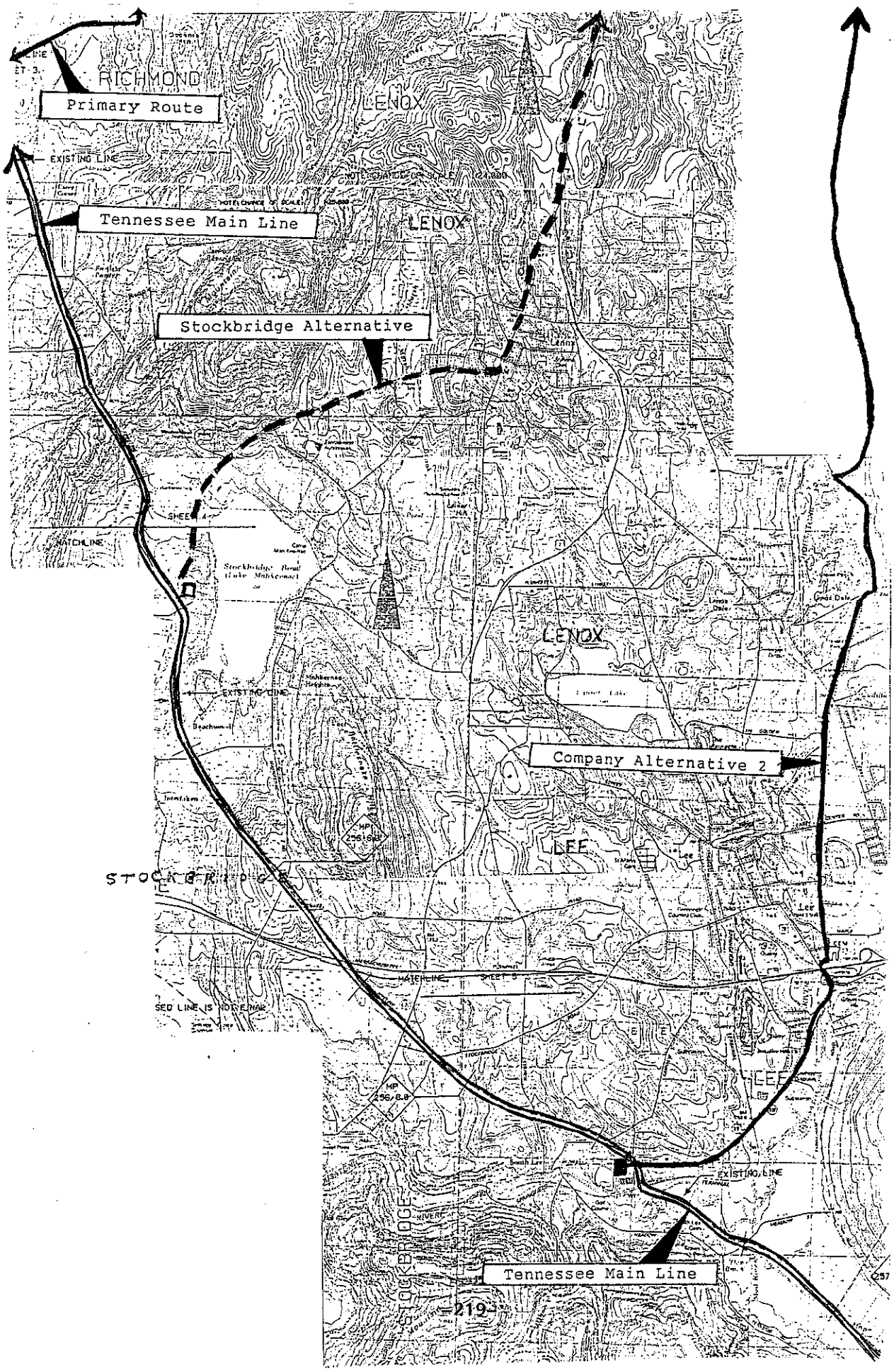
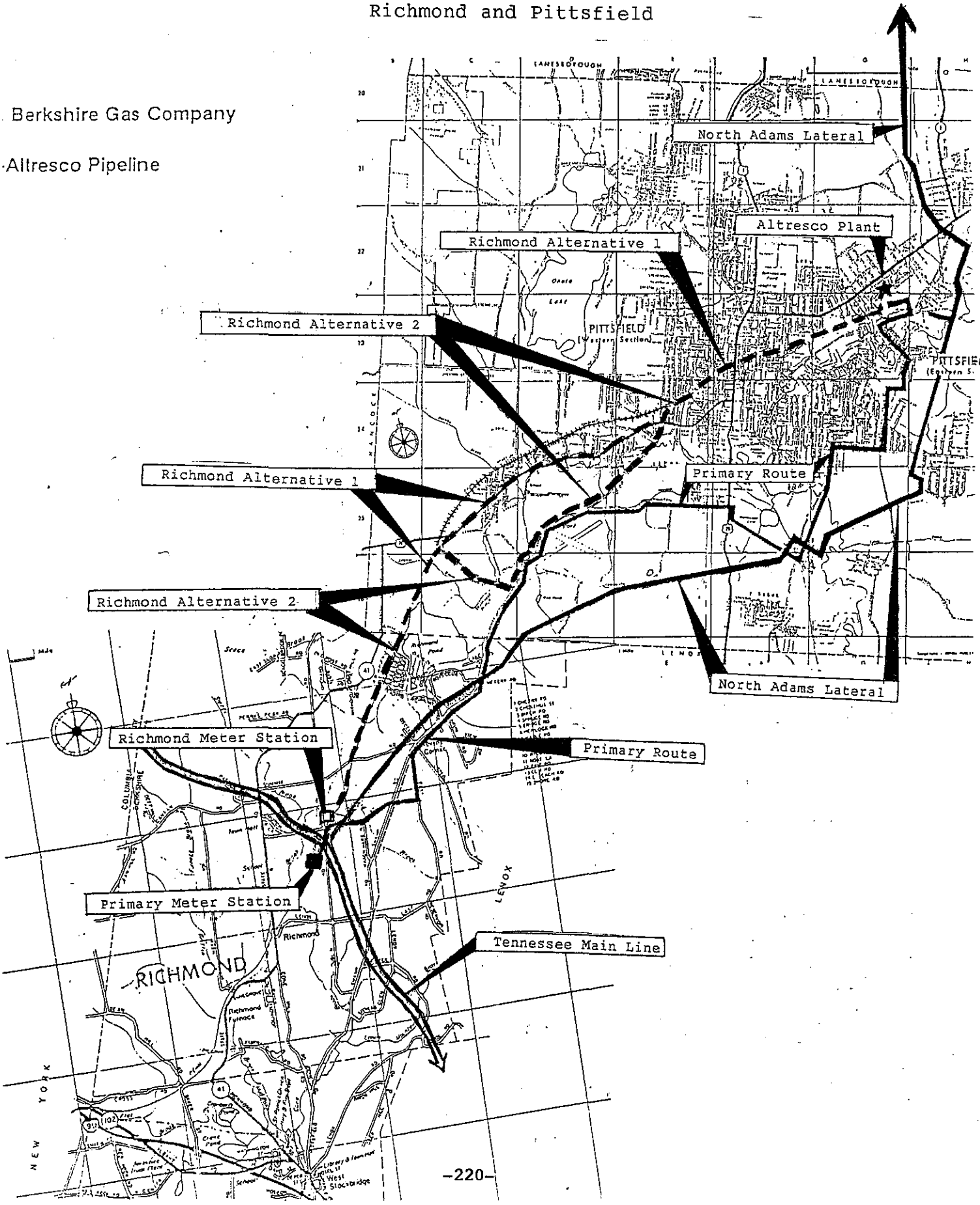


Figure 3
Town of Richmond's Routes in
Richmond and Pittsfield

Berkshire Gas Company

Altresco Pipeline



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

Such petition for appeal shall be filed with the Siting Council within twenty days after the date of services of the decision, order or ruling of the Siting Council or within such further time as the Siting Council may allow upon request filed prior to the expiration of 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. (See. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Council

Proposed Rulemaking Regarding the Procedures by Which Additional Resources are Planned, Solicited, and Procured by Investor-Owned Electric Companies (Integrated Resource Management)	EFSC 90-RM-100

ORDER ON PROPOSED RULEMAKING

Frank P. Pozniak
Hearing Officer
July 5, 1990

On the Decision:

Michael B. Jacobs

Pamela M. Chan
Robert J. Harrold
Stephen Klionsky
Robert D. Shapiro

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I. INTRODUCTION

The purpose of this rulemaking proceeding is to establish a regulatory framework by which additional resources are planned, solicited, and procured to meet an investor-owned electric company's obligation to provide reliable electrical service to ratepayers in a least-cost, least-environmental-impact manner.[1] This Order and proposed regulations (980 CMR 12.00) set forth the Energy Facilities Siting Council's ("EFSC" or "Siting Council") portion of the integrated resource management ("IRM") regulatory framework. On December 6, 1989, the Department of Public Utilities ("Department") issued an Order and proposed regulations (220 CMR 10.00) for its portion of the IRM regulatory framework. See D.P.U. 86-36-G (1989).

Pursuant to G.L. c. 164, sec. 69J, the Siting Council is charged with the responsibility of reviewing the annual demand forecasts and supply plans filed by electric companies. Under the IRM regulatory framework, the Siting Council will continue its traditional review of demand forecasts of electric companies. See: Massachusetts Municipal Wholesale Electric Company, EFSC 88-1, pp. 10-35 (1990) ("1990 MMWEC Decision"); Massachusetts Electric Company, 18 DOMSC 295, 302-335 (1989) ("1989 MECo Decision"); Boston Edison Company, 18 DOMSC 201, 208-223 (1989) ("1989 BECo Decision"); Eastern Edison Company, 18 DOMSC 73, 79-99 (1988) ("1988 EECo Decision"); Western Massachusetts Electric Company, 17 DOMSC 1, 6-18 (1988) ("1988 WMECo Decision"); Nantucket Electric Company, 15 DOMSC 363,

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1/ Pursuant to G.L. c. 164, sec. 69H, the Siting Council is responsible for providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Throughout this Order, the Siting Council uses this statutory standard synonymously with the definition of "total cost to society" contained in the proposed regulations. In the proposed regulations, total cost to society is defined as (a) all direct costs to the electric company; (b) other non-price factors affecting the costs or benefits of the electrical service (e.g., reliability, fuel diversity, environmental externalities); and (c) direct out-of-pocket costs or benefits to the electric company's customers.

366-377 (1987) ("1987 Nantucket Decision"); Cambridge Electric Light Company, 15 DOMSC 125, 130-144 (1986) ("1986 CELCo Decision"); Fitchburg Gas and Electric Light Company, 13 DOMSC 85, 89-102 (1985) ("1985 Fitchburg Decision").

With respect to the supply plan, the Siting Council currently reviews two dimensions of each electric company's supply plan: adequacy and cost.[2] See: 1990 MMWEC Decision, EFSC 88-1, pp. 37-92; 1989 MECo Decision 18 DOMSC at 336-371; 1989 BECo Decision, 18 DOMSC at 225-281; 1988 EECo Decision, 18 DOMSC at 100-131. The Siting Council determines whether a supply plan is adequate in both the short run and the long run. The Siting Council also determines whether a supply plan minimizes the cost of power (that is, whether it is least-cost) subject to tradeoffs with adequacy, diversity, and the environmental impacts of various resource options.[3]

Outside of the IRM regulatory framework, the Siting Council will continue to review the adequacy of an electric company's supply plan in the short run (see Section II.A, below). However, under the IRM regulatory framework, the Siting Council will coordinate its review of the long-run adequacy and

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2/ Diversity, which in past Siting Council decisions has been reviewed separately, currently is treated within the Siting Council's review of cost.

3/ In recent cases, the Siting Council has ordered electric companies to include environmental impacts in their evaluation of resource options. 1990 MMWEC Decision, EFSC 88-1, pp. 89-91; 1989 MECo Decision, 18 DOMSC at 368-369.

cost of the supply plan with the Department.[4] In its part of this coordinated review, the Siting Council will review each electric company's supply plan with respect to its committed resource inventory[5] (see 980 CMR 12.03(7)), and evaluation of resource need (see 980 CMR 12.03(8)). Generally, an electric company's resource need is the difference between the demand forecast and the committed resource inventory. In turn, the Department will review an electric company's supply plan with respect to the all-resource solicitation or resource solicitation process. In the all-resource solicitation, an electric company solicits and evaluates supply-side and C&LM

4/ To establish adequacy in the long run, the Siting Council has required that an electric company must demonstrate that its planning processes can identify and fully evaluate a reasonable range of resource options on a continuing basis while allowing sufficient time for electric companies to make appropriate supply decisions to ensure adequate, cost-effective energy and power resources over all forecast years. Generally, a supply plan that meets the Siting Council's least-cost standards is deemed adequate in the long run. Recognizing that supply planning is a dynamic process carried out under circumstances which make it difficult for an electric company to identify with exactitude all the power resources it plans to rely upon in the latter years of its long-range forecast (Boston Edison Company, 15 DOMSC 287, 301, 322-323, 339-348 (1987) ("1987 BECo Decision"); 1987 Nantucket Decision, 15 DOMSC at 378-379, 384, 390-391; 1986 CELCo Decision, 15 DOMSC at 133-135; 1985 Fitchburg Decision, 13 DOMSC at 102), the Siting Council's review of the long-run cost of the supply plan generally focuses on an electric company's supply planning methodology. 1989 BECo Decision, 18 DOMSC at 225; 1989 MECo Decision, 18 DOMSC at 336. The objectives of the Siting Council's review of an electric company's supply planning process are addressed through the review that would take place under the IRM regulatory framework. Upon implementation of the IRM process, a supply plan that meets the standards of the IRM process will be deemed by the Siting Council to be adequate in the long run (see Section II.D.1, below).

5/ In the proposed regulations, committed resources are defined as those resources identified by an electric company as committed and determined by the Siting Council to be committed after review of an electric company's inventory of existing and planned supply-side and conservation and load management ("C&LM") resources.

resource proposals[6] from project developers[7] to meet the resource need. See 220 CMR 10.03, 10.04. If the Department (1) determines that resource proposals chosen by the electric company from the all-resource solicitation[8] are least-cost, least-environmental-impact resource options (see 220 CMR 10.05), and (2) approves the electric company's contracts with project developers (see 220 CMR 10.06) or pre-approves an electric-company-owned generation facility or C&LM program (see 220 CMR 9.00; D.P.U. 86-36-F), then the Siting Council will accept that the electric company has established that it has a least-cost, least-environmental-impact supply plan, and the Department's findings will be adopted in the Siting Council's final decision on the supply plan. In this manner, the Siting Council will continue to fullfil the requirements of G.L. c. 164, sec. 69J.

Currently, in determining whether a supply plan ensures a least-cost, least-environmental-impact supply, the Siting Council reviews an electric company's processes of identifying and evaluating a variety of resource options. In order for an electric company to establish that it has a least-cost, least-environmental-impact supply plan, it must show that all resources are evaluated on an equal footing. 1989 MECo Decision, 18 DOMSC at 362-371; 1989 BECo Decision, 18 DOMSC at 260-280; 1988 EECo Decision, 18 DOMSC at 123-131. Under the IRM regulatory framework, electric companies still would be required to identify and evaluate a wide range of resource options on an equal footing through the resource solicitation process,

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6/ In the proposed regulations, a resource proposal or project proposal is defined as a proposal providing a demand-side or supply-side resource to the electric company through the all-resource solicitation.

7/ In the proposed regulations, a project developer is defined as any entity, including but not limited to, the host electric company and other electric companies, that submits project proposals for the all-resource solicitation.

8/ In the proposed regulations, the resource proposals chosen by the electric company from the all-resource solicitation and presented to the Department for approval are collectively referred to as the electric company's award group.

specifically its request for proposals ("RFP") and evaluation of proposals, set forth in the Department regulations at 220 CMR 10.03 and 10.04. However, unlike the current review of supply plans by the Siting Council, under the IRM process electric companies would be required to demonstrate to the Department that the resource proposals chosen from the all-resource solicitation represent a least-cost, least-environmental-impact resource mix.[9] See 220 CMR 10.05. Under the IRM regulatory framework, electric companies would be able to begin contract negotiations with project developers only after the Department approves this resource mix. In addition, electric companies would be required to obtain Department approval of all signed contracts. See 220 CMR 10.06.

Pursuant to G.L. c. 164, sec. 69H, the Siting Council is responsible for providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. The Siting Council views the IRM regulatory framework as an efficient process for fulfilling this statutory mandate. The IRM process will require that the need for resources clearly be established by electric companies. In addition, the IRM regulatory framework will include the impact of environmental externalities, and the tradeoff between such externalities and the cost of resources. Further, and most importantly, the IRM process will ensure that C&LM and supply resources are evaluated on an equal footing.

9/ Pursuant to the general authority contained in G.L. c. 164, sec. 94, the Department is responsible for determining the propriety of (1) investments by an electric company in generation facilities, (2) purchases of power by an electric company from a qualifying facility ("QF"), (3) purchases of power by an electric company from another electric company or entity for periods of one year or more, or (4) investments by an electric company in C&LM programs. See also G.L. c. 164, sec. 94A, 220 CMR 8.00, 220 CMR 9.00, D.P.U. 86-36-F (1989). However, under the current Department review process, the electric company is not required to evaluate such investments or purchases systematically against all other resource proposals.

The Siting Council is interested in receiving comments on its proposed regulations. In fact, in Section II of this Order, which contains a discussion of all the areas contained in the proposed regulations, the Siting Council requests commments on particular portions of the proposed regulations.

The Order and proposed regulations reflect discussions and contributions from the Department. The Siting Council and the Department will hold joint technical sessions and public hearings on the proposed regulations.[10]

10/ The Department and Siting Council jointly held technical sessions on the Department's proposed regulations on January 3, 10, 17 and 24, 1990. The two agencies also held joint public hearings on the Department's proposed regulations on March 5, 6, 7, and April 17, 1990.

II. PROPOSED REGULATIONS

A. Introduction

The proposed regulations of the Siting Council establish new procedures for reviewing the demand forecasts and supply plans of certain electric companies. The electric companies to which the proposed regulations apply are: Boston Edison Company, Cambridge Electric Light Company, Commonwealth Electric Company, Eastern Edison Company ("EECo"), Fitchburg Gas and Electric Light Company, Massachusetts Electric Company ("MECo"), Montaup Electric Company ("Montaup"), Nantucket Electric Company, New England Power Company ("NEPCo"), Northeast Utilities ("NU") and Western Massachusetts Electric Company ("WMECo").[11] When the proposed regulations become effective and are implemented, the Siting Council's current regulations governing the review of demand forecasts and supply plans of electric companies, 980 CMR 7.00, will not apply to these companies, except for 980 CMR 7.02(10), 7.04(8) and (9), and 7.05(3).[12] All of 980 CMR 7.00 will continue to apply to municipal-owned electric companies[13]

11/ The Siting Council notes that Mountaup and NEPCo are wholesale electric companies and affiliates of EECo and MECo respectively, and supply almost all of the electricity distributed by these electric companies. See: 1989 MECo Decision, 18 DOMSC at 299-300; 1988 EECo Decision, 18 DOMSC at 76-77. The Siting Council also notes that NU is a public utility holding company comprising WMECo and other affiliated companies. See: Northeast Utilities, 17 DOMSC 1, 4 (1988). NU supplies most of the electricity distributed by WMECo. Montaup, NEPCo, and NU supply electricity to other retail electric companies located in other states; their sales of electricity are regulated by the Federal Energy Regulatory Commission. However, Montaup, NEPCo, and NU fall squarely within the Siting Council's jurisdiction (G.L. c. 164, sec. 69G), and therefore, are required to file supply plans pursuant to these regulations.

12/ These sections apply to the construction of facilities in the Commonwealth.

13/ Under the proposed regulations, Massachusetts Municipal Wholesale Electric Company ("MMWEC") is not required to participate in the IRM process. However, the Siting Council is interested in receiving comments on whether MMWEC and its members would benefit from participating in the IRM process or a process similar to the IRM process.

and to third-party developers proposing to build facilities in the Commonwealth.

The IRM regulatory framework established by the proposed regulations of the Siting Council and the Department consists of a four-phase process. Phase I comprises the Siting Council's and Department's review of an electric company's draft initial filing and initial filing (see 980 CMR 12.03 and 220 CMR 10.03); Phase II comprises the electric company's resource solicitation process (see 980 CMR 10.04); Phase III comprises the Department's review of an electric company's award group (see 980 CMR 10.05); and Phase IV comprises the Department's procedures for approving contracts in the award group, the Department's process for pre-approval, the Siting Council's adoption of Department approvals, and the final EFSC order in the docket (see 220 CMR 10.06 and 980 CMR 12.06).

The Siting Council's participation in the IRM process is limited to Phase I and Phase IV. These proposed regulations set forth the filing requirements and review processes of the Siting Council in these phases, as well as in matters outside the IRM process. The following is an overview of the proposed regulations. A more detailed discussion of various parts of the proposed regulations pertaining to the IRM process is contained in later sections of this Order.

In Phase I, electric companies are required to submit draft initial filings and initial filings to both the Siting Council and Department. Draft initial filings are to be submitted at the time the notice of adjudication is published (approximately nine to ten weeks before the filing date of the

initial filing),[14] and are filed for the purpose of pre-initial filing settlement negotiations (see 980 CMR 12.03(4)). In order for settlement negotiations to be meaningful and productive, draft initial filings must be sufficiently complete. Eight weeks before the date of the initial filing, at least one technical session must be held to explain and clarify the draft initial filing, and to establish procedures and rules for the settlement negotiations.

After the technical session, the electric company is required to enter into discussions with parties to the proceeding for the purpose of evaluating the draft initial filing and reaching agreement on all or some issues in the draft initial filing. Staff members from the EFSC or the Department may participate in the settlement negotiations, in the same roles as parties. However, any EFSC or Department staff member that actively participates in the settlement negotiations shall be prohibited from advising the EFSC or the Department in its review of the initial filing, or from participating in any part of the subsequent proceedings involving the review of that filing. The electric company is required to include in its initial filing any settlement, partial settlement, or contested settlement reached by the parties in the pre-initial filing settlement negotiations.

14/ As set forth in 980 CMR 12.03(3) of the proposed regulations, at least 11 weeks before the initial filing date established by the EFSC and the Department, the EFSC and the Department will issue an Order of Notice to be published by the electric company so as to inform interested persons about the electric company's draft initial filing, technical sessions, and initial filing. Within 10 days of the issuance of the Order of Notice, the electric company shall publish the notice in at least one newspaper of general circulation in its service territory, as approved by the EFSC and the Department, and send actual notice to any person that has filed a request for notice with the electric company. Any person who wishes to intervene as a party must file a written request to the EFSC or the Department for such status within 10 business days of the last publication of the Order of Notice. In addition, any person who wishes to participate as an interested person must file a written request to the EFSC within 10 business days of the last publication of the Order of Notice.

On the date established by the Siting Council and the Department, each electric company will be required to submit its initial filing. The filing schedule for each electric company's subsequent initial filings will be agreed upon by the Siting Council and the Department and set forth in the Siting Council's final order in Phase IV. It is expected that an electric company's initial filing will be required no earlier than 18 months, and no later than 30 months, from the filing date of the that electric company's previous initial filing.

The Siting Council and the Department both are responsible for reviewing various portions of the electric company's initial filing. In the initial filing, the electric company is required to provide its demand forecast, supply plan, and any pre-initial filing settlement agreements. With respect to the supply plan, the electric company is required to provide its committed resource inventory; evaluation of resource need; evaluation of resource potential with respect to the technical potential of C&LM and life extension or repowering of existing power plants; RFP; and initial resource portfolio. In Phase I, the Siting Council reviews the electric company's demand forecast and those portions of the electric company's supply plan relating to the committed resource inventory, evaluation of resource need, and evaluation of the technical potential of C&LM and life extension or repowering. The Siting Council reviews the pre-initial filing settlement agreement if such agreement pertains to the demand forecast, committed resource inventory, evaluation of resource need, or evaluation of the technical potential of C&LM and life extension or repowering. The Department reviews the electric company's RFP, initial resource portfolio, and pre-initial filing settlement agreement if such agreement pertains to the RFP or initial resource portfolio.[15]

15/ For further information on the Department's procedure for review of the initial filing, see 220 CMR 10.03 and D.P.U. 86-36-G (1989).

Each electric company is required to provide information on its demand forecast and committed resource inventory for the five calendar years preceding the year in which the initial filing is submitted and for the 20 calendar years beginning with the year in which the initial filing is submitted. The proposed regulations set forth in detail the information each electric company is required to file for each of these years. See 980 CMR 12.03(5) and 12.03(7).

Pursuant to G.L. c. 164, sec. 69J, the Siting Council may approve or reject a demand forecast or supply plan. Under the proposed regulations, the Siting Council will meet within four months of the initial filing to issue a decision approving or rejecting an electric company's (1) demand forecast and (2) supply plan with respect to the committed resource inventory and evalution of resource need. In cases where the Siting Council rejects a demand forecast, or finds that a separate forecast contained therein (i.e., commercial forecast), is not reviewable, appropriate, or reliable, the Siting Council may order the electric company to address such rejection or findings in its next initial filing.[16] However, as set forth in the proposed regulations, a rejected demand forecast or a finding that a separate forecast contained therein is not appropriate, reliable, or reviewable will not necessarily delay or prevent the IRM process from going forward.[17] Instead, the Siting

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16/ As set forth in 980 CMR 12.07(2) of the proposed regulations, in years that an electric company is not required to submit an initial filing it is required to submit to the Siting Council an intercycle forecast and supply plan. The Siting Council may order an electric company to address in the intercycle forecast a rejected demand forecast or a finding that a particular forecast contained in the demand forecast is not reviewable, appropriate, or reliable. In addition, pursuant to G.L. c. 164, sec. 69J, the electric company may file an amended forecast within six months of a Siting Council decision rejecting the demand forecast.

17/ While for the purposes of the IRM process a rejected demand forecast will not prevent or delay the IRM process from going forward, an electric company cannot commence construction of a facility unless the facility is consistent with an approved forecast. G.L. c. 164, sec. 69I.

Council may adjust or modify the electric company's demand forecast as necessary in order to determine more accurately the electric company's resource need for use in the IRM process.

With respect to the supply plan, the Siting Council performs its review of such plan in Phases I and IV. In Phase I, the Siting Council reviews the electric company's committed resource inventory and the evaluation of resource need. The Siting Council reviews the electric company's committed resource inventory to determine whether such resources are indeed committed resources. If the Siting Council finds that certain resources are not committed resources, the Siting Council may adjust or modify the electric company's committed resource inventory. Similarly, in its review of an electric company's evaluation of resource need (in general, the difference between the demand forecast and the committed resource inventory), the Siting Council may adjust or modify the evaluation of resource need as necessary depending on the findings on the demand forecast and committed resource inventory. If the Siting Council modifies or adjusts the evaluation of resource need, the Siting Council may order the electric company to revise its initial resource portfolio.[18] Under the Department's regulations, the electric company must submit a revised initial portfolio to the Department (see 220 CMR 10.03(7)(b)).

In Phase I, the Siting Council also reviews an electric company's evaluation of resource potential. See 980 CMR 12.03(9). Here, the electric company is required to identify the technical potential of C&LM in its service territory, and the technical potential of life extension or repowering at existing power plants. The purpose of this requirement is to enable project developers to identify C&LM program opportunities

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18/ The electric company may be required to revise its initial resource portfolio in cases when the Siting Council adjusts or modifies the demand forecast. However, in cases when the Siting Council adjusts or modifies the committed resource inventory, any resource determined not to be committed may be added to the electric company's initial resource portfolio. See Section II.D.2, below. In these cases, there would be no need for the electric company to revise its initial resource portfolio.

the IRM process are complete. The remaining phases of the IRM process, including the portion of Phase I involving the Department review, as well as Phases II, III, and IV, all pertain to the all-resource solicitation (i.e., determining the mix of resource proposals necessary to meet the electric company's resource need) and the acquisition of resource proposals. Briefly, in Phase I, the electric company is required to provide its RFP ranking system and selection criteria for review and approval by the Department. In Phase II, the electric company is required to solicit resource proposals from project developers by issuing the RFP. The electric company is required to apply the RFP ranking system and selection criteria approved by the Department in Phase I to compare resource proposals from all project developers, including the host electric company, in order to determine the mix of additional resources that is most likely to result in a reliable supply of electrical service at the lowest total cost to society. That mix of resource proposals constituting the electric company's award group or proposed resource plan will be subject to Department review and approval in Phase III. In Phase IV, the electric company is required to negotiate and finalize contracts with project developers. The final contracts are to be submitted to the Department for review and approval.

The Department's decisions on an electric company's contracts and pre-approval filings in Phase IV will be entered into the Siting Council's docket and accepted as establishing that an electric company has a least-cost, least-environmental-impact supply plan as required by G.L. c. 164, sec. 69H. See 980 CMR 12.06. When the Department's findings are adopted by the Siting Council in the Siting Council's final decision on the supply plan, the Siting Council's docket will be closed.

While outside the purview of the IRM review process, the Siting Council will continue to require an electric company to demonstrate the adequacy of its supply plan in the short run. See 980 CMR 12.07(1). Adequacy is defined as the electric company's ability to provide sufficient capacity to meet its peak loads and reserve requirements. Cambridge Electric Light

and large blocks of power potentially available at existing power plants. The Siting Council will make findings regarding the adequacy of the electric company's process for identifying the technical potential of C&LM and life extension or repowering at existing generating facilities. However, such findings will have no effect on the electric company's evaluation of resource need.

The Siting Council will complete its review of the initial filing within four months of the filing date of the initial filing.[19] See 980 CMR 12.03(10). As stated in the Department's regulations, the Siting Council's findings on the initial filing will be entered into the Department's docket and adopted by the Department in its review of the initial filing.[20] In an unusual situation where the Siting Council does not complete its review in the four-month time period, the electric company's initial filing with respect to the demand forecast, committed resource inventory, and evaluation of resource need will be accepted by the Department for the purposes of the IRM process.

The Siting Council's docket in the review of an electric company's initial filing will remain open until all phases of

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19/ In situations where the Siting Council determines that an initial filing is incomplete because it lacks adequate data or documentation with respect to either the demand forecast, committed resource inventory, evaluation of resource need or evaluation of resource potential, the Siting Council may, pursuant to the general exceptions clause in the proposed regulations, delay the commencement of the Phase I review to allow the electric company to submit a sufficiently complete initial filing. However, the Siting Council does not expect that there will be many instances where delay of the Phase I review will be necessary. Rather, through mechanisms such as the pre-initial filing settlement process, it is likely that the Siting Council will be able to ensure that initial filings will be complete and ready for review.

20/ Pursuant to Department regulations, the Department will complete its review of the initial filing within five months of the electric company's initial filing date. See 220 CMR 10.03(7)(b).

Company, 12 DOMSC 39, 72 (1985); Boston Edison Company, 10 DOMSC 203, 245 (1984). To establish adequacy in the short run, an electric company must demonstrate that it has an identified, secure, and reliable set of resources. In essence, the electric company must own or have under contract sufficient resources to meet its capability responsibility under a reasonable range of contingencies. If an electric company cannot establish that it has adequate supplies in the short run, that electric company must then demonstrate that it operates pursuant to a specific action plan which identifies alternative supplies of energy which may be called upon in the event of certain contingencies. 1987 BECo Decision, 15 DOMSC at 309-322; 1986 CELCo Decision, 15 DOMSC at 134-135, 144-150, 165-166. For the purposes of the initial filing, the short run is defined as the time period extending four calendar years beginning in the year in which the initial filing is submitted.

Finally, an electric company is required to file intercycle forecasts and supply plans in each calendar year when the electric company is not required to submit an initial filing. See 980 CMR 12.07(2). In this manner, the electric company will be complying with the requirement in G.L. c. 164, sec. 69I, which requires electric companies to file annual ten-year forecasts of supply and demand. Depending on the timing of the initial filing, one or two intercycle forecasts and supply plans will be submitted between each electric company's initial filing.

The purpose of requiring electric companies to file an intercycle forecast and supply plan is to provide the Siting Council with the opportunity to review any significant changes or proposed changes in the demand forecast, committed resource inventory, evaluation of resource need, and evaluation of resource potential, from that contained in the previously reviewed initial filing, and to review the adequacy of the electric company's supply plan in the short run.

The Siting Council does not expect the intercycle forecast and supply plan to be as detailed and voluminous as the initial filing. Instead, the electric company is required to

(1) provide a narrative explanation of significant changes or proposed changes in the demand forecast, committed resource inventory, evaluation of resource need, and evaluation of resource potential, from that contained in the previous initial filing, (2) identify any supply-side resource or C&LM resource that was a planned resource and that has become operational since the initial filing, (3) compare the committed resource inventory and the demand forecast for the ten calendar years beginning with the year in which the intercycle forecast and supply plan is submitted, and (4) demonstrate that the supply plan is adequate in the short-run.[21] However, in situations where the Siting Council rejects the demand forecast, or finds that any separate forecast contained within the demand forecast is not reviewable, appropriate, or reliable, the Siting Council may require the electric company to provide, and the Siting Council may review, additional information on the demand forecast or any separate forecast contained therein as part of its intercycle forecast and supply plan.

The remainder of this order contains a discussion and request for comments on the following areas of the proposed regulations pertaining to the IRM process: (1) procedural matters including settlement negotiations, frequency of the initial filing and Siting Council review of the initial filing; (2) the demand forecast; and (3) the supply plan, including the committed resource inventory, evaluation of resource need, and evaluation of resource potential.

B. Procedural Matters

1. Settlement Negotiations

The electric company is required to enter into settlement negotiations with the parties to a proceeding for the purpose of facilitating the EFSC's and Department's coordinated review of the initial filing by (1) evaluating the electric company's

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21/ For the purposes of the intercycle forecast and supply plan, the short run is defined as the four calendar years beginning with the year in which the intercycle forecast and supply plan is submitted.

draft initial filing and improving all parties' understanding of the draft initial filing, (2) reaching agreement among the parties to the maximum extent possible on the electric company's draft initial filing, (3) making agreed upon improvements to the draft initial filing which will be reflected in the initial filing, and (4) identifying specific areas for adjudication, if necessary, before the EFSC, the Department, or both. See 980 CMR 12.03(4).

In order to reach a settlement agreement on any issue contained in the draft initial filing, it is critical that the draft initial filing be sufficiently complete. Accordingly, the draft initial filing must include all the technical volumes that are required to be provided in the initial filing, and each volume should contain adequate data and documentation.

The settlement negotiation process set forth in the proposed regulations represents a significant departure from the manner in which the Siting Council currently reviews forecasts. Accordingly, the Siting Council is interested in receiving comments on the settlement negotiation process as it pertains to the demand forecast, committed resource inventory, evaluation of resource need, and evaluation of resource potential. In the comments, please respond to the following questions.

> What sorts of significant issues are likely to be settled in the negotiations? Will the range of issues that parties are able to settle expand after the first group of reviews of initial filings?
>
> How can technically complex issues such as those contained in the demand forecast be settled given the time period for review and the volumes of information to be reviewed?
>
> With respect to the committed resources inventory, under what circumstances can an agreement be reached that a planned supply-side resource or planned C&LM resource is a committed resource?

2. Frequency of the Initial Filing and Siting Council Review of the Initial Filing

As set forth in 980 CMR 12.03(4) of the proposed regulations, initial filings are to be submitted 18 to 30 months from the filing date of the previous initial filing. It is

anticipated that the entire IRM process, from the draft initial filing to the completion of Phase IV, will take 23 months to complete.[22] Cycles may take less than 23 months to complete if settlements are reached prior to Phase I. The process may take longer if all issues must be adjudicated. In any event, the time frame between cycles will allow some additional flexibility in the filing schedule to account for cycles that may take longer than the 23 months to complete.

The Siting Council is interested in receiving comments on whether the time period between initial filings provides enough flexibility and an opportunity to address problems and issues raised in the previous IRM proceeding. If it does not, please indicate why and justify the use of another time period.

The proposed regulations state that the Siting Council will complete its review of the initial filing in Phase I in four months. In order to keep the Siting Council on a tight review schedule, the proposed regulations have been drafted so that the electric company's demand forecast, committed resource inventory, evaluation of resource need, and evaluation of resource potential would be accepted by the Department for the purposes of the IRM process if decisions were not reached by the Siting Council within the four-month time period. The Siting Council expects that, as all parties gain experience with the IRM process, the four-month time period will be adequate.

Nonetheless, the Siting Council is interested in receiving comments on whether completion of its review within the four-month time period is achievable. In submitting comments, please consider the effect of settlement agreements on the Siting Council's ability to complete the review of the initial filing in four months.

22/ Since the regulatory structure proposed herein represents a major departure from the existing structure, the first cycle for the first group of electric companies may take longer than 23 months to complete. The EFSC and the Department therefore expect to allow additional time to complete the first cycle for the first group of electric companies through implementation of the general exceptions clause in the proposed regulations.

C. Demand Forecast

The demand forecast filing requirements set forth in the proposed regulations at 980 CMR 12.03(5) are essentially the same as those contained in the current regulations. In general, the demand forecast is to include historical data for the five calendar years preceding the year in which the initial filing is submitted and projections for twenty calendar years beginning with the year in which the initial filing is submitted. Projections of the demand for electricity are to be based on substantially accurate historical information and reasonable statistical projection methods. The demand forecast is to include separate forecasts of total annual electric energy demand and seasonal peak loads for each customer class. The customer classes to be reviewed are residential without electric heating, residential with electric heating, total residential, commercial, industrial, street lighting, railway, sales for resale, losses, internal use, "unaccounted for," and any other customer class.

The Siting Council traditionally does not prescribe a particular methodology that must be used by an electric company in forecasting demand. However, the Siting Council does require that the forecast of demand for all customer classes be disaggregated by end-use, as appropriate. In fact, many electric companies currently utilize end-use methodologies in forecasting demand. See: 1989 MECO Decision, 18 DOMSC at 302-335; 1989 BECo Decision, 18 DOMSC at 208-223; 1988 EECo Decision, 18 DOMSC at 302-335.

In addition to the current filing requirements, the electric company would be required to include natural C&LM in its projections of demand for electricity. The electric company also would be required to include, in addition to its base case scenario forecast, scenario forecasts for high load growth and low load growth.

In the proposed regulations, natural C&LM is defined as C&LM that will occur without the intervention of the electric company either as a direct supplier or as a purchaser of third-party C&LM services. Examples of natural C&LM are C&LM programs sponsored or mandated by federal, state, and local governments

including but not limited to building code standards and appliance efficiency standards, market-induced C&LM, and market-induced self-generation.

Some electric companies have already recognized the impact on their demand forecast of natural C&LM, such as government-sponsored appliance efficiency standards. See: 1989 MECo Decision, 18 DOMSC 317-321; 1989 BECo Decision, 18 DOMSC at 217-218. Under the proposed regulations, each electric company would be required to quantify the effects of natural C&LM on its demand forecast. In addition, each electric company would be required to quantify the effects of the substitution of alternative fuels for electricity on the projections of demand for electricity.

Recently, some electric companies have provided high load growth and low load growth scenario forecasts recognizing the uncertainties in its base case scenario forecast.[23] See: 1989 MECo Decision, 18 DOMSC at 328; 1989 BECo Decision, 18 DOMSC at 222. Under the proposed regulations, each electric company is required to provide high load growth and low load growth scenario forecasts, and additional forecast analyses when appropriate. This requirement will provide the Siting Council, the electric company, other project developers, and parties with the opportunity to compare the electric company's supply plan with these alternative demand forecasts.

The Siting Council is interested in receiving comments on these new requirements. In the comments, please respond to the following questions.

> How precisely can the impact of natural C&LM and fuel substitution on demand be estimated?
>
> Should fuel substitution be treated separately from natural C&LM or is it, in fact, natural C&LM?

The Siting Council's standard of review for an electric company's demand forecast remains the same as at present. The

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23/ In the proposed regulations, base case scenario forecast is defined as the electric company's most likely demand forecast scenario.

electric company is required to demonstrate that the demand forecast is: reviewable, that is, it contains enough information and sufficient documentation to allow full understanding of the forecasting methodology; appropriate, that is, it uses a methodology that produces a forecast that is technically suitable to the size and nature of the electric company that produced it; and reliable, that is, it uses a methodology that provides a measure of confidence that its data, assumptions, and judgments produce a forecast of what is most likely to occur. 1989 MECo Decision, 18 DOMSC at 302; 1989 BECo Decision, 18 DOMSC at 208; 1988 EECo Decision, 18 DOMSC at 79. The Siting Council may approve or reject a demand forecast. In approving a forecast, the Siting Council may find that a particular forecast contained therein (i.e., commercial forecast), is not reviewable, appropriate, or reliable.

The Siting Council's ultimate responsibility in the IRM process is to determine the electric company's resource need. Because of this responsibility, the Siting Council finds that it may be necessary to adjust or modify an electric company's demand forecast in cases where a demand forecast is rejected, or where a particular forecast contained therein is found not to be reviewable, appropriate, or reliable. In those cases where the Siting Council finds that an adjustment or modification must be made to a demand forecast, the Siting Council may make such adjustment or modification based either on historical load growth rates, or on statistical projection methods that are appropriate for a company of the size and resources of the electric company, or some other appropriate method.

The Siting Council is interested in receiving comments on its review of a demand forecast. In the comments, please respond to the following questions.

> The EFSC is proposing to allow the IRM process to proceed in the case where the demand forecast of the host electric company has been entirely or partially rejected. Is this the preferable approach, or in the alternative, would it be preferable to delay the acquisition of resource proposals until an amended demand forecast is prepared and approved?

In the case where the electric company's demand forecast is not acceptable, is the use of either (a) historical load growth rates or (b) statistical projection methods for an electric company of the size and resources of the host electric company, appropriate for making an adjustment or modification to the electric company's demand forecast? If not, what other methods should the Siting Council use to ensure that a forecast of demand be forwarded to the Department for the purposes of proceeding with IRM? In setting forth methods to estimate demand, please discuss the effectiveness of using a substitute method in light of the limited period of time provided to review the initial filing under the proposed regulations.

D. Supply Plan

1. Introduction

The Siting Council's review of an electric company's supply plan under the IRM process would be significantly changed from its current review of such plans. Currently, the Siting Council reviews an electric company's supply plan in terms of (a) short-run adequacy and (b) long-run adequacy and cost.

Under the proposed regulations, the Siting Council's review of the adequacy of an electric company's supply plan in the short run remains unchanged. However, under the proposed regulations, the Siting Council will no longer directly review the adequacy and cost of an electric company's supply plan in the long run. At present, the Siting Council reviews the cost of an electric company's resource supply plan in the long run to determine whether such plan is least cost. This least-cost review focusses on an electric company's supply planning process and, in particular, on its process for identifying and evaluating an array of potential additional resource options. In order to meet the Siting Council's least-cost standard, an electric company must establish that it has (1) developed a resource evaluation process which identifies and fairly evaluates all resource options, including the treatment of all resource options on an equal footing, and (2) applied its resource evaluation process to all of its identified resource options.[24] 1989 MECO Decision, 18 DOMSC at 337-338; 1989 BECo Decision, 18 DOMSC at 225-226; 1988 EECo Decision, 18 DOMSC at 102-103.

Under the proposed IRM process, the Siting Council's review of the cost of an electric company's supply plan in the long run consists of reviewing the electric company's committed resource inventory and evaluation of resource need. As set forth in the proposed regulations, the Siting Council reviews information on the reliability, cost, and environmental impacts

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24/ Currently, a supply plan that meets the Siting Council's least-cost standards is deemed adequate in the long run. 1987 BECo Decision, 15 DOMSC at 298, 313-320.

of a resource as provided by the electric company for those resources proposed by the electric company as committed resources. The electric company will present its inventory of committed resources in a form which reflects their relative rank based on the company's proposed RFP criteria. Based on the review of the reliability, cost and environmental impact of each resource, the Siting Council determines what resources are to be considered committed resources. As a result of this determination (as well as determinations regarding the demand forecast), the Siting Council may adjust or modify the electric company's evaluation of resource need when necessary. Moreover, those resources determined by the Siting Council to be committed resources will not be subject to competitive ranking with project proposals submitted pursuant to the all-resource solicitation. The resources determined by the Siting Council not to be committed will be included in, and added to, the electric company's initial resource portfolio and will be subject to competitive ranking with project proposals submitted pursuant to the all-resource solicitation. The proposed regulations set forth the filing requirements and outline the review processes for both the committed resource inventory (980 CMR 12.03(7)) and evaluation of resource need (980 CMR 12.03(8)).

The remaining phases of the IRM process -- that portion of Phase I involving the review by the Department of the electric company's RFP, and Phases II, III, and IV -- all pertain to the all-resource solicitation and acquisition of resource proposals. It is the Department's responsibility in these phases to make the determination that the solicitation and acquisition of project proposals by the electric company provide an adequate least-cost, least-environmental-impact resource mix in the long run. The Department's findings in Phase IV will be entered into the Siting Council's docket and adopted by the Siting Council in the Siting Council's final decision on the supply plan.

Finally, under the proposed regulations, the electric company is required to include in its initial filing an evaluation of C&LM resource potential and an evaluation of the technical potential of life extension and repowering. The

proposed regulations set forth the filing requirements and review processes of the Siting Council with respect to the evaluation of resource potential. See 980 CMR 12.03(9).

The following sections of this Order describe the components of the supply plan that are reviewed by the Siting Council. These components are: committed resource inventory, evaluation of resource need, and evaluation of resource potential.

2. Committed Resource Inventory

Under the proposed regulations, the electric company is required to identify all existing supply-side and C&LM resources and all planned supply-side and C&LM resources, which the electric company proposes to be considered committed resources. All resources[25] identified by the electric company as committed resources will be reviewed by the Siting Council to determine whether they shall be considered committed resources.

The proposed regulations set forth definitions of existing supply-side resource, existing C&LM resource, and planned resource. An "existing supply-side resource" is defined as a resource that either (a) has been providing kilowatts or kilowatthours to the electric company at some time within the year beginning 13 months before and ending one month before the submission of the initial filing, or (b) has provided kilowatts or kilowatthours to the electric company at some time earlier than thirteen months before the submission of the initial filing and can be made operational without pre-approval from the Department pursuant to 220 CMR 9.00.[26] An "existing

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25/ In the proposed regulations, a resource is defined as any facility, technology, measure, plan or action that either generates kilowatts or kilowatthours to meet the requirements of an electric company, or decreases the kilowatt or kilowatthour requirements of an electric company.

26/ The one-year standard provides a time frame for the electric company to identify operational resources. The one month deadline contained in this definition is to provide time for the electric company to verify and report the operation of supply-side resources.

C&LM resource" is defined as a resource that decreases the kilowatt or kilowatthour requirements of an electric company and that has been installed at least one month prior to the date of the initial filing.[27, 28] Finally, a "planned resource" is defined as a resource that is the subject of an approved power sales agreement or demand-side service contract, or has the pre-approval of the Department, but has not provided kilowatts or kilowatthours to the electric company or decreased the kilowatt or kilowatthour requirements of the electric company as of one month prior to the date of the initial filing.

Under the proposed regulations, the electric company is required to provide for each existing supply-side and C&LM resource, historical information on the reliability, cost, and environmental impacts of the resource for the five years preceding the year in which the initial filing is submitted, and projected information on the reliability, cost, and environmental impacts of the resource for twenty calendar years beginning with the year in which the initial filing is submitted. For each planned supply-side and planned C&LM resource, the electric company is required to provide its forecast of performance of planned resources for the twenty calendar years beginning with the year in which the initial filing is submitted.

The Siting Council's review of the resources identified by the electric company as planned resources consistently will be comprehensive. The Siting Council recognizes that a planned resource may be the subject of an approved contract, or pre-approval from the Department. Nonetheless, any planned resource, whether it is contracted for or pre-approved, has a

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27/ The one-month benchmark contained in this definition would provide time for the electric company to verify and report the operation of C&LM resources.

28/ Under the definitions of resource and existing C&LM resource in the proposed regulations, existing C&LM resources are installed C&LM measures that produce capacity and energy savings. The C&LM programs that deliver C&LM measures are not considered "resources" under these proposed regulations.

degree of risk of failure, possibly rendering the supply plan inadequate and affecting the resource need. This uncertainty may relate to the timing or performance of the resource, and may result from such factors as the status of fuel transportation and supply arrangements, transmission access, permitting difficulties, or marketing difficulties for C&LM.

In the proposed regulations, the Siting Council addresses the uncertainty of planned resources in two ways. First, the Siting Council reviews each planned resource to determine whether the resource is in compliance with milestones set forth in the power sales agreement, demand-side service contract, or the electric company's plan that was pre-approved by the Department. For example, in situations where it is clear that the resource has failed to meet certain milestones and the electric company has not justified this failure, or where the electric company has not demonstrated that certain future milestones may in fact be achieved, the Siting Council may determine that a planned resource is not a committed resource for the purpose of the all-resource solicitation.

In addition to this review of each planned resource, the proposed regulations set forth that the electric company is required to apply an attrition factor to its entire inventory of planned resources to account for the contingency that planned resources may not meet the electric company's expected performance levels for such resources. As set forth in the proposed regulations, the attrition adjustment is reflected only in the size of the resource need, and not in the inventory of planned resources. Under the proposed regulations, each electric company is required to provide an attrition factor and a justification for it based on the size and components of the electric company's resource plan. For example, a small inventory of planned resources, all dependent on a particular infrastructure component (i.e., a pipeline), would probably be assigned a different attrition factor than the attrition factor allowed for a larger, more diverse planned resource inventory.

Under the proposed regulations, the attrition factor is subject to Siting Council review. Based on this review, the

Siting Council may adjust or modify this factor. If the Siting Council adjusts or modifies this factor, the Siting Council may, when necessary, adjust or modify the electric company's evaluation of resource need.

In most cases, the Siting Council's review of resources identified by the electric company as existing supply-side resources or existing C&LM resources may not be comprehensive.[29] For example, an existing generating plant that has operated at acceptable performance levels, or an existing C&LM resource that has been installed and has achieved expected annual energy and capacity savings, likely will not be reviewed with extensive scrutiny. However, in cases where an existing generating plant has not operated at acceptable performance levels, or where an existing C&LM resource has not achieved expected savings, the Siting Council likely will review the resource with extensive scrutiny. This approach is consistent with a recent case in which the Siting Council found that extraordinary circumstances may warrant a comprehensive review of existing resources. 1989 BECo Decision, 18 DOMSC at 255. In that case, involving the two-and-one-half year shutdown of Boston Edison Company's Pilgrim nuclear generating plant, the Siting Council found that "such an outage at such a baseload unit is in itself unprecedented and ample reason to evaluate the cost-effectiveness of the unit's continued operation." Id.

The Siting Council notes that in a recent case an electric company asserted that life extension of generating plants constitutes an extraordinary circumstance. Id., at 262. While this assertion was not addressed by the Siting Council in that case, the Siting Council requested the electric company to demonstrate in future forecasts why life extension programs are committed resources, or instead should be treated as resource options subject to evaluation. Id. In addition to filing reliability, cost, and environmental impact information on

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29/ The Siting Council expects that agreements on whether an existing supply-side or C&LM resource is a committed resource may be reached in the pre-initial filing settlement negotiation phase of the IRM process.

resources, under the proposed regulations electric companies are required to report the remaining life of each resource (i.e., the anticipated expiration of equipment or contract without life extension investment). Based on the Siting Council's review of this information, the Siting Council may determine whether the life extension of the plant is a committed resource or a resource subject to competitive ranking.

The Siting Council's review of the electric company's committed resource inventory represents a departure from the manner in which the Siting Council currently reviews supply plans. Accordingly, the Siting Council is interested in receiving comments on the committed resource inventory requirement and review process. In commenting, please respond to the following questions.

> How useful and accurate are the projections of reliability, cost, and environmental impacts of a resource over a twenty-year time period? What factors affecting the reliability of the projections can the electric company improve to make these projections more useful or accurate?
>
> How should the Siting Council determine what constitutes extraordinary circumstances in terms of a resource's reliability, cost, and environmental impacts? Will thresholds be necessary to ensure equal treatment of all resources? Should life extension of existing generating plants always constitute an extraordinary circumstance triggering a comprehensive review?
>
> Is the extraordinary circumstances standard appropriate for triggering a comprehensive review of an existing resource?
>
> In what situations should the Siting Council determine that a planned resource is not a committed resource without a comprehensive review by the Siting Council?
>
> How would subjecting a planned resource to competitive ranking affect the electric company's supply planning process?

What is an appropriate method for devising an attrition factor to apply to the inventory of planned resources? Should the method vary from electric company to electric company or should generic factors be developed and subsequently applied to all electric companies?

The Siting Council and the Department also are considering two alternative methods for reviewing existing and planned resources. As set forth, these alternative methods could enable the Siting Council and the Department to evaluate directly the committed resources relative to those resources offered in response to the RFP. The first of these alternative methods would subject all existing and planned resources of an electric company to an optimization process. Under this method, all of the resources in an electric company's supply plan would be evaluated against the resource proposals selected in the all-resource solicitation with respect to cost and non-price factors. The Siting Council would continue to determine the resource need, but would not eliminate any existing resource from the committed resource inventory due to extraordinary circumstances. During the electric company's review and optimization of resource proposals in Phase III, the electric company would select an award group consisting of resource proposals totaling 130% of the resource need, in accordance with the Department's current proposed regulations. However, under this alternative method, the electric company then would optimize capacity and production using the full award group and the entire committed resource inventory. The combination of resource proposals and committed resources which supplied the needed energy at the lowest cost and least environmental impact would become the electric company's supply mix.

The second alternative method is the same as the first alternative method except that any resource which the Siting Council deems committed (whether existing or planned) with less than five years of operating history would remain in the electric company's supply plan and would not be subject to

supply plan optimization in Phase III.[30]

The Siting Council and the Department seek comments on these alternative methods. In the comments, please respond to the following questions.

How would either of these alternative methods actually benefit ratepayers?

Would either of the alternative methods remain valuable if an upper limit is placed on the value of environmental externalities?

What improvements can be made to the estimates of reliability, cost, or environmental impact to improve the optimization processes?

3. Evaluation of Resource Need

Under the proposed regulations, the electric company is required to provide its forecast of resource need. The Siting Council will review the forecast of resource need and make a determination on the accuracy of such forecast.

The resource need forecast is derived from the demand forecast and the committed resource inventory. The amount of energy and capacity necessary to meet the forecasted demand which is not provided by the committed resources constitutes the resource need. For each calendar year in the ten-year period beginning with the calendar year following the expected completion of Phase IV, the electric company will identify the resource need. Consistent with the Siting Council's findings on the demand forecast and the committed resource inventory, the Siting Council may, when necessary, adjust or modify the

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30/ Under these alternatives, the owner of a plant or provider of a demand-side resource that is removed from an electric company supply inventory would continue to receive contractually obligated payments. As such, future Department approval of resource acquisition agreements may require either capacity payments or buyout provisions designed to make existing resource owners financially whole.

electric company's forecast of resource need. This adjustment or modification of resource need may in some cases lead the EFSC to require the electric company to file an amended initial resource portfolio.

The proposed regulations require the electric company to summarize its resource need for each of the ten calendar years in terms of kilowatts of summer capacity, kilowatts of winter capacity, and kilowatthours of total annual energy requirements. In addition, under the proposed regulations, the electric company is required to describe the general characteristics of resource need for each of the ten calendar years. These general characteristics are: base-load, intermediate-load, or peaking-load needs; equivalent availability needs, in-service dates; on-peak, off-peak, and seasonal production requirements; fuel diversity preferences; technology diversity preferences; voltage control needs; and locational needs. These characteristics of need are guidelines and not requirements for additional resources. The electric company's RFP criteria must reflect these characteristics.

The Siting Council is interested in receiving comments on the review of the electric company's resource need evaluation. In the comments, please respond to the following questions.

> Should the electric company be required to provide specific characteristics of resource need? If so, what types of characteristics should be provided?
>
> Does the identification of specific characteristics of resource need prior to the all-resource solicitation process inhibit or enhance the development and acquisition of resource proposals?

4. Evaluation of Resource Potential

Under the proposed regulations, each electric company is required to identify the technical potential of C&LM in its service territory, and the technical potential of life extension or repowering of existing generation plants. The identification of the technical potential of C&LM and life extension or repowering should enable project developers to identify C&LM

program opportunities and large blocks of power potentially available at existing generation plants. As set forth in the proposed regulation, the electric company is required to provide the technical potential of C&LM regardless of the cost or delivery mechanism, based on an assumption of full market participation. Further, the electric company is required to provide the technical potential of life extension or repowering regardless of the cost or timing of the plant modifications.

The electric company's identification of the technical potential of C&LM should be as inclusive as possible, covering all sectors of customers, end uses, and avoided transmission and distribution losses. Under the proposed regulations, the electric company is required to describe the technical potential from the installation of all state-of-the-art, commercially available technologies that yield the most energy and capacity savings. As part of this description, the electric company is required to summarize the total estimated energy and capacity savings available in the service territory including savings from reductions in transmission and distribution losses, and disaggregate the technical potential of C&LM by (1) customer class and customer class sub-sector, (e.g., residential multi-family housing, commercial retail establishments), and (2) end use (e.g., lighting, water heating). The electric company also is required to provide (1) the estimated value of end user benefits (e.g., labor savings) in addition to energy savings attributable to the installation of particular C&LM technologies, and (2) examples of implementation of such technologies by the electric company, if any.

As set forth in the proposed regulations, each electric company is required to identify all potential C&LM improvements that exist at electric company buildings and facilities. The inclusion of electric company buildings, generation equipment, transformers, and other facilities in the C&LM technical potential is intended to encourage the development of C&LM technical potential, regardless of where energy and capacity savings may be found.

Under the proposed regulations, each electric company is required to identify the range of technical options available for life extension or repowering at existing plants. For each plant, the electric company is required to identify the plant owner, the output received by the electric company, the current fuel and generation technology, and the type of service (i.e., base-load, intermediate, or peaking). For each technical option that may exist at a plant, the electric company is required to provide the fuel and generation technologies, operating or environmental permits that may be required, plant modifications that would be necessary for either life extension or repowering, the type of service (base, intermediate, peaking), extended lifetime of the modified plant, and the capacity of the plant after life extension or repowering.

The technical potential for life extension or repowering may involve substantial replacements of generation and combustion equipment.[31] However, the potential for existing plant life extension or repowering to serve electric power needs in the future may indeed be significant given the siting and construction constraints facing new generation plant proposals. The Siting Council notes that electric companies have been identifying and evaluating life extension potential of existing plants as a distinct resource set in their supply planning processes. See: 1989 MECo Decision, 18 DOMSC at 348-371; 1989 BECo Decision, 18 DOMSC at 250-281; 1988 EECo Decision, 18 DOMSC at 111-131.

The Siting Council is interested in receiving comments on the evaluation of resource potential. In the comments, please respond to the following questions.

> How should C&LM technical potential be assessed? Should the method be consistent across all utilities?
>
> Does end-use quantification of C&LM technical potential require end-use ownership surveys to support the estimates of potential capacity and energy savings?

31/ Repowering should be distinguished from redeveloping former power plant sites, or making use of land at existing plant sites.

Will the exclusion of cost as a factor in the identification of the technical potential of C&LM and life extension or repowering make such identification meaningless?

Is there a need for the electric company to identify the technical potential of life extension or repowering when the proposed regulations require that the electric company's initial resource portfolio be revealed in Phase I?

Are there any disadvantages to identifying the technical potential of life extension or repowering?

How should electric companies report the technical potential of life extension or repowering at the plants which provide the electric company with power through power sales agreements and various ownership arrangements?

E. Request For Comments

The following list summarizes the areas in which the Siting Council seeks direct public comment.

-- Settlement Negotiations. Pages 8-9, 16-17.

The IRM process allows for approximately 8 weeks of discussion and negotiations prior to the initial filing date to provide parties with the opportunity to reach a settlement agreement on any issue contained in the draft initial filing. What sorts of significant issues are likely to be settled in negotiations? Will the range of issues that parties are able to settle expand after the the first group of reviews of initial filings? How can technically complex issues such as demand forecasts be settled given the time frame allotted? With respect to the committed resource inventory, under what circumstances can an agreement be reached that a planned supply-side or C&LM resource is a committed resource?

-- Frequency of the Initial Filing and EFSC Review. Pages 10, 17-18.

The proposed regulations set forth that initial filings be submitted 18 to 30 months from the date of the submittal of the previous initial filing. Does this time period between initial filings provide enough flexibility and an opportunity to address problems and issues raised in the previous IRM proceeding? If it does not, please indicate why and justify the use of another time period.

The proposed regulations also set forth that the Siting Council will complete its review of the initial filing in a four-month time period. The Siting Council is interested in receiving comments on whether the four-month time period for review of the initial filing is achievable. In submitting the comments, please consider the effects of settlement agreements on the Siting Council's ability to complete the review of the initial filing in four months.

-- Demand Forecast. Pages 11-12, 19-23.

Under the proposed regulations, an electric company is required to include in the demand forecast the impacts of natural C&LM and fuel switching in the demand forecast. Can the impact of natural C&LM and fuel substitution on demand be estimated precisely? Should fuel substitution be treated separately from natural C&LM or is it, in fact, natural C&LM?

The EFSC is proposing to allow the IRM process to proceed in the case where the demand forecast of the host electric company has been entirely or partially rejected. Is this the preferable approach, or in the alternative, would it be preferable to delay the acquisition of resource proposals until an amended demand forecast is prepared and approved? In the case where the electric company's demand forecast is not acceptable, or where a particular forecast contained therein is found not to be reviewable, appropriate, or reliable, the Siting Council may adjust or modify an electric company's demand forecast when necessary. Is the use of either (a) historical load growth rates or (b) statistical projection methods for an electric company of the size and resources of the electric company the proper methods to make an adjustment or modification of the electric company's demand forecast. If not, what other methods should the Siting Council use to ensure that a forecast of demand be forwarded to the Department for the purposes of proceeding with IRM? In setting forth methods to estimate demand, please discuss the effectiveness of using a substitute method to adjust or modify a demand forecast in light of the limited period of time provided to review the initial filing under the proposed regulations.

-- Committed Resource Inventory. Pages 12-13, 25-30

Under the proposed regulations, the electric company is required to identify all resources that are existing supply-side and C&LM resources or planned resources that the electric company proposes to be considered committed resources. The electric company is required to provide historical and projected information on reliability, cost, and environmental impacts of existing supply-side and C&LM resources, and projected information on the reliability, cost, and environmental impacts of planned resources. The Siting Council reviews these characteristics to determine if these resources are to be considered committed. The Siting Council's review of existing resources may not be comprehensive, except in extraordinary circumstances. How useful and accurate are projections of reliability, cost, and environmental impacts over a twenty-year

time period? What factors affecting the reliability of the projections can the electric company improve to make these projections more useful or accurate? How should the Siting Council determine what constitutes extraordinary circumstances in terms of a resource's reliability, cost, and environmental impacts? Will thresholds be necessary to ensure equal treatment of all resources? Should life extension of existing generating plants always constitute an extraordinary circumstance triggering a comprehensive review? Is the extraordinary circumstances signal appropriate for triggering a comprehensive review of an existing resource?

-- Planned Resources. Pages 26-28.

The Siting Council's review of the resources identified by the electric company as planned resources consistently will be comprehensive because of the degree of uncertainity associated with planned resources. Under the proposed regulations, the Siting Council addresses the uncertainty of planned resources in two ways. First, each planned resource will be reviewed to determine if such resource has or may achieve the milestones in its supply or C&LM agreement or plan which was pre-approved by the Department. Second, the electric company is required to apply an attrition factor to its inventory of planned resources. The Siting will review this attrition factor. In what situations should the Siting Council determine that a planned resource is not a committed resource without a comprehensive review by the Siting Council? How would subjecting a planned resource to competitive ranking affect the electric company's supply planning process? What is an appropriate method for devising an attrition factor to apply to the inventory of planned resources? Should the method vary from electric company to electric company or should generic factors be developed and subsequently applied to all electric companies?

-- Alternatives for Reviewing Committed Resources. Pages 30-31.

The Siting Council is considering alternative methods for reviewing existing and planned resources. Under one alternative method, existing and planned resources would be subjected to an optimization process. In a second alternative method, existing resources with 5 years or more operating history would have to compete in the ranking of resource proposals. How would either of these alternative methods actually bring benefits to ratepayers? Would either of the alternative methods remain valuable if an upper limit is placed on the value of environmental externalities? What improvements can be made to the estimates of reliability, cost, or environmental impact to improve the optimization processes?

-- Evaluation Of Resource Need. Pages 12, 31-32.

Under the proposed regulations, the electric company is required to provide a mathematical summary of its energy and capacity needs and general characteristics of its resource need. Should the electric company provide specific characteristics of resource need? If so, what types of characteristics should be provided? Does the identification of specific characteristics of resource need prior to the all-resource solicitation process inhibit or enhance the development and acquisition of resource proposals?

-- Evaluation Of Resource Potential. Pages 12-13, 32-34.

Under the proposed regulation, the electric company is required to identify the technical potential of C&LM and life extension or repowering. How should C&LM technical potential be assessed? Should the method be consistent across utilities? Does end-use quantification of C&LM technical potential require end-use ownership surveys to support the estimates of potential capacity and energy savings? Will the exclusion of cost as a factor in the identification of the technical potential of C&LM and life extension or repowering make such identification meaningless? Is there a need for the electric company to identify the technical potential of life extension or repowering when the proposed regulations require that the electric company's initial resource portfolio be revealed in Phase I? Are there any disadvantages to identifying the technical potential of life extension or repowering? How should electric companies report the technical potential of life extension or repowering at the plants which provide the electric company with power through power sales agreements and various ownership arrangements?

F. Additional Staff Resources

The Siting Council believes that the proposed structure would result in an improved and more efficient regulatory system. However, these improvements and efficiencies cannot be realized without adequate staffing to review the substantive filings and administer the process. The ability of the Siting Council and the Department to implement the proposed regulations outlined herein is premised on both agencies acquiring additional staffing, above the levels presently employed by the agencies, to carry out the review and to satisfy existing statutory requirements. Implementation of the proposed regulations will not occur until adequate staff resources are available to the Siting Council and the Department.

III. COMMENCEMENT OF RULEMAKING

Pursuant to G.L. c. 164, sec. 69H, the Siting Council has the authority to adopt and publish rules and regulations consistent with the purpose of G.L. c. 164, secs. 69H-69S, and to amend the same from time-to-time. See 980 CMR 3.00. Accordingly, the Siting Council hereby commences this rulemaking by issuing the attached proposed regulations and authorizing the Siting Council staff to issue the attached notice of proposed rulemaking and public hearing.

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Council

Proposed Rulemaking Regarding the Procedures by Which Additional Resources are Planned, Solicited, and Procured by Investor-Owned Electric Companies (Integrated Resource Management)	EFSC 90-RM-100

Notice of Proposed Rulemaking
Notice of Public Hearing

Notice is hereby given that on July 5, 1990, the Energy Facilities Siting Council ("EFSC") voted to commence a rulemaking proceeding to establish new regulations governing the procedure by which additional resources are planned, solicited, and procured by investor-owned electric companies. The new regulations would be designated as 980 CMR 12.00. The proceeding on the proposed rulemaking is conducted pursuant to G.L. c. 30A, sec. 2, and the EFSC's regulations at 980 CMR 3.00.

The proposed regulations would require electric companies to use an all-resource solicitation process to establish a mix of resources that ensures least-cost, least-environmental impact electricity service. The proposed regulations contain requirements for filing of resource plans and coordinated review of such plans by the EFSC and the Department of Public Utilities. The proposed regulations would apply to investor-owned electric companies that generate or sell electricity for the ultimate use by 50 or more persons in Massachusetts, including Boston Edison Company, Cambridge Electric Light Company, Commonwealth Electric Company, Eastern Edison Company, Fitchburg Gas and Electric Light Company, Massachusetts Electric Company, Montaup Electric Company, Nantucket Electric Company, New England Power Company, Northeast Utilities, and Western Massachusetts Electric Company.

The EFSC will hold at least one day of public hearings to receive oral comments on the proposed regulations beginning on September 5, 1990 to be held at 10:00 a.m. in the offices of the Department of Public Utilities, Room 1210, 100 Cambridge Street, Boston, Massachusetts. Those parties wishing to comment at the public hearing are requested to submit preliminary written comments by August 27, 1990.

The EFSC also will accept written comments on the proposed rulemaking after the conclusion of public hearings. Pursuant to EFSC regulation 980 CMR 3.02(3)(b), the EFSC will accept written comments within seven (7) days after the final public hearing date.

All written comments should be sent to the EFSC offices, 100 Cambridge Street, Room 2109, Boston, Massachusetts 02202. Questions or requests for information should be directed to the Hearing Officer at the address below.

Frank P. Pozniak
Hearing Officer
Energy Facilities Siting Council
100 Cambridge Street, Room 2109
Boston, MA 02202

(617) 727-1136

980 CMR 12.00: RULES GOVERNING THE PROCEDURE BY WHICH ADDITIONAL RESOURCES ARE PLANNED, SOLICITED, AND PROCURED BY INVESTOR-OWNED ELECTRIC COMPANIES.

980 CMR 12.01 Purpose and Scope.

980 CMR 12.02 Definitions.

980 CMR 12.03 PHASE I: Initial Filing Requirements and Siting Council Review.

980 CMR 12.04 PHASE II: Solicitation Process and Project Evaluation (See 220 CMR 10.04).

980 CMR 12.05 PHASE III: Resource Plan Filing Requirments and Department Review (See 220 CMR 10.05).

980 CMR 12.06 PHASE IV: Resource Contracting Procedure. (See also 220 CMR 10.06).

980 CMR 12.07 Other Rules.

980 CMR 12.00: RULES GOVERNING THE PROCEDURE BY WHICH ADDITIONAL RESOURCES ARE PLANNED, SOLICITED, AND PROCURED BY INVESTOR-OWNED ELECTRIC COMPANIES.

980 CMR 12.01 Purpose and Scope

(1) Purpose. The purpose of these regulations is to establish procedures by which additional resources are planned, solicited, and procured through an Integrated Resource Management process to meet an investor-owned electric company's obligation to provide reliable electrical service to customers at the lowest total cost to society. These regulations establish the procedure for determining the need for additional resources.

(2) Scope.

(a) These regulations apply to electric company forecasts of electricity demand, committed resources, and resource need, the identification of the technical potential of conservation and load management, and the technical potential of life extension or repowering of power plants.

(b) Affected utilities. These regulations apply to investor-owned electric companies that generate or sell electricity for the ultimate use by 50 or more persons in the Commonwealth of Massachusetts, including:

1. Boston Edison Company
2. Cambridge Electric Light Company
3. Commonwealth Electric Company
4. Eastern Edison Company
5. Fitchburg Gas and Electric Light Company
6. Massachusetts Electric Company
7. Montaup Electric Company
8. Nantucket Electric Company
9. New England Power Company
10. Northeast Utilities
11. Western Massachusetts Electric Company

(c) Upon the implementation date of these regulations for each affected utility, 980 CMR 7.00 et. seq. shall not apply to such utilities, except for 980 CMR 7.02(10), 7.04(8) and (9), and 7.05(3).

980 CMR 12.02 Definitions

The terms set forth below shall be defined as follows in these regulations, unless the context otherwise requires. These definitions apply only to the regulatory process set forth in 980 CMR 12.00 and 220 CMR 10.00. Other terms relating to this regulatory process not included in this Section are defined in 220 CMR 10.02.

(1) All-Resource Solicitation shall mean the process by which electric companies solicit and evaluate supply-side and demand-side resources from project developers, as described in 220 CMR 10.02.

(2) Award Group shall mean the group of project proposals from the all-resource solicitation that is selected for final contract negotiation and signing. The project proposals in the award group shall be presented to the Department for approval as part of the electric company's proposed resource plan.

(3) Base Case Scenario shall mean the electric company's most likely demand forecast scenario.

(4) Committed Resources shall mean those resources identified by an electric company as committed and determined by the Siting Council to be committed after review of an electric company's inventory of existing and planned supply-side and C&LM resources.

(5) Conservation shall mean a technology, measure, or action designed to decrease the kilowatt or kilowatthour requirements of an electric company.

(6) Conservation and Load Management Resource or Demand-Side Resource shall mean a resource that decreases the kilowatt or kilowatthour requirements of an electric company.

(7) Customer shall mean any entity purchasing electricity from the host electric company on a retail basis.

(8) Department or DPU shall mean the Department of Public Utilities.

(9) Department Regulations shall mean the regulations promulgated by the Department, at 220 CMR 10.00.

(10) Draft Initial Filing shall mean the preliminary initial filing submitted by the electric company for the purposes of pre-filing settlement discussions, pursuant to 980 CMR 12.03(4). The draft initial filing shall be sufficiently complete such that if agreement is reached on any of its components, those components can be submitted as part of the electric company's initial filing.

(11) EFSC or Siting Council shall mean the Energy Facilities Siting Council.

(12) Electric Company shall mean an investor-owned electric utility that generates or sells electricity for ultimate use by 50 or more persons in the Commonwealth of Massachusetts. This definition applies only to those affected utilities listed in 980 CMR 12.01(2)(b).

(13) Existing C&LM Resource shall mean a resource that decreases the kilowatt or kilowatthour requirements of an electric company and that has been installed at least one (1) month prior to the date of the initial filing.

(14) Existing Supply-Side Resource shall mean a supply-side resource that either (a) has been providing kilowatts or kilowatthours to the electric company at some time within the year beginning thirteen (13) months before and ending one (1) month before the submission of the initial filing, or (b) had provided kilowatts or kilowatthours to the electric company at some time other than thirteen (13) months before the submission of the initial filing and can be made operational without pre-approval from the Department pursuant to 220 CMR 9.00.

(15) Host Electric Company shall mean the electric company that conducts the all-resource solicitation for the purpose of procuring resources.

(16) Initial Filing shall mean the documents filed by the host electric company at the EFSC and Department at the beginning of Phase I. The initial filing shall include all of the documents described in 980 CMR 12.03(2).

(17) Initial Resource Portfolio shall mean the combination of resources proposed by the host electric company in the initial filing, pursuant to 980 CMR 12.03(6). The initial resource portfolio shall be designed to meet the additional resource need identified by the host electric company in the initial filing at the lowest total cost to society. The projects proposed in the initial resource portfolio shall be compared with project proposals submitted by other parties in the all-resource solicitation. The information regarding the initial resource portfolio provided in the initial filing need not include price, method of cost recovery, or other cost information.

(18) Life Extension shall mean a specific program implemented in connection with an existing supply-side resource where such a program extends the retirement date of the existing supply-side resource.

(19) Load Management shall mean a measure or action designed to modify the time pattern of customer capacity or energy requirements, for the purpose of improving the efficiency of the electric company's operating system.

(20) Lost C&LM Opportunity shall mean the impact of the failure to take steps necessary to capture cost-effective C&LM savings at the time when it is most practical and inexpensive to do so, such as the point when a building is first constructed or when a customer's energy consuming equipment is replaced.

(21) Natural C&LM shall mean C&LM that will occur without the intervention of the electric company either as a direct supplier or as a purchaser of third party C&LM services.

(22) Peak Demand or Peak Load shall mean the maximum level of consumption of electrical energy in a system, or part thereof, expressed as the maximum megawatt load during a specified time period (e.g. day, week, month, year).

(23) Phase I shall mean the portion of the regulatory process set forth in 980 CMR 12.03 and 220 CMR 10.03.

(24) Phase II shall mean the portion of the regulatory process set forth in 220 CMR 10.04.

(25) Phase III shall mean the portion of the regulatory process set forth in 220 CMR 10.05.

(26) Phase IV shall mean the portion of the regulatory process set forth in 980 CMR 12.06 and 220 CMR 10.06.

(27) Planned Resource shall mean a resource that is contracted for or pre-approved but has not begun to provide kilowatts or kilowatthours to the electric company or decrease the kilowatt or kilowatthour requirements of the electric company.

(28) Pre-approval shall mean the Department procedures for pre-approval of resources pursuant to 220 CMR 9.00, D.P.U. 86-36-F, and D.P.U. 86-36-G.

(29) Project Developer shall mean any entity, including but not limited to, the host electric company and other electric companies, that submits project proposals for the all-resource solicitation.

(30) Project Proposal or Resource Proposal shall mean a proposal for providing a demand-side or supply-side resource to the host electric company through the all-resource solicitation. A host electric company's project proposals shall be set forth in the initial resource portfolio; other entities' project proposals shall be submitted in response to an RFP. A project proposal shall include all of the terms and conditions required by the electric company's RFP, except price for host company proposals. A project proposal may include a portion of a generating facility or C&LM program, as well as the entire facility or program.

(31) Proposed Resource Plan shall mean the award group proposed by the electric company for Department review in Phase III, as well as all of the documentation required to describe the selection of the award group, pursuant to 220 CMR 10.05(2).

(32) Repowering shall mean a specific program implemented with respect to an existing supply-side resource where such program changes the combustion or generation configuration of the existing supply-side resource.

(33) Resource shall mean any facility, technology, measure, plan or action that either generates kilowatts or kilowatthours to meet the requirements of an electric company, or decreases the kilowatt or kilowatthour requirements of an electric company.

(34) Supply-Side Resource shall mean a resource that provides kilowatts or kilowatthours to the electric company. Generation, transmission and distribution systems may be considered supply-side resources to the extent that they increase the total amount of kilowatts or kilowatthours available to the electric company to meet the needs of its retail customers.

(35) Technical Potential of C&LM shall mean the sum of potential capacity and energy savings from the installation of all state-of-the-art, commercially available technologies that yield the most energy and capacity savings for each end use in each customer class subsector, regardless of the cost or delivery mechanism. Technical potential should be based on the assumption that full market participation can be achieved and should not be limited by current or anticipated C&LM programs.

(36) Technical Potential of Life Extension shall mean the kilowatts and kilowatthours provided by the continuation of existing supply-side resources beyond the retirement date of such resources resulting from state-of-the-art, available technologies for life extension, regardless of the cost of such continuation.

(37) Technical Potential of Repowering shall mean the kilowatts and kilowatthours provided by the change in the combustion or generation configuration of an existing supply-side resource resulting from state-of-the-art, available technologies for repowering, regardless of the cost of such repowering but recognizing the physical constraints of the plant site.

(38) Total Cost to Society shall include (a) all direct costs to the electric company; (b) other non-price factors affecting the costs or benefits of the electrical service (e.g., reliability, fuel diversity, environmental externalities); and (c) direct out-of-pocket costs or benefits to the electric company's customers.

980 CMR 12.03 PHASE I: Draft Initial Filing and Initial Filing Requirements and Siting Council Review

(1) Frequency of Filing. Each electric company shall submit to the EFSC and the Department the filings identified below, pursuant to a schedule established by the EFSC and the Department. The filing schedule for each cycle after the first cycle shall be determined in the final order of the previous cycle. In no event shall initial filings be more frequent than 18 months, nor less frequent than 30 months from the previous initial filing.

(2) Documents to be Filed.

(a) Draft Initial Filing. Each electric company shall submit a draft initial filing to the Siting Council and the Department at the time the notice is published pursuant to 980 CMR 12.03(3). The draft initial filing shall be sufficiently complete such that if agreement is reached on any of its components during settlement negotiations pursuant to 980 CMR 12.03(4), those components can be submitted as part of the host electric company's initial filing.

(b) Initial Filing. Each electric company's initial filing shall contain the following documents.

1. Executive Summary. The Executive Summary shall be a non-technical summary of the information presented in each technical volume.

2. Technical Volumes.

A. The Demand Forecast shall include all of the information required by 980 CMR 12.03(5), and any other documentation that the electric company deems useful for EFSC review.

B. The Committed Resource Inventory shall contain all of the information required by 980 CMR 12.03(7), and any other documentation that the electric company deems useful for EFSC review.

C. The Evaluation of Resource Need shall contain all of the information required by 980 CMR 12.03(8), and any other documentation that the electric company deems useful for EFSC review.

D. The Evaluation of Resource Potential shall contain all of the information required by 980 CMR 12.03(9), and any other documentation that the electric company deems useful for EFSC review.

E. The Resource Solicitation Request for Proposals shall contain all the information required by 220 CMR 10.03(6) and any other documentation that the electric company deems useful for Department review.

F. The Initial Resource Portfolio shall contain all of the information required by 980 CMR 12.03(6) and 220 CMR 10.03(5), and any other documentation that the electric company deems useful for Department review.

G. The Prefiling Settlement Package shall contain the results, if any, of the prefiling settlement process, pursuant to 980 CMR 12.04(4), and any other documentation the electric company deems useful for EFSC and Department review of a proposed settlement.

(3) Notice and Participation.

The rules set forth below apply only to the regulatory process set forth in 980 CMR 12.00 and 220 CMR 10.00.

(a) Notice

1. At least eleven weeks before the initial filing date established by the EFSC and the Department, the EFSC and the Department shall issue an Order of Notice to inform interested persons about the electric company's draft initial filing, technical sessions, and formal Phase I initial filing.

2. Within ten days of the issuance of the Order of Notice, the electric company shall publish the notice in at least one newspaper of general circulation in the service territory, as approved by the EFSC and the Department, and send actual notice to any person that has filed a request for notice with the electric company. At the time the notice is published, the electric company shall have prepared a draft initial filing, which it shall submit to the EFSC and the Department and make available to other persons. The draft initial filing will be used for the purposes of discussion at the technical sessions and as the basis for settlement negotiations.

(b) Intervention and Participation. Any person who wishes to intervene as a party or participate as an interested person shall file a written request to the EFSC or the Department to intervene as a party or participate as an interested person, pursuant to 980 CMR 1.05 and 220 CMR 1.03, except that such requests shall be filed within ten business days of the last publication of the Order of Notice. The EFSC and the Department may, at their discretion, hold hearings to consider the requests for intervenor or interested person status.

(4) Prefiling Settlement Procedures

(a) Technical Sessions

1. The electric company shall hold at least one technical session at least eight weeks before the initial filing date established by the EFSC and the Department.

2. The purpose of the technical session is to (a) provide a basis for exchange of information and clarification of the draft initial filing and (b) establish procedures and rules for further discussions designed to limit or settle issues, pursuant to 980 CMR 12.03(4)(b).

(b) Settlement Negotiations

1. The electric company shall enter into discussions with parties for the purpose of evaluating the electric company's draft initial filing and for the purpose of reaching agreement among the parties on all or some issues in the draft initial filing.

2. The purpose of the settlement negotiations is to facilitate the EFSC's and Department's coordinated review of the initial filing by (1) improving all parties' understanding of the electric company's draft initial filing, (2) reaching agreement among the parties to the maximum extent possible on the electric company's draft initial filing, (3) making agreed-upon improvements to the filing, and (4) identifying specific areas for adjudication, if necessary, before the EFSC, the Department, or both.

3. Any settlement, partial settlement, or contested settlement reached by parties shall be filed with the EFSC and the Department in the electric company's formal Phase I initial filing. Final approval of any settlement, partial settlement, or contested settlement pertaining to the demand forecast, the committed resource inventory, evlauation of resource need, and evaluation of resource potential shall be subject to EFSC review. Final approval of any settlement, partial settlement, or contested settlement pertaining to the RFP or the electric company's initial resource portfolio shall be subject to Department review.

4. Discussions and positions taken by the parties during the course of settlement negotiations shall neither be admissible nor subject to discovery during any adjudicatory proceeding. Facts disclosed during such settlement negotiations may be subject to discovery during any adjudicatory proceeding.

5. Staff members from the EFSC or the Department may participate in the settlement negotiations, in the same role as the parties. Any EFSC or Department staff member that actively participates in the settlement negotiations shall be prohibited from advising the EFSC or Commission in its review of the initial filing, or from participating in subsequent proceedings involving the review of that filing. The EFSC or Department shall not be bound on any matter agreed to by EFSC or Department staff members during the settlement negotiations.

(c) Facilitation. The parties are encouraged to use an impartial party to facilitate the settlement negotiations. The EFSC and Department may make staff members available for facilitation. EFSC or Department staff members who facilitate the negotiations shall be prohibited from advising the EFSC or Commission in their review of the intitial filing, or from participating in subsequent proceedings involving the review of that filing. Facilitation expenses (e.g., those expenses incurred for facilitators, meeting rooms) shall be borne by the electric company.

(5) Demand Forecast

(a) Purpose and Scope. This section sets forth the requirements for forecasts of demand. Projections of the demand for electricity shall be based on substantially accurate historical information and reasonable statistical projection methods. The electric company shall demonstrate that the demand forecast is: reviewable, that is, it contains enough information and sufficient documentation to allow full understanding of the forecasting methodology;

appropriate, that is, it uses a methodology that produces a forecast that is technically suitable to the size and nature of the electric company that produced it; and reliable, that is, it uses a methodology that provides a measure of confidence that its data, assumptions, and judgments produce a forecast of what is most likely to occur. The demand forecast shall be subject to Siting Council review in Phase I, pursuant to 980 CMR 12.03(5). Consistent with the findings on the demand forecast, the Siting Council may, in its Order, adjust or modify an electric company's demand forecast in determining the resource need for the all-resource procurement.

(b) Contents of Forecast

1. Demand Forecast Characteristics. The demand forecast shall include historical data for a minimum of five (5) calendar years preceding the year in which the initial filing is submitted and projections for twenty (20) calendar years beginning with the year in which the initial filing is submitted. The electric company shall provide the following information:

   A. Total annual electrical energy demand for the electric company's service territory, with breakdowns for each of the customer classes specified in 980 CMR 12.03(5)(d);
   B. Total seasonal peak demands for the electric company's service territory, with breakdowns for each of the customer classes specified in 980 CMR 12.03(5)(e), for both summer and winter seasons;
   C. Annual service territory load factor;
   D. Annual service territory load duration curves;

E. Service territory load profiles for representative days in both summer and winter seasons;
F. Estimated transmission and distribution losses; and
G. Capability responsibility based on NEPOOL practices and the electric company's reserve requirement.

2. Natural Conservation and Load Management. An electric company's projections of its demand for electricity shall include natural C&LM. The electric company shall quantify the effects of natural C&LM on demand, and include natural C&LM as a major determinant of demand. The electric company shall separately identify the following which are included in the demand forecast:

A. C&LM programs sponsored or mandated by federal, state, and local governments (e.g., building codes, appliance efficiency standards);
B. Market-induced C&LM; and
C. Market-induced self-generation (excluding sales to the company).

3. Fuel Substitution. An electric company's projections of its demand for electricity shall include estimates of the substitution of alternative fuels for electricity.

(c) Demand Forecast Methodology. The Siting Council does not prescribe a particular methodology that must be used by an electric company in forecasting demand. The methodology selected by an electric company must be reviewable, appropriate, and

reliable. The electric company shall describe the following components of its forecast methodology for each year of the forecast period:

1. The major determinants of total annual electric energy demand and seasonal peak demand. Such description shall identify the source of the determinants and document how these determinants were incorporated in the demand forecast. At a minimum, the following determinants shall be described:

   A. Demographic data and economic activity pertaining to the electric company's service territory;
   B. The electric company's projections of its price of electricity and the price elasticity of demand for electricity;
   C. The electric company's estimate of the substitution of electricity for other fuels in competing end-uses;
   D. Behavioral factors which are expected to have a significant affect on electricity demand;
   E. Federal, state, or local policies that are expected to have a significant affect on electricity demand;
   F. Natural C&LM;
   G. Alternate fuels substituted for electricity; and
   H. Other relevant factors.

2. The sources and vintages of the major data components used in the demand forecast.

3. The methodologies used to acquire, organize, modify, and test the validity of data used in the demand forecast, and the techniques used to project electricity consumption based on such data.

4. The major models used in compiling the forecast including a description of the model logic and identification of the key variables affecting the model's outcome.

5. The level of confidence associated with key dependent and independent variables used in the electric company's models.

6. The major assumptions regarding the forecast of electricity demand with a detailed explanation of the reasons in support of these major assumptions.

(d) Customer Classes. Each demand forecast shall include separate forecasts of total annual electric energy demand and seasonal peak loads for each customer class. Commercial and industrial classes shall be identified by two digit Standard Industrial Classification code, and all customer classes shall be disaggregated by end-use as appropriate. Separate forecasts shall be provided for each of the following customer classes:

1. Residential without electric heating;
2. Residential with electric heating;
3. Total residential;
4. Commercial;
5. Industrial;
6. Street lighting;
7. Railway;

8. Sales for resale;
9. Losses, internal use, and unaccounted for; and
10. Any other customer class.

(e) Sensitivity Analyses

1. The demand forecast shall include sensitivity analyses of major assumptions contained in an electric company's forecast methodology.

2. The demand forecast shall include, in addition to the base case growth forecast, high demand growth and low demand growth scenario forecasts. Additional forecast analyses shall be provided by the electric company as appropriate. The high electricity demand growth and low electricity demand growth scenario forecasts shall include estimated annual energy and peak load growth rates over the forecast period, and a brief discussion of the key changes in the variables and assumptions relied on to produce the high, base, and low demand forecasts.

(6) Initial Electric Company Resource Portfolio

(a) The initial resource portfolio shall be designed to meet the entire resource need identified by the host electric company in the evaluation of resource need and filed pursuant to 980 CMR 12.03(8).

(b) The initial resource portfolio shall be designed to provide reliable electrical service to the electric company's customers at the lowest total cost to society.

(c) For each resource in its portfolio, the electric company shall provide all the information proposed to be required of the RFP respondents to the all-resource solicitation, pursuant to 220 CMR 10.00 and all the information required for DPU review of preapproval rate treatment, pursuant to 220 CMR 9.00, except for output price, method of cost recovery, and cost information.

(d) The electric company shall separately identify the following elements of its initial resource portfolio:

1. Resources that are purchased from other entities and that are not yet considered by the electric company as committed;
2. Electric company plant life extensions, repowerings, and continued operation of plants beyond their retirement date that are not yet considered by the electric company as committed;
3. Additional electric company generation facilities not yet considered by the electric company as committed;
4. Additional electric company C&LM programs not yet considered by the electric company as committed; and
5. Any other resource that the electric company proposes for its initial resource portfolio.

(7) Committed Resource Inventory

(a) Purpose and Scope. This part sets forth the requirements for determining an electric company's committed resources. The electric company shall identify all resources that are existing supply-side and C&LM resources or planned resources (i.e., resources that have been pre-approved or that have Department-approved purchase agreements), that the electric company proposes

to be committed resources. The electric company shall rank these resources with the same criteria and weights as are applied to resource proposals. The electric company shall apply a factor to the planned resources to account for the contingency that planned resources may not meet the electric company's expected performance levels for such resources. All of these resources, both existing supply-side and C&LM resources and planned resources, shall be reviewed by the Siting Council for inclusion as committed resources in the supply plan. Those resources determined by the Siting Council to be committed resources shall be included in the electric company's future resource mix, and will not be subject to competitive ranking with new project proposals submitted pursuant to the all-resource solicitation. Those particular resources determined by the Siting Council not to be committed shall be included in, and added to, the electric company's initial resource portfolio and will be subject to competitive ranking. The committed resources shall be compared to the demand forecast to determine the electric company's additional resource need, described in 12.03(8). To facilitate the EFSC review, the electric company shall provide the following information for the five (5) calendar years preceding the year in which the initial filing is submitted, and the twenty (20) calendar years beginning with the year in which the initial filing is submitted. The committed resource inventory shall be subject to EFSC review in Phase I, pursuant to 980 CMR 12.03(7). Consistent with the findings on the committed resource inventory, the Siting Council may, in its Order, adjust or modify the electric company's committed resource inventory.

(b) Identification of Committed Resources

1. Inventory of Existing Supply-Side Resources. Each electric company shall identify all existing supply-side resources that the electric company proposes to be considered committed, and provide the following information for each identified existing supply-side resource:

A. Facility name and unit number, location, owner, and operator;
B. Percentage and quantity of host electric company's ownership of output;
C. Other recipients of plant electrical output;
D. Other recipients of plant thermal output;
E. In-service date;
F. Nameplate capability rating (summer and winter);
G. Current NEPOOL capability rating (summer and winter);
H. Type of service (base, intermediate, peaking);
I. Total acreage of the facility site;
J. Production in kWh;
K. Capacity factor;
L. Equivalent availability factor;
M. Forced outage rate;
N. Heat rate curve;
O. Technology and design, including major pollution control equipment;
P. Fuel type;
Q. Fixed capital costs, disaggregated by AFUDC versus direct, and sunk versus incremental costs;

R. Variable operating costs (both fuel and variable operation and maintenance costs, disaggregated)

S. Fixed operation and maintenance costs;

T. Other costs such as waste disposal, decommissioning, insurance, and property taxes;

U. Environmental impacts such as airborne emission rates, water emission rates, solid waste disposal, hazardous waste disposal, water use, etc., reported in the same format that is required in RFP pursuant to 220 CMR 10.03(6);

V. Remaining life of resource, (anticipated expiration of equipment or contract without life extension investment), with full justification; and

W. Any other relevant information necessary to determine whether the resource should be considered committed.

2. Inventory of Existing C&LM Resources. Each electric company shall identify all existing C&LM resources that the electric company proposes to be considered committed, and provide the following information on each identified existing C&LM resource. The end use of electricity and customer class shall be the basis for this inventory (e.g., industrial motors, residential water heating).

A. Annual energy and capacity savings for the lifetime of the resource, and the basis for the calculation of savings;

B. Impact on summer and winter peak demand, described in kilowatts, for the lifetime of the resource;

C. Technologies used to obtain the foregoing savings;
D. Variable, operating, and maintenance costs;
E. Total incremental costs per kw and kwh; and
F. Measurement or monitoring procedures.

3. Inventory of Planned Supply-Side Resources. Each electric company shall identify all planned supply-side resources that the electric company proposes to be considered committed, and provide the following information on each identified planned supply-side resource:

A. Facility name and unit number, location, owner and operator;
B. Percentage and quantity of host electric company's ownership of output;
C. Other recipients of plant electrical output;
D. Other recipients of plant thermal output:
E. Expected in-service date;
F. MW capability (summer and winter);
G. All fuel types (indicate proportions);
H. Type of service (base, intermediate, peaking);
I. Origin of the resource (i.e., specify solicitation or negotiation);
J. Anticipated retirement date or purchase agreement termination date;
K. Status of power sales agreement or other contract between the host electric company and the project developer, specifying whether the contract has been approved by the appropriate agency;

L. Status of the construction of all relevant structures needed for the operation of the resource;

M. Status of fuel supply contracts and transportation;

N. Status of all environmental and regulatory permits needed for the operation of the resource;

O. DPU pre-approval, if required in the case of electric company-provided generation; and

P. Where the planned resource is an addition to an existing supply-side resource, (e.g. an additional module), the past five (5) years' performance history of the existing supply-side resource.

4. Inventory of Planned C&LM Resources. Each electric company shall identify all planned C&LM resources that the electric company proposes to be considered committed, and provide the following information on each identified planned C&LM resource. The end use of electricity and customer class shall be the basis for this inventory (e.g., industrial motors, residential heating).

A. Annual energy and capacity savings for the lifetime of the resource, and the basis for the calculation of savings;

B. Estimated impact on summer and winter peak demand described in kilowatts for the lifetime of the resource;

C. Technologies planned to be implemented to obtain savings;

D. Targeted market segments and end uses, and the saturation level of the technology in such segments and end uses prior to implementation of the resource;

E. Project details, including origin of the resource (i.e., specify solicitation or negotiation), project proponent, source of design of the resource, and the expiration date of the contract or termination date of the program;

F. Contracts the host electric company has with project developers, and the status of contract approval by the Department, or other appropriate regulatory authority having jurisdiction over the purchase;

G. Electric company C&LM programs which include identified planned C&LM resources. For such programs, the program title, a description of the program, including marketing approaches, delivery mechanisms, pre-approval information, financial incentives and participation levels anticipated;

H. Description of major cost components of the electric company C&LM programs, including electric company budget, scheduling of expenditures, timing and implementation of major steps leading up to installation;

I. For continuations of existing C&LM programs, the past five (5) years' performance of the resources included in such programs, reported in the format specified by the Department for annual C&LM reports;

J. Lost opportunities that the program would capture.

5. Contingency for Planned Resources. The electric company shall apply an attrition factor to its inventory of planned resources to account for the contingency that planned resources may not meet the electric company's expected performance levels for such resources. The electric company shall provide sufficient documentation explaining and justifying the use of this attrition factor. The Siting Council shall review and determine the appropriate factor for both supply-side and demand-side planned resources based on the electric company's resource mix.

(8) Evaluation of Resource Need

(a) Purpose and Scope. This part sets forth the requirements for identifying the electric company's need for additional resources to provide reliable electrical service to customers at the lowest total cost to society. The characteristics of the additional resource need shall be used in establishing the electric company's all-resource solicitation pursuant to 220 CMR 10.00. The Department shall allow for solicitations of economical energy as part of the all resource solicitation. The evaluation of resource need shall be subject to Siting Council review in Phase I, pursuant to 980 CMR 12.03(8). Consistent with the findings on the demand forecast and the committed resource inventory, the Siting Council may, in its Order, adjust or modify the electric company's evaluation of resource need.

(b) Identification of Resource Need

1. The electric company shall identify the general characteristics of the resource need described by the difference between the electric company's forecast of demand and the electric company's committed resource inventory.

2. The need for resources shall be summarized for each year of the ten (10) calendar years beginning with the year following the expected completion of Phase IV, in the following terms:

   A. kilowatts of summer capacity;
   B. kilowatts of winter capacity; and
   C. kilowatthours of total annual energy requirements.

3. The electric company shall describe the general characteristics of the additional resource need for each year of the ten (10) calendar years beginning with the year following the expected completion of Phase IV. This description shall include the following characteristics:

   A. Base-load, intermediate-load, or peaking-load needs;
   B. Equivalent availability needs;
   C. In-service date;
   D. On-peak, off-peak and seasonal production requirements;
   E. Fuel diversity preferences;
   F. Technology diversity preferences;
   G. Voltage control needs; and
   H. Locational needs.

(9) Evaluation of Resource Potential

(a) Technical Potential of C&LM

1. Purpose and Scope. This part sets forth requirements for identifying all uncommitted C&LM technical potential in the host electric company's service territory. The electric company's assessment of the technical potential of C&LM will enable project developers to identify C&LM program opportunities. The identification of the technical potential of C&LM shall be subject to EFSC review in Phase I, pursuant to 980 CMR 12.03(9)(a). The EFSC review shall focus on the electric company's process for identifying the technical potential of C&LM.

2. Identification of Technical Potential of C&LM. The electric company shall identify and quantify the estimated additional capacity and energy savings in its service territory, above the committed resources, that could be obtained from the full installation of technologies, including equipment and procedures, that yield the most energy and capacity savings, regardless of cost or delivery mechanisms and assuming full participation.

A. The electric company shall identify and quantify the estimated capacity and energy savings for each customer class sector, sub-sector (e.g., rental housing, three-digit SIC codes), and the electric company's own buildings and facilities.

B. The electric company shall identify the most efficient potential C&LM option for each end use. For each end use, the electric company shall provide the following information:

1) Estimated energy and capacity savings for each end use based on the full implementation of all C&LM options identified;
2) Estimated value of end-user benefits in addition to the energy savings attributable to the installation of particular conservation or load management improvements; and
3) Total estimated savings for the electric company's service territory, described in terms of energy and peak capacity, with specifications of savings in transmission and distribution line losses, and reduced reserve requirements.

C. The electric company shall specify the potential C&LM options identified above that the electric company has implemented in an existing C&LM resource.

(b) Technical Potential of Life Extension or Repowering.

1. Purpose and Scope. This Part sets forth the basic requirements for identifying all uncommitted plant life extension or repowering potential. The electric company's assessment of technical potential of life extension or repowering will enable project developers to

identify large blocks of power potentially available at existing power plants. The EFSC review shall focus on the electric company's process for identifying the technical potential of life extension or repowering.

2. Identification of Technical Potential of Life Extension or Repowering. For each plant with life extension or repowering potential, the electric company shall identify a wide range of options to life-extend or repower the plant without regard to cost or implementation time. For each option, the electric company shall describe the significant actions needed for life-extending or repowering a plant, based on known plant conditions and state-of-the-art, commercially available technologies. For each plant that the electric company owns or has applicable rights to, the electric company shall provide:

   A. Plant name and owner;
   B. Output received by the electric company;
   C. Existing fuel type and technology;
   D. Type of service (base, intermediate, peaking);
   E. For each potential option for life extension or repowering:
      1) Technologies and fuel type;
      2) Operating or environmental permits that will be required;
      3) Necessary modifications;
      4) Types of service (base, intermediate, peaking);
      5) Length of extension of useful life; and
      6) Capacity after life extension or repowering.

(10) Review of the Initial Filing.

(a) EFSC Review.

1. The EFSC shall conduct an adjudicatory proceeding on the electric company's initial filing pursuant to 980 CMR 1.00. The EFSC may hold technical sessions as required.

2. The EFSC shall review each electric company's initial filing with respect to the demand forecast, the committed resource inventory, the evaluation of resource need, and the evaluation of resource potential. The EFSC findings regarding these issues shall be entered into the Department's docket and adopted by the Department.

3. The EFSC shall complete its proceeding and issue an Order within four months of the electric company's initial filing date. If the EFSC does not issue an Order within four months, the electric company's initial filing with respect to these issues shall be deemed accepted by the Department. The approved initial filing shall be entered into the Department's docket and adopted by the Department.

4. The electric company shall revise its initial resource portfolio if the EFSC orders a material and substantial change to the initial resource portfolio resulting from the findings on the demand forecast, committed resource inventory, or evaluation of resource need. The electric company shall submit its revised initial resource portfolio within the time frame specified in the Department's Order on

the initial filing, but no later than 60 days from the issuance of such Order.

5. The EFSC's docket in a proceeding shall remain open until the Department completes its review in Phase IV pursuant to 220 CMR 10.06.

(b) Department Review. Pursuant to Department regulations, 220 CMR 10.03(7), the electric company shall submit its initial filing to the Department at the same time it submits its filing to the Siting Council. Pursuant to Department regulations, the Department shall be responsible for reviewing each electric company's initial filing to determine whether an electric company's RFP is in the public interest. Pursuant to Department regulations, the Department shall issue an Order on the electric company's initial filing within five months of the initial filing date.

980 CMR 12.04 PHASE II: Solicitation Process and Project Evaluation. See 220 CMR 10.04.

980 CMR 12.05 PHASE III: Resource Plan Filing Requirements and Department Review. See 220 CMR 10.05.

980 CMR 12.06 PHASE IV: Resource Contracting Procedure.

The EFSC's docket in a proceeding shall remain open until the Department completes its review in Phase IV pursuant to 220 CMR 10.06. The Department's findings in this review shall establish that an electric company's resource mix provides reliable electric service to customers at the least cost and with the least environmental impact. These findings shall be entered into the EFSC's docket and adopted by the Siting Council.

980 CMR 12.07 Other Rules.

(1) Short Run Adequacy. In the initial filing, an electric company must demonstrate that it owns or has under contract sufficient resources to meet its capability responsibility under a reasonable range of contingencies in the short run. If an electric company cannot establish that it has adequate supplies in the short run, the electric company shall demonstrate that it operates pursuant to a specific action plan guiding it in being able to rely upon alernative supplies in the event of certain contingencies. The electric company shall compare committed resources, as identified pursuant to 980 CMR 12.03(7), with forecasted demand, as identified pursuant to 980 CMR 12.03(5), for the short run. For the purposes of the initial filing, the short run shall be defined as the time period extending four (4) calendar years beginning with the year in which the initial filing is submitted.

(2) Intercycle Forecasts.

(a) Purpose and Scope. This section sets forth the requirements for intercycle forecasts and supply plans which electric companies must file in each calendar year when the electric company is not required to submit an initial filing. The intercycle forecasts and supply plans shall be submitted in order that the Siting Council may review (1) any significant changes or proposed changes in the demand forecast, committed resource inventory, evaluation of resource need, evaluation of the technical potential of C&LM, and evaluation of the technical potential of life extension or repowering, and (2) the adequacy of the electric company's supply plan in the short run. The Siting Council may, in its discretion, conduct an

adjudicatory proceeding with respect to intercycle forecasts and supply plans pursuant to 980 CMR 1.00.

(b) Content of Forecasts. The electric company shall provide a narrative explanation of significant changes or proposed changes in the electric company's demand forecast, committed resource inventory, evaluation of resource need, and evaluation of resource potential. The Siting Council may require the electric company to include additional information in the intercycle forecast and supply plan if the demand forecast or any separate forecast contained therein was rejected by the Siting Council in the review of the previous initial filing. Any planned supply-side resource or C&LM resource that has become operational since the previous review of the initial filing shall be identified in the intercycle forecast and supply plan. The electric company shall provide a comparison of the committed resource inventory and the demand forecast for the ten (10) calendar years beginning with the year in which the intercycle forecast and supply plan is submitted. The electric company shall demonstrate that it owns or has under contract sufficient resources to meet its capability responsibility under a reasonable range of contingencies in the short run. If an electric company cannot establish that it has adequate supplies in the short run, the electric company shall demonstrate that it operates pursuant to a specific action plan guiding it in being able to rely upon alternative supplies in the event of certain contingencies. The electric company shall compare the committed resource inventory with demand forecast for the short run. For the purposes of the intercycle forecast and supply plan, the short run

shall be defined as the time period extending four (4) calendar years beginning with the year in which the intercycle forecast and supply plan is submitted.

(3) Exceptions. The EFSC may, where appropriate, grant an exception to any provision of these regulations.

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Council

In the Matter of the Petition of MASSPOWER, Inc. for Approval to Construct a Bulk Generating Facility and Ancillary Facilities	EFSC 89-100

FINAL DECISION

Frank Pozniak
Hearing Officer
August 10, 1990

On the Decision:

Robert J. Harrold

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Intervenor

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The Energy Facilities Siting Council hereby CONDITIONALLY APPROVES the petition of MASSPOWER, Inc. to construct a 240 megawatt bulk generating facility and ancillary facilities in Springfield, Massachusetts.

I. INTRODUCTION

A. Summary of the Proposed Project and Facilities

MASSPOWER, Inc. ("MASSPOWER") has proposed to construct a 240 megawatt ("MW") combustion turbine, combined cycle cogeneration facility at the Monsanto Chemical Company ("Monsanto") complex in Springfield, Massachusetts (Exh. M-1, p. 1).[1] The primary fuel for the facility will be natural gas, although the facility will be capable of using distillate No. 2 oil as a backup fuel (id., p. 2). Delivery of sufficient volumes of natural gas to the proposed facility will require construction of a new natural gas pipeline,[2] while a three-day supply of backup oil would be stored in an on-site storage tank proposed to be constructed by MASSPOWER (id., pp. 27, 34).

MASSPOWER's petition includes a request to construct the generating facility, along with the following ancillary facilities: (1) a 4,400-foot, 115 kilovolt ("kV") transmission line, consisting of about 2,800 feet of underground line and 1,600 feet of overhead line, to interconnect the generating facility to the Northeast Utilities Service Company's ("NUSCo") transmission system; (2) a 270-foot by 280-foot switchyard to be located adjacent to NUSCo's transmission system on property owned by the Partyka Resource Management Company ("Partyka");

1/ While the MASSPOWER facility has a nominal rating of 240 MW, its summer capacity is 225 MW (Tr. 1, p. 13).

2/ This pipeline, proposed to be constructed by the Bay State Gas Company ("Bay State"), currently is being reviewed by the Siting Council in a separate proceeding docketed as EFSC 89-13.

and (3) a 1,200,000 gallon storage tank for No. 2 oil (id., Supplement to Section 3.4, p. 34, Attachment 2; Exh. HO-S-4).

MASSPOWER also would construct the following structures: (1) a 900,000 gallon raw-water storage tank; (2) a 750,000 gallon demineralized-water storage tank; (3) a 30,000 gallon ammonia storage tank; (4) a six-cell wet surface air cooled condensor; (5) one 213-foot tall exhaust stack; and (6) waste-water holding tanks (Exhs. M-1, p. 119, Attachment 2, M-2, pp. 3-1, 3-3, App. 2, p. 4, HO-E-13). The generating facility and most ancillary facilities and structures would be sited on what is currently a parking lot adjacent to Monsanto's existing steam generating plant (Exh. M-1, Attachment 2; Exh. HO-N-17). However, the switchyard would be located about 2,600 feet northwest of the main project site (Exh. M-1, Attachment 3A). Construction of the project is estimated to take about 24 months at a cost of approximately $173,000,000 (Exhs. M-2, p. 3-6, HO-PV-3, HO-COM-5).

MASSPOWER has received certification from the Federal Energy Regulatory Commission ("FERC") that the project constitutes a "Qualifying Facility" ("QF") under the Public Utilities Regulatory Policies Act of 1978 ("PURPA"), which requires electric utility companies to purchase power from QFs for a price at or below the utility's avoided cost of production (Exh. HO-N-14). The FERC certification of MASSPOWER is based upon a finding that MASSPOWER would sell enough of the facility's steam byproduct so as to qualify as a cogeneration facility under PURPA (id.). MASSPOWER would sell approximately 50,000 pounds per hour ("lbs/hr") of steam to Monsanto over a 20-year time period (Exh. M-1, p. 18).

MASSPOWER has signed a 20-year power purchase agreement ("PPA") with the Massachusetts Municipal Wholesale Electric Company ("MMWEC") for 10.645 MW of power (Exhs. HO-N-30A,

HO-N-30A, App. A).[3] In addition, based on utility biddingresults,[4] MASSPOWER stated that it was in the award groups of the following Massachusetts electric companies: (1) Boston Edison Company ("BECo") for approximately 100 MW; (2) Commonwealth Electric Company ("CELCo") for approximately 25 MW; and (3) Western Massachusetts Electric Company ("WMECo") for approximately 54 MW (Exh. HO-N-30).[5] MASSPOWER also indicated that bids would likely be submitted to Consolidated Edison Company, Long Island Lighting Company, Niagara Mohawk Power Corporation, and Public Service Company of New Hampshire (id.; Tr. 1, pp. 22-23). Further, MASSPOWER stated that capacity would be offered to municipal electric utilities in Massachusetts and other New England states (Tr. 1, pp. 20-21; Exh. HO-N-1). Finally, MASSPOWER asserted that its output would be fully dispatchable by the New England Power Pool ("NEPOOL") (Exh. HO-N-2).

MASSPOWER is a wholly-owned subsidiary of J. Makowski Company ("JMC") and consists of a group of five investors: JMC, Bechtel Development Company ("Bechtel"), General Electric Company ("GE"), Tenneco Gas Marketing Company ("Tenneco"), and

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3/ The MMWEC members participating in this purchase are Holyoke and Littleton (Exh. HO-N-30A, App. A). The Siting Council notes that the record in this case contains several references to an 18.75 MW power sales agreement with MMWEC, however the actual contract provided by MASSPOWER does not support that level of sales (id.; Exhs. HO-N-30, HO-N-1, Supplemental).

4/ In Massachusetts, utilities issue requests for proposals ("RFP") for the solicitation and acquisition of electricity from QFs under the regulations of the Massachusetts Department of Public Utilities ("MDPU"). See 220 CMR 8.00. During the proceeding, the Hearing Officer took administrative notice of these regulations (Tr. 1, p. 101).

5/ MASSPOWER indicated that it had been disqualified by WMECo from that utility's award group and had appealed that disqualification to the MDPU (Exhs. HO-N-21, HO-RR-2). The MDPU in D.P.U. 89-52 (1989) reinstated MASSPOWER into the WMECo award group (Exh. HO-RR-2).

Granite State Gas Transmission, Inc. ("Granite State") (Exh. M-1, p. 1).[6] This is the first energy project developed by MASSPOWER. However, MASSPOWER indicated that JMC, which was established in 1972 for the purpose of providing services to gas and electric companies in the Northeast, has developed energy projects such as the Ocean State Power project ("Ocean State") in Rhode Island, an independent power project scheduled for initial commercial operation in late 1990, and other projects involving combined cycle cogeneration facilities in Bethpage, New York, and Selkirk, New York (id., pp. 4-6).

B. Procedural History

On March 8, 1989, MASSPOWER filed with the Siting Council its proposal to construct the cogeneration facility and ancillary facilities described herein (Exh. M-1). On August 15, 1990, the Siting Council conducted a public hearing in the City of Springfield. In accordance with the direction of the Hearing Officer, MASSPOWER provided notice of public hearing and adjudication.

On August 22, 1989, Bay State filed a petition to intervene. On August 31, 1989, the Hearing Officer issued a Procedural Order granting Bay State's petition. On the same date, the Hearing Officer conducted a pre-hearing conference to establish a procedural schedule for the remainder of the proceeding.

The Siting Council conducted evidentiary hearings on December 14, 15, 19, and 20, 1989. MASSPOWER presented six witnesses: Robert V. Bibbo, an environmental consultant for HMM Associates, who testified regarding the environmental impacts of the proposed facility; John C. Dalton, senior consultant with the Reed Consulting Group ("Reed"), who testified regarding the need for the proposed project; James A. Kekeisen, senior associate in JMC's Gas Development Group, who testified

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6/ MASSPOWER indicated that this investor group is bound by a Cost Sharing Agreement, and has executed a Joint Venture Agreement (Exhs. M-1, p. 1, HO-PV-13A, HO-PV-13B).

regarding fuel supply and transportation; Theodore J. Kolenda, electrical engineer and senior project engineer with the Bechtel Corporation, who testified regarding facility design; Wayne J. Oliver, managing consultant with Reed, who testified regarding the need for the proposed project; and Thomas R. Smith, vice president of the Electric Project Development Group of JMC and project manager of the MASSPOWER project, who testified regarding steam requirements, PPAs, project construction, financing, maintenance, operation, and site selection.

The Hearing Officer entered 191 exhibits into the record, largely comprised of MASSPOWER's responses to information and record requests. Nine exhibits of MASSPOWER also were entered into the record.

Pursuant to briefing schedule established by the Hearing Officer, MASSPOWER filed its brief on January 26, 1990.

C. Jurisdiction

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

As a combined cycle cogeneration facility with a capacity of approximately 240 MW, MASSPOWER's proposed generating unit falls squarely within the first definition of "facility" set forth in G.L. c. 164, sec. 69G. That section states, in part, that a facility is:

> (1) any bulk generating unit, including associated buildings and structures, designed for, or capable of operating at a gross capacity of one hundred megawatts or more.

At the same time, MASSPOWER's proposal to construct a transmission line, switchyard, and oil storage facilities, fall within the third definition of "facility" set forth in G.L. c. 164, sec. 69G, which states that a facility is:

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

In accordance with G.L. c. 164, sec. 69H, before approving an application to construct facilities, the Siting Council requires non-utility applicants to justify generating facility proposals in four phases. First, the Siting Council requires the applicant to show that additional energy resources are needed (see Section II.A, below). Second, the Siting Council requires the applicant to establish that its project is superior to alternate approaches in terms of cost, environmental impact, reliability and ability to address the previously identified need (see Section II.B, below). Next, the Siting Council requires the applicant to show that its project is viable (see Section II.C, below). Finally, the Siting Council requires the applicant to show that its site selection process has not overlooked or eliminated clearly superior sites, and, in cases where an alternate site has been noticed, that the proposed site for the facility is superior to the alternate site in terms of cost, environmental impacts, 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, sec. 69H, the Siting Council is charged with the responsibility for implementing energy policies to provide a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In carrying out this statutory mandate with respect to proposals to construct energy facilities in the Commonwealth, the Siting Council evaluates whether there is a need for additional energy resources[7] to meet reliability or economic efficiency objectives. The Siting Council therefore must find that additional energy resources are needed as a prerequisite to approving proposed energy facilities.

In evaluating the need for new energy facilities to meet reliability objectives, the Siting Council has evaluated the reliability of supply systems in the event of changes in demand or supply, or in the event of certain contingencies. With respect to changes in demand or supply, the Siting Council has found that new capacity is needed where projected future capacity available to a system is found to be inadequate to satisfy projected load and reserve requirements. Altresco-Pittsfield, Inc. 17 DOMSC 351, 360-369 (1988) ("Altresco-Pittsfield"); Northeast Energy Associates, 16 DOMSC 335, 344-360 (1987) ("NEA"); Cambridge Electric Light Company, 15 DOMSC 187, 211-212 (1986) ("1986 CELCo Decision"); Massachusetts Electric Company, 13 DOMSC 119, 137-138 (1985) ("1985 MECo Decision"); New England Electric System, 2 DOMSC 1, 9 (1977). With regard to contingencies, the Siting Council has

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7/ In this discussion, "additional energy resources" is used generically to encompass both energy and capacity additions, including, but not limited to, electric generating facilities, electric transmission lines, energy or capacity associated with power sales agreements, and energy or capacity associated with conservation and load management.

found that new capacity is needed in order to ensure that service to firm customers can be maintained in the event that a reasonably likely contingency occurs. Middleborough Gas and Electric Department, 17 DOMSC 197, 216-219 (1988); Boston Edison Company, 13 DOMSC 63, 70-73 (1985) ("1985 BECo Decision"); Taunton Municipal Lighting Plant, 8 DOMSC 148, 154-155 (1982); Commonwealth Electric Company, 6 DOMSC 33, 42-44 (1981); Eastern Utilities Associates, 1 DOMSC 312, 316-318 (1977).

The Siting Council also has determined in some instances that utilities need to add energy resources primarily for economic efficiency purposes. The Siting Council has found that a utility's proposed energy facility was needed principally for providing economic energy supplies relative to a system without the proposed facility. 1985 MECo Decision, 13 DOMSC at 178-179, 183, 187, 246-247; Boston Gas Company, 11 DOMSC 159, 166-168 (1984).

While G.L. c. 164, sec. 69H, requires the Siting Council to ensure an adequate supply of energy for Massachusetts, the Siting Council has interpreted this mandate broadly to encompass not only evaluations of specific need within Massachusetts for new energy resources (1985 BECo Decision, 13 DOMSC at 70-73; Hingham Municipal Lighting Plant, 14 DOMSC 7 (1985) ("1985 Hingham Decision")), but also the consideration of whether proposals to construct energy facilities within the Commonwealth are needed to meet New England's energy needs. Turners Falls Limited Partnership, 18 DOMSC 141, 151-165 (1988) ("Turners Falls"); Altresco-Pittsfield, 17 DOMSC at 359-365; NEA, 16 DOMSC at 344-360; Massachusetts Electric Company, 15 DOMSC 241, 273, 281 (1986) ("1986 MECo Decision"); 1985 MECo Decision, 13 DOMSC at 129-131, 133, 138, 141. In so doing, the Siting Council has fulfilled the requirements of G.L. c. 164, sec. 69J, which recognizes that Massachusetts' generation and transmission system is interconnected with the region and that reliability and economic benefits flow to Massachusetts from Massachusetts utilities' participation in NEPOOL.

In cases where a non-utility developer seeks to construct a jurisdictional generating facility principally for a specific utility purchaser or purchasers, the Siting Council requires the applicant to demonstrate that the utility or utilities needs the facility to address reliability concerns or economic efficiency goals. Where a non-utility developer has proposed a generating facility for a number of power purchasers that include purchasers that are as yet unknown, or for purchasers with retail service territories outside of Massachusetts, need may be established on a regional basis on either reliability or economic efficiency grounds. Altresco-Pittsfield, 17 DOMSC at 361-365; NEA, 16 DOMSC at 344-360. However, the non-utility developer that proposes a generating facility to serve a regional need must also demonstrate to the Siting Council that the proposed facility benefits Massachusetts -- that is, it offers reliability, economic efficiency, or other benefits to the Commonwealth in sufficient magnitude so that the construction of an energy facility in the state is consistent with the energy needs and resource use and development policies of the Commonwealth. Turners Falls, 18 DOMSC at 153-164; Altresco-Pittsfield, 17 DOMSC at 361-362, 366-369; NEA, 16 DOMSC at 344-360.

2. Status of MASSPOWER's Power Sales Agreements

MASSPOWER has provided the Siting Council with a signed PPA with MMWEC for 10.645 MW (Exh. HO-N-30A, App. A). In addition, MASSPOWER has indicated that it is currently negotiating with BECo for 100 MW, CELCo for 25 MW, and WMECo for 54 MW (Exh. HO-N-30). Since MASSPOWER is in the award group of each of the foregoing utilities, it asserted that finalizing PPAs with BECo, CELCo, and WMECo is a virtual certainty based on MDPU regulations governing QF sales of electricity (Brief, p. 13). If MASSPOWER sells the capacity listed above to the foregoing utilities, it would have about 51 MW available to market to other utilities in the region (Exh. HO-N-30).

While MASSPOWER asserts that it is likely to be selling power to known purchasers, until PPAs are signed and approved,

power purchasers are considered to be unknown for the purposes of our review. Therefore, because MASSPOWER proposes to construct a facility for a number of power purchasers that are as yet unknown, the Siting Council evaluates whether New England needs the proposed 240 MW of additional energy resources for reliability or economic efficiency purposes beginning in 1992 and beyond, and whether Massachusetts is likely to receive reliability, economic efficiency, or other benefits from the proposed additional energy resource beginning in 1992 and beyond.[8]

3. New England's Need for Additional Energy Resources

MASSPOWER argued that New England needs additional energy resources for reliability and economic efficiency purposes (Exh. M-1, pp. 39-40). MASSPOWER claimed that the region needs additional energy resources for reliability purposes because projected capacity in New England is inadequate to satisfy the region's projected load and reserve requirements (id., pp. 41, 50-51). In addition, MASSPOWER argued that its facility would provide economic efficiency benefits to the Commonwealth and to the region (id., pp. 40, 51).

In support of its argument that New England needs additional power resources for reliability purposes, MASSPOWER provided several analyses and reports regarding future electricity demand and supply (id., pp. 53-54; Exhs. HO-N-6B, HO-N-26A through HO-N-26D). Specifically, MASSPOWER predicated its analysis of regional need on (1) six demand forecast/supply forecast scenarios developed by applying two distinct demand forecasts to three discrete supply forecasts; and (2) NEPOOL's June 1989 "Executive Report Assessing NEPOOL's Resource Adequacy and Potential Resources (1991 through 2004)" ("NEPOOL

8/ The Siting Council evaluates regional need and Massachusetts benefits beginning in 1992, the first full year in which MASSPOWER asserts that the proposed facility will be in operation (Exh. M-1, p. 3).

Assessment") (Exhs. M-1, pp. 41-51, HO-N-6A, HO-N-9, HO-N-26D). MASSPOWER also presented various industry and government forecasts and reports in support of its argument that MASSPOWER needs additional power resources for reliability purposes (Exhs. M-1, pp. 53-54, HO-N-26A through HO-N-26C). While MASSPOWER's six demand forecast/supply forecast scenarios analyzed regional need over the 1988-1995 time period, the Siting Council focusses its review on the time period from 1992 to 1995 as the proposed project is planned for operation beginning in 1992.

MASSPOWER's first demand forecast was a modified version of NEPOOL's 1988 NEPLAN forecast contained in the "Forecast Report of Capacity, Energy, Loads and Transmission, 1988-2003" ("CELT Report") ("1988 modified NEPLAN demand forecast") (Exhs. M-1, p. 42, HO-N-6A). MASSPOWER performed a single modification to that forecast -- replacing NEPLAN's forecasted summer peak load for 1988 with the actual summer peak load for that year taken from the 1989 CELT Report (Exh. M-1, p. 42, Table 9-2). Subsequent years' peak loads were then projected to grow at the NEPLAN-forecasted rate of 1.97 percent per year (id.).

For its second demand forecast, MASSPOWER developed its own "Alternative Demand Forecast" (id., p. 43). Here, MASSPOWER again began by replacing NEPLAN's forecasted summer peak load for 1988 with the actual summer peak load for that year taken from the 1989 CELT Report (id., p. 42, Table 9-2). However, MASSPOWER then projected that load would grow at a rate of 4 percent per year through 1991 and at a rate of 2.7 percent per year thereafter (id., p. 43). MASSPOWER asserted that these growth rates were consistent with recent actual growth rates and that these rates had been accepted by the Siting Council in the

Altresco-Pittsfield decision (id.; Exhs. HO-N-7, HO-N-10).[9] Further, MASSPOWER asserted that since the alternative demand forecast's growth rates were consistent with recent history, future peak loads based on these rates were more likely to be realized than peak loads based on the lower NEPLAN forecasted rate of 1.97 per year (Exh. M-1, p. 43).[10]

MASSPOWER's three supply forecasts consisted of: (1) a modified version of the supplies identified in the 1988 CELT Report, which MASSPOWER designated as its base case supply forecast;[11] (2) a no-Seabrook forecast composed of MASSPOWER's base case supply forecast less Seabrook capacity; and (3) a non-utility generation ("NUG") attrition forecast composed of MASSPOWER's base case supply forecast less 50 percent of the NUG

9/ Using actual data, MASSPOWER calculated the average compound annual historic growth rate for New England as 3.5 percent for the period 1979-1988 (Exh. HO-N-10). For the period 1983-1988, MASSPOWER calculated the average compound annual historic growth rate for New England as 4.3 percent (id.).

10/ MASSPOWER contended that NEPLAN had consistently underforecasted peak loads in recent years (Exh. M-1, p. 42). In support of this contention, MASSPOWER reported that the 1987 NEPLAN demand forecast understated the region's 1987 summer peak load by 3.9 percent, and that the 1988 NEPLAN demand forecast understated the 1988 summer peak by 4 percent (id.). MASSPOWER also claimed that the 1988 NEPLAN demand forecast's projected peak for the region for the winter of 1989-90 was surpassed in January 1990 (id.).

11/ MASSPOWER stated that supplies identified as available to the region within the 1988 CELT Report were modified based on an assessment of specific non-utility generation ("NUG") projects over the 1989-1992 timeframe (Exh. M-1, p. 45, Table 9-1). As a result, MASSPOWER deleted the capacity of NUG projects no longer expected to move forward, and added NUG capacity to reflect updated PPA transactions (id.).

capacity projected by the 1988 CELT Report (id., pp. 43-44, Tables 9-2 to 9-4).[12, 13]

The six scenarios developed by MASSPOWER exhibited capacity deficiencies for every year analyzed with one minor exception (id., Tables 9-2 to 9-4). See Table 1. The exception was the 1988 modified NEPLAN demand forecast/base case supply forecast scenario ("1988 modified base case scenario") which indicated a capacity surplus in 1992, the first year under review, but capacity deficiencies in all later years (id.). All scenarios, including the 1988 modified base case scenario, exhibited capacity deficiencies with a discernable rising trend, i.e., starting at a lower level in the initial years and rapidly increasing over time (id.). Overall, capacity deficiencies described by the six scenarios ranged in size from a low of 462 MW in 1992 (alternative demand forecast/base case supply forecast scenario) to a high of 4,246 MW in 1995 (alternative demand forecast/no-Seabrook supply forecast scenario (id.). Under the most conservative scenario -- the 1988 modified base case scenario -- which indicated a surplus in 1992, deficiencies ranged from 571 MW in 1993 to about 1,650 MW in 1995 (id.).

12/ MASSPOWER stated that an assumed 50 percent reduction in NUG capacity was justified based on: (1) acceptance of that rate of attrition by the MDPU in its decision in D.P.U. 88-33 (1988); (2) NUG attrition rates in other states, such as California; (3) a consultant's data base regarding nation-wide NUG attrition which indicates that a 50 percent rate may be conservative; (4) unanticipated cost additions to NUG projects necessary to gain compliance with increasingly stringent environmental standards; and (5) known constraints on gas supplies in the New England region (Exh. M-1, pp. 48-49; Tr. 4, pp. 34-37, 41, 44).

13/ MASSPOWER asserted that its no-Seabrook supply forecast -- representing a reduction of 1,150 MW to the New England region -- was responsive to and served as a proxy for a Siting Council concern regarding disruptions of existing supply sources (Exh. M-1, p. 46). See Altresco-Pittsfield, 17 DOMSC at 365. MASSPOWER also asserted that its base case supply forecast -- which included an update of NUG project capacity ratings -- was responsive to a Siting Council concern regarding uncertainties surrounding NUG development (id., p. 44). See Altresco-Pittsfield, 17 DOMSC at 364-365.

Based on essentially the same structure as the foregoing scenarios (NEPLAN and alternative demand forecasts; base case, no-Seabrook, and NUG-attrition supply forecasts), MASSPOWER also developed another set of six scenarios. In these scenarios the CELT-based demand forecasts and supply plans were updated based on the 1989 NEPLAN demand forecast and 1989 CELT Report (Exh. HO-N-6C). See Table 2. However, in these scenarios, MASSPOWER did not modify the 1989 NEPLAN demand forecast or the alternative demand forecast with the actual summer peak load for 1989 (id.). Under this set of scenarios, capacity deficiencies were again common over the years 1994-1995. However, during the initial years 1992-1993, particularly 1992, these deficiencies were less pronounced than the deficiencies under the same scenarios based on the 1988 CELT Report (id.). For example, five scenarios based on the 1988 CELT Report projected capacity deficiencies in 1992, while only two scenarios based on the 1989 reports (alternative demand forecast/NUG-attrition supply forecast and alternative demand forecast/no-Seabrook supply forecast) projected capacity deficiencies (id.; Exh. M-1, Tables 9-2 to 9-4). In addition, the highest capacity deficiency projected for 1992 by the scenarios decreased from 1,612 MW under the 1988 CELT Report to 977 MW under the 1989 reports (id.).

However, the capacity deficiencies based on the 1989 reports again conformed to a pattern of increasing size over the 1992-1995 period. See Table 2. The 1989 reports had capacity deficiencies increasing from a low of 330 MW in 1992 to a high of 3,865 MW in 1995 (Exh. HO-N-6C).

To further support its assertions that additional energy resources are needed by the region in 1992 for reliability purposes, MASSPOWER provided the NEPOOL Assessment. This document is based on a probabilistic approach, which MASSPOWER endorsed as the most appropriate methodology available for assessing resource adequacy (Exhs. HO-N-9, HO-N-26D). The NEPOOL Assessment essentially evaluated NEPOOL's ability to meet or exceed its reliability standard at various confidence levels, and described the amounts of capacity additions required to

(beyond the committed resources listed in the 1989 CELT Report) to meet a 70 percent confidence level in 1991, and a need for an additional 952 MW of capacity to meet a 70 percent confidence level in 1992 (id., Technical Supplement, pp. 6-7). The NEPOOL Assessment also showed the need for additional capacity to meet a 70 percent confidence level in the following amounts: 1,605 MW in 1993; 2,215 MW in 1994; and 2,797 MW in 1995 (id.). In addition, the NEPOOL Assessment showed that the 50 percent confidence level could be met by existing resources throughout 1992, but would require 254 MW of additional capacity in 1993, 760 MW of additional capacity in 1994, and 1,381 MW of additional capacity in 1995 (id.).

In addition to the foregoing analyses, MASSPOWER also presented the following industry and government forecasts and reports (1) the Massachusetts Executive Office of Energy Resources ("MEOER") SAFER Report ("SAFER") of December, 1988; (2) the December, 1986 Final Report of the New England Governor's Conference ("NEGC"); (3) a February, 1988 Federal Reserve Bank of Boston report "Planning for New England's Electricity Requirements" ("Federal Reserve"); and (4) the 1988 North American Electric Reliability Council ("NERC") Reliability Assessment (Exhs. M-1, pp. 53-54, HO-N-26A through HO-N-26C).

MASSPOWER asserted that these forecasts and reports supported MASSPOWER's contention that the region needs additional generating resources in the near future (Exh. HO-N-9). MASSPOWER acknowledged that the NEGC document was no longer current, but asserted that the NEGC approach -- examination of a broad range of contingencies -- was nonetheless sound and had been applied by MASSPOWER (id.). MASSPOWER claimed that the Federal Reserve report advanced the notion that the risk of undersupply is far greater than that of oversupply, and that NERC considered the NEPOOL region to be in serious need of additional capacity (id.). Based on these forecasts and reports, MASSPOWER asserted that the region needs additional resources for reliability purposes beginning as early as 1992 (id.).

In this proceeding, MASSPOWER has demonstrated that it has relied on a variety of forecasting and analytical materials in its assessment of regional need. However, certain materials referenced by MASSPOWER such as the SAFER Report, the NEGC Report, and the Federal Reserve report, use forecasting data which may be unreliable due to age. Further, MASSPOWER has not demonstrated that the growth rates used in its alternative demand forecast are still appropriate. These rates, which were accepted by the Siting Council in the Altresco-Pittsfield decision issued two years ago, were based on actual data from the period 1979-1988. As a result, this data may also be unreliable due to age. In a previous decision, the Siting Council criticized a project proponent for use of dated material, and emphasized that a proponent must utilize the most current information for forecasting purposes. Altresco-Pittsfield, 17 DOMSC at 364.

MASSPOWER's assessment of regional need was in large part based on six scenarios which included a range of assumptions such as high and low rates of load growth, inclusion and exclusion of Seabrook capacity, and two levels of NUG development. The Siting Council notes that these scenario analyses were more comprehensive than those provided in the Siting Council's last review of a cogeneration project. See Altresco-Pittsfield, 17 DOMSC at 362-365. However, MASSPOWER could have strengthened its assessment of regional need in several ways. For example, MASSPOWER could have developed additional scenarios to assess the effects on regional need of existing plant performance, impacts of utility-sponsored C&LM programs, and fuel prices. Further, the availability of new gas supplies in the region is likely to have a major impact on generating facility development. While MASSPOWER addressed several important variables affecting regional need, other important variables were not included. In the future, the Siting Council will require project proponents to provide a more comprehensive assessment of regional need including a sensitivity analysis of major variables affecting regional need.

In addition, while NEPOOL's Assessment was endorsed by MASSPOWER as the most appropriate methodology available for assessing regional need, MASSPOWER offered no independent analyses validating the advantages of the methodology or its results. The methodology contained in this report includes a wide range of inputs and assumptions which could have been subjected to further analysis by MASSPOWER. In the future, the Siting Council will require project proponents who present the NEPOOL Assessment to establish regional need to fully explain and analyze that document's advantages and impact on an assessment of regional need.

Nonetheless, the Siting Council finds that, given the strengths of the MASSPOWER analysis indicated above, MASSPOWER has presented a reasonable range of plausible demand and supply forecasts which provide an adequate basis for assessing regional need based on changes in demand and supply variables.

Based on the scenarios presented by MASSPOWER, it is likely that capacity deficiencies in the region will occur beginning in 1992. More importantly, in every year after 1992, almost all the scenarios projected regional capacity deficiencies.

Accordingly, based on the record in this proceeding, the Siting Council finds that MASSPOWER has established that New England needs at least 240 MW of additional energy resources for

reliability purposes beginning in 1992 and beyond.[16]

4. Benefits to Massachusetts

Having established that New England needs at least 240 MW of additional energy resources to meet reliability objectives by 1992, the Siting Council determines whether the proposed project is likely to provide reliability, economic, environmental, or other benefits to Massachusetts in 1992 and beyond.

a. Power Sales

In NEA, the Siting Council found that, consistent with current resource use and development policies of the Commonwealth, ratepayers in Massachusetts benefit economically from the addition of cost effective QF resources to their utilities' supply mix (16 DOMSC at 358). In that case, the Siting Council also found: (1) that a signed and approved PPA

16/ In regard to MASSPOWER's assertion that 240 MW are needed in the region for economic efficiency reasons, the Siting Council notes that MASSPOWER's major analysis regarding economic efficiency is largely undocumented (Exh. M-1, pp. 54-55, Table 9-8). This analysis, based on a levelized cost methodology applied to a sample of NUG projects, provided no explanation of how its sample of NUG projects was derived, and was based on 1988 data only with no indication that it had been updated to include more recent transactions. Moreover, it is unclear that fuel price assumptions and other key assumptions used in the methodology are representative of MASSPOWER's bid. While the Siting Council recognizes that a levelized cost methodology is generally sound, the Siting Council also notes that the results of such a methodology cannot be evaluated without a full description of underlying data and assumptions. We note that in Section II.B.3, below, the Siting Council accepts MASSPOWER's comparison of offered power to utilities' avoided costs as an appropriate methodology for establishing that a proposed project is at or below the avoided cost of such utilities. However, at this time we are not prepared to accept the "less than avoided cost" standard as dispositive for purposes of determining whether New England needs additional energy resources for economic efficiency purposes. Therefore, for purposes of this proceeding, the Siting Council finds that MASSPOWER has failed to establish that New England needs at least 240 MW of additional energy resources for economic efficiency purposes.

between a QF and a utility constitutes prima facie evidence of the utility's need for additional energy resources for economic efficiency purposes; and (2) that a signed and approved PPA which includes a capacity payment constitutes prima facie evidence of the need for additional energy resources for reliability purposes. Id.

Here, MASSPOWER argues that its proposed project is consistent with policies of the Commonwealth, and that its PPA with MMWEC and its plans to complete PPAs with BECo, CELCo, and WMECo demonstrate that Massachusetts will benefit from additional energy resources for economic efficiency and reliability purposes (Brief, pp. 12-16).

In support of this argument, MASSPOWER submitted a copy of its signed PPA to sell 10.645 MW to MMWEC beginning in 1992, an agreement that provides for capacity payments to MASSPOWER (Exhs. HO-N-30A, HO-N-30A, App. A). MASSPOWER indicated that it also is negotiating actively with BECo, CELCo, and WMECo (Exh. HO-N-30).

In addition, Mr. Smith stated that once a project was in a purchasing utility's final award group, it has a virtual "guarantee" of getting a contract with that utility (Tr. 2, pp. 42, 67). Mr. Smith also stated that MASSPOWER could sell its power outside of the bid process by negotiating with purchasers, and that in instances where MASSPOWER was not included in a utility's award group, it could wait and see if other projects were disqualified, creating an opportunity for MASSPOWER to move into the award group (id. pp. 43-44).[17]

MASSPOWER also argued that its facility will provide reliability and economic efficiency benefits to Massachusetts even in the absence of the PPAs (Brief, p. 14). MASSPOWER

17/ Mr. Smith stated that MASSPOWER's bid to Eastern Utility Associates ("EUA") for 30 MW was ranked fourth, just missing EUA's contract award group (Tr. 1, p. 22). Mr. Smith claimed that if any of the award group projects were disqualified, MASSPOWER then would have an opportunity to enter EUA's award group (id.).

asserted that the SAFER Report demonstrated that Massachusetts will require additional capacity beginning in 1995 and additional peak capacity as early as 1992 for reliability purposes (Exh. M-1, pp. 53-54, Tables 9-5, 9-6, and 9-7). MASSPOWER also asserted that its proposed project would provide economic efficiency benefits to Massachusetts utilities based on a cost comparison with a sample of NUG projects (id., pp. 54-56, Table 9-8).

In addition, MASSPOWER argued that its facility will provide reliability and economic efficiency benefits to Massachusetts because (1) its development team is experienced; (2) its gas supply arrangement is superior to those of other projects in the region; and (3) its progress has been demonstrated in connection with obtaining signed and approved PPAs (Tr. 1, pp. 68-72).

The Siting Council consistently has assessed reliability and economic efficiency benefits to Massachusetts in terms of signed and approved PPAs with Massachusetts utilities, as opposed to forecasts of need. Altresco-Pittsfield, 17 DOMSC at 366-367; NEA, 16 DOMSC at 354-360. Here, MASSPOWER has not provided any signed and approved PPAs. While MASSPOWER has signed a PPA with MMWEC, the MDPU does not have the authority to review and approve PPAs of municipal electric companies, and the Siting Council -- which does have jurisdiction over MMWEC's supply plan -- has not found that such an agreement represents a least-cost addition to MMWEC's supply plan.[18] Although MASSPOWER argues that since it is in a utility's award group it would have a virtual "guarantee" of getting a contract with that utility, there simply is no certainty that being in an award group means a contract will be signed with the purchasing utility or that the MDPU will approve the contract. In fact, Mr. Smith's statement that, in instances where MASSPOWER was not included in a utility's award group, it could wait and see if

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18/ The Siting Council also notes that in EFSC 88-1 (1990), the Siting Council's most recent review of MMWEC's supply plan, the Siting Council found that MMWEC had failed to establish that its supply plan ensured a least-cost energy supply and rejected the supply plan (p. 92).

other projects were disqualified, creating an opportunity for MASSPOWER to move into an award group, demonstrates the witness' understanding that being in an award group is no guarantee of a signed and approved contract. Notably, MASSPOWER has been in BECo's and CELCo's award group since December, 1989, and yet it has not signed a contract with either of those utilities (Tr. 1, pp. 12-13). Consistent with the Siting Council's statutory mandate to ensure a necessary energy supply to the Commonwealth, it is necessary that project proponents demonstrate reliability and economic efficiency benefits to Massachusetts with signed and approved PPAs, because without signed and approved PPAs, there is no "guarantee" that such power would be sold to Massachusetts utilities.

In addition, although the SAFER Report projects that Massachusetts utilities need capacity, MASSPOWER has provided only one piece of evidence -- the 10.645 MW PPA with MMWEC -- to indicate that Massachusetts utilities may, in fact, receive capacity from MASSPOWER. Further, although MASSPOWER's cost comparison with a sample of NUG projects may show economic efficiency benefits to Massachusetts utilities, this comparison offers no guarantee of such benefits in the absence of signed and approved PPAs with Massachusetts utilities. Therefore, the Siting Council rejects MASSPOWER's argument that the SAFER Report and its comparative economic analysis show that MASSPOWER actually will provide reliability and economic efficiency benefits to Massachusetts.

Finally, an experienced development team, a superior gas contract, and progress in marketing power simply do not mean that power will be sold to Massachusetts utilities. Therefore, the Siting Council also rejects MASSPOWER's argument that its facility will provide reliability and economic benefits based on these factors.

While MASSPOWER has not presented any signed and approved PPAs -- the only evidence that a project's power sales actually will benefit Massachusetts -- the Siting Council recognizes that being in the award group of three Massachusetts utilities is significant. While the inclusion of a project in a utility's award group does not guarantee that a PPA will be signed with

that utility or that the MDPU or other appropriate regulatory authority will approve such a contract, it does represent an important first step towards reaching approved PPA status. In fact, MASSPOWER's presence in three utilities' award groups indicates some likelihood that, in the future, MASSPOWER will be able to establish that Massachusetts is likely to receive reliability or economic efficiency benefits from its PPAs. However, the Siting Council also finds that inclusion in an award group (or award groups) alone does not constitute Massachusetts benefits under our standard.

b. Steam Sales

In its NEA decision, the Siting Council established that a non-utility developer proposing the addition of energy resources in the Commonwealth must demonstrate that it offers reliability or economic efficiency benefits to the Commonwealth in sufficient magnitude so that construction of an energy facility in the state is consistent with the energy needs and resource use and development policies of the Commonwealth (16 DOMSC at 349). In Altresco-Pittsfield, the Siting Council found that a non-utility developer also may demonstrate benefits to the Commonwealth based on economic grounds outside of a PPA or on environmental grounds if such benefits are consistent with the policies of the Commonwealth (17 DOMSC at 368-369).

MASSPOWER reported that it has completed a 20-year steam sales agreement with Monsanto, representing average steam deliveries of about 50,000 lbs/hr (Exhs. M-1, p. 18, HO-N-18).[19] MASSPOWER argued that this steam sales agreement would provide substantial economic benefits to Monsanto, and that environmental benefits would be produced in

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19/ MASSPOWER stated that Monsanto requires about 150,000 lbs/hr of steam on an annual average basis (Exh. HO-N-17). Thus, MASSPOWER's steam sales represent a partial accommodation of Monsanto's steam needs, effectively supplying about one-third of Monsanto's steam requirements (id.; Tr. 1, p. 110).

the Springfield area as a result of this agreement (Brief, pp. 15-16).[20]

MASSPOWER claimed that its steam sales agreement provided economic benefits to Monsanto due to (1) the pricing structure of its steam; and (2) assumptions regarding Monsanto's future investments in steam production facilities (Exh. HO-N-19). Essentially, MASSPOWER priced its steam at Monsanto's avoided cost of production, based on production costs associated with Monsanto's existing steam boiler (id.). However, MASSPOWER stated that as future investments in steam generating facilities become necessary to Monsanto, MASSPOWER's steam price -- based on Monsanto's current capital costs -- would represent a more attractive option (id.). In addition, MASSPOWER claimed that its ability to supply steam to Monsanto provided a redundancy benefit to that company, although no value was assigned for redundancy (id.). MASSPOWER stated that Monsanto has chosen to continue operations of its existing coal boiler to ensure a high availability of steam supply (Exh. HO-N-16).

The Siting Council notes several concerns regarding the economic benefits of the steam sales agreement claimed by MASSPOWER. First, MASSPOWER's price terms -- at avoided cost -- essentially mirrors Monsanto's own costs of steam production. Since Monsanto could conceivably incur the costs necessary to produce steam itself, as opposed to paying these monies to MASSPOWER, the steam sales price terms alone present no economic advantage to Monsanto. While a steam sales price based on

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20/ MASSPOWER also claimed that its steam sales agreement provides its proposed project with important safeguards (Exh. HO-N-15). MASSPOWER stated that Monsanto is obligated to accept the minimum amount of steam necessary for the proposed project to maintain QF status, i.e., an average of 37,500 lbs/hr on an annual basis (id.). Should Monsanto's steam requirements fall below the minimum annual quantity, MASSPOWER stated that Monsanto has agreed to (1) attempt to develop an additional steam requirement; and (2) give MASSPOWER at least two years notice prior to reducing its steam consumption below an annual average of 37,500 lbs/hr (id.).

less-than-avoided-cost would provide some economic benefits to a steam purchaser, a price structure based on avoided cost is by definition equivalent to the purchaser's costs. Second, MASSPOWER failed to substantiate its claim that capital investments in steam facilities by Monsanto would make MASSPOWER's steam economic in the future. MASSPOWER offered no evidence to describe the timing and extent of any prospective capital investments in Monsanto's steam generating capability, and failed to describe how steam produced by such facilities would compare with the future price of MASSPOWER's steam. Further, MASSPOWER provided no information to demonstrate that it could supply additional amounts of steam in the future. The Siting Council consistently has required petitioners to provide complete documentation of their assumptions. Bay State Gas Company, 16 DOMSC 283, 307 (1987); Eastern Utilities Associates, 11 DOMSC 61, 65 (1984). Finally, while the redundant steam facilities could offer a higher level of reliability to Monsanto, MASSPOWER has not shown whether such redundancy would be economical, nor can we state that a redundant steam supply constitutes a benefit to the Commonwealth per se.

In Altresco-Pittsfield, the petitioner established that its cogeneration steam would be sold at a unit cost substantially below that of the steam purchaser (17 DOMSC at 368). In fact, the petitioner showed that it would cost its steam host $6 million dollars more per year to produce its own steam than it would to purchase steam from the cogeneration facility. Id. Here, MASSPOWER has not made a similar showing.

Based on the foregoing, the Siting Council finds that MASSPOWER has failed to establish that Massachusetts would receive economic benefits beginning in 1992 and beyond from its steam sales agreement with Monsanto.

MASSPOWER also contended that its steam supply to Monsanto would produce air quality benefits to Springfield due to reduced coal consumption, estimated as 18,000 tons less of coal per year (Exh. HO-N-17). In support of this contention, MASSPOWER provided an analysis concluding that an 18,000 tons per year ("TPY") reduction in coal use by Monsanto would

correspond to reductions of 286 TPY of sulfur dioxide ("SO_2") and by 137 TPY of nitrogen oxides ("NO_x") (Exh. HO-E-40). Essentially, MASSPOWER determined the rate of coal consumption at Monsanto's existing facility, and then calculated the reduction represented by its steam sales agreement (id.). MASSPOWER did not indicate what source of information was used to estimate the levels of SO_2 and NO_x per ton of coal.

In addition, MASSPOWER's contention regarding air quality benefits failed to take into account the emissions of its proposed facility. The Siting Council notes that the proposed facility would emit 56 TPY of SO_2 and 330 TPY of NO_x (Exh. HO-E-40). Thus, the net effect of reduced coal use by Monsanto and projected emissions of the MASSPOWER facility is a 230 TPY decrease of SO_2 with a 193 TPY increase of NO_x. While air quality in the Springfield area would benefit from reduced levels of SO_2, it is clear that air quality would be impacted by increased levels of NO_x. Further, the Siting Council notes that Monsanto's coal-fired boiler will continue to operate and that Monsanto could use this boiler to produce additional steam supplies in the future, with associated air quality impacts.[21]

Accordingly, the Siting Council finds that MASSPOWER has not established that Massachusetts is likely to receive environmental benefits beginning in 1992 and beyond from MASSPOWER's steam sales agreement with Monsanto.

21/ MASSPOWER also asserted that operation of its proposed facility would lead to regional emission reductions due to displacement of existing oil- and coal-fired power plants (Exh. M-1, p. 95). The Siting Council notes that any attempt to establish Massachusetts benefits from displacement of power plants throughout the region would require a comprehensive analysis of the impacts on Massachusetts' air quality from emission sources throughout the region. Such an analysis clearly is absent in the record of this case. For a further discussion of MASSPOWER's arguments regarding regional air quality benefits, see Section III.E.1, below.

c. Other Benefits

MASSPOWER asserted that it will provide other economic benefits to Monsanto in the form of (1) an annual lease payment for use of properties associated with the proposed facility; (2) payment for use of Monsanto's cooling water; and (3) payment for use of Monsanto's existing waste-water treatment facility (Exh. HO-RR-8).

MASSPOWER stated that its lease payment will be an annual payment at a fixed rate for a 20-year period (Exhs. M-1, pp. 17-18, HO-S-1). In addition, MASSPOWER agreed to pay Monsanto $1.65/thousand cubic feet for use of cooling water currently discarded by Monsanto (Exh. HO-C-3). MASSPOWER reported that the level of payment agreed upon allows Monsanto to recover 50 percent of its cost for the water purchased from the City of Springfield (id.). MASSPOWER stated that it also will pay Monsanto for use of existing waste-water treatment facilities (Exh. HO-N-19).

MASSPOWER conceded that these benefits to Monsanto are not related directly to the purchase of steam (Exh. HO-RR-8). In fact, MASSPOWER claimed that its benefits to Monsanto consist of a package, containing steam sales, lease payments, water payments, and waste-water facility payments (id.). Based on all components of the package, MASSPOWER calculated that Monsanto's utility costs would be reduced by about 23 percent in 1992, and by an average of 15 percent over a 20-year period (id.).

While the 20-year site lease, MASSPOWER's payment for cooling water, and MASSPOWER's payment for use of waste-water facilities represent attractive project attributes for Monsanto, the Siting Council notes that these benefits are conferred directly upon Monsanto with a less direct benefit flowing to the community and the state. Although a 15 to 23 percent decrease in Monsanto's cost for utilities may be significant to Monsanto, it is not clear from the record how this reduction in utility costs relates to Monsanto's overall operating costs, and, thus, whether such a reduction in utility costs has a meaningful impact on Monsanto's competitiveness.

Therefore, while the Siting Council finds that the site lease, and payments for cooling water and use of waste-water

facilities provide some economic benefit to Massachusetts, we also find that these benefits alone do not constitute Massachusetts benefits under our standard.

d. Conclusions on Benefits to Massachusetts

In the NEA case, the Siting Council for the first time required a proponent to establish the need for additional energy resources by showing (1) that the additional resources were needed on a regional basis; and (2) that the additional resources were needed by Massachusetts.[22] In setting forth this second requirement -- the so-called Massachusetts benefits test -- the Siting Council recognized its statutory responsibility to ensure an adequate energy supply for the Commonwealth. NEA, 16 DOMSC at 348-350.

In NEA, the applicant proposed to construct a 300 MW cogeneration facility and submitted signed and approved PPAs with three Massachusetts utilities totalling 150 MW as evidence that Massachusetts needed the power offered by the project. In that case, the Siting Council found that Massachusetts ratepayers derive economic efficiency benefits when PPAs offering electricity at or below a utility's avoided cost are signed by Massachusetts utilities and approved by the appropriate ratemaking authority (id., p. 359). The Siting Council also found that if the signed and approved PPA between a cogenerator and a Massachusetts utility includes a capacity payment to the cogenerator, then Massachusetts ratepayers derive reliability benefits from the proposed project (id., pp. 358-359).

In the Altresco-Pittsfield decision, the Siting Council expanded its definition of Massachusetts benefits beyond the

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22/ In cases where an applicant proposes to construct a jurisdictional generating facility (or a jurisdictional transmission line or gas pipeline designed to support a non-jurisdictional generating facility) and the power from the generating facility will be sold principally to a Massachusetts utility or utilities, then the submission of signed and approved PPAs adequately demonstrates both regional and Massachusetts need for the generating facility. Massachusetts Electric Company, 18 DOMSC 383, 396-397 (1989).

economic efficiency and reliability benefits of PPAs to include certain other project benefits not associated with power sales. Specifically, in Altresco-Pittsfield, the Siting Council found that the proponent's project (1) offered environmental benefits to Massachusetts; and (2) provided economic benefits to the Commonwealth through its steam sales agreement with the industrial host. Altresco-Pittsfield, 17 DOMSC at 368. In that case, the Siting Council also found that the proposed 156 MW project offered economic efficiency and reliability benefits to Massachusetts based on a signed and approved PPA for 100 MW between the applicant and MECo (id., pp. 366-367). However, the Siting Council was silent as to whether the 100 MW PPA alone was sufficient to establish Massachusetts benefits without considering the environmental and economic steam sales benefits associated with the project.

In our Turners Falls decision, the Siting Council again clarified its definition of Massachusetts benefits, this time to include as a benefit recreational facilities to be constructed by the project developer. In that case, the recreational benefits were the only benefits offered to the Commonwealth, because the jurisdictional facility was a transmission line which served only to connect a 20 MW, non-jurisdictional generating facility to the electric transmission grid, and this generating facility had contracted to sell its entire power output to out-of-state utilities. Turners Falls, 18 DOMSC 141, 144, 145, 156.[23]

In adopting a Massachusetts benefits test as a part of our review of the need for a generating facility, the Siting Council recognizes its statutory responsibility, under G.L. c. 64, section 69I, to minimize the cost and environmental impacts associated with the development of additional energy

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23/ In Turners Falls, the applicant proposed to construct a jurisdictional transmission line to connect a 20 MW cogeneration facility to the regional power grid. While the Siting Council did not have jurisdiction over the 20 MW plant, it held that it could not determine the need for the jurisdictional transmission line without first determining whether the 20 MW facility was needed (18 DOMSC at 151-155).

resources. Nonetheless, our articulation of the Massachusetts benefits standard and the application of that standard in recent cases, to some degree, has left open the question of what level of benefits -- economic efficiency, reliability, environmental, or other -- must flow to the Commonwealth in order to satisfy the Massachusetts benefits test. This case provides us with the opportunity to provide two additional observations in the evolution of this standard.

First, the level of benefits required to meet the Massachusetts benefits test must be commensurate with the size and nature of the proposed facility. Certainly, the benefits of a modest recreational facility associated with a short transmission line and a 20 MW generating plant would not be sufficient for a much larger generating plant, such as the one proposed by MASSPOWER here.

Second, the Massachusetts benefits test, while important, has to be weighed against the recognition of the interrelationship of Massachusetts' energy supply and the regional system. The New England region's generating and transmission system is a unified whole, and any parochialism by Massachusetts in rejecting facilities which may not be of immediate benefit to Massachusetts may lead other states to disapprove the siting of facilities which <u>are</u> of significant benefit to Massachusetts. The Massachusetts benefit standard should be set to allow us to remain a host to those necessary, least-cost, least-environmental-impact generating projects designed to serve the entire region, while, at the same time, ensuring that they bring some meaningful benefit to Massachusetts.

In the instant case, MASSPOWER has not established that its proposed project offers economic efficiency or reliability benefits to the Commonwealth through signed and approved PPAs with Massachusetts utilities. At the same time, however, the Siting Council has found that because MASSPOWER is included in the award group of three Massachusetts utilities, there is some likelihood that the project eventually will have the signed and approved contracts which, in turn, are evidence of economic efficiency and/or reliability benefits to the Commonwealth. In

addition, the Siting Council has found that the MASSPOWER project offers other economic benefits to Massachusetts through (1) its 20-year site lease with Monsanto; (2) its payment to Monsanto for cooling water; and (3) its payment to Monsanto for use of existing waste-water facilities.

Applying the test developed in prior cases along with the observations noted above, the Siting Council finds that, if, in addition to the other benefits recognized above, the proposed contract with BECo is signed and approved, or the proposed contract with WMECo is signed and approved, the Siting Council's Massachusetts benefits standard will be met. Other signed and approved contracts with Massachusetts utilities, if the contract is at least the size of the proposed contract with WMECo, also will meet the Siting Council's test here. Accordingly, we find that, at such time as MASSPOWER submits to the Siting Council: (1) a signed and approved contract with BECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case; or (2) a signed and approved contract with WMECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case; or (3) a signed and approved contract(s) with the same Massachusetts utilities or others which, in total, amount to a level approximating at least that bid to WMECo, the Massachusetts benefits standard will be fulfilled.

In arriving at our finding above, the Siting Council has for the first time addressed a situation in which a developer requests Siting Council approval before PPAs are signed and approved. We recognize that developers may seek Siting Council approval at an early stage of power marketing, before inclusion in any utility's award group. Further, we believe that it is important for our process to allow facility developers to obtain, when warranted, Siting Council approval relatively early in the development process. The Siting Council does not believe there are insurmountable barriers to a showing that allows Siting Council approval before the marketing of power is final. In those cases, it simply is important for proponents to establish meaningful benefits to Massachusetts that are not associated with power sales.

5. Conclusions on Need

The Siting Council has found that MASSPOWER (1) has established that New England needs at least 240 MW of additional energy resources for reliability purposes beginning in 1992 and beyond; and (2) has not established that benefits to the Commonwealth are of sufficient magnitude to justify construction of the facility consistent with the energy needs, resource use and development policies of Massachusetts. Therefore, at this time MASSPOWER has not demonstrated a need for additional energy resources. However, the Siting Council also has determined that MASSPOWER will meet the Massachusetts benefits standard, and thus the need standard, if it enters into a certain level of power supply contracts with Massachusetts utilities and these contracts are approved by the appropriate regulatory authority.

Accordingly, we find that MASSPOWER has demonstrated a need for additional energy resources if: (1) MASSPOWER presents to the Siting Council (a) a signed and approved contract with BECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case; or (b) a signed and approved contract with the WMECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case; or (c) a signed and approved contract(s) with the same Massachusetts utilities or others, which, in total amount to a level approximating at least that bid to WMECo; and (2) the Siting Council staff verifies that the response to (1) above is complete and adequate. At such time that the Hearing Officer in this case shall verify that the response to (1) above is complete and adequate, those responses shall be filed in the docket in this proceeding and the finding that MASSPOWER has demonstrated a need for additional energy resources shall be entered.

B. Comparison of Proposed Project and Alternative Approaches

1. Standard of Review

G.L. c. 164, sec. 69H, requires the Siting Council to evaluate proposed projects in terms of their consistency with providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at lowest possible cost. In addition, G.L. c. 164, sec. 69I, requires a project proponent to present "alternatives to planned action" which may include (a) other methods of generating, manufacturing or storing, (b) other sources of electrical power or gas, and (c) no additional electrical power or gas.[24]

In implementing its statutory mandate, the Siting Council has required a petitioner to show that, on balance, its proposed project is superior to alternate approaches in the ability to address the previously identified need and in terms of cost, environmental impact and reliability. Additionally, where a non-utility developer proposes to construct a QF facility in Massachusetts, the Siting Council determines whether the project offers power at a cost below the purchasing utility's avoided cost. Altresco-Pittsfield, 17 DOMSC at 370-378; NEA, 16 DOMSC at 360-380; 1986 CELCo Decision, 15 DOMSC at 212-218; 1985 MECo Decision, 13 DOMSC at 141-183; 1985 BECo Decision, 13 DOMSC at 67-68, 73-74.

2. Need

To address the identified need for at least 240 MW of additional energy resources by 1992, MASSPOWER proposes to construct a 240 MW, dual-fuel combined cycle cogeneration power plant in Springfield (Exh. M-1, p. 1). MASSPOWER stated that

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24/ G.L. c. 164, sec. 69I, also requires a petitioner to provide a description of "other site locations." The Siting Council reviews the Company's proposed site, as well as other site locations, in Section III, below.

its proposed project could be constructed in 24 months and that it is expected to commence commercial operation beginning in 1992 (id., p. 40; Exh. HO-PV-3).

MASSPOWER examined several alternate approaches to addressing the identified need, including both non-conventional and conventional technologies (Exh. M-1, p. 58; Tr. 4, pp. 76-77). However, MASSPOWER claimed that non-conventional technologies were not capable of meeting the identified need (Exh. HO-COM-1). MASSPOWER asserted that non-conventional technologies such as municipal solid waste-fired ("MSW") and biomass-fired facilities were typically too small to satisfy the identified need of at least 240 MW (id.; Exh. M-1, p. 58). For example, MASSPOWER reported that biomass facilities in the New England region are typically sized in the range of 10 to 25 MW (Exh. HO-COM-1). Further, MASSPOWER stated that the Commonwealth is currently enforcing a moratorium on development of any new MSW facilities (id.). MASSPOWER did not indicate whether either of the foregoing alternatives could generate steam and thus provide steam supplies to an industrial user such as Monsanto. In addition, MASSPOWER's witness, Mr. Oliver, stated that MASSPOWER did not determine whether or not an equivalent level of C&LM was feasible for implementation in the New England region (Tr. 4, p. 77).

MASSPOWER asserted that conventional technologies could provide a means of meeting the identified need (Exh. M-1, p. 59). Specifically, MASSPOWER identified distillate-oil-fired combined cycle plants ("distillate oil plant"), residual-oil-fired steam plants ("residual oil plant"), circulating fluidized bed coal plants ("fluidized bed coal plant"), and conventional coal-fired plants as capable of being designed to generate 240 MW or more and provide steam to the Monsanto industrial facility (id.). MASSPOWER stated that a conventional coal plant was included in its assessment of conventional technologies despite the fact that such a plant would not be able to meet the identified need in 1992 due to its construction time requirements (id.).

Based on the foregoing, the Siting Council finds that

MSW-fired and biomass-fired generating facilities, and conventional coal-fired facilities fail to address the identified need. Therefore, in reviewing the cost and environmental impacts of the proposed project, the Siting Council compares the proposed project, a gas-fired combined cycle plant ("gas combined cycle plant"), to the alternate project approaches -- a distillate oil plant, a residual oil plant, and a fluidized bed coal plant. Further, based on the record, the Siting Council finds that the proposed project, a distillate oil plant, a residual oil plant, and a fluidized bed coal plant are comparable in terms of their ability to meet the identified need.

3. Cost

The Siting Council evaluates the proposed project in terms of whether it minimizes cost by determining (1) if the project is superior to a reasonable range of practical alternatives in terms of cost; and (2) if the project offers power at a cost below purchasing utilities' avoided costs.

MASSPOWER compared the power costs of a gas-fired combined cycle plant with those of alternatives using a total revenue requirements methodology (Exh. M-1, pp. 60-71). Essentially, MASSPOWER developed cost streams for the identified plants, discounted these into net present value terms, and levelized these to derive a cost of power in cents per kilowatt hour ("¢/kwh") (id., pp. 77-78).

MASSPOWER recognized that the long-term cost performance of a gas-fired combined cycle plant was sensitive to fuel prices (id., p. 63). In fact, MASSPOWER stated that about 50 percent of the total costs of power of a gas-fired combined cycle plant are attributable to fuel costs (id., p. 60). Consequently, MASSPOWER evaluated the power costs of that plant under four fuel price scenarios: (1) proposed MASSPOWER gas price and escalators; (2) proposed MASSPOWER gas prices escalated by the weighted average cost of gas; (3) price of domestic gas based on

the Penn East project;[25] and (4) prices based on ten months of gas use and two months of oil use with both fuels' prices escalated as predicted by Data Resources, Inc. ("DRI") (id., p. 66). MASSPOWER provided no information regarding the sensitivities of the alternative plants to various fuel price scenarios (id., pp. 57-71).

Based on its total revenue requirements methodology, MASSPOWER calculated the levelized busbar costs of (1) a gas combined cycle plant under the identified fuel price scenarios; and (2) the previously identified alternative plants (id., p. 68). Overall, costs ranged from 7.35¢/kwh to 12.29¢/kwh, with the absolute lowest cost represented by a gas combined cycle plant fueled by MASSPOWER's proposed gas price and escalators (Exh. M-8, Attachment 2).[26] Costs of alternative plants were higher than any cost represented by a gas combined cycle plant under any of MASSPOWER's fuel scenarios (id.).

MASSPOWER performed the foregoing cost comparison using cost data obtained primarily from the 1986 Electric Power Research Institute ("EPRI") Technical Assessment Guide ("TAG") (Exh. M-1, p. 60). For example, cost data for a gas combined cycle plant -- representing the MASSPOWER project -- were based on TAG (Exh. M-1, Section 10.2, Table 2). Costs of a distillate oil plant and a residual oil plant were also based on TAG, with modifications on TAG data to reflect (1) a 1992 in-service date; (2) size differences between projects described in TAG and 240 MW

25/ The Penn East project formally began in 1987 as a partnership of Texas Eastern and Consolidated Natural Gas Company designed to bring existing natural gas supplies not currently being utilized in other regions of the country into the Northeast. See Boston Gas Company, 19 DOMSC at 332, 408 (1990).

26/ MASSPOWER reported that based on final gas supply contract terms, its levelized busbar cost of power would be 7.38¢/kwh under a 50 percent ProGas Limited of Canada ("ProGas") and 50 percent Distrigas of Massachusetts ("DOMAC") supply arrangement, and 6.99¢/kwh under a 100 percent DOMAC arrangement (Exh. HO-COM-6). MASSPOWER asserted that the use of these actual prices in the levelized busbar analysis still would result in a gas combined cycle plant being the lowest cost plant in the overall ranking (id.).

and (3) higher costs of generating facilities proposed for construction in the northeastern United States (id., p. 60-61).[27] Finally, MASSPOWER stated that cost data for the fluidized bed coal plant were based on the Riverside project being developed by Applied Energy Services in Rhode Island (id., p. 70, Section 10.2, Table 2).

While the Siting Council commends MASSPOWER for it's use of a comprehensive cost analysis, we note one weakness in this analysis. Instead of using cost data associated with its own project, MASSPOWER relied on TAG data (id., p. 66, Section 10.2, Table 2). For example, while MASSPOWER stated that capital costs of its project would be about $769/kw, it used TAG's estimate of $829/kw as an input to its levelized busbar cost analysis (id.; Exh. HO-RR-17). Further, MASSPOWER used TAG's higher operation and maintenance ("O&M") cost estimates instead of its own (Exh. HO-RR-17). Based on project-specific cost data, MASSPOWER's levelized costs would have been about 7.15¢/kwh (id.). In a past case, project proponents have used project specific data. Altresco-Pittsfield, 17 DOMSC at 373. Here, if MASSPOWER used project specific data, its proposed project would have fared even better in comparison to alternative projects.

Nonetheless, the Siting Council finds that MASSPOWER has established that its proposed project is superior to a reasonable range of alternate approaches in terms of cost.

MASSPOWER asserted that its proposed project would offer power at a cost below utilities' avoided costs (Exh. M-1, p. 74). In support of this assertion, MASSPOWER presented a 20-year projection of its power costs beginning in 1992 compared to a similar projection based on the avoided costs of individual utilities, including BECo under that company's first and second QF solicitations, Fitchburg Gas and Electric Company, CELCo, and

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27/ MASSPOWER stated that TAG estimated the installed cost of generating facilities in the northeastern United States to be about 9 percent higher than those of other regions (Exh. M-1, p. 61).

MMWEC (Exh. M-1, pp. 73-75). In performing this comparison, MASSPOWER stated that it escalated key components of its project (such as transportation charges and energy charges) according to the same escalation rates used by utilities in development of their avoided costs (id., pp. 72-73). MASSPOWER reported that in all cases the power costs of its proposed project were less than or equal to the avoided costs of the identified utilities (id., p. 74).

First, the Siting Council accepts MASSPOWER's methodology used in comparing the long-term costs of its power relative to the avoided costs of utilities. This methodology represents a comprehensive approach -- a valid proxy for determining whether a project's costs are competitive and likely to win bids.[28] However, the Siting Council notes that MASSPOWER's comparison with MMWEC's avoided costs is based on an MMWEC-wide avoided cost, instead of the avoided costs of the municipal utilities which have actually entered into PPAs with MASSPOWER, i.e., Littleton and Holyoke. MMWEC consists of about 33 members, each with a distinct avoided cost. Thus, an MMWEC-wide avoided cost is wholly inadequate as a basis for determining whether or not a PPA is below the avoided cost of a specific MMWEC member.

Although MASSPOWER has not presented signed and approved PPAs, the Siting Council notes that MASSPOWER has been included in a number of award groups. The fact that MASSPOWER has been included in award groups is a very strong indicator that the proposed project has met important utility price criteria as well as non-price criteria. While in the past the Siting Council has required project proponent to show that a project offers power at a cost below the purchasing utilities avoided

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28/ The Siting Council notes that while we accept this methodology as establishing that MASSPOWER's power offerings likely will be below utilities avoided costs, this methodology alone would not enable the petitioner to establish regional need on economic efficiency grounds, or to meet the Massachusetts benefits test (see Sections II.A.3 and II.A.4.a, above). In fact, even if MASSPOWER had exclusively considered the avoided costs of utilities outside of Massachusetts, MASSPOWER's methodology would have been equally persuasive in establishing that its power will be offered below utilities avoided costs.

cost based on signed and approved PPAs (see Altresco-Pittsfield, 17 DOMSC at 372-374; NEA, 16 DOMSC at 368-375), here the combination of (1) a comprehensive methodology comparing the long-term costs of MASSPOWER's power relative to the avoided costs of utilities; and (2) the inclusion of the MASSPOWER project in a number of award groups, demonstrates the likelihood that the proposed project offers power at a cost below the purchasing utilities' avoided costs.

Based on the foregoing, the Siting Council finds that MASSPOWER has demonstrated that its proposed project offers power at a cost below the purchasing utilities' avoided cost.

In sum, the Siting Council has found that MASSPOWER has established that (1) its proposed project is superior to a reasonable range of alternate approaches in terms of cost; and (2) its proposed project offers power at a cost below the purchasing utilities' avoided costs. Accordingly, the Siting Council finds that MASSPOWER has established that its proposed project minimizes cost.

4. Environmental Impacts

MASSPOWER asserted that its proposed project was superior to a distillate oil plant, a residual oil plant, and a fluidized bed coal plant in terms of environmental impacts (Exh. M-1, p. 89). MASSPOWER based this assertion on an analysis of environmental impacts including fuel transportation, fuel storage, land area requirements, air emissions, water requirements, waste-water discharges, and solid waste byproducts (id., pp. 80-88). MASSPOWER stated that environmental impacts of its proposed project and alternatives were referenced to a net power output of 240 MW with a steam output of 50,000 lbs/hr (id., p. 79).

In evaluating the transportation and storage of fuel, MASSPOWER first estimated the annual fuel requirements of each alternate approach (id., p. 80). For purposes of its analysis, MASSPOWER assumed (1) a capacity factor of 90 percent for a gas combined cycle plant and a distillate oil plant; (2) a capacity factor of 75 percent for a residual oil plant; and (3) a

capacity factor of 70 percent for a fluidized bed coal plant (id., pp. 80-81).[29] Based on these assumptions, MASSPOWER estimated that annual fuel requirements would amount to (1) 18 billion cubic feet of natural gas; (2) 120 million gallons of distillate oil; (3) 110 million gallons of residual oil; or (4) 615,000 tons of coal (id., p. 80).

MASSPOWER assumed that oil and coal would be transported by rail, and that natural gas would be delivered by underground pipeline (id., pp. 80-81).[30] MASSPOWER indicated that oil would be transported in tank cars of about 20,000 gallons each, while coal would be transported in rail cars of 100 ton capacity (id.). MASSPOWER stated that for either oil or coal delivery, a 100 to 120 car train would be required on an average of once per week (id., p. 81). Consequently, MASSPOWER claimed that rail transportation of oil or coal would result in vehicle traffic disruption in the Springfield area (Exh. HO-COM-12). MASSPOWER stated that natural gas transportation would require installation of a new 18.2-mile pipeline (id.). However, MASSPOWER claimed that once a pipeline had been installed it would have no further effect on traffic, and that it would have no impact on aesthetics in the area (id.). Consequently, MASSPOWER asserted that transportation of fuel through an underground pipeline involved the least impact of the transportation systems identified (Exh. M-1, p. 81).

29/ MASSPOWER stated that annual fuel requirements for a distillate oil plant were based on MASSPOWER's proposed facility under oil-firing conditions (Exh. HO-COM-10). Annual fuel requirements for a residual oil plant were based on an assumed fuel requirement of 2,500 MMBtu/hr heat input (id.). MASSPOWER did not identify the basis of the annual fuel requirements of the fluidized bed coal plant, other than to indicate that engineering assumptions were used (id.).

30/ MASSPOWER mentioned that oil could be delivered with an underground pipeline and that coal could be delivered by truck (Exh. HO-COM-12). However, MASSPOWER's analyses focussed primarily on rail delivery of these fuels (Exh. M-1, pp. 80-81).

While MASSPOWER asserted that a natural gas pipeline would be the least-impact fuel supply option, MASSPOWER failed to provide sufficient evidence to substantiate its assertion. MASSPOWER claimed that vehicle traffic would be disrupted by rail delivery, but MASSPOWER provided no supporting information, such as the number of traffic intersections which a 100-car train would affect in the Springfield area, and what times of day or night such trains would enter Springfield. While the Siting Council recognizes that an underground pipeline would avoid traffic disruption, it is not clear from the evidence presented how rail delivery of fuel would impact vehicle traffic in the Springfield area.

Accordingly, based on the foregoing, the Siting Council makes no finding regarding whether the proposed project or alternate approaches are preferable in terms of fuel transportation.

In terms of fuel storage, MASSPOWER stated that an oil-fired facility would typically require 30 days of storage based on industry standards (id.). Thus, MASSPOWER projected oil storage to consist of three separate three-million-gallon tanks equipped with containment dikes (Exh. HO-COM-10). MASSPOWER estimated that three acres of land space would be required to accommodate this level of oil storage (id.).

MASSPOWER assumed that a coal-fired facility required 90 days of fuel storage capacity (Exh. M-1, p. 81). MASSPOWER based its coal storage space estimates on industry standards and on those of a coal-fired facility proposed for construction at Chanute Air Force Base in Illinois ("Chanute") (Exh. HO-COM-10). MASSPOWER stated that the Chanute facility would store coal at a ratio of 24,000 tons per 1.65 acres (id.). Thus, according to MASSPOWER, a 90-day coal storage requirement would mean a capacity of 150,000 tons which would require the use of 10 acres of land (id.). However, by modifying the slope of the coal pile, MASSPOWER claimed that this tonnage of coal could be stored on as little as 7.5 acres (id.).

MASSPOWER asserted that a natural gas pipeline required no fuel storage space (Exh. HO-COM-12). MASSPOWER also asserted that nearby residents would be reassured by use of a natural gas

Accordingly, based on the foregoing, the Siting Council finds that the proposed project is preferable to alternative approaches in terms of land area requirements.

MASSPOWER based its evaluation of air emissions on TPY of SO_2, NO_x, particulates, carbon monoxide, and non-methane hydrocarbons (precursors to ozone) (Exh. HO-RR-17). In performing this evaluation, MASSPOWER assumed that (1) its proposed facility would be 100 percent gas-fired; (2) the sulfur content of distillate oil would be about .25 percent sulfur by weight; (3) residual oil would have a sulfur content of 2.0 percent; (4) coal would contain 1.5 percent sulfur; and (5) control technologies such as selective catalytic reduction ("SCR"), limestone injection, and particulate controls would be implemented (Exh. M-1, pp. 83-84). Based on the foregoing assumptions, MASSPOWER calculated that its proposed facility would produce the least amounts of air emissions for all pollutants identified, with one exception (id., p. 83). MASSPOWER reported that its proposed facility would produce more carbon monoxide than a distillate oil plant (Exh. HO-RR-17). See Table 3.

Accordingly, based on the foregoing, the Siting Council finds that the proposed project is preferable to alternative approaches in terms of air emissions.

With respect to water, MASSPOWER asserted that gallons per day ("GPD") requirements of the proposed project and the distillate oil plant were identical, and that these requirements represented about half of the water required for either a residual oil plant or a fluidized bed plant (Exh. M-1, p. 85). For waste-water discharges, MASSPOWER claimed that its proposed project would produce the least amount, followed closely by a distillate oil plant (id., p. 87; Exh. HO-RR-17). Again, MASSPOWER reported that waste-water flows of the proposed project and a distillate oil plant would represent about half of the waste-water amounts projected for either a residual oil plant or a fluidized bed coal plant (Exh. M-1, p. 85).

Accordingly, based on the foregoing, the Siting Council finds that both the proposed project and a distillate oil plant are preferable to alternative approaches in terms of water requirements and waste-water discharges.

Finally, MASSPOWER compared its proposed project and alternatives in terms of the amounts of solid waste byproducts produced (id., p. 87). MASSPOWER asserted that solid waste byproducts -- as represented by flue gas cleaning residue -- would not be produced by either the proposed project or a distillate oil plant (id.). Thus, MASSPOWER compared the amount of flue-gas cleaning residues associated with operations of a fluidized bed coal plant and a residual oil plant (id.). MASSPOWER reported that a fluidized bed coal plant would produce solid waste byproducts at a rate of about 140,000 TPY, and that a residual oil plant produced about 70,000 TPY (id.).

Accordingly, based on the foregoing, the Siting Council finds that both the proposed project and a distillate oil plant are preferable to alternative approaches in terms of solid waste byproducts.

In sum, the Siting Council has found that (1) the proposed project is preferable to alternative approaches in terms of fuel storage; (2) that the proposed project is preferable to alternative approaches in terms of land area requirements; (3) that the proposed project is preferable to alternative approaches in terms of air emissions; (4) that both the proposed project and a distillate oil plant are preferable to alternative approaches in terms of water requirements and waste-water discharges; and (5) that both the proposed project and a distillate oil plant are preferable to alternative approaches in terms of solid waste byproducts. The Siting Council also has made no finding regarding whether the proposed project or alternate approaches are preferable in terms of fuel transportation.

Accordingly, on balance, the Siting Council finds that the proposed project is superior to alternative approaches with respect to environmental impacts.

5. Conclusion on Comparison of Proposed Project and Alternative Approaches

The Siting Council has found (1) that the proposed project, a distillate oil plant, a residual oil plant, and a fluidized bed coal plant are comparable in terms of their ability to meet the identified need; (2) that MASSPOWER has established that its proposed project is superior to a reasonable range of alternate approaches in terms of cost; (3) that MASSPOWER has established that its proposed project offers power at a cost below purchasing utilities avoided costs; and (4) that the proposed project is superior to alternative approaches with respect to environmental impacts. However, the Siting Council has made no finding on the reliability of the power generated by the proposed project or the alternate approaches.

Accordingly, based on the foregoing, the Siting Council finds that the proposed project is superior to a reasonable range of alternative approaches.

As set forth above, once an applicant has shown that additional resources are needed, the Siting Council requires an applicant to establish that its proposed project approach is superior to alternate approaches in terms of cost, environmental impact, reliability, and meeting the identified need. In addition, the Siting Council requires a non-utility proponent of a generating facility to show that its proposed project offers power below the avoided costs of purchasing utilities. In the instant case and the earlier NEA and Altresco-Pittsfield cases -- all proposals by non-utility developers to construct cogeneration facilities -- the Siting Council focussed its evaluation of proposed and alternate project approaches on a comparison of the applicant's proposed generating technology and other generating technologies capable of delivering the necessary energy resources. While MASSPOWER has met the project approach standard as set forth in NEA and Altresco-Pittsfield, the Siting Council has some serious concerns about continuing to employ an analysis to evaluate various project approaches to providing additional energy resources which is based exclusively on a comparison of technologies.

First, a review of project approaches based exclusively on technologies is somewhat incompatible with our review of project approaches in proposals filed by utilities to construct facilities. While a utility also is required to show that its proposed project approach is superior to alternate approaches in terms of cost, environmental impact, reliability, and meeting an identified need, the Siting Council reviews utility proposals within the context of a utility's overall supply planning process.

In the case of a utility proposal to construct a transmission line or gas pipeline, the Siting Council has not considered alternate technologies or designs as part of its review of project approaches. For example, a utility proposing to construct a 345 kV transmission line may need to show that building a new transmission line is superior to reconductoring or rebuilding an existing line, building a lower voltage line, increasing C&LM efforts, or possibly, building a generating facility. However, in considering the different project approaches available to a utility in these cases, the utility is not required to look at different technologies or designs for building a 345 kV transmission line.

In the case of a utility proposal to construct a generating facility, the Siting Council would require the utility to address its technology choice at the project level, but only within the context of the utility's supply planning process. This would enable the Siting Council to determine whether the utility's decision to pursue the proposed project was the result of a process which fully evaluated a comprehensive range of resource options, including C&LM, on an equal footing, and that the proposed project represented the least-cost, least-environmental-impact approach available to the utility.

Second, a technology-based review of project approaches in non-utility cases fails to evaluate a complete range of project approaches. In comparing different technologies for cogeneration projects, we ignore several other generic approaches to meeting a need for additional energy resources,

such as C&LM, smaller generating projects, or power purchases from other states or regions. However, our inability to review a full range of project approaches does not result from any failure of the non-utility applicant. Unlike the utility which must meet a discrete and finite need of its customers, the non-utility provider has neither the obligation to serve nor the access to a full range of resources available to meet that obligation. Simply put, while a non-utility developer is required to meet regional and/or Massachusetts need tests for additional energy resources, the non-utility developer cannot provide C&LM resources or buy power from a distant hydropower facility. Therefore, it is inappropriate to require a non-utility developer to establish that it has selected a superior project approach from among a full range of resource options when the non-utility developer only has access to one option -- its proposed project.

However, the fact that a non-utility developer does not have access to a full range of resource options does not mean that we are any less committed to ensuring that the developer's proposed project is superior to alternate project approaches in terms of cost, environmental impact, reliability, and meeting the identified need. Instead, we recognize that this critical evaluation -- the evaluation of a non-utility developer's cogeneration or IPP project relative to an entire menu of options available to the state and region -- must be performed in a more effective and meaningful manner.

In terms of cost, we find that one of our current cost tests -- the requirement that a non-utility developer establish that its proposed project offers power below purchasing utilities' avoided costs -- remains essential to our review of project approaches. However, in future cases, the Siting Council will consider different methods of reviewing whether a non-utility developer's project proposal is superior to alternate project approaches in terms of environmental impact, reliability, and meeting identified need, and the tradeoffs of each of these criteria with cost. In formulating a new standard of review in this area, we will attempt to find mechanisms which (1) allow us to compare proposals by non-utility developers with

a full range of resource options available to the state and region; and (2) place greater emphasis on determining whether a non-utility developer's proposed project is consistent with our statutory mandate and the resource use and development policies of the Commonwealth. This new standard of review will apply to all proposals by non-utility developers to construct generating facilities which are currently before the Siting Council and all parties to those proceedings will be afforded full and fair opportunity to address this new standard in pending cases.

C. Project Viability

1. Standard of Review

The Siting Council has determined that a proposed QF project is likely to be viable as a source of energy if (1) the project is reasonably likely to be financed and constructed so that the project will actually go into service as planned; and (2) the project is likely to operate and be a reliable, least-cost source of energy over the life of its power sales agreements. Altresco-Pittsfield, 17 DOMSC at 378; NEA, 16 DOMSC at 380.

In order to meet the first test of viability, the proponent must establish (1) that the project is financiable; and (2) that the project is likely to be constructed within applicable time frames and capable of meeting performance objectives. In order to meet the second test of viability, the proponent must establish (1) that the project is likely to be operated and maintained in a manner consistent with appropriate performance objectives; and (2) that the proponent's fuel acquisition strategy reasonably ensures low-cost, reliable energy resources over the terms of the power sales agreements. Altresco-Pittsfield, 17 DOMSC at 378.

In this case, MASSPOWER asserts that its proposed project meets these tests and therefore would be a viable source of energy over time (Brief, pp. 24-37).

2. Financiability and Construction

In considering a proponent's strategy for financing a proposed project, the Siting Council considers whether the project is reasonably likely to be financed so that the project actually will go into service as planned. Here, MASSPOWER stated that JMC would be responsible for securing financing for the proposed project (Exh. HO-PV-14). MASSPOWER asserted that JMC has had extensive experience in obtaining financing for projects similar to MASSPOWER (id.). In support of this assertion, MASSPOWER reported that JMC was a participant in financing the $71.2 million cogeneration facility project in Bethpage, New York, and that JMC is the lead developer for the Ocean State I and Ocean State II projects which required financing of $246.6 million and $222.2 million, respectively (id.).

With respect to the proposed project, MASSPOWER stated that JMC would be assisted by a finance committee composed of representatives from Bechtel, GE, Granite State, and Tenneco (id.). While MASSPOWER stated that it had not yet secured financing for its proposed project, it asserted that a descriptive memorandum would be issued to financial institutions during July, 1990, with bid responses expected by August 1, 1990 (Exh. HO-PV-23).

MASSPOWER stated that in order to receive construction financing for the proposed project, MASSPOWER must sell 75 percent of its capacity and energy under long-term PPAs (Exhs. M-1, p. 3, HO-PV-16; Tr. 1, pp. 23, 88, 92). MASSPOWER reported that any percentage of the project not sold under long-term PPAs would be sold to WMECo at its short-term QF rate, which generally includes an energy component but excludes a capacity component (Tr. 1, p. 78).[31] However, MASSPOWER stated that sales to WMECo at that company's short-term QF rate would be an interim measure only, as MASSPOWER's marketing goal is to enter into more favorable long-term PPAs for its entire

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31/ MASSPOWER stated that short-term sales of QF power to WMECo were mandated under PURPA (Tr. 1, p. 74).

output (Exh. HO-PV-16).

MASSPOWER provided pro forma financial statements for its project under scenarios involving different levels of sales, various fuel supply arrangements, a range of transportation rates, and different levels of plant availabilities (Exhs. HO-PV-16A, HO-RR-20A through HO-RR-20J).[32] Based on these pro forma financial statements, MASSPOWER projected debt service coverage ratios averaging 3.0 over the 20-year period of long-term PPAs (Exh. HO-RR-20). MASSPOWER asserted that debt coverage ratios are an index used by financial institutions to assess a project's ability to repay its debt, and that financial institutions generally require an average debt service coverage ratio of about 1.5 (id.).

MASSPOWER indicated that industry conventions for financing third-party projects generally require 80 percent debt and 20 percent equity (Tr. 1, p. 35). Mr. Smith stated that equity would have to be increased to "approximately 40 percent" if 75 percent of capacity and energy of the proposed facility was sold pursuant to long-term PPAs and the other 25 percent was sold to WMECo at its short-term QF rate (id.). Mr. Smith stated that an increase to 40 percent equity would "reduce the profitability of the project to the equity participants" -- but that this would not affect the price of power (Tr. 1, pp. 35-36).

MASSPOWER stated that if the amount of energy and capacity sold pursuant to long-term PPAs was above 50 percent but below 75 percent, involvement of a third entity would be considered as part of its financial strategy (Exh. HO-PV-16; Tr. 1, p. 54).[33] According to Mr. Smith, the entity would

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32/ MASSPOWER's pro forma financial statements were based largely on MASSPOWER's utility award group performance (Exh. HO-RR-20). For example, financial scenarios included sales of 100 MW to BECo, 25 MW to CELCo, and various levels of long-term sales to WMECo (id.). MASSPOWER's scenarios also included at least 60 MW of sales at WMECo's short-term QF rate (id.).

33/ MASSPOWER also stated that it would consider adding subordinated debt if long-term power sales amounted to more than 50 percent but less than 75 percent of its output (Exh. HO-PV-16).

consist of "the MASSPOWER investors or a subset thereof" (Exh. HO-PV-16; Tr. 1, p. 54). MASSPOWER provided that the entity concept would be implemented to bring sales up to the 75 percent level (Tr. 1, pp. 46). Mr. Smith stated that the entity would actually buy energy and capacity from MASSPOWER to bring sales to that level under the same financial assurances that a conventional power purchaser would agree to under a long-term PPA (Exh. HO-PV-16; Tr. 1, p. 34). Thus, MASSPOWER asserted that a lender would see "no difference" in terms of the credit of the facility (Tr. 1, p. 34). Mr. Smith stated that to make this purchasing entity concept feasible, the entity would have to guarantee the monetary difference between long-term contract rates and WMECo's short-term QF rate (id., pp. 74-75).[34] Finally, MASSPOWER stated that the entity could sell the energy and capacity "at a more attractive price" in the future (id., pp. 34, 47).

MASSPOWER determined that if less than 33 percent of its energy and capacity were sold pursuant to long-term PPAs, the proposed project would most likely be delayed pending further sales of its output (Exh. HO-PV-16). Mr. Smith stated that without "at least one" signed and approved PPA, he doubted that the project could receive construction financing (Tr. 1, p. 86). However, Mr. Smith also stated that MASSPOWER has already made considerable investments in its project, and if sales were not immediately forthcoming, it would continue to pursue sales for a "time period that would be rather extensive" (id., p. 89).

The Siting Council notes that MASSPOWER's proposed project has exhibited a high degree of financial strength. Even under scenarios involving less-than-75-percent sold under long-term PPAs, MASSPOWER's pro forma statements demonstrated

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34/ Mr. Smith stated that guarantees offered by the entity "would probably take the form of some sort of letter of credit" (Tr. 1, p. 75).

debt coverage ratios averaging about 3.0 for a 20-year period. Further, MASSPOWER's scenarios addressed sensitivities of the project to important variables such as plant availability, fuel supply source, and transportation rates. In each instance, MASSPOWER demonstrated that its project would be financiable based on debt coverage ratio performance. In addition, MASSPOWER has described a financial strategy consisting of several financing options available for implementation. The combination of favorable debt coverage ratios under a variety of circumstances and a flexible financial strategy provide a basis to ensure that MASSPOWER is reasonably likely to meet its financial objectives.

Based on the foregoing, the Siting Council finds that MASSPOWER has established that its proposed project is financiable.

In considering a proponent's construction strategy for a proposed project, the Siting Council considers whether a project is reasonable likely to be constructed so that the project will actually go into service as planned. Here, MASSPOWER indicated that its turnkey construction agreement ("TCA") would be executed with the Bechtel Eastern Power Company ("Bechtel Power") (Exh. M-1, p. 23). MASSPOWER stated that it had scheduled finalization of its TCA toward the latter stages of project development, and therefore execution was not anticipated before late June, 1990 (Exh. HO-PV-25).[35] MASSPOWER stated that the TCA would assign Bechtel Power full responsibility for design, engineering, procurement, installation, and performance testing of the generating plant and ancillary facilities (Exh. M-1, p. 23).

MASSPOWER indicated that its TCA would be structured around a fixed price with bonus/penalty provisions for early/late delivery (id., p. 24). MASSPOWER stated that

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35/ MASSPOWER provided a draft TCA (Exh. HO-PV-17A). However, as of the date of this decision, a final TCA has not been submitted.

the actual amount of the fixed price would be based on the construction schedule as established during negotiations (id.). MASSPOWER noted that the construction schedule is expected to specify dates for accomplishment of all major project milestones (id., p. 23; Exh. HO-PV-17A). MASSPOWER estimated that construction of its project would require about 24 months from the date of financial closing (Exh. HO-PV-3).

MASSPOWER asserted that Bechtel Power is a highly experienced builder of power plants (Brief, pp. 29-30; Exh. M-1, pp. 8-11). MASSPOWER stated that since 1988, Bechtel Power had commenced or completed construction of 10 cogeneration projects (Exh. HO-PV-19). MASSPOWER also stated that Bechtel Power has had extensive experience with construction of large generating plants (id.). Further, MASSPOWER identified 16 electric transmission line projects between 115 kV and 500 kV constructed by Bechtel Power since 1983, and several ancillary transmission lines built in association with cogeneration plants (Exh. HO-PV-19). Finally, MASSPOWER stated that the Bechtel Power employees assigned to MASSPOWER include a project manager who is also managing the Ocean State project and the cogeneration project in Selkirk, N.Y., and a senior project engineer who has supervised the design and engineering of several combined cycle and simple cycle generating facilities (Exhs. HO-PV-20, M-6).

In terms of construction sites, MASSPOWER reported that it had completed a site lease agreement with Monsanto for the proposed cogeneration plant (Exh. HO-S-1). Mr. Smith stated that MASSPOWER's site agreement had been approved by Monsanto's Board of Directors (Tr. 1, p. 14). With respect to the site proposed for construction of the proposed switchyard, MASSPOWER reported that it had reached an agreement in principle for an easement with an affiliate of Partyka, but that a final agreement has not been completed (Exh. HO-S-4, Supplement).

The Siting Council agrees with MASSPOWER that Bechtel Power has acquired a noteworthy level of experience as a builder of power plants, cogeneration facilities, and transmission lines. In addition, the Siting Council notes that a major strength of MASSPOWER's construction arrangement is its fixed

price provision -- a provision which inherently mitigates financial risk to MASSPOWER. Nonetheless, a TCA between MASSPOWER and Bechtel Power has yet to be finalized. In addition, construction of the proposed facility is predicated on acquisition of all sites, yet a final agreement for the proposed switchyard has not yet been secured. While MASSPOWER has made progress towards finalization of its construction arrangements, several major items remain incomplete.

In the past, the Siting Council has found that a signed TCA for the design and construction of a proposed project provides reasonable assurances that the project is likely to be constructed on schedule and able to perform as expected. Altresco-Pittsfield, 17 DOMSC at 380. Here, MASSPOWER has not submitted an executed TCA, nor a final agreement for its switchyard site. Therefore, the Siting Council finds that, at this time, MASSPOWER has not established that its proposed project is likely to be constructed within applicable time frames and be capable of meeting performance objectives. However, the Siting Council also finds that at such time as MASSPOWER executes an appropriate TCA and a final agreement for its switchyard site, MASSPOWER will be able to establish that its proposed project meets the second part of the first test of viability.

The Siting Council has found that (1) MASSPOWER has established that its proposed project is financiable; and (2) MASSPOWER, at this time, has not established that the project is likely to be constructed within applicable timeframes and be capable of meeting performance objectives. Therefore, MASSPOWER, at this time, has not demonstrated that its proposed project meets the Siting Council's first test of viability. However, the Siting Council also has determined that MASSPOWER will establish that the proposed project is likely to be constructed within applicable time frames and be capable of meeting performance objectives, and thus fulfill the first test of viability, if it enters into an appropriate TCA and final agreement for the site of the proposed switchyard.

Accordingly, we find that MASSPOWER has demonstrated it has met the first test of viability if it enters into an appropriate TCA and final agreement for the site of the proposed switchyard. Within 45 days of receipt of an executed TCA and site agreement for the proposed switchyard, the Siting Council will issue a decision determining whether MASSPOWER has demonstrated that the project has met the first test of viability.

3. Operations and Fuel Acquisition

In determining whether a QF project is likely to be viable as a reliable, least-cost source of energy over the life of its power sales agreements, the Siting Council evaluates the ability of the project proponent or other responsible entities to operate and maintain the facility in a manner which ensures a reliable energy supply. Altresco-Pittsfield, 17 DOMSC at 381. In a case where the proponent has relatively little experience in the development and operation of a major energy facility, that proponent must establish that experienced and competent entities are contracted for, or otherwise committed to, performance of critical tasks. These tasks should be set out pursuant to detailed contracts or other agreements that include financial incentives and/or penalties which ensure reliable performance over the life of the power sales agreements. Altresco-Pittsfield, 17 DOMSC at 381-382.

Here, MASSPOWER has not demonstrated that it has experience as an operator of major generating facilities (Exh. M-1, pp. 1-6). The experience of JMC, MASSPOWER's parent corporation, is primarily that of a supplier of natural gas and a developer of energy projects, as opposed to an operator of generating facilities (id.).

However, MASSPOWER asserted that one of its partners in the proposed project, GE, would be the recipient of its O&M contract, and that GE has had requisite O&M experience (Exhs. HO-PV-2, HO-PV-21A). In support of this assertion, MASSPOWER identified seven combined cycle generating facilities for which GE holds O&M contracts, including the Ocean State and

Altresco-Pittsfield generating facilities (Exh. HO-PV-21A). The Siting Council recognizes that an O&M contract between MASSPOWER and GE could provide the means to demonstrate that the proposed project is likely to be operated and maintained in a manner consistent with reliable performance over the life of the power sales agreements.[36]

Nonetheless, the Siting Council notes that MASSPOWER has not finalized an O&M contract with GE (Exhs. M-1, pp. 25-26, HO-PV-2). While MASSPOWER claimed that it could conclude an O&M agreement with GE in a short time because of its familiarity with GE, MASSPOWER stated that completion of an O&M agreement has been scheduled for the latter stages of the project's development (Exh. HO-PV-24; Tr. 2, p. 2-36).

While the Siting Council recognizes that project developers have full discretion in scheduling completion dates of project tasks, the Siting Council's review of critical aspects of the project is foreclosed when these tasks remain incomplete. In a previous case, the Siting Council found that an executed O&M contract assured the Siting Council that a project is likely to be operated and maintained in a manner consistent with reliable performance over the life of the power sales agreements. Altresco-Pittsfield, 17 DOMSC at 382. Here, the absence of a finalized O&M agreement effectively prevents the Siting Council from evaluating the ability of the project proponent or other responsible entities to operate and maintain the facility in a manner which ensures a reliable energy supply.

Accordingly, based on the foregoing, the Siting Council finds that, at this time, MASSPOWER has failed to establish that the proposed project is likely to be operated and maintained in a manner consistent with appropriate performance objectives.

36/ Certain operating aspects of the proposed facility also were addressed within MASSPOWER's draft TCA (Exh. HO-PV-17A). For example, MASSPOWER's draft TCA included provisions guaranteeing (1) output capabilities; and (2) heat rates (Exh. M-1, pp. 23-24).

However, the Siting Council also finds that at such time as MASSPOWER executes an appropriate O&M agreement which includes financial incentives and/or penalties which ensure reliable performance over the life of the unit, MASSPOWER will be able to establish that its proposed project meets the first part of the second test of viability.

In considering an applicant's fuel acquisition strategy, the Siting Council considers whether such a strategy reasonably ensures low-cost, reliable energy resources over the terms of the power sales agreements.

MASSPOWER stated that it has secured two fuel supply options for its proposed project (Exh. M-1, pp. 28-34). The first option consists of receiving 50 percent of its gas from ProGas and 50 percent from DOMAC (id., p. 27; Exh. HO-RR-10). The second option consists of receiving 100 percent of its gas from DOMAC (Exh. M-1, p. 31).

With respect to the first option, MASSPOWER reported that gas purchase precedent agreements have been concluded with both ProGas and DOMAC based on the foregoing proportions (Exhs. HO-PV-5, HO-PV-5A, HO-PV-5B).[37] Under the ProGas agreement, ProGas would supply gas to the proposed project on a firm basis for a period of 20 years (Exh. M-1, p. 28). This agreement specifies that ProGas would deliver a maximum daily quantity of 25 million cubic feet ("MMcf") of natural gas to MASSPOWER (id., pp. 28-29).

MASSPOWER asserted that ProGas is a reliable supplier with proven reserves of 3.461 trillion cubic feet ("Tcf") spread over 155 gas fields (id., p. 29).[38] MASSPOWER calculated that over the life of its project, its gas requirements would

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37/ MASSPOWER provided an agency agreement authorizing Orchard Gas ("Orchard Gas") to execute the ProGas purchase on behalf of MASSPOWER (Exh. HO-PV-5F).

38/ Mr. Kekeisen stated that JMC has contracted for 66 MMcf per day from ProGas as part of its Alberta Northeast Project, and that, in the near future, ProGas will supply an additional 75 MMcf per day to Ocean State (Tr. 2, p. 137).

represent approximately 4.7 percent of ProGas' existing proven reserves (id.).

MASSPOWER stated that the price of gas from ProGas is subdivided into two major components: (1) a demand charge, representing the fixed cost of Canadian pipeline systems, based on rates established in regulatory proceedings; and (2) a commodity charge representing the wellhead costs of the gas and variable pipeline costs, based on an initial price escalated according to the three-month rolling average of NEPOOL's average fossil fuel cost ("AFFC") (id., pp. 30-31; Tr. 1, p. 136; Tr. 3, p. 63). MASSPOWER asserted that a major advantage of the AFFC was its stability, largely due to the inclusion of coal costs (Exh. M-1, p. 63). MASSPOWER stated that the price of gas from ProGas could be renegotiated once every three years (id., p. 31).[39]

MASSPOWER stated that its ProGas volumes would originate in Alberta, Canada, and be shipped on the TransCanada system to the U.S. - Canadian border in New York (id., p. 28). ProGas volumes would then flow into the proposed Iroquois system for delivery to Tennessee (id.). From Tennessee, the ProGas volumes would flow into a new line to be built by Bay State for delivery to the project (id.).[40] MASSPOWER stated that ProGas would contract directly with Canadian pipeline firms for transportation services (id.). MASSPOWER presented precedent transportation agreements with Iroquois, Tennessee, and Bay State (Exhs. HO-PV-5C, HO-PV-5D, HO-PV-5E).

39/ MASSPOWER stated that the basic objectives of price renegotiation were (1) to ensure that the proposed project retains NEPOOL status as a base load plant; and (2) to ensure that ProGas receives a price that is competitive with and comparable to the market price for gas in the region (Exh. M-1, p. 31).

40/ Bay State has filed its proposal for construction of this new pipeline in EFSC 89-13. The Bay State pipeline filing describes (1) a proposed 16-inch, 500 psi pipeline with a length of about 18 miles; and (2) an alternative 16-inch, 500 psi pipeline of about 18 miles, along with an 8-inch 500 psi pipeline of about 11 miles in length.

Several new pipeline facilities would be required to accommodate transport of ProGas volumes to the proposed facility (Exh. M-1, p. 27). MASSPOWER reported that transport of ProGas volumes would require (1) expansion of the TransCanada pipeline system in Canada; (2) construction of the Iroquois project in the northeastern U.S.; and (3) modifications to Tennessee's system (Exhs. HO-PV-7, HO-PV-8, HO-PV-11).[41] In addition, MASSPOWER stated that delivery of either ProGas or DOMAC volumes would require construction of the proposed Bay State pipeline (Exh. HO-PV-11).

MASSPOWER stated that Canadian regulatory approvals were currently being sought for (1) a long-term export license; and (2) a certificate of public convenience and necessity. MASSPOWER stated that a Province of Alberta removal permit for the ProGas volumes was granted in May 1990 (Exh. HO-PV-4 Supplement). In addition, MASSPOWER's witness, Mr. Kekeisen, stated that its ProGas contract had been approved by a vote of the Canadian producers (Tr. 2, p. 2-127). MASSPOWER stated that domestic regulatory applications have been filed for (1) authorization to import gas from Canada; (2) a certificate of public convenience and necessity for the Iroquois project; (3) modifications to Tennessee's system; and (4) the proposed Bay State pipeline (Exhs. HO-PV-4, HO-PV-11).

MASSPOWER's second fuel supply option calls for DOMAC to supply 100 percent of the fuel for the proposed project (Exh. M-1, p. 32). Pursuant to the DOMAC contract, DOMAC would provide MASSPOWER with a firm supply of liquefied natural gas ("LNG") over a 20-year period (id., p. 31). MASSPOWER's DOMAC contract specifies delivery of 50 percent of the proposed project's requirements, or 25 MMcf of gas per day at the interconnection of the Tennessee and Bay State systems (id.). However, the DOMAC contract contains a provision -- to be exercised solely at MASSPOWER's discretion -- that DOMAC supply

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41/ Proposed modifications as filed by Tennessee in FERC Docket CP89-629-000 include additional pipeline looping, lateral replacement, increased compression, and new meter stations along Tennessee's existing system in New York, Massachusetts, Connecticut, and Rhode Island.

100 percent of the gas requirements of the project (id., p. 32). Mr. Kekeisen stated that the option of receiving 100 percent DOMAC supplies could be implemented for a two-year "bridge" period to allow for completion of regulatory proceedings and construction associated with delivery of the ProGas volumes (Tr. 3, p. 69).

MASSPOWER stated that DOMAC's gas supply arrangement is supported by reserves belonging to DOMAC's Algerian supplier, Sonatrach (Exh. M-1, p. 32). MASSPOWER reported that Sonatrach had reserves of about 110 Tcf (id., p. 32; Tr. 3, p. 3-7). MASSPOWER did not calculate the percentage of Sonatrach's proven reserves that its project would consume over a 20-year term (Exh. M-1, pp. 31-33).

MASSPOWER stated that DOMAC's LNG was priced according to Ocean State's gas supply arrangement (id., p. 32). Thus, DOMAC's price was subdivided into: (1) a "call payment" based on demand charges paid by Ocean State in the preceding month; and (2) a commodity component consisting of an initial gas price escalated by a three-month rolling average of the NEPOOL AFFC (id., pp. 31, 34). Mr. Kekeisen stated that the price of DOMAC LNG was not subject to regulatory review since it was a purchase of fuel by an end-user (Tr. 2, p. 2-118). However, MASSPOWER stated that DOMAC pricing is subject to renegotiation and if necessary, arbitration, once every five years (Exh. M-1, p. 34).

MASSPOWER stated that DOMAC gas would be delivered through a displacement arrangement with the Boston Gas Company ("Boston Gas") (id., p. 32). Mr. Kekeisen stated that displacement would be accomplished under a long-term firm transportation contract between DOMAC and Boston Gas, allowing transportation of up to 220 MMcf per day (Tr. 2, p. 102). To accomplish displacement, DOMAC's LNG would be off-loaded from ocean-going tankers and vaporized at Everett, Massachusetts (Exh. M-1, p. 32). Essentially, vaporized LNG then would be delivered to Boston Gas, and gas headed for the Boston Gas system would be diverted to MASSPOWER (id.). MASSPOWER asserted that no new gas transportation facilities would be required to accommodate transport of DOMAC volumes to the proposed Bay State

pipeline, and that DOMAC would be responsible for arranging transportation of the volumes between Everett, Massachusetts, and the proposed Bay State pipeline (Exh. M-1, pp. 27, 32). MASSPOWER stated that its precedent agreement for transportation of gas with Bay State has been submitted to the MDPU (Exh. HO-PV-4). However, MASSPOWER reported that physical delivery of DOMAC volumes to MASSPOWER could not be accomplished without installation of the proposed Bay State pipeline (Exh. M-1, pp. 28-29, Attachment 4B; Exh. HO-PV-4).

While MASSPOWER has identified two potential fuel supply options, Mr. Kekeisen stated that profitability of the proposed project would "be greater" under the 100 percent DOMAC supply scenario (Tr. 3, p. 61). However, Mr. Kekeisen noted that other factors -- such as supply diversity and overall reliability -- led MASSPOWER to select the 50 percent ProGas and 50 percent DOMAC approach as "the most attractive" fuel supply option for its proposed project (id., pp. 61-62).

Based on the 50 percent ProGas and 50 percent DOMAC option, Mr. Kekeisen stated that the greatest disruption faced by the project would involve a shortfall of 25 MMcf per day, since a simultaneous disruption of both ProGas and DOMAC supplies would be unlikely (id., pp. 15-16). In the event of a short-term disruption to one of two gas supplies, MASSPOWER stated that it would rely on distillate oil as a short-term backup fuel (Exh. M-1, p. 34). MASSPOWER has incorporated a 1,200,000 gallon storage tank -- sufficient for three days of operation -- into the design of its facility (id.).

MASSPOWER contended that resupply of oil would be accomplished by pipeline and/or truck methods (Tr. 2, p. 112; Exh. HO-RR-13). In support of this contention, MASSPOWER reported that an oil pipeline -- the Buckeye Jet Line ("Buckeye") pipeline -- was already serving Monsanto's industrial facilities (Exh. HO-RR-12). MASSPOWER also stated that a Mobil Oil pipeline -- with a daily capacity of 15,000 barrels per day -- was located in the immediate vicinity of the

proposed generating plant (id.).[42] In addition, Mr. Kekeisen stated that several large oil storage tanks adjacent to the Buckeye pipeline were available for lease by MASSPOWER (id.; Tr. 3, pp. 11-12, 14, 16).[43] Nonetheless, Mr. Kekeisen indicated that MASSPOWER had not concluded any arrangements for pipeline resupply or tank storage of oil (Tr. 2, p. 92; Tr. 3, p. 14).

MASSPOWER estimated that truck resupply of oil could be accomplished by 36 truck trips per day based on capacity of 10,000 gallons per truck and full plant output requirements (Exh. HO-RR-13). Mr. Kekeisen stated that a Belcher Oil ("Belcher") facility was located within two miles of the proposed project, and that Belcher had "considerable distribution capacity" with respect to trucking (Tr. 2, p. 116).

In the event of longer-term disruptions to gas supplies, MASSPOWER identified several potential methods of acquiring gas supplies (Exhs. HO-PV-6, HO-PV-10, HO-RR-14, HO-RR-18). First, MASSPOWER stated that if import of ProGas volumes were delayed, it would exercise its option for increased DOMAC volumes (Exh. HO-PV-6). Thus, MASSPOWER asserted that its plant could receive gas despite longer regulatory or construction delays (Exh. M-1, pp. 27-28). Next, MASSPOWER stated that if DOMAC gas supplies were interrupted, it would attempt to purchase gas supplies on the spot market (Exh. HO-PV-10). Mr. Kekeisen characterized spot gas as "interruptible gas supplies" contracted from "a producer-supplier on the long-line pipelines"

42/ Mr. Kekeisen stated that the Mobil pipeline is not connected to the Monsanto facility, but that truck transport could be arranged from that pipeline's terminus to the proposed project (Tr. 3, p. 17).

43/ Mr. Kekeisen reported that stored oil would be used when pipeline capacity was unavailable (Tr. 3, pp. 11-14). Mr. Kekeisen stated that under normal conditions, Buckeye would be able to resupply MASSPOWER once every seven days (Tr. 3, pp. 3-14).

(Tr. 3, p. 74). Mr. Kekeisen stated that spot gas generally would be available about eight months a year (Tr. 2, p. 113). However, Mr. Kekeisen identified another option -- "gas availability" -- or gas sold by the local distribution companies which is generally available for periods greater than eight months a year (Tr. 3, p. 75).

Third, MASSPOWER contended that Bay State could supply MASSPOWER with 25 MMcf/day on all but the coldest 20 days of the winter using its existing LNG and propane-air facilities (Exhs. HO-RR-14, HO-RR-18). In support of this contention, MASSPOWER provided a brief analysis of Bay State's LNG and propane-air capabilities (Exh. HO-RR-14). Mr. Kekeisen stated that Bay State propane-air facilities are used only for "needle peaks" which occur over a range of seven to ten days per year (Tr. 2, pp. 123-124).

Finally, MASSPOWER indicated that it could structure its oil-firing to achieve 70 consecutive days of oil use during the winter (Exh. HO-RR-18). MASSPOWER stated that its environmental permits will allow 35 days of oil-firing per calendar year (id.). Thus, 35 days of oil-firing at the end of one year combined with another 35 days at the beginning of a new year would allow MASSPOWER to use oil for 70 straight days during the winter (id.). In sum, MASSPOWER claimed that combinations of spot gas, gas availability, Bay State supplies, and winter oil-firing would allow it to withstand a disruption of DOMAC supplies for up to 90 days without an adverse effect on plant operations (id.).[44]

44/ MASSPOWER stated that it could divert a shipment of LNG to meet its project needs (Exh. HO-RR-18). Mr. Kekeisen stated that if an LNG tanker was travelling along the East Coast it could be rerouted to DOMAC's terminal within "three to four days" (Tr. 3, p. 3-10). Mr. Kekeisen also stated that additional world-wide supplies of LNG are expected as a result of new production in Norway, Nigeria and Venezuela (Tr. 2, p. 110; Tr. 3, p. 9). Finally, Mr. Kekeisen stated that DOMAC was currently negotiating a long-term LNG supply contract with Nigerian producers (Tr. 3, p. 9).

MASSPOWER has described a fuel acquisition strategy with several important advantages for the proposed project. First, MASSPOWER has acquired long-term gas supply commitments from two sources. Second, MASSPOWER's fuel is indexed to a price escalator which is likely to rise more slowly than other energy price escalators, with subsequent cost advantages for the proposed project. Third, MASSPOWER's DOMAC fuel supply option offers MASSPOWER immediate access to full fuel supplies independent of pending regulatory approvals of MASSPOWER's ProGas supplies. Nonetheless, even under MASSPOWER's DOMAC fuel supply option, fuel cannot be physically delivered to the proposed project without the installation of the proposed Bay State pipeline. While MASSPOWER has described a fuel acquisition strategy that involves firm supplies and addresses important cost issues, that strategy cannot be implemented until all necessary fuel delivery components have been constructed. Accordingly, the Siting Council finds that, at this time, MASSPOWER has failed to establish that its fuel acquisition strategy reasonably ensures low-cost, reliable energy resources over the terms of its power sales agreements. However, the Siting Council also finds that at such time as Bay State receives approval from the Siting Council for its pipeline proposed in EFSC 89-13, MASSPOWER will be able to establish that its proposed project meets the second part of the second test of viability.

The Siting Council has found that, at this time, (1) MASSPOWER has failed to establish that the proposed project is likely to be operated and maintained in a manner consistent with appropriate performance objectives; and (2) that MASSPOWER has failed to establish that its fuel acquisition strategy reasonably ensures low-cost, reliable energy resources over the terms of its power sales agreements. Therefore, MASSPOWER, at this time, has not demonstrated that its proposed project meets the Siting Council's second test of viability. However, the Siting Council also has determined that at such time as (1) MASSPOWER executes an appropriate O&M agreement which

includes financial incentives and/or penalties which ensure reliable performance over the life of the unit; and (2) Bay State receives approval from the Siting Council for its pipeline proposed in EFSC 89-13, MASSPOWER will be able to establish that its proposed project meets the second test of viability.

Accordingly, we find that MASSPOWER has demonstrated it has met the first part of the second test of viability if MASSPOWER executes an appropriate O&M agreement which includes financial incentives and/or penalties which ensure reliable performance over the life of the unit. Within 45 days of receipt of an executed O&M agreement, the Siting Council will issue a decision determining whether MASSPOWER has demonstrated that the project has met the first part of the second test of viability.

In addition, we find that MASSPOWER has demonstrated it has met the second part of the second test of viability if Bay State receives approval from the Siting Council for its pipeline proposed in EFSC 89-13. At such time as the Hearing Officer in this case verifies that this condition is met, the finding shall be entered in the docket in this proceeding that MASSPOWER has demonstrated that the project has met the second part of the second test of viability.

4. Conclusions on Project Viability

The Siting Council has found that MASSPOWER has demonstrated that its proposed project (1) is reasonably likely to be financed and constructed so that the project will actually go into service as planned if it enters into an appropriate TCA and final agreement for the site of the proposed switchyard; and (2) is likely to operate and be a reliable, least-cost source of energy over the life of its power sales agreements if (a) MASSPOWER executes an appropriate O&M agreement which includes financial incentives and/or penalties which ensure reliable performance over the life of the unit, and (b) Bay State receives approval from the Siting Council for its pipeline proposed in EFSC 89-13.

Accordingly, the Siting Council finds that MASSPOWER has established that, upon confirmation by the Siting Council (and the case of the condition relating to the proposed pipeline, the Hearing Officer) of adequate completion of the above conditions, its proposed project is likely to be viable as a source of energy.

D. Conclusions on Proposed Project

The Siting Council has found that: (1) MASSPOWER has demonstrated a need for at least 240 MW of additional energy resources if MASSPOWER presents to the Siting Council (a) a signed and approved contract with BECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case, or (b) a signed and approved contract with WMECo for the approximate level of power bid by MASSPOWER as set forth in the record of this case, or (c) a signed and approved contract(s) with the same Massachusetts utilities or others which in total amount to a level approximating at least that bid to WMECo; (2) MASSPOWER has demonstrated that the proposed project is superior to a reasonable range of alternate approaches; and (3) MASSPOWER has demonstrated that the proposed project is likely to be viable as a source of energy if (a) MASSPOWER enters into an appropriate TCA and final agreement for the site of the proposed switchyard, (b) MASSPOWER executes an appropriate O&M agreement which includes financial incentives and/or penalties which ensure reliable performance over the life of the unit, and (c) Bay State receives approval from the Siting Council for its pipeline proposed in EFSC 89-13.

III. ANALYSIS OF THE PROPOSED FACILITIES

A. Standard of Review

G.L. c. 164, sec. 69I, requires a facility proponent to provide information regarding "other site locations." In implementing this statutory mandate, the Siting Council requires the petitioner to show that its proposed facilities siting plans are superior to alternatives and that its proposed facilities are sited at locations that minimize costs and environmental impacts while ensuring supply reliability.

In previous cases, once the Siting Council has determined that (a) new energy resources are needed, and (b) the applicant has proposed a project that is, on balance, superior to other broad approaches (which we have termed "project approaches") in terms of cost, environmental impacts, reliability and meeting identified need (Berkshire Gas Company, EFSC 89-29 (Phase II), pp. 36-37 (1990) ("1990 Berkshire Decision"); Boston Edison Company/Massachusetts Water Resources Authority, 19 DOMSC 1, 38-42 (1989) ("BECo/MWRA"); Turners Falls Limited Partnership, 18 DOMSC 160, 175-178 (1988) ("Turners Falls"); Braintree Electric Light Department, 18 DOMSC 20, 31-40 (1988) ("1988 Braintree Decision"); Altresco-Pittsfield, 17 DOMSC at 387; NEA, 16 DOMSC at 381-409), the Siting Council then has required the petitioner to show that it has examined a reasonable range of practical facility siting alternatives. In order to determine that a facility proponent has considered a reasonable range of practical alternatives, the Siting Council typically has required the proponent to meet a two prong test: the proponent must establish that (1) it has developed and applied a reasonable set of criteria for identifying and evaluating alternatives; and (2) it has identified at least two

sites or routes with some measure of geographic diversity.[45] BECo/MWRA, 19 DOMSC at 38-42; Turners Falls, 18 DOMSC at 175-178; 1988 Braintree Decision, 18 DOMSC at 31-40; Commonwealth Electric Company, 17 DOMSC 301-303 (1988) ("1988 CELCo Decision"); NEA, 16 DOMSC at 381-409. Finally, the proponent must demonstrate that the proposed site/route for the facility is superior to the noticed alternative(s) on the basis of balancing cost, environmental impact, and reliability of supply (BECo/MWRA, 19 DOMSC at 38-42; Turners Falls, 18 DOMSC at 175-178).

The requirement that a proponent has considered a reasonable range of practical facility alternatives has been extensively discussed in two recent cases, Altresco-Pittsfield and the 1990 Berkshire Decision. In Altresco-Pittsfield, the Siting Council focussed on the applicability of the second prong of the practicality test -- the requirement that an applicant identify at least two sites or routes with some measure of geographic diversity. In that case, the Siting Council recognized that, in the siting of a cogeneration facility, there often are compelling reasons for locating the proposed cogenerator in close proximity to the steam purchaser(s) (17 DOMSC at 394). These advantages include locating near a significant steam load, the availability of steam lines or other infrastructure needed by the cogeneration facility, and the fact that the steam host may be in a position to provide available

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

superior to the petitioner's preferred route or site.[46]

As indicated above, Altresco-Pittsfield and the 1990 Berkshire Decision address different prongs of the practicality test. In Altresco-Pittsfield, the Siting Council found that in some cases a second practical facility site with geographical diversity may not exist for a cogeneration facility. In the 1990 Berkshire Decision, the Siting Council found that, whether or not there is a "noticed" alternative which is practical, primary emphasis should be placed on determining whether the applicant has utilized an appropriate site selection process which identifies and evaluates all reasonable alternatives.

In this decision we further define the exemption set forth in Altresco-Pittsfield concerning the need for a noticed alternative site. See Section III.C.3, below.

B. Description of Proposed Facilities[47]

MASSPOWER proposes to construct a 240 MW combined cycle cogeneration plant on a site of about six acres (Exh. M-2, p. 3-1).[48] The proposed site, which is owned by Monsanto, presently serves as a parking lot for Monsanto (id.). The

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46/ In making this distinction, the Siting Council does not mean to invite parties to present an exhaustive list of possible alternative routes and sites which must then be evaluated in our proceeding relative to the preferred route or site. Instead, through a comprehensive review of the petitioner's site selection process, i.e., a consideration of how specific criteria were developed and applied, the Siting Council can determine whether clearly superior routes or sites have been overlooked or eliminated.

47/ MASSPOWER asserted that there were no practical alternatives to its proposed site (Exh. M-1, p. 94). As a result, MASSPOWER did not include a noticed alternative in its petition. In addition, MASSPOWER did not identify any alternative routes for its proposed ancillary transmission line. See Section III.C, below, for a discussion of MASSPOWER's site selection process.

48/ The proposed cogeneration plant will have a nominal electric output of 246 MW gross and 239 MW net at International Standards Organization conditions (Exh. M-2, p. 2-1).

major components of the proposed cogeneration plant include two gas-fired combustion turbine generators rated at 87 MW each which feed exhaust gases into two heat recovery steam generators ("HRSG") (id., p. 2-1; Exh. M-1, pp. 13-14). Steam produced in the HRSGs is routed to a single steam turbine generator rated at 72 MW (Exhs. M-1, pp. 13-14, M-2, p. 2-1). Extraction steam from the steam turbine generator will serve Monsanto (id.). The proposed cogeneration plant will be capable of supplying its steam host with an annual average of 50,000 lbs/hr (Exh. M-2, p. 2-1). The principal fuel for the combustion turbines will be natural gas supplied by the proposed Bay State pipeline,[49] while a three-day supply of oil will be stored on-site as a backup fuel (Exhs. M-1, p. 34, M-2, p. 2-1). Air emissions will be controlled through selective catalytic reduction ("SCR") control technology (Exh. M-2, pp. 2-1 to 2-2). SCR chemistry requires sizable amounts of ammonia, which will be stored on-site in a 30,000 gallon tank (id., pp. 6-68 to 6-69). Other components of the proposed facility include six cells of a wet surface air cooled condenser, two above-ground water storage tanks, a 213-foot tall stack, and several buildings enclosing the combustion turbines, HRSGs, and associated plant equipment (Exhs. M-1, p. 2, M-2, p. 3-1, App. 2, p. 4).

The project proponent also contemplates a switchyard at a site about one-half mile from the cogeneration plant on the opposite side of the Chicopee River (Exh. M-1, Attachment 3A). The switchyard is designed as a conventional air-insulated facility with five circuit breakers, disconnect switches, instrument transformers, and a relay control house of approximately 30 feet by 45 feet, all contained within a fenced parcel of about 270 feet by 280 feet (Exhs. M-2, p. 7-7, HO-E-25). The switchyard site is immediately adjacent to

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49/ The transportation of ProGas volumes would also require the (1) expansion of the TransCanada pipeline system in Canada; (2) construction of the Iroquois project in the Northeast; and (3) modifications to Tennessee's system (Exhs. HO-PV-7, HO-PV-8, HO-PV-11).

the NUSCo transmission system, on Partyka property (Exh. M-1, Attachment 3B).[50]

MASSPOWER also proposes to construct a three-circuit 115 kV transmission line which will carry power from the cogeneration plant to the switchyard for delivery to the NUSCo transmission system (id., Supplement to 3.4). The proposed transmission line comprises 4,400 feet overall, with (1) a 2,800-foot underground segment traversing Monsanto's complex, and (2) a 1,600-foot overhead segment crossing the Chicopee River and terminating at the proposed switchyard (id.). The underground segment will be contained in a duct bank to be installed on Monsanto's property (id.). Four towers of about 95 feet each will carry the overhead segment, beginning with one tower on Monsanto property and terminating with three towers at the switchyard site (id.).

C. Site Selection Process

1. Development and Application of Siting Criteria

MASSPOWER asserted that its site selection process met the standard set forth in the Altresco-Pittsfield decision (Brief, pp. 38-40). MASSPOWER indicated that its site selection process focussed on (1) identification of a steam host with significant steam demand and available land for siting consistent with the needs of a 240 MW facility, and (2) selection of an acceptable site in the proximity of the chosen steam host (Exh. M-1, p. 90). Mr. Smith stated that MASSPOWER chose to pursue a 240 MW project due to (1) its ability to use GE Frame 7EA combustion turbines; (2) economies of scale; and (3) the proponent's familiarity with the design of a 240 MW facility through the development of other projects (Tr. 1, pp. 95-97). Based on this desire to pursue a 240 MW

50/ MASSPOWER indicated that it will interconnect with NUSCo line #1723, and that line #1723 currently is being relocated to a point adjacent to the proposed switchyard (Exh. M-2, p. 7-7).

gas-fired combined cycle project, MASSPOWER formulated six siting criteria, as follows: (1) sizable steam needs of potential steam host; (2) financial stability of the steam host; (3) industrial zoning of the potential site; (4) proximity to a major gas pipeline; (5) adequate water supply; and (6) proximity to an electric transmission system (Exh. M-1, pp. 90-91).

MASSPOWER stated that it made "a number of inquiries" in an attempt to identify potential sites which met its criteria (id., p. 92). However, MASSPOWER did not describe the manner in which the inquiries were made, to whom the inquiries were made, nor the full range of responses which resulted from the inquiries. MASSPOWER also did not indicate the geographic area covered by the inquiries.

MASSPOWER stated that it identified a site owned by the Westover Development Company ("Westover") in Ludlow, Massachusetts as an alternative to the Monsanto site for its proposed cogeneration project (Exh. HO-S-2). Based on an application of its siting criteria, MASSPOWER determined that the Westover site satisfied only two of its six criteria: (1) proximity to a fuel supply; and (2) access to an electric transmission line (id.). Further, MASSPOWER determined that steam demand in the Westover area was not sufficient to reliably support MASSPOWER's QF status (id.). Consequently, MASSPOWER rejected the Westover site (Exh. M-1, p. 92).

With respect to its Monsanto site, MASSPOWER provided a general discussion of its characteristics in terms of the identified criteria (id., pp. 90-94). Based on an application of its siting criteria, MASSPOWER determined that the proposed site met all six of its criteria for selecting a site for the cogeneration facility (id., pp. 92-93).

In regard to the choice of a specific site in the vicinity of the Monsanto complex, MASSPOWER indicated that locating the proposed facility within the boundaries of the Monsanto complex provided significant advantages for the proposed project (Exh. HO-S-2; Tr. 1, pp. 139-140). MASSPOWER identified these advantages as (1) the ability to make use of the existing steam and condensate piping system at the facility;

(2) the ability to utilize cooling water from the Monsanto facility for its own water purposes; and (3) the ability to tie into the existing Monsanto waste-water treatment facility (Exhs. HO-S-2, HO-C-2, HO-C-3). Based on these advantages, MASSPOWER stated that it focused its review on sites within the Monsanto complex only (Exh. HO-S-2; Tr. 1, p. 140). MASSPOWER stated that it determined that no other site within the Monsanto complex offered any significant advantages over the proposed site in terms of environmental impacts (Tr. 1, pp. 141-142). In addition, MASSPOWER stated that it compared other potential five-acre sites on the Monsanto complex to the proposed site in terms of (1) Monsanto's plans for expansion, and (2) the prior use of such site by Monsanto, and determined that the proposed site was the only viable site (id., p. 140; Exh. HO-S-2).

Therefore, MASSPOWER argues that it has examined a reasonable range of practical siting alternatives, and that a practical alternative site with some measure of geographic diversity does not exist (Brief, pp. 38-40).

2. Analysis of Site Selection Process

In previous decisions regarding cogeneration facilities, the Siting Council has found that criteria such as those developed by MASSPOWER are appropriate for use in identifying and evaluating sites for cogeneration facilities. Altresco-Pittsfield, 17 DOMSC at 392-393; NEA, 16 DOMSC at 386-387. The Siting Council notes, however, that while the criteria MASSPOWER developed are appropriate, there are two significant limitations to these criteria.

First, MASSPOWER's criteria are uniformly broad. MASSPOWER gave no indication that it had enunciated more specific aspects underlying each criterion, such as a minimum quantity of steam demand, water supply, or financial resources of potential steam hosts. In addition, MASSPOWER provided no evidence that weights had been assigned to the criteria. Assignment of weights to criteria would have indicated how MASSPOWER rated the relative importance of each separate criterion. In previous cases, the Siting Council has noted its

concerns regarding the absence of weights in a company's site selection criteria. 1990 Berkshire Decision, EFSC 89-29 (Phase II), pp. 50-51; BECo/MWRA, 19 DOMSC at 41-42. Second, MASSPOWER's siting criteria focussed mainly on factors associated with successful development and operation of its proposed facility, while omitting significant concerns such as environmental impacts. For example, in selecting a steam host, criteria such as the proximity to residences, noise impacts, or wetlands impacts could have been used by MASSPOWER to assess the environmental impacts of the proposed facility on a community and its residents.

While the development of such broad criteria may be minimally acceptable for use in the preliminary identification and evaluation of potential steam hosts, the Siting Council is concerned that MASSPOWER did not develop a more detailed set of criteria for identification and evaluation of specific sites in and around the Monsanto complex. The recognition of economic or engineering advantages associated with siting on a steam host's property should in no way preclude the development of more complex criteria which enable review of a reasonable range of siting alternatives off-site as well as on-site. The development of more comprehensive criteria for final siting will enable a project proponent to identify and comprehensively evaluate a full range of possible sites. Here, MASSPOWER's failure to develop more comprehensive criteria effectively limited its ability to identify and evaluate a full range of sites in the vicinity of Monsanto.

Nonetheless, for the purposes of this review, the Siting Council finds that MASSPOWER has developed a minimally acceptable set of criteria for identifying and evaluating alternatives.

In regard to MASSPOWER's application of its siting criteria, the Siting Council again notes concerns with the thoroughness of MASSPOWER's site selection process. The Siting Council is hampered in its evaluation of MASSPOWER's application of siting criteria by a lack of detail in the information provided by MASSPOWER in this proceeding. In evaluating steam

hosts, while MASSPOWER appropriately applied its criteria in choosing between the Westover site and the Monsanto site, the Siting Council notes that MASSPOWER failed to provide a quantitative assessment of the steam demand, the water supply, and the size of the Westover site itself. Further, MASSPOWER failed to explain how the proximity of a fuel pipeline to the Westover site was considered relative to the other criteria.

In regard to the Monsanto site, the Siting Council notes that while MASSPOWER stated that the proposed Monsanto site meets all six criteria, the fourth criterion -- proximity to a fuel supply -- is directly dependent on construction of a 18-mile high-pressure pipeline proposed to be constructed by Bay State. A more detailed analysis of how MASSPOWER applied each individual criterion in evaluating alternative steam hosts would have enabled us to determine whether the criteria were appropriately applied in evaluating the Westover and Monsanto sites.

Finally, in regard to MASSPOWER's application of its criteria for the identification and evaluation of specific sites in the vicinity of Monsanto, the limited criteria set forth by MASSPOWER directly impacted the ability of MASSPOWER to identify and comprehensively analyze final sites. While the Siting Council supports the siting of cogeneration facilities on the property of steam hosts where such siting minimizes the costs and environmental impacts of such facilities, the Siting Council notes simply because land exists on the property of a steam host is not a sufficient reason in and of itself to disregard other potential sites. Only through the application of a comprehensive site selection process can a project proponent ensure that a clearly superior site, either on or off the property of a steam host, has not been overlooked or improperly eliminated. In this case, MASSPOWER identified the clear project advantages associated with locating the facility on Monsanto property. MASSPOWER failed, however, to adequately consider the possible economic disadvantages associated with locating the facility on Monsanto property. Further, while MASSPOWER stated that no other sites on Monsanto's property

offered environmental benefits relative to the proposed site, MASSPOWER failed to fully describe how that determination was made.

Nonetheless, the Siting Council finds that MASSPOWER has minimally established that it has appropriately applied its criteria in the identification and evaluation of alternatives.

As noted in Section III.A, above, the Siting Council found in the 1990 Berkshire decision that a comprehensive site selection process is the best way to ensure that a reasonable range of practical siting alternatives have been considered. The Siting Council indicated in that decision that in future cases the Siting Council review would focus on the site selection process to ensure that the petitioner has not overlooked or eliminated any clearly superior route or site, rather than on the practicality of a "noticed alternative."

The Siting Council notes, however, that the 1990 Berkshire decision was issued after hearings and the briefing period in this case had ended. Consequently, it is understandable that MASSPOWER focused its arguments on establishing that no practical facility alternative exists. To that end, MASSPOWER has provided documentation to indicate that (1) Monsanto is a known steam purchaser with an annual steam demand of about 150,000 lbs/hr; (2) Monsanto has executed a steam sales agreement with MASSPOWER for a sizable proportion of its annual steam needs; and (3) Monsanto has agreed to locate the proposed facility on its property (Exhs. M-1, pp. 18, 90-94, HO-N-18A, HO-S-1).

Accordingly, based on the record in this proceeding, the Siting Council finds that MASSPOWER has established that practical alternatives to the proposed facility do not exist.

3. Conclusions on Site Selection Process

The Siting Council has found (1) that MASSPOWER has developed a minimally acceptable set of criteria for identifying and evaluating alternatives; (2) that MASSPOWER has appropriately applied its criteria for identifying and evaluating alternatives; and (3) that MASSPOWER has established

that practical facility site alternatives to the proposed site do not exist.

Accordingly, the Siting Council finds that MASSPOWER has considered a reasonable range of practical facility siting alternatives.

While the Siting Council has found in this case that MASSPOWER has evaluated a reasonable range of siting alternatives, the Siting Council notes that a clarification of its site selection standard, as applied to cogeneration facilities, is appropriate in light of both the Altresco-Pittsfield and Berkshire decisions. Therefore, in future cases, the Siting Council will no longer require that a proponent of a cogeneration facility establish that practical alternative sites do not exist in order to be exempted from the requirement to include in its filing a noticed alternative site. Rather, in the future, a noticed alternative site will not be required if the cogeneration proponent (1) has a steam sales agreement with existing steam purchaser(s) sufficient to qualify it for QF status; and (2) has a proposed site fully within the property boundaries of the principal steam host.

However, in the future, whether or not a noticed alternative site must be included in a filing, the Siting Council will review the applicant's site selection process, consistent with the 1990 Berkshire decision, to ensure that clearly superior facility sites have not been overlooked or eliminated. Therefore, even in those cases where a noticed alternative site for a cogeneration facility is not required -- cases in which (1) the proponent has a steam sales agreement with existing steam purchasers sufficient to qualify it for QF status; and (2) the proponent's preferred site is fully within the property boundaries of the principal steam host -- the proponent of a cogeneration project would be well served to include as noticed alternatives those sites (on and off the steam host's property) which are roughly comparable to the preferred site in terms of achieving the appropriate balance between minimizing cost, minimizing environmental impacts and providing reliability.

D. Cost Analysis of the Proposed Facilities

Although MASSPOWER has established that there are no practical alternatives to its proposed site (see Section III.C, above), the Siting Council nevertheless must determine whether the proposed facilities are consistent with ensuring a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Therefore, the Siting Council evaluates the proposed facilities to determine whether the cost estimates associated with construction are (1) realistic for a facility of the size and design of MASSPOWER; and (2) minimized consistent with the mitigation of environmental impacts.

MASSPOWER estimated that the construction costs of the proposed facilities would total about $173.4 million, with the TCA representing about $142.7 million (Exh. HO-COM-5). MASSPOWER stated that its TCA will cover construction of the proposed power plant, including the SCR system and the switchyard, construction management and start-up, and a contingency of $5.9 million dollars (id.). In addition, MASSPOWER stated that it will expend about $30.7 million consisting of NUSCo transmission upgrades ($3.0 million), owner's expenses -- development costs, financing costs, and mobilization -- ($12.1 million), and interest during construction ($15.6 million) (Exhs. HO-C-1, HO-COM-5). Overall, MASSPOWER estimated that its proposed facility would cost about $769/kW in 1992 dollars (Exh. HO-RR-17).

MASSPOWER stated that the land costs associated with the 20-year site lease agreement were not reflected in the construction costs (Exh. M-1, p. 17). However, MASSPOWER asserts that its proposed site offers several cost advantages to MASSPOWER (Brief, pp. 40-41). First, MASSPOWER stated that its location adjacent to the existing steam generating facility allows considerable use of the existing steam delivery system (Exh. HO-S-2). MASSPOWER also stated that it has access to a plentiful water supply on a reduced-cost basis, and can dispose of its waste-water into an existing pre-treatment facility on a cost-shared basis (Exhs. HO-C-2, HO-C-3). Finally, the location

of the proposed power plant is about 2,600 feet from the NUSCo transmission system, thereby lessening interconnection costs (Exh. M-1, Attachment 3A, HO-C-4).

In this proceeding, MASSPOWER has shown that its estimated capital cost of $769/kW is below the EPRI TAG's average estimate of $829/kW for facilities of similar size and design (Exhs. M-1, p. 66, Section 10.2, Table 2, HO-RR-17). In addition, MASSPOWER has shown that the location of its proposed site provides access to the existing steam system and electric transmission system, and that its water use and waste-water discharge arrangements minimize costs. Further, the Siting Council notes that each of these cost minimization measures is consistent with mitigating environmental impacts.

Accordingly, the Siting Council finds that MASSPOWER has established that the cost estimates associated with the proposed facility are (1) realistic for a facility of the size and design of MASSPOWER; and (2) minimized consistent with the mitigation of environmental impacts.

E. Environmental Analysis of the Proposed Facilities

Although MASSPOWER has established that there are no practical alternatives to its proposed site (see Section III.C, above), the Siting Council nevertheless must determine whether the proposed facilities are consistent with ensuring a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Therefore, the Siting Council evaluates the environmental impacts of the proposed facilities to determine whether or not these have been adequately minimized.

1. Air Quality

MASSPOWER asserted that operation of its facility will not lead to a deterioration to local or regional air quality (Exh. M-1, p. 95). MASSPOWER claimed that the primary fuel for its facility, natural gas, is the cleanest fuel available and that distillate oil would only be used as an emergency backup fuel (id.). Further, MASSPOWER stated that its emissions would

be kept well below federal and state standards due to its reliance on natural gas and use of state-of-the-art pollution control technology (id.). Finally, MASSPOWER claimed that operations of its proposed facility would lead to improved regional air quality due to displacement of existing oil-fired and coal-fired power plants (id.).

MASSPOWER stated that its proposed facility would be required to comply with provisions of the federal Clean Air Act as administered by the EPA and the Massachusetts Department of Environmental Protection ("MDEP") (Exh. M-2, p. 6-1). With respect to more specific air quality issues, MASSPOWER identified 5 major air pollutants to be emitted by its proposed facility that are regulated under the Clean Air Act: (1) SO_2, (2) NO_x, (3) particulates ("TSP"), (4) carbon monoxide ("CO"), and (5) non-methane hydrocarbons which are precursors to ozone ("O_3") (Exhs. M-1, pp. 95-101, M-2, pp. 6-1 to 6-2). However, MASSPOWER indicated that its emissions of TSP, O_3, and CO were not major concerns based on regulatory standards and practices (Exh. M-2, pp. 6-3 to 6-4, 6-51). MASSPOWER claimed that (1) its projected emissions of TSP and O_3 were below the regulatory threshold of 100 TPY; and (2) elevated CO levels in the Springfield area are caused by motor vehicle emissions and that MDEP realizes that stationary sources such as MASSPOWER do not contribute significantly to that problem (Exh. M-2, pp. 6-3 to 6-4, 6-51).

However, MASSPOWER indicated that its NO_x emissions would trigger specific provisions of the Clean Air Act known as New Source Performance Standards ("NSPS") (id.). MASSPOWER indicated that NSPS would also apply to its SO_2 emissions (id.).[51]

51/ MASSPOWER stated that NSPS provisions apply to a proposed new source of emissions if that source has the capability to emit either SO_2, NO_x, TSP, CO, or O_3 at a rate of 250 TPY or more (Exh. M-2, Appendix 2, p. 4). Here, MASSPOWER's NO_x emissions will exceed 250 TPY triggering NSPS review (id., p. 2).

MASSPOWER stated that under NSPS, assessments of Best Available Control Technology ("BACT") options were required for NO_x and for SO_2 emissions.[52] MASSPOWER asserted that it would meet BACT requirements for NO_x with state-of-the-art control technology (id., p. 6-5). MASSPOWER stated that NO_x emissions would be controlled with steam injection and SCR (id.).[53] MASSPOWER asserted that SCR is considered to be BACT with respect to NO_x emissions, and that MDEP would fully support SCR as BACT for the MASSPOWER project (id., p. 6-3, 6-5). MASSPOWER provided a copy of a draft conditional approval from MDEP for its emission control technology (Exh. HO-E-1, Supplement). In addition, MASSPOWER claimed that its NO_x emissions based on SCR were consistent with air quality goals set forth by the New England States for Coordinated Air Use Management (Exhs. M-1, p. 97, M-2, Appendix 2, p. 10). Based on its SO_2 BACT assessment, MASSPOWER concluded that implementation of SO_2 control technology was prohibitive on economic grounds and further that BACT was not justified by air quality modeling results (Exh. M-2, pp. 6-5 to 6-7, Appendix 2, pp. 14-15).[54] However, MASSPOWER stated that even without BACT, its SO_2 emissions would comply with the Commonwealth's acid rain reduction program, which limits average SO_2 emissions to 1.2 pounds per million Btu ("lbs/MMBtu") (id., Appendix 2, p. 1).

52/ MASSPOWER stated that a BACT assessment for SO_2 was required (1) because NSPS stipulates that once the NO_x emissions of a project exceed 250 TPY then a BACT assessment is required if that project's emissions of SO_2 are greater than 40 TPY, and (2) MASSPOWER's projected emissions of SO_2 amount to 56 TPY (Exh. M-2, p. 6-6).

53/ MASSPOWER claimed that use of steam injection in combination with SCR would limit its NO_x emissions to 9 parts per million ("ppm") (corrected to 15 percent O_2 content in the turbine exhaust, dry gas volume) (Exhs. M-2, Appendix 2, p. 5, M-1, pp. 97, 99).

54/ MASSPOWER stated that a BACT assessment allows for consideration of (1) energy use; (2) environmental impact; and (3) economic impacts of potential control technology options (Exh. M-2, Appendix 2, p. 1).

In addition to the foregoing NSPS provisions, MASSPOWER reported that it was required to demonstrate that its SO_2 emissions would not contribute to a deterioration of existing air quality in the Springfield area (id., pp. 6-3 to 6-4). MASSPOWER selected two EPA air quality models to use in that demonstration, including (1) the Industrial Source Complex Short-term Model ("ISCST"), and (2) the VALLEY model (id., pp. 6-8 to 6-10). Based on results of studies using these models, MASSPOWER concluded that its SO_2 emissions would not contribute to an air quality problem in the Springfield area under oil- or gas-firing conditions (id., pp. 6-16, 6-20, 6-23, 6-35). Further, MASSPOWER claimed that results of studies using the foregoing models demonstrated that its nitrogen dioxide ("NO_2") emissions would comply with an MDEP one-hour standard (id., pp. 6-35 to 6-37).

MASSPOWER stated that state emissions standards also apply to releases of ammonia "slip" (id., p. 6-39). MASSPOWER described ammonia slip as ammonia which inadvertently passes through the SCR system without reacting and is therefore released into the atmosphere through the stack (id.). MASSPOWER claimed that its releases of ammonia slip would be limited to a maximum of 20 parts per million volume ("ppmv") (corrected to 15 percent O_2, dry basis) through proper design and operation of its SCR technology (id.). In addition, MASSPOWER claimed that ammonia slip concentrations would be well below MDEP standards (id.).

Finally, in terms of regional air quality, MASSPOWER argued that operations of its proposed facility would provide net improvements to regional air quality (Exh. HO-E-40). MASSPOWER argued that reductions of 3,300 TPY of NO_x and 4,100 TPY of SO_2 were likely, resulting from displacement of residual oil-fired and coal-fired facilities and due to decreased use of Monsanto's coal-fired boiler (id.). For purposes of this argument, MASSPOWER assumed that its facility would be 100 percent gas-fired, that non-peak demand comprises 75 percent of a year, and that emission reductions are based on 0.5 percent sulfur residual oil-fired facilities (Exh. M-2,

p. 6-48). MASSPOWER also claimed that its steam sales agreement would provide environmental benefits to the region (Exh. HO-E-40). However, the Siting Council has found that MASSPOWER has failed to establish that its steam sales agreement would produce clear environmental benefits (see Section II.A.4.b, above).

In regard to MASSPOWER's assertion that emissions reductions will result from power plant displacement within NEPOOL, the Siting Council finds that MASSPOWER's analysis is based on an insufficient level of documentation to support the assumptions on which its major conclusion is based. In a previous case, the Siting Council found that a proponent must provide full documentation of its assumptions pertaining to the potential displacement of existing generating facilities. Altresco-Pittsfield, 17 DOMSC at 400. The Siting Council notes that MASSPOWER has documented certain of its assumptions but that the scope of this documentation is unnecessarily limited. Key assumptions undocumented by MASSPOWER, but nonetheless significant, include NEPOOL plant dispatch procedures, plant availability projections, fuel price projections, reserve requirement estimates, transmission system capability estimates, and likely revisions to environmental permitting. Thus, the Siting Council notes that a determination of the environmental advantages or disadvantages of a specific plant cannot be made without a more comprehensive assessment of key institutional, economic, and regulatory factors and their effect on existing as well as proposed facilities.

Nevertheless, the Siting Council notes that MASSPOWER will use natural gas as its primary fuel, and that MASSPOWER will install advanced control technology to reduce its emissions of NO_x. Accordingly, based on the foregoing, the Siting Council finds that the proposed facility will have an acceptable impact on air quality.

2. Noise

MASSPOWER stated that its facility would comply with all existing noise level standards (Exhs. M-1, p. 107, M-2,

p. 5-14). MASSPOWER asserted that while noise increases of up to 10 decibels ("dB") were allowed by MDEP standards, its proposed facility would increase noise by only 4 dB (Exh. M-2, p. 6-53).[54A] In support of this assertion, MASSPOWER submitted (1) the results of a noise survey taken in the vicinity of the proposed project; and (2) a description of the noise mitigation measures incorporated into its generating plant (id., p. 6-55). In addition, MASSPOWER stated that its proposed switchyard would contain no noise-producing equipment (Exh. HO-E-26).

MASSPOWER stated that it performed a survey of ambient noise over weekday and weekend periods of the day and night during October and November, 1988 (Exhs. M-1, p. 109, M-2, Appendix 5, p. 4). MASSPOWER stated that ambient noise was defined generally as the background level of noise which was exceeded 90 percent of the time (Exh. M-1, p. 107). MASSPOWER indicated that the lowest ambient level surveyed was about 45.6 dB as measured at the residence located nearest to the proposed generating facility (id., p. 114). Based on its ambient noise survey, MASSPOWER identified the Massachusetts Turnpike and the Monsanto plant as major contributors to current ambient noise levels (id., p. 113).

MASSPOWER stated that noise mitigation was incorporated into its proposed project through design features including: enclosing turbines and other mechanical components within buildings, insulating walls, minimizing the number of doors and

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54A/ MASSPOWER stated that it had agreed to limit ambient noise increases from its proposed facility based on terms of its site lease agreement with Monsanto (Exh. HO-S-1, Article 7.1, pp. 21-22). MASSPOWER stated that its site lease agreement with Monsanto included a provision limiting ambient noise increases from its proposed facility to (1) no more than 2 dB at the northern, eastern, and western boundaries of Monsanto's industrial complex; and (2) no more than 4 dB at Monsanto's southern boundary (id.). While the 2 dB increase would be within MDEP standards, MASSPOWER provided no evidence to indicate how it would achieve an increase of only 2 dB at the aforementioned Monsanto boundaries.

windows, using axial flow fans, and specifying noise emission standards for ventilation equipment (id., pp. 114 to 115; Exh. HO-E-9). Based on the foregoing design features, MASSPOWER asserted that its proposed project would produce noise at a level of no more than 48 dBA as measured at the nearest Monsanto property boundary (Exh. M-2, p. 6-55).

MASSPOWER claimed that the existing ambient noise and the highest expected plant noise would combine to produce a new ambient noise level of 50 dB as measured at the nearest residence (id.). MASSPOWER stated that a noise level of 60 dB was identified as adequate to ensure full intelligibility of outdoor conversation (id., p. 6-56). In addition, MASSPOWER asserted that noise levels below 70 dB would be unlikely to expose individuals to the possibility of hearing loss (id.). Thus, MASSPOWER concluded that operations of its facility would produce no adverse effects with respect to noise (id., p. 6-55).

The Siting Council finds that MASSPOWER has provided adequate support for its claim that noise impacts from the proposed facilities would meet applicable limits. The Siting Council notes that MASSPOWER has identified various components of its proposed facility which could contribute to increased levels of ambient noise and has proposed measures which will largely mitigate those increases. Accordingly, the Siting Council finds that, with MASSPOWER's proposed mitigation measures, operation of the proposed facilities would have an acceptable impact on community noise levels.

3. Water Supply

MASSPOWER stated that its water needs can be satisfied through an arrangement to use water currently being discarded by the Monsanto industrial plant (Exh. M-1, p. 115). MASSPOWER indicated that Monsanto's industrial plant currently requires about 4.0 million gallons per day ("MGD") of water for once-through cooling purposes, and that following use by Monsanto, this water is discharged into the Chicopee River (id., pp. 115-116). MASSPOWER asserted that this water is of sufficient quality and low enough in temperature to be used as

the water supply for the proposed facility (Exh. M-2, p. 5-20). Consequently, MASSPOWER has arranged to use about 2.0 MGD of Monsanto's cooling water for operations of its proposed generating facility (Exh. M-1, p. 115).[55] However, MASSPOWER indicated that prior to use in the proposed generating facility, the water would be filtered and demineralized at treatment facilities to be installed by MASSPOWER (Exh. M-2, p. 6-58).

In the event of contingencies, including periods during which the Monsanto plant is not operating, MASSPOWER stated that it would use City of Springfield water, delivered through an independent water hookup to that city's water system (Exhs. M-1, p. 116, M-2, p. 5-20, HO-E-16).[56] MASSPOWER indicated that use of its independent water hookup would be limited to contingency responses only (Exhs. M-1, p. 116, M-2, p. 5-20, HO-E-16). MASSPOWER did not indicate whether or not it would require authorization from the City of Springfield for such a hookup (Exhs. M-1, p. 116, M-2, p. 5-20, HO-E-1, HO-E-16).

The Siting Council recognizes that MASSPOWER's proposed re-use of Monsanto cooling water represents an innovative and conservation-oriented solution to its water requirements. The re-use of Monsanto's cooling water avoids an impact to the Springfield water system under all but contingency conditions, and is likely to successfully consolidate the independent water needs and water uses of two large industrial facilities.

Based on the foregoing, the Siting Council finds that MASSPOWER has provided sufficient documentation to support its assertion that water supplies are available to support the

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55/ MASSPOWER stated that its facility would also utilize about 7,000 gallons per day (.007 MGD) of City of Springfield water for drinking and sanitary uses (Exh. M-2, p. 6-58).

56/ MASSPOWER stated that the City of Springfield presently has a water demand of about 40 MGD and a supply capacity of about 100 MGD (Exh. HO-E-16). Further, MASSPOWER reported that Springfield's water supply capacity is scheduled to reach 110 MGD starting in 1990, based on installation of new equipment (id.).

proposed facilities without adverse impact. Accordingly, the Siting Council finds that the proposed facilities would have an acceptable impact upon the City of Springfield's water supply.

4. Waste-water Discharge

MASSPOWER stated that its wastewater would meet pre-treatment requirements of the EPA and the City of Springfield (Exh. M-2, p. 6-63). MASSPOWER stated that compliance with the foregoing pre-treatment standards would be accomplished through control technology, and/or selective applications of chemicals (id., pp. 6-63 to 6-64). Further, MASSPOWER asserted that the amount of waste-water produced by its proposed facility would have a negligible impact on existing treatment facilities (id.). MASSPOWER also indicated that waste-water flows would be significantly lower than the proposed facility's overall water supply requirements since the majority of water withdrawn for use in the proposed plant would be evaporated to the atmosphere or consumed by plant operations (id., p. 6-62).[57]

MASSPOWER stated that control technology would be used to meet waste-water regulations applicable to oil/grease and temperature levels (id., p. 6-63). With respect to selective applications of chemicals, MASSPOWER stated that chromium and zinc would not be used in any plant processes affecting waste-water and that wastes containing copper would be treated off-site (id., p. 6-64). In addition, MASSPOWER indicated that its waste-water would be treated at Monsanto's existing "equalizing" system to neutralize acidity (Exhs. M-1, p. 119, M-3, p. 4-8). MASSPOWER stated that Monsanto presently discharges about 6 MGD of its own waste-water to its facility,

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57/ MASSPOWER stated that its overall water supply requirements amount to about 2.0 MGD (Exh. M-2, p. 6-59). However, operations of the cooling system will evaporate about 1.2 MGD into the atmosphere, production of steam and other boiler operations will consume about .42 MGD, while about .38 MGD would remain as waste-water (id., pp. 6-58 to 6-59).

and that MASSPOWER would add another .38 MGD (Exh. M-2, p. 4-7).

MASSPOWER stated that waste-water released from the Monsanto equalizing system -- including Monsanto waste-water and that of MASSPOWER -- would be sent through the City of Springfield sewer system for transport to the Bondi Island Regional Waste-water Treatment Plant ("Bondi Island") for further treatment (id., p. 5-21).[58] Waste-water treatment at Bondi Island includes coarse filtering, primary clarification, secondary aeration, final clarification, and chlorination (id., p. 6-64). The rated capacity of Bondi Island is about 174 MGD at peak, with average monthly flows of about 67 MGD (id., p. 6-64). MASSPOWER indicated that under dry weather conditions, flows averaged about 40 to 45 MGD at Bondi Island (id.).

MASSPOWER asserted that its waste-water flows were minor relative to the capacity of Bondi Island, and that its flows would not have a significant impact on Bondi Island (id.). In fact, MASSPOWER estimated that its waste-water amount would represent about one percent of Bondi Island's capacity under dry weather conditions (id.). MASSPOWER indicated that it would need a Springfield Regional Waste-water Treatment Plant Industrial Waste-water Discharge Permit (Exh. HO-E-1, Supplement). MASSPOWER did not indicate whether such a permit would cover transport of its waste-water through the City of Springfield sewer system, or whether it would be covered by any existing permit held by Monsanto (Exh. HO-E-1).

Accordingly, the Siting Council finds that waste-water flows of the proposed facilities would have an acceptable impact on the existing waste-water treatment system. However, the Siting Council notes that additional information regarding the need for and status of local permits associated with waste-water flows and treatment would have provided the Siting Council with a more complete understanding of MASSPOWER's waste-water impacts.

58/ Bondi Island is located in Westfield, about 6 miles southwest of Monsanto (Exh. M-2, p. 5-21).

5. Wetlands and Waterways

MASSPOWER stated that construction of its proposed project would affect two land areas classified as wetlands by the Massachusetts Wetland Protection Act, including (1) stream banks; and (2) vegetated areas which border streams or wetlands ("BVW") (Exh. M-2, Appendix 6, pp. 7-8). MASSPOWER stated that construction of its proposed project would require: (1) trimming of trees on the banks of the Chicopee River; and (2) clearing and grading within a BVW on the north side of the Chicopee River (id., Appendix 6, pp. 1-9). In addition, MASSPOWER identified a potential waterway impact due to a reduction of water presently discharged into the Chicopee River (id., p. 6-62; Exhs. M-3, p. 5-12, HO-E-34). However, MASSPOWER asserted that impacts to the banks of the Chicopee River, the BVW, and to the Chicopee River itself would be minimal (Exhs. M-2, pp. 7-8 to 7-9, HO-E-34). In addition, MASSPOWER reported that none of its proposed facilities would be located within the 100-year floodplain of the Chicopee River (Exh. HO-E-29).

MASSPOWER indicated that its proposed overhead transmission line would cross the Chicopee River, and that the right-of-way beneath this transmission line required 6 feet of clearance from existing vegetation (Exh. HO-E-23). Thus, MASSPOWER stated that trees growing on the banks of the Chicopee River would be trimmed to provide that clearance (id.). However, MASSPOWER claimed that it would only trim trees which actually interfere with installation of the proposed overhead line, leaving other trees and vegetation intact, and that tree trimming would be accomplished with hand methods (Exh. M-2, p. 7-9). MASSPOWER stated that tree trimming would involve removal of five to 15 feet of the topmost portions of the trees, and that exposed portions of trimmed trees would be treated to prevent disease (Exh. HO-E-23). Overall, MASSPOWER estimated that about 50 trees would have to be be trimmed, consisting of 35 trees on the south bank of the Chicopee River and 15 trees on the north bank (id.). MASSPOWER stated that the right-of-way beneath the proposed overhead transmission line would be maintained with hand methods and that herbicides would not be

used (id.; Exh. M-2, p. 7-9).

MASSPOWER stated that its proposed switchyard, three of its transmission towers, and an access road were to be located in a BVW across the Chicopee River from the Monsanto site (Exh. M-2, p. 7-8). MASSPOWER asserted that it would employ mitigation measures to control erosion and to promote rapid stabilization of all disturbed areas within that BVW (Exh. M-3, p. 5-11). MASSPOWER provided that a double row of haybales would be installed, and that these would remain in place until final stabilization has occurred (Exh. M-2, p. 7-8). Further, MASSPOWER asserted that switchyard would be surfaced with gravel, as opposed to an impervious substance, thereby eliminating a potential increase in runoff (id.).

MASSPOWER reported that Monsanto currently discharges about 4.0 MGD of cooling water into the Chicopee River, but that these discharges would be reduced to about 2.0 MGD once the proposed facility commences operation (see Section III.E.3, above) (Exhs. HO-E-34, M-2, p. 6-62, M-3, p. 5-12). MASSPOWER asserted that a 2.0 MGD reduction in discharges would have an insignificant impact on the streamflows of the Chicopee River (Exhs. HO-E-34, M-3, pp. 5-12 to 5-13). In support of this assertion, MASSPOWER analyzed streamflows of the Chicopee River under two low-flow conditions: (1) the seven day average low flow with a return period of 10 years ("7Q10"); and (2) a seven day average low flow with a return period of two years ("7Q2") (Exh. M-2, p. 8-12). Based on these analyses, MASSPOWER estimated that a 2.0 MGD reduction would result in streamflow decreases of (1) 2.4 percent under 7Q10 conditions; and (2) about 1.6 percent under 7Q2 conditions (id.).

The Siting Council notes that MASSPOWER's tree trimming proposal would leave trees beneath its proposed overhead transmission line largely intact, and is therefore more favorable to protection of wetland areas than alternate methods such as tree removal. In addition, the Siting Council notes that MASSPOWER has provided adequate analyses of potential streamflow impacts to the Chicopee River. Accordingly, based on the foregoing, the Siting Council finds that with the mitigation

measures proposed by MASSPOWER, the proposed facility would have acceptable impacts on wetlands. The Siting Council also finds that the 2.0 MGD reduction of discharges into the Chicopee River proposed by MASSPOWER would have an an acceptable impact on waterways.

6. Visual Impacts

The major visual impact from the proposed facility will be created by the 213-foot exhaust stack, four overhead transmission towers (one of which would be 99 feet high and the others would be 95 feet high), and, to a lesser degree, a building enclosing the HRSG (with a maximum roof height of 82 feet), and a building enclosing the turbine (with a maximum roof height of 60 feet) (Exhs. M-1, Supplemental to Section 3.4, M-2, pp. 3-3, 5-23, 6-67, M-3, p. 3-1, HO-E-20, HO-E-25). MASSPOWER asserted that the scale of its cogeneration facility is consistent with structures already present on the Monsanto site and that due to the topography of the surrounding area the proposed facilities will not contribute to increased visual impacts (Exh. M-2, pp. 5-1, 5-23). MASSPOWER further stated that Monsanto has an existing stack similar in height to the 213-foot stack proposed by MASSPOWER, but MASSPOWER did not set forth the height of the existing Monsanto stack (id.).

With respect to the stack height, MASSPOWER argued that "Good Engineering Practice" or "GEP" mandates a stack height of 213 feet as "de minimus" under MDEP and EPA air quality regulations (Exhs. M-2, p. 6-9, HO-E-4). MASSPOWER claimed that the "de minimus" GEP is unrelated to the height or dimensions of nearby buildings and this 213-foot stack height would be allowed regardless of the height and width of nearby buildings (Exh. HO-E-4). MASSPOWER claimed that a 213-foot stack was strongly supported by the MDEP based on its dispersion characteristics, including its ability to (1) reduce local air quality impacts to their lowest possible levels; (2) eliminate downwash of emissions; and (3) minimize the impacts of emissions at receptor locations above the stack top (id.). MASSPOWER asserted that it would use simple structural elements and colors

to minimize visual impacts. However, MASSPOWER provided no specific information describing what methodologies would be used to select structural elements and colors that would minimize visual impacts (Exh. M-1, p. 123)

With respect to the transmission line towers, the 99-foot tower would be constructed on the northwestern corner of the Monsanto compound and the three 95-foot towers would be constructed at the site of the proposed switchyard (Exhs. M-1, Supplemental to Section 3.4, HO-E-20, HO-E-25). MASSPOWER stated that "A" frame steel transmission towers were selected over lattice towers due to: (1) reduced space requirements; (2) better aesthetic appearance; and (3) ease of installation (Exh. HO-E-22). However, MASSPOWER provided no evidence to indicate that it had considered any other combination or placements of towers to meet visual impact concerns (id.).

While the record tends to support MASSPOWER's position that (1) the location of the proposed facility on the Monsanto industrial site (with its pre-existing visual impacts); and (2) the surrounding topography contribute to minimizing the visual impacts of the proposed facility, MASSPOWER largely has failed to address the project's visual impacts. MASSPOWER's analysis would have been strengthened considerably if it had assessed the visual impact of its proposed project within some framework which indicated the tradeoffs between visual impact and other concerns. For example, MASSPOWER has clearly failed to address the visual impacts associated with its stack. A comprehensive visual impact analysis of stack heights would have reviewed a range of stack height options, including those above and below 213 feet, and assessed the relative cost and environmental impact differentials of these heights prior to selecting a specific height. Here, MASSPOWER basically has selected a stack height without considering alternatives of any sort. In fact, MASSPOWER stated that it had not considered reducing the height or profile of its proposed buildings to provide for a lower stack height because it had chosen a height based on "de minimus" GEP (Exh. HO-E-4).

In addition, it is important to note that while air

quality concerns are inexorably tied to stack heights, compliance with stack height requirements for purposes of emission regulation is not tantamount to a finding that the mandated stack height has acceptable visual impacts. On the contrary, there may be sites which simply cannot accommodate the visual impacts associated with stacks constructed sufficiently high to meet air quality requirements. It also bears mention that project proponents should be on notice that citing to GEP is the beginning, and not the end of a discussion of stack height or other building or tower dimensions.[59] The Siting Council's understanding is that GEP refers only to a recommended engineering guideline that is not immutable.

In light of the foregoing, MASSPOWER is ORDERED to construct its two main buildings, its exhaust stack and its transmission towers at no more than the following heights (except for minor variations): exhaust stack, 213 feet; HRSG building, 82 feet; turbine building, 60 feet; transmission tower on the Monsanto property, 99 feet; other transmission towers, 95 feet. Should the design plans for these structures change such that the height of these structures would exceed these heights, except for minor variations, MASSPOWER is ORDERED to provide all such information to the Siting Council so that the Siting Council may decide whether to inquire further into this issue.[60]

59/ This case also indicates that there may be some confusion concerning what is called for under GEP. In other cases, we have been told that GEP is directly related to the height of attached and nearby buildings. Specifically, GEP has been said to recommend that stack height should be two and one-half times the height of nearby structures (see Altresco-Pittsfield, 17 DOMSC at 405).

60/ In setting out specific Orders in regard to visual impacts, the Siting Council does not in any way intend to diminish a project proponent's absolute obligation to construct its facility in strict conformance with all aspects of its proposal with the Siting Council. In the case of changes, other than minor variations, a project proponent is required to file that information with the Siting Council so that the Siting Council may decide whether to inquire further into that issue.

Pursuant to the foregoing, and in recognition of the ORDERS set forth above, the Siting Council declines to find that the construction of the proposed facilities would result in an unacceptable visual impact on the surrounding community.

7. Safety

Major safety issues identified by MASSPOWER included (1) selection, storage, and transport of ammonia; (2) the potential for roadway icing due to cooling system drift; and (3) possible pre-existing contamination of its proposed site (Exh. M-2, pp. 6-68 to 6-69; Exh. HO-E-31A).

MASSPOWER stated that ammonia would be required as an input to its SCR pollution control technology (Exh. M-2, p. 6-69). However, MASSPOWER stated that for safety reasons it had selected aqueous ammonia for that use (id.). MASSPOWER stated that aqueous ammonia was a water-based solution, with a concentration of 28 percent ammonia and 72 percent water (id.). MASSPOWER's witness, Mr. Bibbo, stated that this concentration is about the same as ammonia-based cleaning solutions "available in supermarkets" (Tr. 3, p. 93). In addition, MASSPOWER stated that under normal circumstances aqueous ammonia would not rapidly vaporize, thereby decreasing its ability to disperse into the surrounding environment (Exh. M-2, p. 6-70). MASSPOWER rejected the alternative type of ammonia, anhydrous ammonia, due to (1) its 100 percent concentration of ammonia; and (2) its ability to vaporize rapidly and disperse into the surrounding environment (id.).

MASSPOWER asserted that its aqueous ammonia storage system was designed to promote safety (id., p. 6-69; Exh. HO-RR-11). First, MASSPOWER stated that its storage tank would be surrounded by a steel dike large enough to contain a complete tank failure underlain at ground level by an impervious membrane (id.; Tr. 2, p. 75). Second, MASSPOWER asserted that a total tank failure would not endanger the public (Exh. HO-RR-11). MASSPOWER stated that it modeled ammonia concentrations due to a tank failure under "worst-case" atmospheric conditions (Exh. M-2, p. 6-70). Based on this

modeling, MASSPOWER claimed that ammonia concentrations at the Monsanto boundary closest to the proposed project would not exceed the applicable federal safety level for ammonia exposure of 500 ppm (id.).[61] Consequently, MASSPOWER concluded that injuries to the public would not occur even during the worst conceivable tank failure conditions (id., p. 6-71). Finally, MASSPOWER claimed that the design of its tank had a frequency of total tank failure rate of only five 5 in 100,000,000 years (id., p. 6-69).

Finally, MASSPOWER stated that it would develop an ammonia-spill emergency plan (Exh. HO-RR-12). MASSPOWER indicated that its emergency plan would consist of (1) a risk evaluation; and (2) an action plan delineating an evacuation strategy for the area (Exh. HO-E-45). MASSPOWER stated that its emergency plan was subject to review by Springfield's Police and Fire Departments, and its Civil Defense Agency (Exh. HO-E-45).[62]

MASSPOWER stated that aqueous ammonia would be trucked to its proposed facility in shipments of about 8,000 gallons each (Exhs. M-2, p. 6-71, HO-E-44). MASSPOWER claimed that over the period 1983-1988 aqueous ammonia had been safely transported by truck throughout the U.S., with no accidents leading to an irreversible injury to the public (Exh. M-2, p. 6-72).

61/ Mr. Bibbo stated that a proposed 60,000 gallon ammonia storage tank was decreased to 30,000 gallons in order to reduce potential off-site concentration under catastrophic failure conditions (Tr. 3, p. 90).

62/ MASSPOWER indicated that its emergency plan would be developed in accordance with National Response Team "Guidelines for Emergency Response Planning," and guidelines of the Chemical Manufacturers' Association "Community Awareness and Emergency Response" program (Exh. HO-E-45). In addition, MASSPOWER stated that its emergency plan would be developed in conjunction with the Local Emergency Planning Committee ("LEPC") (Exh. HO-RR-12). MASSPOWER stated that even though the LEPC does not require an emergency response plan for aqueous ammonia such a plan would be developed to alleviate any concerns regarding its use (Exh. HO-RR-11).

In regard to roadway icing, MASSPOWER asserted that operations of its proposed cooling system would not contribute to roadway icing in winter (id., p. 6-68). MASSPOWER stated that its cooling system would produce water droplets or "drift" which could freeze on roadways during winter months (id., pp. 6-67 to 6-68). However, MASSPOWER claimed that the roads closest to its proposed facility -- Worcester Street and the Massachusetts Turnpike -- were far enough away from the cooling system to avoid any significant drift deposition (id.). MASSPOWER indicated that Worcester Street was about 1,000 feet from the proposed cooling system, and that the Massachusetts Turnpike was about 2,100 feet from the same point (id.). In addition, MASSPOWER stated that icing of drift deposits would only be likely to occur about eight percent of any year, and that if problems with drift arise its cooling system could be adjusted so that less drift would result (id.).

With respect to possible pre-existing contamination of its proposed site, MASSPOWER stated that the Monsanto compound had been assessed for such contamination in 1987 (Exh. HO-E-31A). Based on the results of that assessment, MASSPOWER asserted that the land areas designated for use by its facility including the proposed generating plant, storage tanks, access road, transmission towers, duct bank, and switchyard were free of contamination from hazardous materials (id.).

The Siting Council accepts MASSPOWER's contention that aqueous ammonia is safer than alternative types. In addition, the Siting Council recognizes that MASSPOWER's decision to develop an emergency response plan furthers safety objectives in the Springfield area and represents responsible planning by a developer. Accordingly, based on the safety measures presented by MASSPOWER, the Siting Council finds that the proposed facilities would have acceptable safety impacts.

8. Electrical Effects of Transmission Line

MASSPOWER stated that its proposed 115 kV transmission line would produce electric and magnetic fields (Exh. HO-E-19, Supplement). However, MASSPOWER asserted that the electric and

magnetic field levels would be produced at relatively low levels (id.).[63] In addition, MASSPOWER stated that the potential for exposure to electric and magnetic fields would be minimal and would not involve the general public (id.).

MASSPOWER estimated the maximum electric and magnetic field levels that would be produced by its transmission line, as shown in the table below (id.). In performing these estimates, MASSPOWER differentiated between the field levels associated with the overhead and underground sections of its transmission line (id.). In addition, MASSPOWER stated that its magnetic field estimates were based on line phasings which would minimize production of those fields (id.). MASSPOWER measured electric field levels in terms of kilovolts per meter ("kV/m") while magnetic fields were measured in milligauss ("mG") (id.).

	Electric Field	Magnetic Field
Overhead Section	0.34 kV/m	20 mG
Underground Section	0.00 kV/m	3 mG

MASSPOWER stated that the underground section of its proposed 115 kV transmission line would be located entirely within the Monsanto industrial complex and that the overhead section would be located in an unpopulated area north of the Chicopee River (id.). In addition, MASSPOWER claimed that the area surrounding its overhead line is generally inaccessible (id.).

In a previous review of proposed transmission facilities which included 345 kV transmission lines, the Siting Council

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63/ MASSPOWER stated that Florida had established the most stringent electric and magnetic field standards in the nation, and that its proposed field levels were well below those standards (Exh. HO-E-19, Supplement). MASSPOWER stated that its electric field level was 17 percent of that allowed in Florida, and that its magnetic field level was about 14 percent of that state's standard (id.).

addressed the expected electrical effects of such facilities. 1985 MECo Decision, 13 DOMSC at 223-242. In that case, it was estimated that the electric field would not exceed 1.8 kV/m and that the magnetic field would not exceed 85 mG along the edge of the right-of-way in Massachusetts. Id. Here, the Siting Council notes that the electric and magnetic field levels estimated by MASSPOWER are well below the electric and magnetic field levels noted in that case.

Based on the record in this proceeding, the Siting Council finds that the proposed transmission line would have acceptable impacts with respect to electrical effects. In addition, the Siting Council notes that MASSPOWER developed its estimates of electric and magnetic fields using state-of-the-art software and modeling techniques. Thus, MASSPOWER has effectively expanded the scope of information pertaining to these fields, especially with regard to the field levels estimated for underground sections of proposed transmission lines.

9. Conclusions on Environmental Impacts

The Siting Council has found that, with the environmental mitigation proposed by MASSPOWER, the environmental impacts of construction and operation of the proposed facilities at the proposed site would have an acceptable impact on air quality, noise, water supply, waste-water treatment, wetlands and waterways, safety, and electrical effects. At the same time, the Siting Council has declined to find that construction of the proposed facilities would result in an unacceptable visual impact on the surrounding community. Accordingly, the Siting Council finds that, on balance, construction and operation of the proposed facilities at the proposed site would have acceptable environmental impacts.

F. Conclusions on the Proposed Facilities

The Siting Council has found that MASSPOWER has considered a reasonable range of practical facility siting alternatives. In addition, the Siting Council has found that

MASSPOWER has established that the cost estimates associated with the proposed facility are (1) realistic for a facility of the size and design of MASSPOWER; and (2) minimized consistent with the mitigation of environmental impacts. Further, the Siting Council has found that the environmental impacts of construction and operation of the proposed facilities at the proposed site are acceptable. However, the Siting Council has made no finding on the reliability of the power generated at and transmitted from the proposed facility at the proposed site.

Accordingly, the Siting Council finds that the construction and operation of the proposed facilities at the proposed site is acceptable in terms of costs and environmental impacts.

IV. DECISION AND ORDER

The Siting Council finds that upon compliance with the four conditions set forth in Section II.D, the construction of the proposed generating facility and ancillary facilities is consistent with providing a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Accordingly, the Siting Council hereby APPROVES the petition of MASSPOWER, Inc. to construct a bulk generating facility and ancillary facilities subject to the conditions set forth in Section II.D.

Further, the Siting Council ORDERS MASSPOWER, Inc. to comply with the ORDERS set forth in Section III.E.6.

Frank P. Pozniak
Hearing Officer

Dated this 10th day of August, 1990.

UNANIMOUSLY APPROVED by the Energy Facilities Siting Council at its meeting of August 10, 1990 by the members and designees present and voting. Voting for approval of the Tentative Decision as amended: Paul W. Gromer (Commissioner of Energy Resources); Barbara Kates-Garnick (for Mary Ann Walsh, Secretary of Consumer Affairs and Business Regulation); Joellen D'Esti (for Alden S. Raine, Secretary of Economic Affairs); Robert Roach (for John P. DeVillars, Secretary of Environmental Affairs); Sarah Wald (Public Environmental Member); Kenneth Astill (Public Engineering Member); and Michael Ruane (Public Electricity Member).

Paul W. Gromer
Chairperson

Dated this 10th day of August 1990

Table 1

MASSPOWER, INC.

Projections of NEPOOL Demand and Supply
Supply Surplus/(Deficit) in MW

Forecast	Base Case Scenario 1992	1993	1994	1995
1988 NEPLAN Forecast	552	(571)	(1,112)	(1,650)
Alternative Forecast	(462)	(1,565)	(2,331)	(3,090)

Forecast	No Seabrook Scenario 1992	1993	1994	1995
1988 NEPLAN Forecast	(598)	(1,721)	(2,262)	(2,800)
Alternative Forecast	(1,612)	(2,715)	(3,481)	(4,246)

Forecast	50 Percent NUG Attrition Scenario 1992	1993	1994	1995
1988 NEPLAN Forecast	(89)	(1,177)	(1,717)	(2,263)
Alternative Forecast	(1,102)	(2,171)	(2,936)	(3,701)

Notes:

1. Base case scenario consists of Seabrook and all committed NUG projects.

2. MASSPOWER's alternative demand forecast assumed load growth of 4 percent per year through 1991 and 2.7 percent thereafter.

3. MASSPOWER established NEPOOL reserve requirements by assuming a constant reserve margin of 20 percent.

Source: Exh. M-1, Table 9-2

Table 2

MASSPOWER, INC.

Projections of NEPOOL Demand and Supply
Supply Surplus/(Deficit) in MW

Forecast	Base Case Scenario 1992	1993	1994	1995
1989 NEPLAN Forecast	1,437	574	(332)	(1,037)
Alternative Forecast	173	(859)	(1,900)	(2,715)

Forecast	No Seabrook Scenario 1992	1993	1994	1995
1989 NEPLAN Forecast	287	(576)	(1,482)	(2,187)
Alternative Forecast	(977)	(2,009)	(3,050)	(3,865)

Forecast	50 Percent NUG Attrition Scenario 1992	1993	1994	1995
1989 NEPLAN Forecast	934	71	(836)	(1,540)
Alternative Forecast	(330)	(1,363)	(2,404)	(3,219)

Notes:

1. Base case scenario consists of Seabrook and all committed NUG projects.

2. MASSPOWER's alternative demand forecast assumed load growth of 4 percent per year through 1991 and 2.7 percent thereafter.

3. MASSPOWER established NEPOOL reserve requirements by assuming a constant reserve margin of 20 percent.

Source: Exh. HO-N-6C

TABLE 3

Proposed Project Compared to Alternatives
Estimated Annual Air Emissions
(Tons Per Year)

Substance	Proposed Project	Distillate Oil Plant	Residual Oil Plant	Fluidized Bed Coal Plant
Sulfur Dioxide	56	2000	1600	1800
Nitrogen Oxides	330	460	460	460
Particulates	44	80	115	115
Carbon Monoxide	210	190	250	750
Ozone	20	80	39	70

Notes:

1. Emissions of proposed project based on 100 percent gas firing.

2. Ozone emissions based on non-methane hydrocarbon emissions, precursors to ozone.

Sources: Exhs. M-1, p. 83; Exh. HO-RR-17

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

Such petition for appeal shall be filed with the Siting Council within twenty days after the date of services of the decision, order or ruling of the Siting Council or within such further time as the Siting Council may allow upon request filed prior to the expiration of 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. (See. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).