

**ISSUES MEMORANDUM**  
**Brockton Power Company, LLC -- Project Change, EFSB 07-7A**

**OVERVIEW**

**Applicant:** Brockton Power Company, LLC (“Brockton Power” or, the “Company”)

**Name of Project:** Brockton Power’s Request for a Project Change (“PC”)

**Description of the Project as Approved by the EFSB in 2009:** A 350-MW combined-cycle electric generating facility (“Project”) capable of being powered either by natural gas or Ultra Low Sulfur Distillate (“ULSD”). Cooling water for the Project would come from the Brockton Advanced Water Reclamation Facility (“AWRF”), located adjacent to the Project site. Several Project buildings/structures were admittedly not compliant with local zoning (e.g., they exceeded the local zoning ordinances’ height limitations).

**Summary of the PC Proposal:**

Brockton Power seeks to make three changes to the Project as approved by the Board:

1. **Water Use -- To Use Potable Water Instead of AWRF Water**

The Company says it still prefers to use AWRF treated effluent for cooling tower makeup, but the City of Brockton (“City”) has refused to negotiate a contract to sell that water to Brockton Power. Thus, Brockton Power seeks Board approval to use potable water from the City’s municipal water system (“City water”) for all Project water needs.

2. **Fuel -- To Eliminate ULSD and Use 100 Percent Natural Gas to Fuel the Project**

The Company proposes to eliminate the use of ULSD (and associated equipment) as an alternate fuel for the turbine, and to proceed with natural gas as the Project’s only fuel.

3. **Design -- To Make Design Modifications to Reduce the Height of Certain Project Components:** The Company proposes to make the following design changes:

Eliminate the Heat Recovery Steam Generator (“HRSG”) building and replace it with a 116-foot HRSG sound wall system.

Redesign the main power facility building to reduce maximum building height to 60 feet.

Redesign additional structures to reduce height to no more than 25 feet. The redesigned structures include: the natural gas metering and compressor building; the water treatment building; the cooling tower electric equipment building; the MV switchgear building; the fire pump house; the switchyard control building; and the aqueous ammonia storage building.

## **PROCEDURAL HISTORY**

**Project Approval in Original Proceeding:** On August 7, 2009, the Board issued a Final Decision approving, subject to several conditions, the Company's petition to construct and operate the Project and related transmission line (the "Original Proceeding"). In the same decision, the Board denied Brockton Power's request for exemptions from the City's Zoning Ordinance. Three of the intervenors appealed the Final Decision to the SJC. That appeal has been stayed until the Board issues a final order in this proceeding or until June 3, 2011, whichever occurs first.

**The PC:** On April 9, 2010, Brockton Power submitted a project change filing to the Board. In addition to Brockton Power, the parties in the project change proceeding are the same as in the Original Proceeding: the City, the Town of West Bridgewater, the Taunton River Watershed Alliance ("TRWA"), Custom Blends LLC, National Grid, and certain West Bridgewater and City residents represented by Alternatives for Communities and Environment, Inc. ("ACE").

**Motion to Treat the PC as a New Case:** Several intervenors requested that the Board treat the PC Filing as a new petition to construct under G.L. c. 164, § 69J¼, rather than a continuation of the Original Proceeding. The Presiding Officer denied this request, but granted the intervenors' request for discovery, evidentiary hearings, and other adjudicatory process. The Presiding Officer also granted the request to hold another public comment hearing in the City. Thus, the parties in this project change proceeding have been afforded a more expansive adjudicatory process than has been afforded to any other parties in previous project change cases heard by the Board.

## **SCOPE OF REVIEW**

**Further Inquiry?** -- When presented with a project change filing, the Board will not inquire further about the proposed change if the change does not alter in any substantive way either the assumptions or conclusions reached in the Board's underlying decision. Cape Wind Project Change, 16 DOMSB 194, 202 (2008) ("Cape Wind PC") citing Berkshire Power Decision on Compliance, 7 DOMSB 423, at 437 (1997); see also, Fore River Project Change, 15 DOMSB 403, 409 (2006) ("Fore River PC").

**The Further Inquiry** -- In a case like this one, where the Board has conducted further inquiry, the Board evaluates the environmental impacts of a proposed change or changes to ensure that those impacts have been minimized consistent with the minimization of costs associated with the mitigation, control, and reduction of environmental impacts. How the Board determines whether the environmental impacts of the proposed change(s) have been minimized is fact-dependant. In prior project change proceedings, the Board has compared the environmental impacts of the facility as originally approved with the environmental impacts of the project as changed. Where impacts increased, the Board has explored mitigation options. Cape Wind PC, at 214-215; Fore River PC, at 421-422; Sithe Mystic Project Change, 13 DOMSB 118, 137-139 (2001). Where relevant, the Board also has considered whether a rebalancing of environmental impacts with reliability and diversity of supply was needed. Fore River PC, 15 DOMSB at 409. Also, the Board has considered a balancing of environmental advantages of the proposed change against environmental disadvantages, some of which can only partially be mitigated. Cape Wind PC, at

206-215. In addition to reviewing environmental impacts, where applicable, the Board has considered whether the proposed changes are consistent with the current health and environmental protection policies of the Commonwealth. See IDC Bellingham, 11 DOMSB 27, 74-75 (2000).

**Parties' Positions** -- ACE asserts that the Siting Board may not approve the PC unless the Board finds that the Company's project change filing (i.e., the document filed by the Company with the EFSB on April 9, 2010 which describes the proposed project changes) is substantially accurate and complete. ACE argues that such a finding is required by statute and has due process and public policy implications. ACE asserts that if a company is allowed to provide new and different information throughout the project change evidentiary hearings that contradicts or is missing from the original project change filing, intervenors will be denied due process because they will not have time to review and analyze the information and engage appropriate experts. ACE Reply Brief at 4. In addition, ACE asserts that members of the public need accurate and complete information on which to testify at public hearing, take a position on the proposal, or decide whether to intervene. Id.

### **ELIMINATION OF ULSD**

**Original Proceeding:** The Board approved use of ULSD subject to no more than 60 days' (1,440 hours) use per year. The Board directed that two weeks' ULSD use be reserved for December.

**The Proposed Change:** Brockton Power proposes to change its facility from a dual fuel facility to an all-natural gas facility.<sup>1</sup> Brockton Power says it is making this change to (1) address community concerns; and (2) reduce air emissions, particularly those of PM<sub>2.5</sub>. The change also allows the Company to avoid EPA's Prevention of Significant Deterioration ("PSD") review.<sup>2</sup> Brockton Power says it is able to make this change because (1) natural gas is more widely available in New England as a result of recent pipeline expansions and availability of LNG from Canaport; and (2) it signed a firm supply (versus "spot") agreement with Bay State Gas.

**Parties' Positions:** No party explicitly opposes the elimination of ULSD-firing capacity. The City argues, however, that the EFSB must deny the PC because the Company inadequately and inaccurately described the Project's air impacts.<sup>3</sup>

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<sup>1</sup> The Company's three 2,000 kW black-start generators that serve to restart the turbine in the event of an emergency will continue to be fueled by ULSD.

<sup>2</sup> See page 6 for further discussion regarding PSD Greenhouse Gas ("GHG") review.

<sup>3</sup> ACE supports the elimination of ULSD because it "will result in improved air quality impacts as compared to the original design." ACE Reply Brief at 14-15. ACE states, however, that the Siting Board must scrutinize the newly estimated air quality impacts to determine if they are substantially accurate and complete and have been minimized.

## **Environmental Impacts**

### **a. Air**

On May 4, 2010, the Massachusetts Department of Environmental Protection (“DEP”) issued its Proposed Conditional Approval for the Project based on the Project Air Plan Approval Application (“Air Plan”). The Air Plan assumes a 100 percent natural gas facility.<sup>4</sup> The Proposed Conditional Approval, the Air Plan, and the project change filing incorporate the annual emission limits (for gas only) in tons per year (“tpy”) shown in the table below. As indicated in the table, switching the Project’s fuel source to 100 percent natural gas significantly improves the Project’s overall air emission profile.

**Reductions in Facility-Wide Annual Emissions\***

<b>Pollutant</b>	<b>Gas and ULSD (tpy)</b>	<b>Gas Only (tpy)</b>	<b>% Change</b>
NO <sub>x</sub>	107.1	76.1	-29%
CO	108.9	98.5	-10%
VOC	31.0	19.2	-38.0%
PM <sub>10</sub>	85.2	51.8	-39%
PM <sub>2.5</sub> <sup>^</sup>	85.2	49.1	-42%
SO <sub>2</sub>	6.9	5.3	-23%

\*Annual emissions are based on a 12-month rolling average, calculated on a monthly basis.

<sup>^</sup>PM<sub>2.5</sub> is a subset of PM<sub>10</sub>. In the Original Proceeding, the Company assumed that PM<sub>2.5</sub> was 100% of the PM<sub>10</sub> associated with the cooling tower. In the PC Filing the Company assumed that only 12% of PM<sub>10</sub> associated with the cooling tower was PM<sub>2.5</sub>. This change in assumptions reduced PM<sub>2.5</sub> in total by 2.9 tpy.

The results of the air modeling for the gas-only facility shown in the following table indicate that there will be even more significant percentage reductions in annual and short-term maximum ground level air quality impacts associated with eliminating ULSD capability.

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<sup>4</sup>

In its initial Air Plan submitted to DEP on April 25, 2008, the Company proposed to operate a dual-fuel facility as subsequently approved by the EFSB in August 2009. However, in March 2010, the Company submitted a revised Air Plan reflecting a 100 percent gas-fired facility. DEP issued a Proposed Conditional Approval on May 3, 2010. DEP has yet to issue a final approval.

### Modeled Air Quality Impacts vs. SILs and NAAQS

Pollutant	Averaging Period	Approved Project Max Impact (ug/m3)	Gas Only Max Impact (ug/m3)	% Reduction	SIL <sup>5</sup> (ug/m3)	Gas Only Total Impact <sup>^</sup> as % of NAAQS
<b>NO<sub>2</sub></b>	Annual Max	0.0325	0.0265	19%	1	9%
<b>SO<sub>2</sub></b>	3-Hour (H2H)	0.229	0.098	57%	25	4.4%
	24-Hour (H2H)	0.137	0.055	60%	5	9.3%
	Annual Max	0.00225	0.002	10%	1	10.0%
<b>PM<sub>10</sub></b>	24-Hour (H2H)	3.43	1.90	45%	5	24.4%
	Annual Max	0.25	0.24	5%	1	37.1%
<b>PM<sub>2.5</sub>*</b>	24-Hour**	3.43	0.61	82%	1.2*	80.9%
	Annual Max	0.25	0.03	89%	0.3*	63.1%
<b>CO</b>	1-Hour (H2H)	7.78	1.44	82%	2,000	8.6%
	8-Hour (H2H)	4.43	0.69	84%	500	18.9%

\*Reflects proposed SILs for PM<sub>2.5</sub>. Final SILs for PM<sub>2.5</sub> have not yet been promulgated.

\*\*Five-year average of maximum 24-hour high values

H2H = Highest second high value

<sup>^</sup>Total impacts include measured background levels.

In the Original Proceeding, the Board noted, “the MADEP is the agency responsible for judging the validity of the Company’s air quality modeling and data in its review of the Company’s request for an air permit.” Final Decision at 26. The Air Plan conditionally proposed for approval by DEP states that “the final results of the source interactive modeling analysis indicated that under no condition will the Permittee [Brockton Power] by itself or with existing sources, violate the Federal or State ambient air quality standards or cause a condition of air pollution” (Exh. EFSB-C-G-6(A) at 8-3).

<sup>5</sup> Significant Impact Levels (SILs) for individual pollutants are intended to represent the level of air quality impact from a source at which the impact begins to exceed *de minimis* air quality impact. For air impacts above SILs project proponents are required to provide a comprehensive interactive air quality analysis modeling all existing major sources. SILs are not health-based standards and are typically one to five percent of the NAAQS (which are health-based standards).

Neither ACE nor TRWA disputes the Company’s air emissions analysis or that the elimination of ULSD results in improvements in the Project’s air emissions profile. While the City does not assert that the air impacts of the changed facility are worse than in the Original Proceeding, it does argue that the Company’s description of the air impacts is not substantially accurate. The following table summarizes the City’s air arguments and the Company’s response.

Air Issue	City’s Arguments	Company’s Response
CO emissions	The Project’s CO emissions will be 138.8 tpy not 98.5 tpy, as calculated by the Company. The Company’s calculation is wrong because the Company (1) selected emission rates lower than 12.5 lbs/hr maximum allowed in the Air Plan; (2) improperly took credit for start/stop cycles; and (3) improperly used a 30 percent capacity factor.	<p>The Company’s estimated CO emissions are conservative and were calculated in accordance with standard practice. The Company used a 30 percent capacity factor and a high number of stops/starts to be conservative: the more stop/start cycles assumed, the lower the Project’s capacity factor, but the higher the Project’s estimated CO emissions. The oxidation catalyst will kept CO emissions at or below 12.5 lbs/hr during normal operations.</p> <p>Brockton Power bears the risk of any miscalculation of CO emissions. Even if there has been a miscalculation, the Company must comply with the Air Plan, which includes a 98.5 tpy CO emission limit.</p>
GHG PSD approval	Under the “Tailoring Rule,” the Company will need a PSD permit for GHGs if the Company has not commenced construction by July 1, 2011. This will require a BACT assessment which may require lower emissions and perhaps, even changes to the turbine configuration.	If the Company has to comply with the PSD GHG rules, it will. The Company already provided DEP with a CO <sub>2</sub> BACT analysis. DEP has incorporated the CO <sub>2</sub> emission rate of 842 lbs per MW/hr in its approval of the Air Plan.
Non-Road Engine Standards	The Company incorrectly estimated PM emissions for the Project’s emergency generators by (1) referencing the wrong unit in the emission standards; and (2) assuming the Tier 2 Non-Road Engine standards instead of Tier 4 emission standards in its modeling. Using Tier 4 emission standards, the Project estimated PM <sub>2.5</sub> impacts would be above the SIL.	Calculation of PM emissions is correct. The Tier 2 standard for PM emissions can be expressed either as grams/kWh or as grams per brake horsepower-hour. The Tier 4 standard became effective for large engines in January 2011. Thus, the Project is obligated to purchase emergency generators that comply with the Tier 4 standard emission limits and will do so.
Potential to Emit (“PTE”)	The Company’s emission projections do not comport with DEP’s definition of PTE. The Company does not have vendor guarantees, did not provide stack data from other facilities, and failed to fully consider nearby PM <sub>2.5</sub> emission sources.	<p>Project equipment will have to operate consistent with permit emission limits. Otherwise, the Project cannot be built.</p> <p>The Company’s modeling includes an allowance for secondary formation of particulates in its PM<sub>2.5</sub> emissions estimates.</p>
Air Quality Modeling Data	The Company’s air quality impact modeling is inaccurate because it uses unrepresentative metrological data ( <u>i.e.</u> , data from Logan Airport).	The Siting Board already decided in the Original Proceeding that metrological data for Logan is representative of conditions at the Project site.

- b. **Visual** -- The elimination of the ULSD storage tank will reduce visual impacts.
- c. **Water** -- The elimination of ULSD will reduce the Project's water requirements because of the reduced use of the nitrogen oxide control system.

**Costs:** The capital cost of a single fuel turbine will be \$4 million lower than that of a dual-fueled turbine. Eliminating the ULSD storage tank and associated facilities will reduce capital costs further by \$532,000.

### **Reliability**

- a. **Impact on the Project's Operating Reliability** -- Because the Company has secured a firm 365-day contract for gas, the Company asserts that plant operation will be as reliable as the approved dual fuel facility.
- b. **System Implications** -- No party presented evidence that the switch to 100 percent natural gas will negatively affect New England electric system reliability. In prior EFSB cases, however, the Board has noted the reliability benefits of regional fuel diversity and recognized that the ability for some facilities to have fuel options is "imperative for the reliability of electric supply in the event of contingency affecting regional gas supplies." Brockton Power, LLC, 10 DOMSB 157 at 192 (2000); *see also* Sithe Edgar Development LLC, 10 DOMSB 1 (2000), Fore River PC.

### **Questions for the Board:**

- Does the Company's description of the air impacts of the fuel change meet the standard of "substantially accurate and complete" set forth in G.L. c. 164, § 69J¼?
- Have the environmental impacts associated with the fuel change been minimized consistent with the minimization of costs associated with the mitigation, control and reduction of environmental impacts?
  - How do the air impacts of the 100 percent natural gas fired facility compare to those of the Original Proceeding?
- Where no party presented evidence that the PC would negatively impact electric system reliability, but Board precedent generally supports fuel diversity and dual fuel facilities, should the Board find that a Brockton Power facility fueled by 100 percent natural gas will negatively impact regional electric system reliability?
  - If so, do the reliability benefits of retaining a dual fuel facility outweigh the environmental benefits of switching to 100 percent natural gas?

## DESIGN CHANGES

**Original Proceeding:** In the zoning exemption portion of the Original Proceeding, the Company sought exemption from provisions of the City’s Zoning Ordinance, including the height restrictions (which limited the height of principal buildings to 60 feet and accessory buildings to 25 feet). The Board denied the Company’s petition.

**Proposed Changes:** The Company seeks Board approval to: (1) replace the HRSG building with a 116-foot HRSG sound wall system; (2) lower the height of the main power facility building to a maximum height of 60 feet; and (3) lower the height of additional project components to a height of no more than 25 feet.

**Zoning:** The Company asserts that with the proposed design changes the Project complies with local zoning. The City disagrees. In rejecting Brockton Power’s request to be exempted from local zoning, the Board left the issue of zoning compliance to the City and, if necessary, the courts to determine. Currently, the Company and the City’s Zoning Board of Appeals or Planning Board are parties in at least five cases pending in Land Court where zoning issues will be determined.

### **Environmental Impacts:**

#### **a. Noise**

As demonstrated by the chart below, the Company’s design changes will not increase sound levels at the nearest residences during the quietest nighttime hours beyond that approved for the Project in the Original Proceeding (i.e., a maximum increase of 5 dBA above background noise levels).

#### **Sound Level Modeling Results – Project Plus Nighttime Background at Nearest Residence (Excerpted from the PC Filing at 4-14)**

<b>Receptor</b>	<b>Brockton Plant (dBA)</b>	<b>Lowest L<sub>90</sub> Background (dBA)</b>	<b>Total (dBA)</b>	<b>Updated Increase Over Background (dBA)</b>	<b>EFSB Approved Increase (dBA)</b>
ST-1 End of Mobile Dr.	38	39	42	3	3
ST-2 Hayward Ave./ Rte. 28 Intersection	42	39	44	5	5
ST-3 Crown Place Condos	41	41	44	3	3
ST-4 71 Appleby St.	40	36	41	5	5
ST-6 Brockton Housing Main Street	34	40	41	1	1



Using daytime/evening background, the proposed design changes result in a 0.2 dBA increase at receptor ST-6 and a 0.1 dBA increase at receptor ST-3. The proposed design changes do not alter the Board-approved maximum increase in ambient baseline levels at receptors ST-4 and ST-2. Specifically, with the noise reduction features incorporated in the facility design, noise impacts at these receptors will continue to be no more than 5 dBA during the quietest nighttime hours, and less at other times.

**b. Noise Mitigation**

ACE argues that the Board should require Brockton Power to implement additional noise mitigation to reduce the maximum noise level at receptors ST-4 and ST-2 to 3 dBA for a cost of \$3.5 million.<sup>6</sup> In the Original Proceeding, the Board declined to require the Company to implement mitigation that could achieve a similar 2 dBA reduction of nighttime ambient sound levels increases at receptors ST-4 and ST-2 for a net increased cost of \$1.2 million.<sup>7</sup> In so finding, the Board stated, “the proposed facility as planned would already provide a level of noise mitigation consistent with Siting Board precedent.”

**c. Land Use**

The proposed design changes do not change the surrounding land uses or the prior uses of the Project site itself. With respect to state and local requirements related to land use, since the Original Proceeding, the City has amended its Zoning Ordinance removing electric power generating plants from the list of permitted uses in the Industrial-2 and 3 zones. The City and Brockton Power disagree as to whether this zoning change applies to the Project. In the Original Proceeding, the Project admittedly did not comply with local zoning (e.g., did not meet the height requirements). The proposed design changes either result in a zoning compliant Project (if the Company is right) or the Project remains as it was in the Original Proceeding, not in compliance with local zoning (if the City is right).

**d. Visual**

Most views of the Project will remain the same as in the Original Proceeding. At two locations, the sound wall is not visible, while the prior approved HRSG building was visible.

**Cost:** The design changes lower construction costs by approximately \$5 million.

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<sup>6</sup> This mitigation would include the installation of an ATCO Noise Management wall/roof system and ventilation system (including an exhaust stack silencer) to reduce the sounds of the rooftop exhaust fans, the stack exhaust, the HRSG, and the steam turbine. The \$3.5 million represents a net increase over the \$11.5 million of noise mitigation costs incorporated in the Project design.

<sup>7</sup> While both mitigation proposals are designed to achieve a 2 dBA reduction in sound levels at ST-4 and ST-2, changes in Project design since the Original Proceeding have increased the cost of achieving that level of sound reduction.

### **Questions for the Board:**

- Have the environmental impacts associated with the design changes been minimized consistent with the minimization of costs associated with the mitigation, control and reduction of environmental impacts?
  - Are the environmental impacts of the design changes greater than, less than or substantially similar to the impacts reviewed in the Original Proceeding?
  - If the impacts are greater, should the Board impose mitigation measures to minimize environmental impacts?

### **USE OF MUNICIPAL WATER**

**The Original Proceeding:** In the Original Proceeding, Brockton Power stated that it preferred to use treated effluent from the AWRF for cooling water makeup. The Company stated that, while not preferred, as an alternative, it could use City water.<sup>8</sup>

In its Final Decision, the EFSB agreed that the proposed use of AWRF water for cooling water makeup was preferable to using City water. Thus, the Board conditioned its finding that water resource impacts would be minimized on, among other conditions, Brockton Power's use of AWRF water as the facility's primary cooling water source. However, recognizing the most recent record evidence indicating some uncertainty around the availability of the City's AWRF water supply, the Siting Board imposed the following condition:

The Siting Board directs the Company to work with the City of Brockton with respect to water supply issues associated with use of Brockton AWRF water, and to provide a report to the Siting Board with respect to the outcome of such efforts. Furthermore, if the Company intends to use potable water for the majority of the water requirements of its proposed facility, the Siting Board directs the Company to provide a project change filing to the Siting Board, together with an analysis as detailed as that done for AWRF water, but directed to those issues that are germane to the use of potable water, including opportunities for water conservation.

The Siting Board concluded that subject to the various water-related conditions and "any further ruling or conditions that the Siting Board may issue as part of its review of a project change review," that water resource impacts of the proposed facility, including impacts related to water use would be minimized.

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<sup>8</sup> The Company asserts that, if it were to construct the Project, the City would be under an obligation to supply the Project with water through its municipal water system (Exh. EFSB-C-W-22). The intervenors have not addressed this assertion.

**Reason for Proposed Change:** Brockton Power says that it still prefers to use AWRP water, but the City has refused to negotiate a contract for AWRP water. Brockton Power asserts that it made an offer to the City Council in January 2010 to pay the City \$500,000 per year for two million gallons per day (“MGD”) of treated effluent from the AWRP. The City Council, however, has tabled the matter and has not considered it. The City did not dispute Brockton Power’s assertions and did not offer any evidence about AWRP water.

### **BACKGROUND REGARDING THE CITY’S WATER SUPPLY**

The City has a long history of water supply challenges and disputes with neighboring municipalities and environmental groups regarding the best use of water resources.

Since 1899, the City has had the right to take water from Silver Lake and the obligation to provide water to the towns of Whitman and Hanson (and, on an emergency basis, to the towns of Pembroke, Halifax, and East Bridgewater). In the 1960s, the City experienced a severe drought. In 1964, the Legislature granted the City the right, under certain conditions, to divert water from Furnace and Monponsett Ponds into Silver Lake, thereby expanding the volume of water available to the City from the Silver Lake system. Since 1994, the City has obtained a small supply of water (<10 percent) from the Brockton Reservoir in Avon.

The level of water in Silver Lake fluctuates. The City attempts to manage its withdrawals so that Silver Lake’s water level is between 45-47.5 feet NGVD. Above a level of 45 feet NGVD, Silver Lake and adjoining Forge Pond essentially become one. If the level of Silver Lake falls to 45 feet or below, a strip of land is exposed that separates Silver Lake and Forge Pond. Above a level of 47.5 feet NGVD, water spills over the Forge Pond Dam and into the upper Jones River. Water is withdrawn from Silver Lake year around, 24-hours a day.

**Administrative Consent Order (“ACO”):** In the early 1980s, the City experienced a “20-year drought,” i.e., a level of drought that occurs about once every 20 years. In 1986, the combination of prolonged drought conditions and inefficiencies in the management of the City’s water resources (e.g., leaky pipes, lack of water conservation) precipitated intervention by the Massachusetts DEP in the City’s water supply management. DEP’s involvement in the City’s water supply management became more extensive in 1995, when DEP and the City entered into an ACO that is still in effect. The ACO limits the City’s withdrawal from the Silver Lake system and Brockton Reservoir to 11.3 MGD and requires certain conservation measures. Since implementation of the ACO, the City has substantially reduced its distribution leakage and demand per capita.

**Aquaria Contract:** In 1993, the Massachusetts Executive Office of Environmental Affairs published a report outlining a strategy for meeting the water needs of the City and other Taunton River Basin communities through the year 2020. Among other things, the report proposed a desalination plant as a solution for the long-term water needs of these communities (Exh. BP-ACE-C-AM-10(1) at 5). In late 2008, the Aquaria desalination water treatment facility (which draws water from the Taunton River) in Dighton began operation. The City entered into a 20-

year agreement<sup>9</sup> with Aquaria to purchase water from the Aquaria facility in 2002 and began receiving water in December 2008. Currently, the City is the only contracted customer for Aquaria water.

**a. The City's Contract Rights for Aquaria Water**

Under the Aquaria Contract, the City is entitled to a "Firm Commitment" from Aquaria that represents the minimum amount of water that Aquaria must make available to the City and for which the City is obligated to make an annual fixed payment. In 2014, when the Project is expected to begin operation, the City's Firm Commitment from Aquaria will be 3.5 MGD. The City's Firm Commitment amount increases incrementally yearly until a maximum of 4.07 MGD is reached in 2019. The Firm Commitment remains 4.07 MGD through 2029. The City also has the right to the first 1 MGD of "excess water" from Aquaria on a daily and yearly average basis. During June, July and August, the City has the right to demand that Aquaria produce and provide a minimum of 0.5 MGD of excess water in addition to the Firm Commitment.<sup>10</sup>

**b. The City's Current Use of Aquaria**

Since 2008, the City has withdrawn far less than its Firm Commitment from Aquaria. For example, from April 2009 to November 2009, the City took 0.35 MGD on average, the minimum to ensure that Aquaria water remains "fresh." Through most of 2010, the City's water withdrawal rate averaged 0.8 MGD. From August 9 through 31, 2010, however, the City's withdrawal rate averaged 1.98 MGD. On August 22, the City withdrew a one day maximum of 3.15 MGD. The City made these increased withdrawals to test the capability of the Aquaria system and to protect Silver Lake water levels.

**WMA Permit and Comprehensive Water Management Plan:** The MEPA certificate for the Aquaria facility required each community that wanted to use Aquaria water to modify that community's Water Management Act ("WMA") permit. In 2005, DEP issued a modification to the City's WMA permit. The WMA permit required the City to complete a Comprehensive Water Management Plan ("CWMP") for DEP approval that would describe the City's use of water and all its sources. DEP stated:

While the Department believes the Aquaria connection will provide [the City] with a long-term source of water and the opportunity to better manage its other water sources to minimize environmental impacts, it is premature to make a judgment on the appropriate

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<sup>9</sup> This Agreement also grants the City options to renew for an additional thirty years in five-year increments. See Agreement, Article 3 (Exh. BP-C-1, Section 2, Appendix at 10).

<sup>10</sup> The City's payments for Aquaria water have a fixed and variable component (and both components have escalation clauses beginning in the fourth year). The annual fixed payment is \$167,480 per 0.1 MGD of Firm Commitment. This is independent of the volume actually used. In 2014, the annual payment will be approximately \$5.8 million. From 2019-2028, the annual payment will be approximately \$6.8 million.

management of [the City’s] sources, until the [CWMP] is reviewed and approved. The Department will modify [the City’s] permit upon the Department’s approval of the management plan to require the implementation of a plan that minimizes the impacts of the existing withdrawals.

Exh. BP-C-1, Appendix A at sub-appendix C at 2 (letter from DEP to Mr. Brian Creedon, Water Systems Manager for the City of Brockton, dated June 1, 2005).

The City submitted a draft CWMP (which includes a Drought Demand Management Program (“DDMP”) and a Demand Management Plan) in May 2007. In its CWMP, the City requests that the ACO be lifted. DEP provided comments on May 21, 2009. The City submitted its response to those comments in November 2009. DEP has yet to approve the CWMP.

**WATER SUPPLY**

**Sources of Water** -- The City has three main sources of water:

Water Source	Type of Source	Water Available (MGD)
Silver Lake system  (Silver Lake, Furnace Pond and Monponsett)	Primary Source (~90%)	10.5 (annual average daily withdrawal)*
Brockton Reservoir (in Avon)	Small, secondary	0.8 (annual average daily withdrawal)*
Aquaria Desalination Plant	Recently contracted additional source	3.5 (Firm Commitment in 2014)  The City also has exclusive right to the first 1 MGD of excess water.

\*As limited by the ACO. Silver Lake and Brockton Reservoir registered levels are more (together, 11.98 MGD).

## Costs of City's Water

### The Cost of the City of Brockton's (COB's) Water by Source

	Water from ACO Resources <sup>(b)</sup>	Water from Firm Aquaria Volumes <sup>(c)</sup>		Water from Firm Aquaria Volumes <sup>(c)</sup> Variable Costs Only
		Fixed <sup>(a)</sup>	Variable	Variable Only
Cost to COB per Million Gallons	\$325	\$4,588	\$1,230	\$1,230
Daily Cost to COB to Supply 1.25 MG to Brockton Power	\$406.25	\$5,735 fixed + \$1,537.50 variable = \$7,272.50 total		\$1,537.50
COB Rate to Users for 1.25 (MGD)	\$8,987	\$8,987		\$8,987
COB Daily Incremental Revenue from Water Sale to Brockton Power	\$8,580.75	\$1,714.50		\$7,449.50
COB Annual Incremental Revenue <sup>(d)</sup>	\$3,132,000	\$625,793		\$2,719,068

The figure of 1.25 MGD corresponds to the water needs of Brockton Power operating at full capacity five days per week at 59° F.

<sup>(a)</sup> In the Aquaria contract fixed costs are quoted as annual dollars/daily average gallon. For the purposes of the comparison in the chart, the fixed costs for year 2014 have been divided by 365 days. Please note that the City of Brockton is obligated to pay the fixed costs associated with its Aquaria contract whether or not the City takes any water from Aquaria.

<sup>(b)</sup> Brockton contracts with Veolia Water to operate and maintain its water treatment facilities. Its current contract with Veolia Water specifies a fixed charge per annual average million daily gallons of treated flow of \$325, provided the annual average flow is between 10.8 and 13.2 MGD.

<sup>(c)</sup> "Water from Firm Aquaria Volumes" refers to the City of Brockton's current firm contractual commitment to take or pay for annual average volumes beginning at 1.9 MGD in Year One of the Contract (December 2008-November 2009) and increasing to a maximum of 4.07 MGD in Contract Years 12-20. Please note that virtually all cost elements of the Aquaria contract are subject to annual escalation beginning in Contract Year 4 (December 2011-November 2012).

<sup>(d)</sup> The daily incremental revenue multiplied by 365 days.

## WATER DEMAND

### City's Water Demand:

City's peak water use in early 1980s	14 MGD
City's current annual average	10 MGD*
City's estimate of demand in 2015 (without Brockton Power)	10.15 to 11.44 MGD

\*The City implemented various conservation and other measures such as leakage control to decrease its demand from 1980 levels.

### The Project's Projected Water Demand:

Daily Average (100% capacity factor, 59°F)	1.75 MGD*
Average Annual Basis (70% capacity factor, 59°F)	1.1 MGD
Daily Maximum (100% load, 90°F)	2.1 MGD

\*This daily average is less than what the Company proposed in the Original Proceeding using AWRP water (1.75 MGD vs. 1.9 MGD using AWRP).

**Company Proposed Conservation/Mitigation:** Brockton Power has offered \$100,000 over five years to the City to reduce leaks and generally improve its water system. The City's net gain for providing the Project with City water would be approximately \$2.8 million per year (before escalation).<sup>11</sup>

## PRECEDENT

The Board has allowed generators to use municipal water for cooling in several cases. In the most recent case, Pioneer Valley, the Board approved use of municipal water when the surplus after supplying the power plant was 1.4-1.7 MGD. To address concerns about reducing downstream river flows, the Siting Board conditioned its approval in Pioneer Valley on the applicant working with the town to implement mitigation and conservation measures and required the applicant to provide \$80,000 for this effort.

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<sup>11</sup> Assuming that the Project were to purchase 1.1 MGD for cooling tower makeup and that the incremental volumes come from Aquaria, the City's incremental cost would increase by appropriately \$500,000 per year (1,100,000 gpd x 365 day/yr x \$1.23/1,000 gal. = \$494,000 yr.) Under current water rates, Brockton Power would pay nearly \$3.3 million a year. (1,100,000 gpd x 365 days/yr. x \$8.17/1,000 = \$3,280,255/yr) to the City. Thus, the City's incremental gain would be nearly \$2.8 million a year (which is about 17% of its current water revenues of approximately \$16 million).

## PARTIES' ARGUMENTS

### Adequacy of the Water Supply

#### a. The Company

- As shown in the table below, the City has ample available water to supply Brockton Power and meet the City's needs. The most conservative scenario (ACO still in effect, Brockton Power using 2.1 MGD) shows a surplus after serving the Project.

#### **City of Brockton, Available Water Supply vs. Projected Use**

Supply Scenario	Silver Lake System (MGD)	Brockton Reservoir (MGD)	Aquaria Firm Commitment (MGD)	Total Supply (MGD)	City's Projected Use in 2015 (MGD)	Project Use (MGD)	Surplus or Available Capacity w/City + Project (MGD)
2014 Projection w/ACO (1 <sup>st</sup> yr of Brockton Power operations)	~10.5	~0.8	3.5	14.8	10.15-11.44	2.10 /max. day 1.75 /ave. day	1.26 to 2.5 1.61 to 2.9

#### Company's Response to IR ACE-C-W-10.

- If one assumes that the ACO is lifted, but the Project's requirement is 2.1 MGD, the surplus would be between 3.06 and 4.35 MGD in 2014 and would continue to expand as Aquaria's firm supply increases.
- The City does not dispute the existence of a surplus or deny the existence of sufficient capacity to serve Brockton Power.
- The purpose of the Aquaria contract is to provide the City with supplemental water, not to reduce pro rata the water the City takes from Silver Lake. The City has always intended to continue to use its traditional water supply as the City's primary water source.
- The fact that there were isolated days last August where the City used approximately 3.0 MGD of Aquaria water does not mean that there is not enough water to serve Brockton Power. On those August days, the City only took 9.3 MGD from Silver Lake and Brockton Reservoir (2.0 MGD less than the ACO limit of 11.3). In 2014, the City will be able to take another .5 MGD of Firm Commitment from Aquaria and can draw on its other Aquaria water rights. Regardless, the right to take water from a particular source is based on an annual average MGD basis (not on select days). This gives the City the flexibility to deal with any particular high demand day.
- The fact that DEP has not approved the City's CWMP is not an obstacle to EFSB approval. Under current licenses and registrations, the City has enough water to supply Brockton Power. A recent SJC case, Water Department of Fairhaven v. Department of Environmental



Protection, 455 Mass. 740 (2010), grandfathers existing withdrawal limits so the City's registered withdrawals cannot be reduced unless a state of water emergency is declared by the Massachusetts Department of Environmental Protection pursuant to G.L. c. 21G, § 15. 455 Mass. at 742, n. 4.

**b. ACE and TWRA**

- DEP has yet to approve the City's DDMP or its CWMP. These draft plans do not include the addition of Brockton Power as part of the City's demand. We do not know what conditions or restrictions DEP might put on the City's water withdrawals or whether DEP would make a different determination if its review included Brockton Power.
- There may be situations where the City will not have enough water to serve Brockton Power. The City's proposed DDMP calls for the City, under certain drought conditions, to buy water from Aquaria up to its full Firm Commitment, as required, to enable the City to reduce its Silver Lake withdrawals. During such drought conditions, the City might not have sufficient water to supply Brockton Power. This summer, the City used more than 3 MGD of Aquaria water on certain days. On such hot days, there would be inadequate supply to provide 2 MGD to the Project, protect Silver Lake, and comply with the DDMP.

**Water Supply and Contingency Events**

**a. The Company**

- The Project's water use will not impair the City's ability to respond to inter-municipal emergency water supply requests. The City's demand forecast incorporates water use (0.05-0.07 MGD) by "other" users (including the Town of Hanson). There is surplus water for emergencies even if other users make emergency requests for more than 0.07 MGD. For instance, on July 12, 2010, the Town of Hanson requested 0.14 MGD from the City. The City supplied Hanson with water from Aquaria.
- The Project's (1) storage tank (which can store 750,000 gallons of water), (2) pressure control valve (that enables regulation of water flow), and (3) ability to reduce or cease withdrawals for up to eight hours while maintaining full load operation, can help the City address any emergency situations.

**b. ACE and TWRA**

- The Company's calculation of a surplus ignores the City's emergency response requirements to supply water to the towns of Pembroke, Halifax, Hanson, East Bridgewater, Stoughton and Whitman. When and how much water these communities may seek is unknown.
- Contingency events may result in not enough water. For instance, Aquaria could sustain a mechanical failure.

**Environmental Impacts**

**a. The Company**

- The fact that the Company and the Siting Board agree that treated effluent from the AWRF is the preferred alternative, does not mean that environmental impacts cannot be minimized by using City water. The Siting Board does not need to make an either/or choice. Both alternatives can be found to minimize environmental impacts.
- The City is currently operating close to its ACO limit. The incremental volume of water for the Project would come from Aquaria. By using Aquaria water, there will be no impact on the Silver Lake system.
- Brockton Power has offered to provide \$100,000 towards City water system improvements. Brockton Power's purchase of water from the City also would provide the City with much needed revenue, which could be used by the City to buy additional water or otherwise address environmental concerns with Silver Lake and the Jones River.
- The Project will not adversely affect downstream resources. Discharge flow to the AWRF will be less than in the Original Proceeding. At 70 percent load there will be a reduction from 0.4 MGD in the underlying proceeding to 0.16 MGD in the PC; at 100 percent load there will be a reduction from 0.6 MGD in the underlying proceeding to 0.21 MGD in the PC. Average AWRF discharges to the Salisbury River will increase by two percent (from 12.8 MGD to 13 MGD). Changing the Project's water source from AWRF to City water will not impact flooding at Westbridge Landing.

**b. ACE and TRWA**

- Because the Siting Board has already concluded that using AWRF water minimizes environmental impacts and is the preferred water solution, the Board cannot find that use of City water minimizes environmental impacts.
- The City's current withdrawal (without Brockton Power) is already stressing the Silver Lake system and the Jones River. Undesirable environmental impacts include adverse effects on mussels, fish migrations and water quality. Adding withdrawals for Brockton Power will simply exacerbate the situation. Lower levels of water at Silver Lake may affect the lake's aquatic populations and water quality. Reductions to, or absence of, spillovers from the

Silver Lake system may have similar consequences on the Jones River and other connected waterways (i.e., Stump and Herring Brooks).

- The purpose of the Aquaria contract was to relieve existing stress and undo damage to the Silver Lake system, not to allow for a new large water user. Brockton Power's use of Aquaria water will limit the City's ability to manage its water supplies to limit environmental impacts on the Silver Lake system.
- Brockton Power cannot guarantee that the City will manage its water supply system in a way that limits impacts to the water resources of the Silver Lake system. The City could continue to take the maximum amount possible from the Silver Lake system before it buys from Aquaria. Thus, the addition of Brockton Power may simply increase the amount of time that the City is taking the maximum amount it can from the Silver Lake system.
- Brockton Power has failed to study the effect of increased volumes of discharge to the Salisbury River and the impacts of the Project on downstream communities such as Westbridge Landing, which is subject to flooding.

### **Policies of the Commonwealth**

#### **a. The Company**

In the Original Proceeding, the Board found that the Project is consistent with the environmental and health policies of the Commonwealth. Because there is no evidence that the PC will change in any substantial way that finding, the finding must stand.

#### **b. ACE and City of Brockton**

The Project's use of municipal water is inconsistent with the Commonwealth's Water Policy and Water Supply Policy because said use: 1) does not keep water local (both Aquaria water and the water from Silver Lake come from watersheds that do not naturally include Brockton); 2) will not protect Silver Lake from the City's "over-reliance" on it as a water resource; and 3) will impair the Silver Lake habitat for mussels and the Jones River fish habitat. Furthermore, that locating a fossil fuel plant next to an environmental justice area violates the Commonwealth's EJ policy.

### **QUESTIONS FOR THE BOARD**

- Does the Company's description of the environmental impacts associated with the Project's use of City water meet the standard of "substantially accurate and complete" set forth in G.L. c. 164, § 69J¼?

- Does the Company’s proposal to use City water for cooling tower makeup minimize water use impacts consistent with the minimization of costs associated with the mitigation, control and reduction of those impacts?<sup>12</sup>
  - Is there enough City water to serve the Project?
  - If there is enough water, have the environmental impacts associated with the Project’s use of that water been minimized?
  - Should the Board impose additional mitigation measures to minimize environmental impacts?
- Is the use of City water consistent with the current health and environmental policies of the Commonwealth?

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<sup>12</sup> In the Original Proceeding, the Board concluded that using AWRP water was preferable to using City water thereby implying (but not explicitly stating) that the environmental impacts of using City water are greater than the impacts of using AWRP water.