

BEALS AND THOMAS, INC.

Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772-2104
mail@btiweb.com

Tel: 508-366-0560
Fax: 508-366-4391
www.btiweb.com

April 2, 2010

US Environmental Protection Agency
NCCW GP Processing
Municipal Assistance Unit (CMU)
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Via: Email to: NCCW.GeneralPermit@epa.gov
FedEx

Reference: Application for Coverage under Noncontact Cooling Water General Permit
Notice of Intent
Weston Corporate Center
Weston, Massachusetts
BTI Project No. 0193.45

Dear US Environmental Protection Agency:

On behalf of the Applicant, Boston Properties, Beals and Thomas, Inc. respectfully submits this Notice of Intent (NOI) for Noncontact Cooling Water (NCCW) General Permit. The Applicant proposes to seasonally withdraw water from the south quarry pond on the Subject Property to be used in cooling the proposed building during the warmer months between May and September. Whenever outdoor ambient conditions are cool enough, the system will operate in the air economizer mode and demand for cooling water will be reduced or eliminated. This will occur primarily near the beginning and end of the cooling season.

The Applicant will be implementing a noncontact deep water source cooling system with intake and outflow piping installed in the south quarry pond. A small pump house structure (approximately 12 feet by 18 feet) will be located adjacent to the south quarry pond. Cold water (40°F) will be pumped from near the bottom of the quarry (below 200 feet deep) to heat exchangers in the building and returned to the quarry ponds at 50-58°F near the surface (25 to 35 feet deep). This will result in a discharge temperature that is approximately constant and 12°F higher than the intake water temperature.

Based on a study by TMP Consulting Engineers, Inc., the cooling water will be drawn from the hypolimnion, where the cold dense water resides in the quarry. Since the cooling water will be drawn from the hypolimnion and returned near the surface, the effect over the summer cooling season would be for the hypolimnion level to go down and the depth of the warmer water near the top to increase. The temperature of the return water after being used for building cooling will be about 55°F, actually cooler or about the same as the temperature of the surface water. Therefore, there would effectively be no increase in the temperature of the quarry water, only a change in the level of the thermocline depth.

If the entire quarry water volume could be uniformly raised in temperature by the addition of the annual cooling energy consumption of the building, the water temperature would be raised by about 1.7°F. In reality this does not occur because the surface of the pond constantly loses heat due to evaporation and wind convection. The temperature of the reintroduced water can be about equal to as much as 7°F cooler than the ambient water temperature at a depth of 25 feet. So in the late summer months, when the thermocline is well established, the return water temperature from the building cooling system would have the effect of slightly cooling the ambient water near the top of the thermocline. Near the beginning of the cooling season, the return water temperature will be slightly warmer than the ambient water temperature at the discharge depth while the epilimnion and the thermocline are just starting to get established.

There are no chemical additives being introduced to the water in the quarry recirculation. Therefore, there will be no change in pH.

Best Technology Available (BTA)

The intake structure is below 200 feet in depth. Beals and Thomas, Inc. prepared an Invertebrate Study in March of 2008 (see attached) to provide a qualitative assessment of the estimated macroinvertebrate habitat conditions within the quarry and potential implications of the cooling water withdrawal and discharge.

The report concluded that, considering the lack of suitable habitat features and absence of food sources within the littoral zone of the pond, as well as potential predation by vertebrate species the quarry does not support robust macroinvertebrate populations. Based on the minimal anticipated thermal effect on water quality, the proposed cooling system component of the project will have a negligible effect on any macroinvertebrate populations that may be present within the south quarry.

The fish species observed and noted in the invertebrate study would not be located at the depth of the intake structure. Additionally, it is highly improbable that any fish species would be located at the depth of the intake structure because there is no direct inlet or outlet allowing deep-water fish species access to the quarry.

The design capacity of the cooling water intake structure is 1.0 million gallons per day (MGD). The maximum intake velocity is 1.11 feet per second (fps). The maximum velocity of the outlet structure is 1.2 fps.

Endangered Species Eligibility Act

Beals and Thomas, Inc. has consulted the US Fish and Wildlife (USFW) website and determined that the Subject Property does not contain federally listed endangered and threatened species. According to the USFW, the only species mapped in Middlesex County is the Small whorled Pogonia in Groton, MA. See attached documentation from Appendix 2 of the NCCW General Permit and information from the USFW.

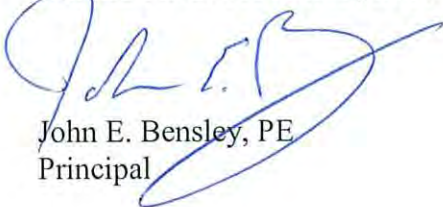
National Historic Preservation Act

A portion of the Subject Property is located within the Boston Post Road Historic District listed on the National and State Registers of Historic Places (NRIND, 2/11/1983). This district includes approximately 170 properties on both sides of Boston Post Road from Stony Brook to Plain Road (National and State Register of Historic Places updated through December 2009). Based upon information provided in the Final Environmental Impact Report (FEIR) document filed under the Massachusetts Environmental Policy Act (MEPA), "when the District was formed, the line was drawn to exclude several intrusive elements including the Route 128 interchange and the Mass Broken Stone quarry operation." The site of the proposed water removal from the South Quarry Pond, formerly used in the Mass Broken Stone quarry operation is not on the National or State Register of Historic Places.

As required, a copy of this NOI filing has been sent to the Massachusetts Department of Environmental Protection (DEP), Worcester Office. The filing fee of \$385 and a copy of the transmittal form (BRP WM 11) have been sent to the DEP lock box in Boston.

Very truly yours,

BEALS AND THOMAS, INC.



John E. Bensley, PE
Principal

Attachments:

1. Form for Notice of Intent for Non Contact Cooling Water General Permit
2. Summary of Water Quality Parameters-South Quarry Pond, September 2008 and Site, Sample and Subsurface Exploration Location Plan, Figure 2, September 2007, by Haley & Aldrich
3. Revised Grading at Pump Vault, CSK-019C, September 1, 2009 by Beals and Thomas, Inc.
4. Endangered Species Act Eligibility information
5. National Historic Preservation Act information
6. Velocity Calculation, by Beals and Thomas, Inc., March 10, 2010
7. Invertebrate Study, by Beals and Thomas, Inc., March 28, 2008
8. MA DEP Transmittal Form (BRP WM 11)

cc. Massachusetts Department of Environmental Protection, (via Certified Mail)
Kevin Sheehan, Boston Properties (via US Mail)

JEB/kdw/cp/019345END001

BEALS AND THOMAS, INC.

APPENDIX 5

Suggested Form for Notice of Intent (NOI) for the Noncontact Cooling Water General Permit

1. General facility information. Please provide the following information about the facility.

a) Name of facility: <u>Weston Corporate Center</u>		Type of Business: <u>Office</u>
Facility Location Address : <u>133 Boston Post Road, Weston, MA</u> longitude: <u>42d 22' 20.29" N</u> latitude: <u>71d 16' 31.09" W</u>	Facility SIC codes: <u>73</u>	Facility Mailing Address (if not location address) <u>c/o Boston Properties</u> <u>800 Boylston Street, Suite 1900</u> <u>Boston, MA 02199</u>
b) Name of facility owner: <u>BP Weston Quarry LLC</u>		Email address of owner: <u>mcantalupa@bostonproperties.com</u>
Owner's Tel #: <u>(617) 236-3300</u> Owner's Fax #: <u>(617) 236-3684</u>		Owner is (check one): 1. Federal ☐ 2. State ☐ 3. Tribal ☐ 4. Private ☒ 5. Other ☐ (Describe) _____
Address of owner (if different from facility address) <u>See Facility Mailing Address</u>		
Legal name of Operator, if not owner: <u>Same as Owner</u> Operator Contact Name: <u>Michael Cantalupa</u> Operator Tel Number: <u>(617) 236-3300</u> Fax Number: <u>(617) 263-3684</u> Operator's email: <u>mcantalupa@bostonproperties.com</u> Operator Address (if different from owner) <u>Same as owner</u>		
d) Attach topographic map indicating the locations of the facility and the receiving water; all NCCW discharge points; upstream and downstream monitoring points. Map attached? ☒		
e) Check Yes or No for the following: 1. Has a prior NPDES permit been granted for the discharge? Yes ☐ No ☒ If Yes, Permit Number: _____ 2. Is the discharge a "new discharge" as defined by 40 CFR Section 122.22? Yes ☒ No ☐ 3. Is the facility covered by an individual NPDES permit? Yes ☒ No ☐ If Yes, Permit Number _____ 4. Is there a pending application on file with EPA for this discharge? Yes ☐ No ☒ If Yes, date of submittal: _____		

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as needed)

a) Name of receiving water into which discharge will occur: Unnamed Quarry Pond
 State Water Quality Classification: None Freshwater: Yes Marine Water:

b) Describe the discharge activities for which the owner/applicant is seeking coverage: see attached cover letter

c) FOR MASSACHUSETTS FACILITIES ONLY: Engineering Calculations: Submit the completed engineering calculation of the surface water temperature rise as shown in Attachment A of the General Permit. Check if attached: ✓

d) Number of outfalls 1

For each outfall:

e) What is the maximum daily and average monthly flow of the discharge? Note that EPA will use the flow reported here as the facility's permitted effluent flow limit. Max Daily Flow 1,000,000 GPD Average Flow 750,000 GPD

f) What is the maximum daily and average monthly temperature of the discharge (in degrees F)? Max Temp. 58 Average Temp. 52

g) What is the maximum and minimum monthly pH of the discharge (in s.u.)? Max pH N/A Min pH N/A

h) FOR MASSACHUSETTS FACILITIES ONLY: Is the source water of the NCCW potable water? Yes No ✓ If Yes, EPA will calculate the Total Residual Chlorine limit for facilities located in Massachusetts.

i) Is the discharge continuous? Yes No ✓ If no, is the discharge periodic (P) (occurs regularly, i.e., monthly or seasonally, but is not continuous all year) or intermittent (I) (occurs sometimes but not regularly) or both (B) P
 If (P), number of days or months per year of the discharge 5 m and the specific months of discharge May-September;
 If (I), number of days/year there is a discharge N/A

j) Latitude and longitude of each discharge within 100 feet: outfall 1: long. 71d 16' 23" lat. 42d 22' 15"; outfall 2: long. N/A lat. N/A;
 outfall 3: long. N/A lat. N/A (See http://www.epa.gov/tri/report/siting_tool)

k) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water N/A cfs
 Please attach any calculation sheets used to support stream flow and dilution calculations. See General Permit Attachment B for equations and additional information.

MASSACHUSETTS FACILITIES: See Part 3.4 and Appendix 1 of the General Permit for more information on ACEC.
 Areas of Critical Environmental Concern (ACEC): Does the discharge occur in an ACEC? Yes No ✓
 If yes, provide the name of the ACEC:

3. NCCW Source Water Information. Please provide information about the NCCW source water, using separate sheets as necessary:

a) Indicate source of the NCCW (i.e., municipal water supply, private well, surface water withdrawal, groundwater): Source: <u>Surface water withdrawal</u> Name of Source Water: <u>unnamed quarry pond</u> Is the source registered/permitted under MA Water Management Act or NHDES Water User Registration Rule (Env Wq 2202)? Yes <u> </u> No <u>✓</u> If yes, registration number: <u> </u>	b) If source water is surface water: i) Is it a freshwater river or stream Yes <u> </u> No <u>✓</u> ii) Is it a lake? no <u> </u> reservoir? no <u> </u> iii) Is it tidal river? no <u> </u> estuary? no <u> </u> ocean? no <u> </u> c) Is the source water groundwater? Yes <u> </u> No <u>no</u> If yes, see Appendix 8 and submit effluent and surface water test results, as required in Part 5.4 of the General Permit. d) Does the facility use both a primary and backup source of noncontact cooling water? Yes <u> </u> No <u>✓</u> If yes, attach information that identifies and explains the primary and backup sources of noncontact cooling water for and how often the backup supply was used in last three years.
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4. Best Technology Available for CWIS

Are you subject to BTA requirements at Part 4.2 of the General Permit? (Facility's discharge is covered by this General Permit and the facility withdraws noncontact cooling water from surface source water). Yes <u>✓</u> No <u> </u> If No, explain:	If YES, attach the facility-specific BTA description as required in Part 4.3 of the General Permit. For additional information and guidance, see Questions 13-23 of the NCCW Fact Sheet, posted at http://www.epa.gov/region1/npdsw/nccwsp.html. Provide a map showing the location of each CWIS intake structure; NCCW outfall(s) and any CWIS feature referred to in the BTA description. Include in your description: <u> </u> Measures to meet the General Permit Part 4.3.a general BTA requirements, including documentation that describes the facility's monitoring program for impinged fish and/or invertebrate; or the required alternative monitoring plan frequency and/or protocol <u> </u> A characterization of the source water body's aquatic life habitat in the vicinity of each CWIS during the seasons when the CWIS may be in use <u> </u> The attributes of the current CWIS <u> </u> Design measures of the CWIS <u> </u> Operation measures of the CWIS <u> </u> Historical occurrence of impinged fish for the past five years <u> </u> If applicable, a demonstration that the facility's intake rate is commensurate with a closed-cycle recirculation system <u> </u> Other components to reduce impingement and/or entrainment of aquatic life
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4. BTA FOR CWIS CONTINUED:

Provide the following information for each CWIS to support your attached facility-specific BTA description.

Design capacity of the of the CWIS 1.0 MGD

Maximum monthly average intake of the CWIS during the previous five years N/A MGD Month in which this flow occurred N/A

Maximum through-screen design intake velocity 1.11 feet/second (fps)

For facilities where the CWIS is located on a freshwater river or stream, provide the following information:

The source water's annual mean flow N/A cubic feet/second (cfs) as available from USGS or other appropriate source

The design intake flow as a % of the source water's annual mean flow N/A Attach calculations if equal to or less than 5% of annual mean flow.

The source water's 7Q10 N/A cfs. See Attachment B of the General Permit for more information on 7Q10 determinations.

The design intake flow as a percent of the source water's 7Q10

5. Contaminant Information

If applicable, attach a listing of all non-toxic pH neutralization and/or dechlorination chemicals used, including chemical name and manufacturer; maximum and average daily quantity used as well as the maximum and average daily expected concentrations (mg/l) in the NCCW discharge, and the vendor's reported aquatic toxicity (NOAEL and/or LC₅₀ in percent for aquatic organism(s)).

6. Determination of Endangered Species Act Eligibility: Provide documentation of ESA eligibility as required at Part 3.4 and Appendix 2, Part C, Step 4, of the General Permit. In addition, respond to the following questions.

- a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes No ☒ No ☒
- b) Has any consultation with the federal services been completed? Yes No ☒ No ☒
- c) Is consultation underway? Yes No ☒ No ☒
- d) What were the results of the consultation with the U.S. Fish and Wildlife Service and/or NOAA Fisheries Service (check one):
a "no jeopardy" opinion or written concurrence on a finding that the discharges are not likely to adversely affect any endangered species or
- e) Which of the five eligibility criteria listed in Appendix 2, Section B (A,B,C,D or E) have you met? A
- f) Attach a copy of the most current federal listing of endangered and threatened species from the USF&W web site listed in Appendices 2, 2.1 and 4

7. Documentation of National Historic Preservation Act requirements: Please respond to the following questions:

- a) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility site or in proximity to the discharge? Yes No ☒ No ☒
- b) Have any State or Tribal historic preservation officers been consulted in this determination? Yes No ☒ or No ☒ If yes, attach the results of the consultation(s).
- c) Which of the three National Historic Preservation Act requirements listed in Appendix 3, Section C (1,2 o3) have you met? 1

8. Supplemental Information: Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit

9. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22 (see below) including the following certification:

I certify under penalty of law that (1) no biocides or other chemical additives except for those used for pH adjustment and/or dechlorination are used in the noncontact cooling water (NCCW) system; (2) the discharge consists solely of NCCW (to reduce temperature) and authorized pH adjustment and/or dechlorination chemicals; (3) the discharge does not come in contact with any raw materials, intermediate product, water product (other than heat) or finished product; (4) if the discharge of noncontact cooling water subsequently mixes with other wastewater (i.e. stormwater) prior to discharging to the receiving water, any monitoring provided under this permit will be only for noncontact cooling water; (5) where applicable, the facility has complied with the requirements of this permit specific to the Endangered Species Act and National Historic Preservation Act; and (6) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility Name: Weston Corporate Center, BP Weston Quarry LLC-Owner

Operator signature:

Title: Senior VP of Development

Date: 3-30-10

Federal regulations require this application to be signed as follows:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively, or,
3. For a municipality, State, Federal or other public facility, by either a principal executive officer or ranking elected official.

Owner/

TABLE II
SUMMARY OF WATER QUALITY PARAMETERS
SOUTH QUARRY
PROPOSED WESTON CORPORATE CENTER
WESTON, MASSACHUSETTS

SOUTH QUARRY										
MONITORING DATE	SAMPLING DEPTH (ft)	SAMPLING LOCATION								COMMENTS
		S. EAST		S. NORTH		S. WEST		S. CENTER		
		TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	
16-Aug-07	25	14.6	624	15.5	632	14.2	632	14.5	635	S. North temp fluctuate 15.5 to 20.4
16-Aug-07	50	7	633	6.7	635	7.1	660	7.2	657	
16-Aug-07	75	4.9	671	4.6	618	4.9	674	4.9	673	
16-Aug-07	100	4.5	673	4.5	579	4.5	676	4.5	676	
16-Aug-07	125	4.4	681	4.4	576	4.4	681	4.4	681	
16-Aug-07	150	4.6	682	4.6	563	4.6	685	4.6	682	
16-Aug-07	175	4.7	689	4.7	579	4.7	694	4.7	693	
16-Aug-07	200	4.7	689	4.7	561	4.7	694	4.7	692	
16-Aug-07	225	-	-	-	-	-	-	4.7	694	
16-Aug-07	250	-	-	-	-	-	-	4.7	694	
16-Aug-07	275	-	-	-	-	-	-	4.7	694	
16-Aug-07	300	-	-	-	-	-	-	4.7	694	
16-Aug-07	325	-	-	-	-	-	-	-	-	
16-Aug-07	350	-	-	-	-	-	-	-	-	
16-Aug-07	375	-	-	-	-	-	-	-	-	
16-Aug-07	400	-	-	-	-	-	-	-	-	
16-Aug-07	425	-	-	-	-	-	-	-	-	
16-Aug-07	450	-	-	-	-	-	-	-	-	
Weather:										
17-Aug-07	25	13.6	544	14.1	544	12.9	546	13.6	538	
17-Aug-07	50	6.6	575	7.9	554	6.9	576	7	565	
17-Aug-07	75	4.9	582	5.1	580	5.2	580	5	580	
17-Aug-07	100	4.6	496	4.6	584	4.5	586	4.6	580	
17-Aug-07	125	4.7	497	4.5	588	4.4	589	4.5	583	
17-Aug-07	150	4.6	499	4.6	597	4.6	598	4.4	589	
17-Aug-07	175	4.6	499	4.7	598	4.6	598	4.7	594	
17-Aug-07	200	4.6	499	4.7	506	4.7	599	4.7	594	
17-Aug-07	225	-	-	-	-	-	-	4.7	598	
17-Aug-07	250	-	-	-	-	-	-	4.7	599	
17-Aug-07	275	-	-	-	-	-	-	4.7	601	
17-Aug-07	300	-	-	-	-	-	-	4.7	601	
17-Aug-07	325	0	-	-	-	-	-	-	-	
17-Aug-07	350	-	-	-	-	-	-	-	-	
17-Aug-07	375	-	-	-	-	-	-	-	-	
17-Aug-07	400	-	-	-	-	-	-	-	-	
17-Aug-07	425	-	-	-	-	-	-	-	-	
17-Aug-07	450	-	-	-	-	-	-	-	-	
Weather:										
21-Aug-07	25	-	-	-	-	-	-	14.4	750	Water sampling conducted at 20, 200, and 425 ft.
21-Aug-07	50	-	-	-	-	-	-	7.1	778	
21-Aug-07	75	-	-	-	-	-	-	4.9	795	
21-Aug-07	100	-	-	-	-	-	-	4.5	801	
21-Aug-07	125	-	-	-	-	-	-	4.4	805	
21-Aug-07	150	-	-	-	-	-	-	4.6	816	
21-Aug-07	175	-	-	-	-	-	-	4.7	817	
21-Aug-07	200	-	-	-	-	-	-	4.7	817	
21-Aug-07	225	-	-	-	-	-	-	4.7	817	
21-Aug-07	250	-	-	-	-	-	-	4.7	821	
21-Aug-07	275	-	-	-	-	-	-	4.7	823	
21-Aug-07	300	-	-	-	-	-	-	4.7	825	
21-Aug-07	325	-	-	-	-	-	-	-	-	
21-Aug-07	350	-	-	-	-	-	-	-	-	
21-Aug-07	375	-	-	-	-	-	-	-	-	
21-Aug-07	400	-	-	-	-	-	-	-	-	
21-Aug-07	425	-	-	-	-	-	-	-	-	
21-Aug-07	450	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										

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SUMMARY OF WATER QUALITY PARAMETERS
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PROPOSED WESTON CORPORATE CENTER
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SOUTH QUARRY										
MONITORING DATE	SAMPLING DEPTH (ft)	SAMPLING LOCATION								COMMENTS
		S. EAST		S. NORTH		S. WEST		S. CENTER		
		TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	
29-Aug-07	25	24	583	16.1	571	15.1	569	19.2	591	
29-Aug-07	50	7.7	592	7.1	599	6.9	604	8.2	586	
29-Aug-07	75	5.2	608	5.4	610	5.1	608	5.2	608	
29-Aug-07	100	4.7	613	4.7	614	4.6	612	4.6	615	
29-Aug-07	125	4.6	616	4.6	619	4.6	616	4.5	619	
29-Aug-07	150	4.6	618	4.7	629	4.6	619	4.7	627	
29-Aug-07	175	4.9	628	4.9	631	4.7	627	4.9	630	
29-Aug-07	200	4.9	630	4.9	550	4.7	681	4.9	631	
29-Aug-07	225	-	-	-	-	-	-	4.9	631	
29-Aug-07	250	-	-	-	-	-	-	4.9	631	
29-Aug-07	275	-	-	-	-	-	-	4.9	631	
29-Aug-07	300	-	-	-	-	-	-	4.9	631	
29-Aug-07	325	-	-	-	-	-	-	-	-	
29-Aug-07	350	-	-	-	-	-	-	-	-	
29-Aug-07	375	-	-	-	-	-	-	-	-	
29-Aug-07	400	-	-	-	-	-	-	-	-	
29-Aug-07	425	-	-	-	-	-	-	-	-	
29-Aug-07	450	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
14-Sep-07	25	14.9	611	15.1	611	15.2	608	14.9	611	
14-Sep-07	50	11.6	602	8.2	624	7.2	635	7.4	638	
14-Sep-07	75	5.4	649	5.2	650	5.2	664	5.2	649	
14-Sep-07	100	4.7	652	4.9	649	4.9	649	4.6	653	
14-Sep-07	125	4.9	652	4.6	655	4.6	651	4.6	655	
14-Sep-07	150	4.9	652	4.7	657	4.7	660	4.9	664	
14-Sep-07	175	4.9	655	5	664	4.9	667	4.9	667	
14-Sep-07	200	4.9	655	5	480	4.9	667	4.9	667	
14-Sep-07	225	-	-	-	-	-	-	4.9	667	
14-Sep-07	250	-	-	-	-	-	-	4.9	667	
14-Sep-07	275	-	-	-	-	-	-	4.9	667	
14-Sep-07	300	-	-	-	-	-	-	4.9	667	
14-Sep-07	325	-	-	-	-	-	-	-	-	
14-Sep-07	350	-	-	-	-	-	-	-	-	
14-Sep-07	375	-	-	-	-	-	-	-	-	
14-Sep-07	400	-	-	-	-	-	-	-	-	
14-Sep-07	425	-	-	-	-	-	-	-	-	
14-Sep-07	450	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
27-Sep-07	25	15.6	560	15.6	566	15.7	565	21.1	581	
27-Sep-07	50	7.7	584	7.9	589	7.5	589	7.6	589	
27-Sep-07	75	5.2	600	5.5	601	5.2	600	5.2	600	
27-Sep-07	100	4.7	601	4.9	602	4.7	604	4.9	602	
27-Sep-07	125	4.7	604	4.6	608	4.7	608	4.7	604	
27-Sep-07	150	4.9	609	4.9	616	4.9	612	4.9	616	
27-Sep-07	175	5.0	616	5.0	617	5.0	616	5.0	616	
27-Sep-07	200	5.0	616	5.0	540	5.0	620	5.0	616	
27-Sep-07	225	-	-	5.0	540	-	-	5.0	620	
27-Sep-07	250	-	-	-	-	-	-	5.0	620	
27-Sep-07	275	-	-	-	-	-	-	5.0	620	
27-Sep-07	300	-	-	-	-	-	-	5.0	620	
27-Sep-07	325	-	-	-	-	-	-	-	-	
27-Sep-07	350	-	-	-	-	-	-	-	-	
27-Sep-07	375	-	-	-	-	-	-	-	-	
27-Sep-07	400	-	-	-	-	-	-	-	-	
27-Sep-07	425	-	-	-	-	-	-	-	-	
27-Sep-07	450	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
11-Oct-07	25	16.4	451	17	448	17.4	448	16.9	450	
11-Oct-07	50	7.7	470	7.7	466	7.7	470	8.0	465	
11-Oct-07	75	5.4	480	5.5	477	5.4	479	5.4	477	
11-Oct-07	100	5.1	476	5.0	476	5.0	479	5.0	476	
11-Oct-07	125	5.2	382	4.9	481	4.9	484	4.9	481	
11-Oct-07	150	5.2	383	5.1	485	4.9	435	5.1	485	
11-Oct-07	175	5.1	383	5.1	488	4.9	434	5.1	488	
11-Oct-07	200	5.1	383	5.2	432	4.9	437	5.1	488	
11-Oct-07	225	-	-	-	-	-	-	5.1	488	
11-Oct-07	250	-	-	-	-	-	-	5.1	488	
11-Oct-07	275	-	-	-	-	-	-	5.1	488	
11-Oct-07	300	-	-	-	-	-	-	5.1	491	
11-Oct-07	325	-	-	-	-	-	-	-	-	
11-Oct-07	350	-	-	-	-	-	-	-	-	
11-Oct-07	375	-	-	-	-	-	-	-	-	
11-Oct-07	400	-	-	-	-	-	-	-	-	
11-Oct-07	425	-	-	-	-	-	-	-	-	
11-Oct-07	450	-	-	-	-	-	-	-	-	

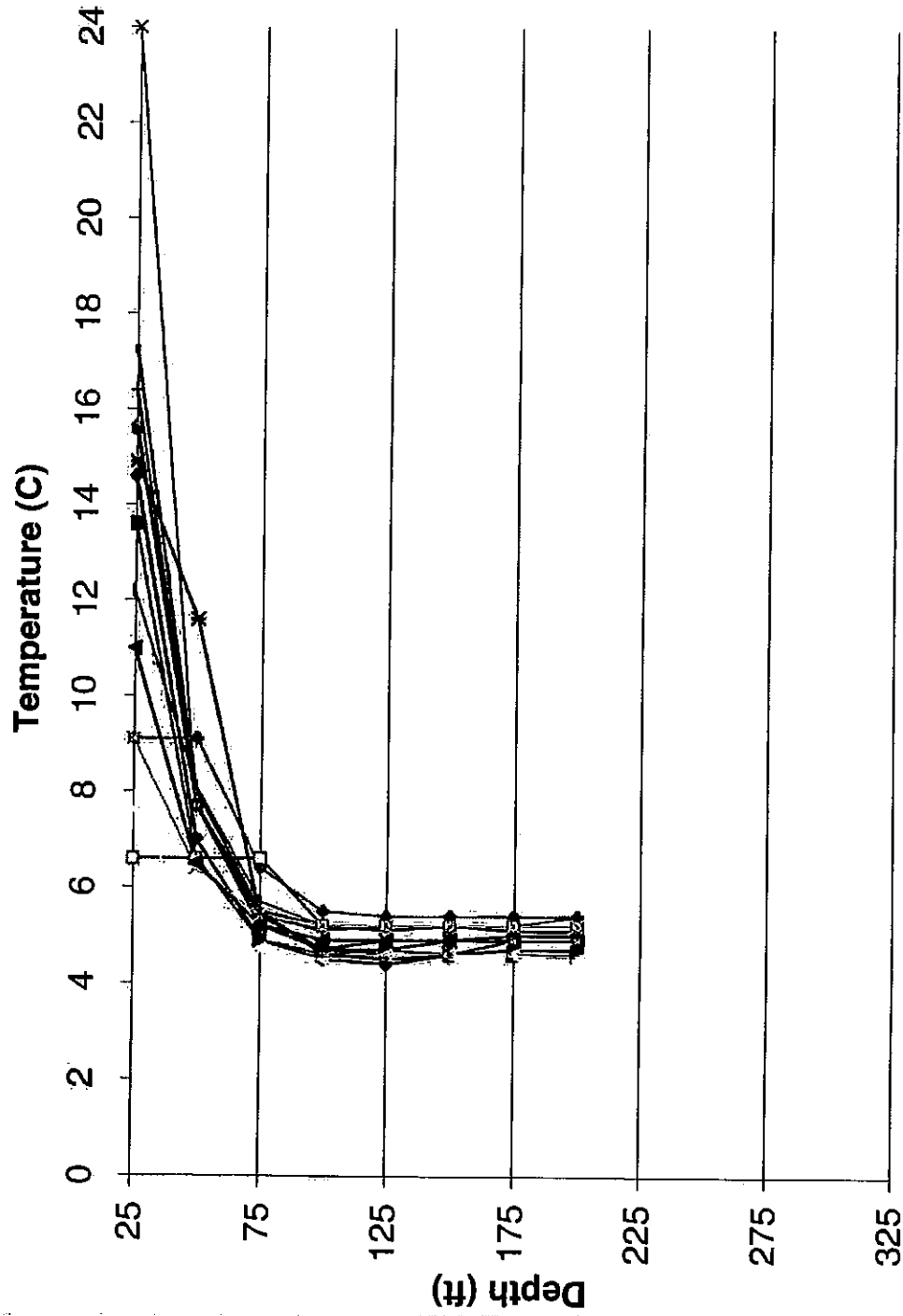
TABLE II
SUMMARY OF WATER QUALITY PARAMETERS
SOUTH QUARRY
PROPOSED WESTON CORPORATE CENTER
WESTON, MASSACHUSETTS

SOUTH QUARRY										
MONITORING DATE	SAMPLING DEPTH (ft)	SAMPLING LOCATION								COMMENTS
		S. EAST		S. NORTH		S. WEST		S. CENTER		
		TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	
Weather: Refer to HOBO weather station										
26-Oct-07	25	17.2	583	17.2	582	17.2	580	17.2	583	Conductivity at North 530-560
26-Oct-07	50	8.0	586	8.1	587	7.9	588	8.4	588	
26-Oct-07	75	5.5	601	5.6	601	5.6	600	6.5	597	
26-Oct-07	100	5.2	599	5.1	602	5.1	599	5.2	603	
26-Oct-07	125	5.1	606	5.1	606	5.1	608	5.0	608	
26-Oct-07	150	5.2	610	5.2	610	5.2	525	5.2	610	
26-Oct-07	175	5.2	617	5.2	617	5.2	519	5.2	617	
26-Oct-07	200	5.2	624	5.2	560	5.1	519	5.2	617	
26-Oct-07	225	-	-	5.2	537	-	-	5.2	617	
26-Oct-07	250	-	-	-	-	-	-	5.2	617	
26-Oct-07	275	-	-	-	-	-	-	5.2	619	
26-Oct-07	300	-	-	-	-	-	-	5.2	623	
26-Oct-07	325	-	-	-	-	-	-	-	-	
26-Oct-07	350	-	-	-	-	-	-	-	-	
26-Oct-07	375	-	-	-	-	-	-	-	-	
26-Oct-07	400	-	-	-	-	-	-	-	-	
26-Oct-07	425	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
12-Nov-07	25	12.2	395	12.1	397	12.2	395	12.1	397	Conductivity readings corrected for calibration
12-Nov-07	50	8.1	403	8.0	403	8.0	403	8.2	401	
12-Nov-07	75	5.7	409	5.7	411	5.6	411	5.7	409	
12-Nov-07	100	5.2	410	5.2	410	5.2	410	5.2	410	
12-Nov-07	125	5.2	413	5.1	413	5.1	416	5.1	413	
12-Nov-07	150	5.2	419	5.2	419	5.2	419	5.2	419	
12-Nov-07	175	5.2	422	5.2	421	5.2	350	5.2	421	
12-Nov-07	200	5.4	399	5.2	423	5.2	352	5.2	423	
12-Nov-07	225	-	-	-	-	-	-	5.2	423	
12-Nov-07	250	-	-	-	-	-	-	5.2	424	
12-Nov-07	275	-	-	-	-	-	-	5.2	424	
12-Nov-07	300	-	-	-	-	-	-	5.2	424	
12-Nov-07	325	-	-	-	-	-	-	-	-	
12-Nov-07	350	-	-	-	-	-	-	-	-	
12-Nov-07	375	-	-	-	-	-	-	-	-	
12-Nov-07	400	-	-	-	-	-	-	-	-	
12-Nov-07	425	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
30-Nov-07	25	9.1	221	9.1	221	9.1	221	9.1	221	
30-Nov-07	50	9.1	221	9.1	221	9.1	221	9.1	220	
30-Nov-07	75	6.4	226	5.9	227	6.5	227	9.1	220	
30-Nov-07	100	5.5	227	5.2	229	5.5	227	5.2	228	
30-Nov-07	125	5.4	179	5.2	229	5.2	229	5.2	229	
30-Nov-07	150	5.4	179	5.2	232	5.2	232	5.2	232	
30-Nov-07	175	5.4	179	5.2	232	5.2	210	5.4	233	
30-Nov-07	200	5.4	179	5.2	234	5.2	210	5.4	233	
30-Nov-07	225	-	-	-	-	-	-	5.4	233	
30-Nov-07	250	-	-	-	-	-	-	5.4	233	
30-Nov-07	275	-	-	-	-	-	-	5.4	233	
30-Nov-07	300	-	-	-	-	-	-	5.4	235	
30-Nov-07	325	-	-	-	-	-	-	-	-	
30-Nov-07	350	-	-	-	-	-	-	-	-	
30-Nov-07	375	-	-	-	-	-	-	-	-	
30-Nov-07	400	-	-	-	-	-	-	-	-	
30-Nov-07	425	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
13-Dec-07	25	6.6	563	6.6	563	6.6	561	6.5	563	
13-Dec-07	50	6.6	563	6.6	564	6.6	563	6.6	563	
13-Dec-07	75	6.6	563	6.2	569	6.5	565	6.1	568	
13-Dec-07	100	5.2	578	5.2	576	5.2	573	5.2	572	
13-Dec-07	125	5.2	579	5.2	578	5.2	578	5.2	577	
13-Dec-07	150	5.2	549	5.2	584	5.2	534	5.2	584	
13-Dec-07	175	5.2	549	5.4	588	5.2	530	5.2	590	
13-Dec-07	200	5.2	551	5.4	588	5.2	530	5.4	588	
13-Dec-07	225	-	-	-	-	-	-	5.4	588	
13-Dec-07	250	-	-	-	-	-	-	5.4	589	
13-Dec-07	275	-	-	-	-	-	-	5.4	591	
13-Dec-07	300	-	-	-	-	-	-	5.4	594	
13-Dec-07	325	-	-	-	-	-	-	-	-	
13-Dec-07	350	-	-	-	-	-	-	-	-	
13-Dec-07	375	-	-	-	-	-	-	-	-	
13-Dec-07	400	-	-	-	-	-	-	-	-	
13-Dec-07	425	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										

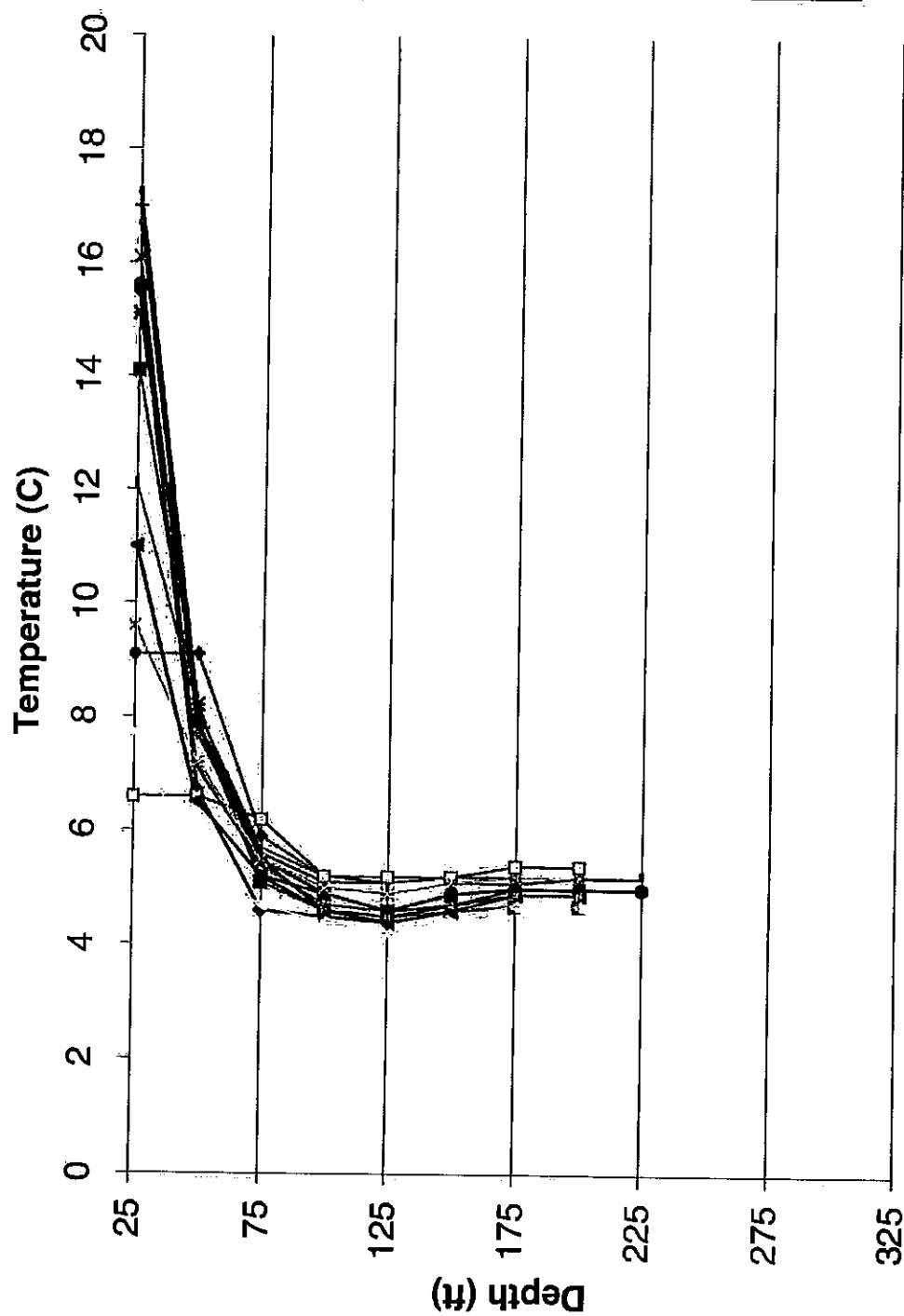
TABLE II
SUMMARY OF WATER QUALITY PARAMETERS
SOUTH QUARRY
PROPOSED WESTON CORPORATE CENTER
WESTON, MASSACHUSETTS

SOUTH QUARRY										
MONITORING DATE	SAMPLING DEPTH (ft)	SAMPLING LOCATION								COMMENTS
		S. EAST		S. NORTH		S. WEST		S. CENTER		
		TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	TEMP DEGREES C	CONDUCTIVITY µS/cm	
7-May-08	25	7.6	571	7.7	572	7.7	570	7.7	565	
	50	5.4	582	5.4	582	5.4	582	5.5	577	
	75	4.7	583	4.7	583	4.7	583	4.7	580	
	100	4.5	479	4.4	591	4.4	591	4.2	590	
	125	4.6	477	4.2	598	4.2	594	4.2	594	
	150	4.6	477	4.5	602	4.4	581	4.6	602	
	175	4.6	477	4.7	610	4.4	581	4.7	608	
	200	4.5	479	4.7	571	4.4	581	4.7	608	
	225	-	-	4.7	573	-	-	4.7	608	
	250	-	-	-	-	-	-	4.7	610	
	275	-	-	-	-	-	-	4.7	613	
	300	-	-	-	-	-	-	4.7	614	
	325	-	-	-	-	-	-	-	-	
	350	-	-	-	-	-	-	-	-	
	375	-	-	-	-	-	-	-	-	
	400	-	-	-	-	-	-	-	-	
	425	-	-	-	-	-	-	-	-	
21-May-08	25	9.1	555	9.6	551	9.1	560	9.1	555	
	50	6.4	563	7.2	559	6.4	564	6.5	561	
	75	5.4	570	5.5	562	5.4	570	5.5	566	
	100	5.2	516	5.0	568	5.0	573	5.1	569	
	125	5.2	516	4.9	573	4.9	580	4.9	578	
	150	5.2	516	5.1	579	5.0	546	5.0	578	
	175	5.2	516	5.2	589	5.0	543	5.2	592	
	200	5.2	516	5.2	589	5.0	540	5.2	592	
	225	-	-	-	-	-	-	5.2	566	
	250	-	-	-	-	-	-	5.2	484	
	275	-	-	-	-	-	-	5.2	484	
	300	-	-	-	-	-	-	5.2	484	
	325	-	-	-	-	-	-	-	-	
	350	-	-	-	-	-	-	-	-	
	375	-	-	-	-	-	-	-	-	
	400	-	-	-	-	-	-	-	-	
	425	-	-	-	-	-	-	-	-	
Weather: Refer to HOBO weather station										
25-Jun-08	25	11.0	563	11.0	559	11.0	561	11.6	558	
	50	6.5	570	6.5	569	6.6	572	6.5	567	
	75	5.2	576	5.2	572	5.2	576	5.2	572	
	100	4.9	577	4.6	582	4.5	589	4.4	581	
	125	4.9	577	4.4	591	4.4	591	4.4	589	
	150	4.9	577	4.6	599	4.5	546	4.6	597	
	175	4.9	577	4.9	600	4.5	546	4.7	600	
	200	4.9	577	4.9	600	4.5	546	4.9	599	
	225	-	-	-	-	-	-	4.9	600	
	250	-	-	-	-	-	-	4.9	602	
	275	-	-	-	-	-	-	4.9	604	
	300	-	-	-	-	-	-	4.9	604	
	325	-	-	-	-	-	-	-	-	
	350	-	-	-	-	-	-	-	-	
	375	-	-	-	-	-	-	-	-	
	400	-	-	-	-	-	-	-	-	
	425	-	-	-	-	-	-	-	-	
12-Sep-08	25	15.7	544	16.7	547	15.2	546	15.1	548	
	50	7.7	550	7.7	550	7.5	555	7.7	553	
	75	5.5	560	5.5	560	5.4	563	5.5	560	
	100	4.6	569	4.6	566	4.6	568	4.6	571	
	125	4.5	573	4.5	573	4.5	577	4.5	577	
	150	4.6	580	4.7	581	4.6	584	4.6	580	
	175	4.9	536	4.9	586	4.9	586	4.9	586	
	200	4.9	422	4.9	520	4.9	589	4.9	588	
	225	-	-	-	-	-	-	4.9	589	
	250	-	-	-	-	-	-	4.9	589	
	275	-	-	-	-	-	-	4.9	589	
	300	-	-	-	-	-	-	4.9	589	

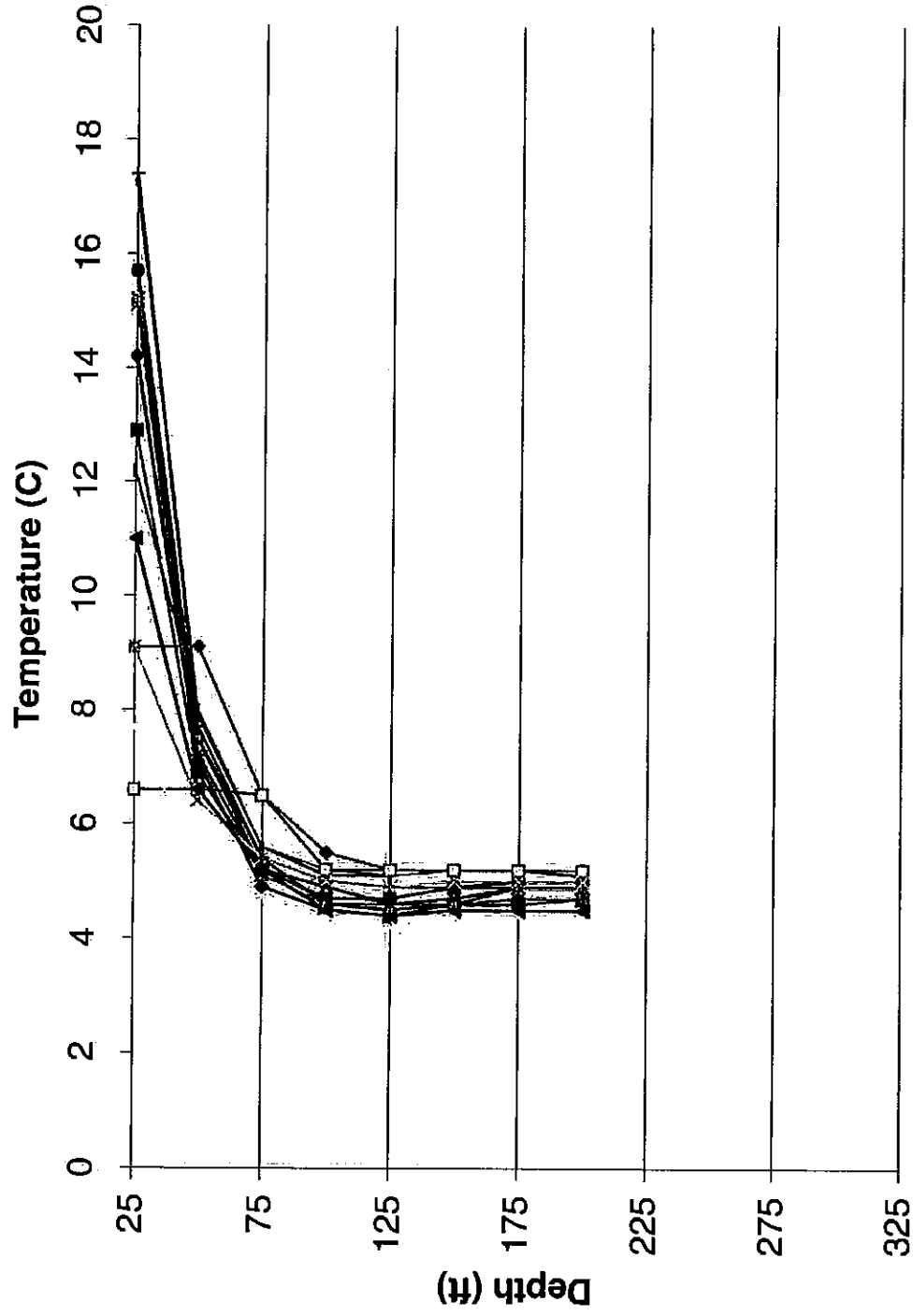
STRATIFICATION: South Quarry, S. East



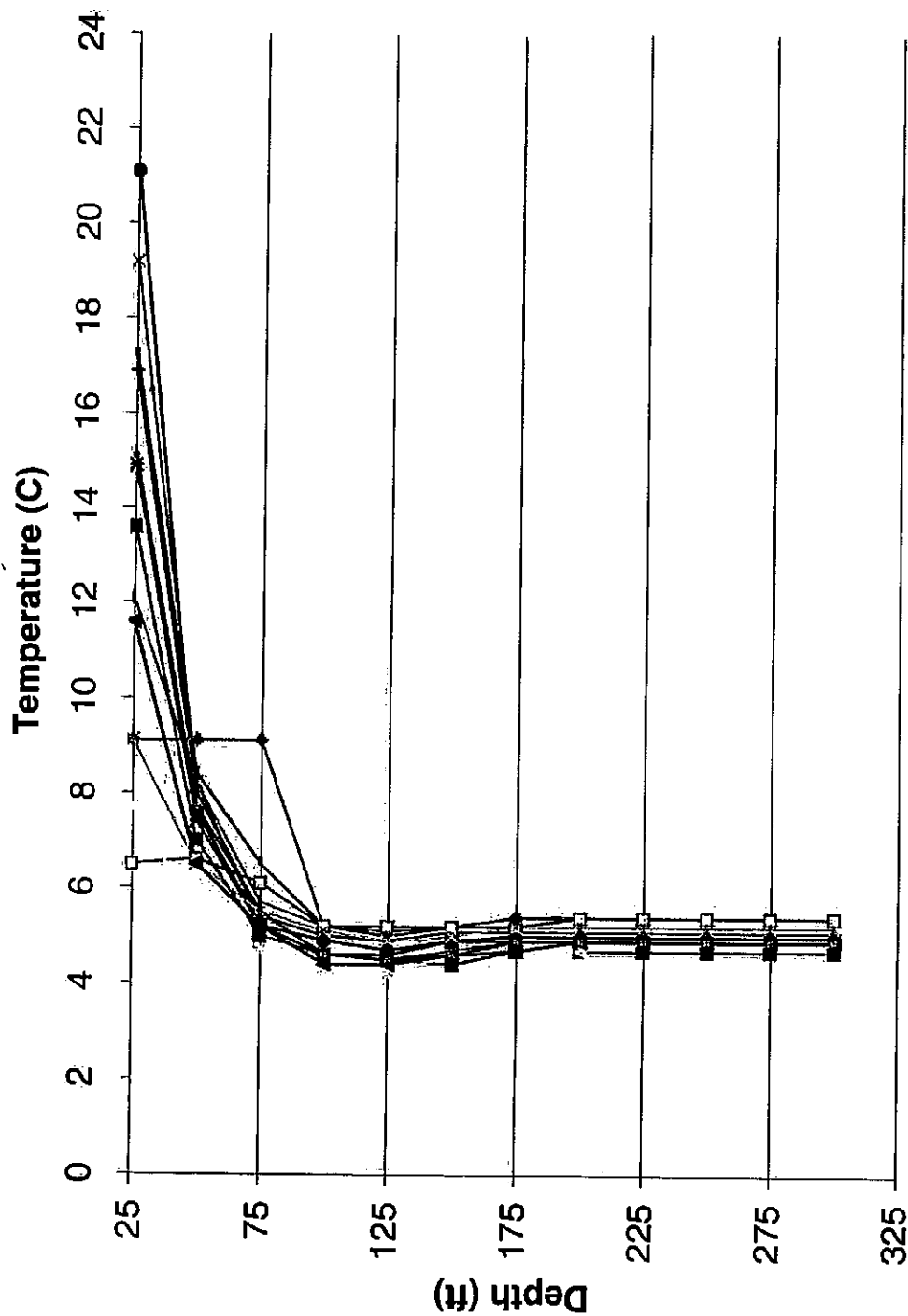
STRATIFICATION: South Quarry, S. North

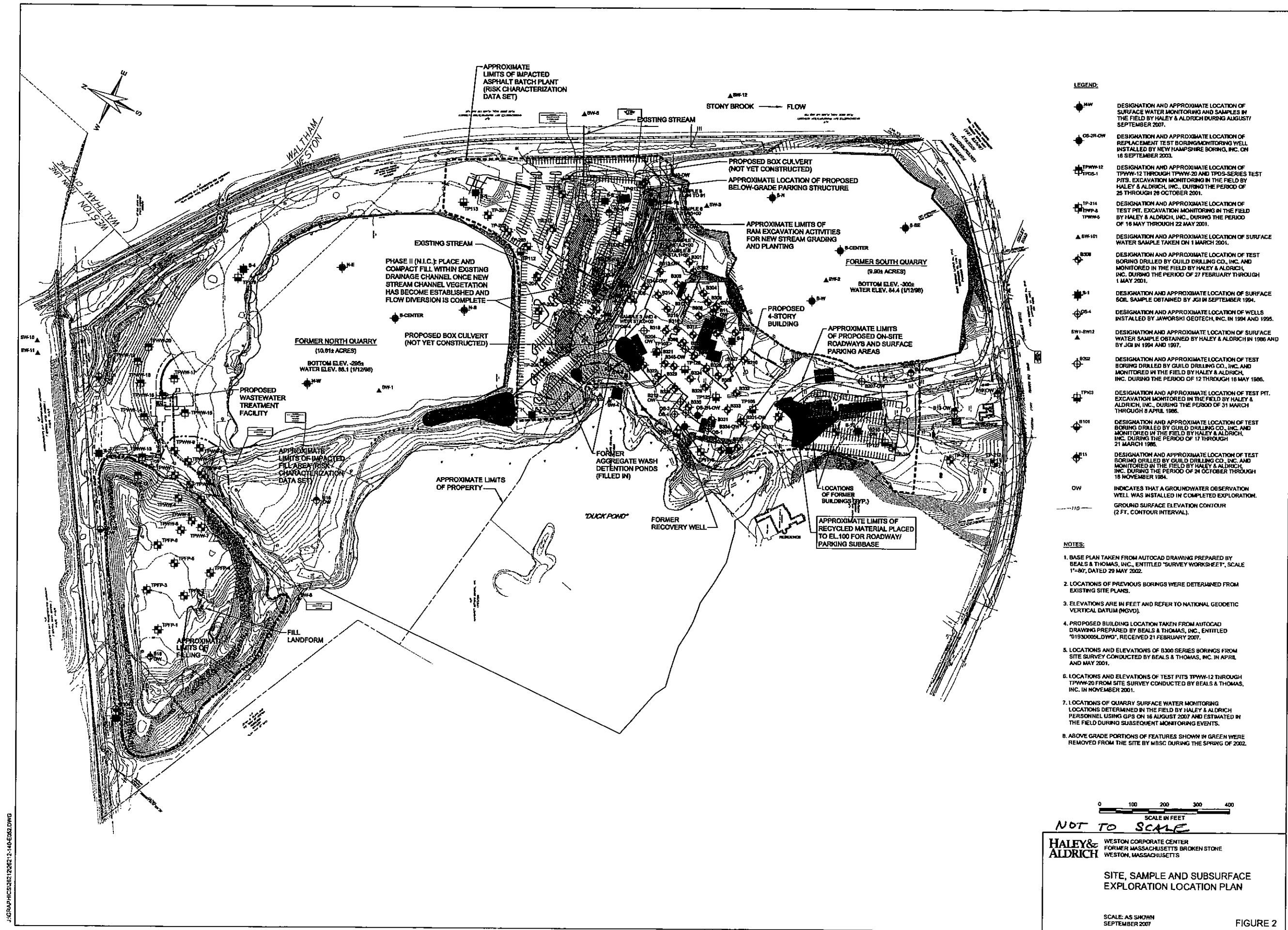


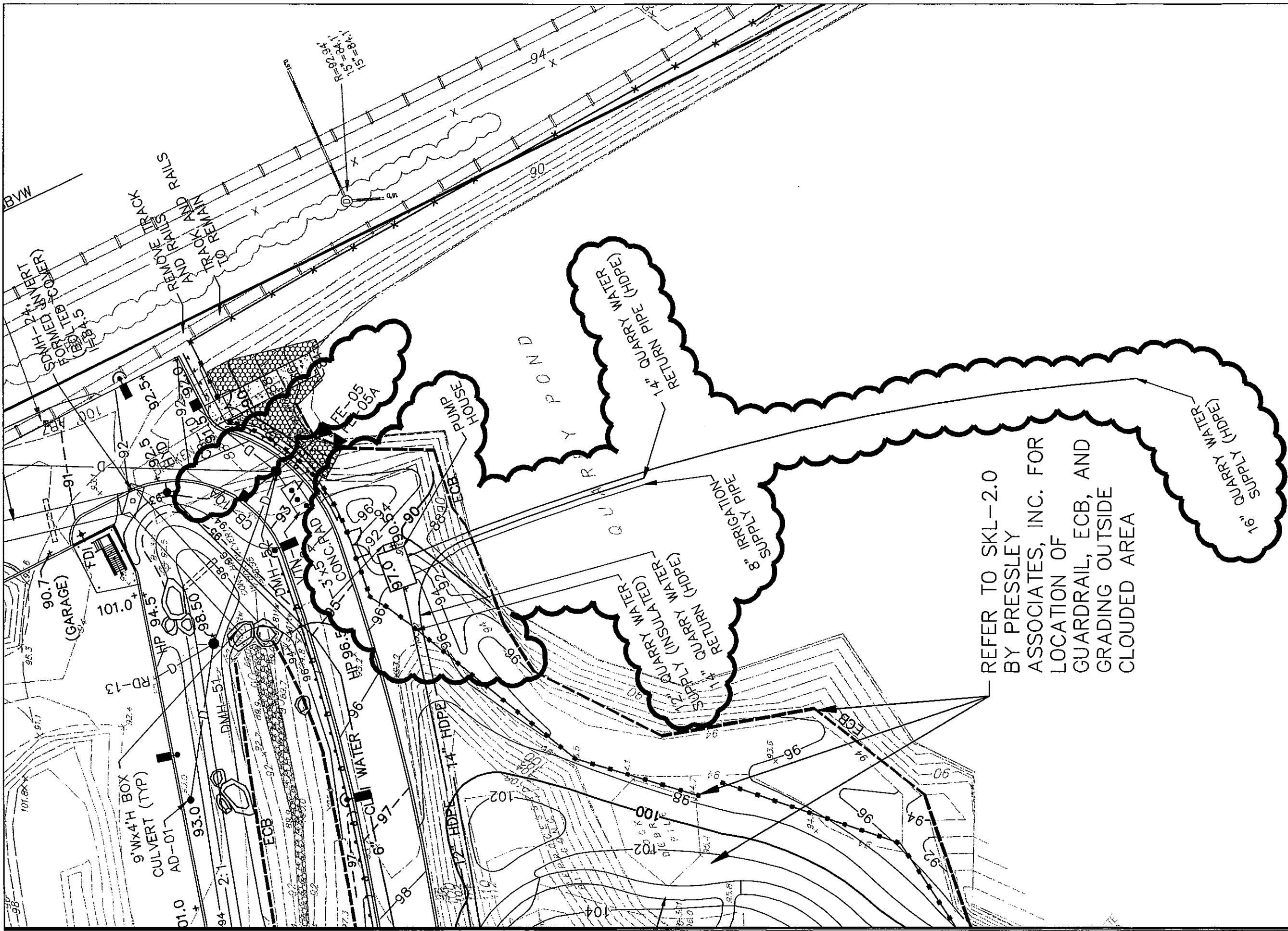
STRATIFICATION: South Quarry, S. West



STRATIFICATION: South Quarry, S. Center

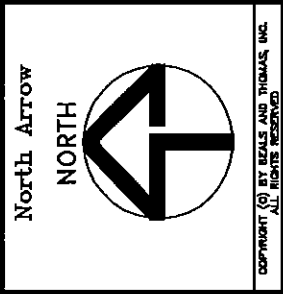






Reference Drawing C-5

Bulletin #92



The Corporate Center
Weston, Massachusetts

Boston Properties Limited
Partnership
800 Boylston Street
Boston, Massachusetts

Revised Grading at Pump Vault
CSK-019C

Scale: 1" = 40' Date: 09/01/2009

Source File: 0193D005X.dwg
Drawing No. 0193P065C.dwg
BTI Project No. 0193.38

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague
	Dwarf wedgemussel	Endangered	Mill River	Whately
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hadley, Hatfield, Amherst and Northampton
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
Suffolk	Piping Plover	Threatened	Coastal Beaches	Winthrop
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster

- Eastern cougar and gray wolf are considered extirpated in Massachusetts.
- Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
- Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Revised 06/22/2009



The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

RECEIVED

JUL 27 1998

MEPA

July 24, 1998

Secretary Trudy Coxé
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02202

ATTN: MEPA Unit

RE: The Corporate Center, Boston Post Road, Weston, MA; MHC # 5125; EOE # 10230

Dear Secretary Coxé:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the Final Environmental Impact Report (FEIR) for the project referenced above. The proposed project is located adjacent to and within the Boston Post Road Historic District which is listed in the State and National Registers of Historic Places.

MHC understands that the proposed project involves the construction of The Corporate Center office complex at the former Massachusetts Broken Stone Company quarry site in Weston. The project site includes the mid-nineteenth century Ella M. Brotchie House, a contributing property within the Boston Post Road Historic District. Following a review of the Draft Environmental Impact Report (DEIR) in July 1995, MHC determined that the proposed project would have an "adverse effect" on the Boston Post Road Historic District through the partial demolition and relocation of the Brotchie House and the introduction of visual elements which would alter the setting of the historic district.

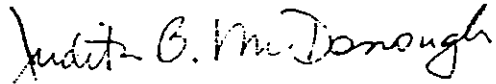
MHC understands that, due to site plan changes for the proposed office complex, the relocation of the Brotchie House is no longer necessary. The project proponent has agreed to retain the house in its current location and rehabilitate it for reuse. Although a new use for the house has yet to be determined, the FEIR indicates that the "building restoration materials, components, detailing, and colors shall reflect the mid-nineteenth century period of the original construction (e.g., wood clapboards, wood shingles, single glazed windows and storm sash)."

MHC is pleased that the project proponent has identified an alternative which will allow the Brotchie House to remain intact in its current location. After a review of the information presented in the FEIR, I concur to a finding of "no adverse effect" for the proposed undertaking (95C CMR 71.07(2)(b)(2)) **provided the following condition is met:** the project proponent shall afford the MHC and the Weston Historical Commission an opportunity to review and approve plans and

specifications for the Botchie House rehabilitation to ensure that the proposed work is consistent with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.

These comments are provided to assist in compliance with Massachusetts General Laws, Chapter 9, Sec. 26-27c, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00) and MEPA. If you have any questions, please feel free to contact Gary Hammer at this office.

Sincerely,

A handwritten signature in cursive script, reading "Judith B. McDonough".

Judith B. McDonough
Executive Director
State Historic Preservation Officer
Massachusetts Historical Commission

cc: Weston Historical Commission

Town/Name/Address -----	Designation -----	Date -----	# Props -----
Westford (cont.)			
Westford Center Historic District Boston, Depot, Graniteville and Leland Rds and Hildreth, Lincoln and Main Sts	NRDIS	08/28/1998	183
Westminster			
Westminster Village - Academy Hill Historic Dist. Bacon, Adams, Main, Dawley, Academy Hill, Leominster and Pleasant Sts	NRDIS	06/23/1983	50
Wood, Ahijah House 174 Worcester Rd	NRIND	09/07/1987	3
Wood, Ezra - Warner, Levi Place 165 Depot Rd	NRIND	07/07/1983	1
Wood, Nathan House 164 Worcester Rd	NRIND	09/14/1987	2
Weston			
Allen, Abel House 1 Chestnut St	NRIND	01/09/1978	1
Boston Post Road Historic District Both sides of Boston Post Rd from Plain Rd to Stony Brook	NRDIS	02/11/1983	170
Case's Corner Historic District School, Wellesley, Newton and Ash Sts	NRDIS	09/12/2002	90
Church St, 171 171 Church St	PR Exp:	04/29/1999	2
Crescent Street Historic District Crescent St and Boston Post Rd	NRDIS LHD	02/11/1983 09/23/1993	11 11
Golden Ball Tavern and Barn 662 Boston Post Rd	NRIND PR Exp: NRDIS	09/28/1972 04/08/1977 04/08/2007 02/11/1983	1 1 1 1
Harrington House, The 555 Wellesley St	NRIND	06/22/1976	1
Hobbs, Isaac House 87 North Ave	NRIND NRDIS	06/01/1982 03/01/2001	1 1

6/12/1998

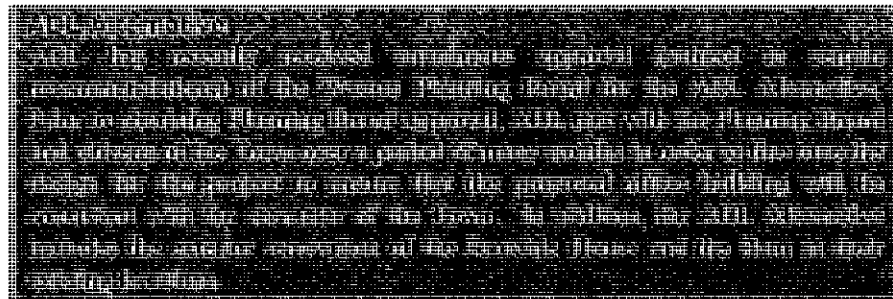
2.3.6 Historic and Town Character

The Town of Weston is characterized as a residential community. Streets are generally lined with homes interspersed by local schools and churches. Regis College is located off of Wellesley Street south of Route 20.

Under the Proposed Project, the current asphalt batching and quarry operations will be terminated. The office building that is proposed will be more in character with the community than the existing industrial land use. The property entrance will be landscaped and the present level of truck traffic will be markedly reduced. Site landscaping will provide aesthetically pleasing buffers to adjacent properties, and lighting will be installed which maintains safety while minimizing glare and off-site reflection.

Boston Post Road (Route 20) is the main road through Town and the majority of its length has been defined as an historic district. When the District was formed, the line was drawn to exclude several intrusive elements including the Route 128 interchange and the Mass Broken Stone quarry operation. A portion of the Project Site is located within the Boston Post Road Historic District. This District is listed on the National and Massachusetts Registers of Historic Places. The Ella M. Brotchie House, which is located within the Project Site along the north side of Route 20, is considered a contributing structure to the Historic District. The Brotchie House along with the Nathaniel Sibley House and the Dr. Roger Prescott House, both located on the south side of Route 20, are the easternmost structures of the Weston Historic District.

The Proposed Project originally included moving the Brotchie House to an area approximately 135 feet to the east of its current location. Due to changes in the Site Plan as a result of the local review process, the Brotchie House will remain in its current location. The Project Proponent will perform exterior renovations to allow for its reuse.



2.3.7 Construction Impacts

The Proposed Project is expected to generate some noise related to construction traffic and site work including grading, bedrock blasting and building construction. However, the noise and air quality impacts expected to occur during the construction period are similar to existing impacts which result from the on-going asphalt batching and quarry operations at the site. Stone quarry operations and asphalt batching operations have resulted in the removal of the majority of the vegetation on the property. Consequently, the construction related impacts to woodland or vegetated areas are limited to the leaching field required for wastewater disposal and a small area of the southernmost parking

INTAKE VELOCITY CALCULATION

$$Q = VA$$

Q = DESIGN CAPACITY OF INTAKE STRUCTURE

$$= 1,000,000 \frac{\text{GAL}}{\text{DAY}} \left(\frac{1 \text{ CF}}{7.48 \text{ GAL}} \right) \left(\frac{1 \text{ DAY}}{24 \text{ HR}} \right) \left(\frac{1 \text{ HR}}{60 \text{ MIN}} \right) \left(\frac{1 \text{ MIN}}{60 \text{ SEC}} \right) = 1.55 \text{ CFS}$$

A = CROSS-SECTIONAL AREA OF INTAKE PIPE

$$= \pi r^2 = \pi \left(\frac{16''}{2} \right)^2 = 201.06 \text{ IN}^2 \left(\frac{1 \text{ SF}}{144 \text{ IN}^2} \right) = 1.40 \text{ SF}$$

V = VELOCITY AT INTAKE

$$V = Q/A = 1.55 \text{ CFS} / 1.40 \text{ SF} = \boxed{1.11 \text{ FPS}}$$

JOB NO. 0193.45

CALC BY: LLB

DATE: 03/10/2010

TOWN: WESTON

CHECKED BY: JTB

DATE: 3/24/10

PROJECT: THE CORPORATE CENTER

PAGE 1 OF



Invertebrate Study

Weston Corporate Center

**(DEP File #337-0368)
Weston Corporate Center
Weston, Massachusetts**

Prepared for:
**Boston Properties
The Prudential Center
800 Boylston Street
Boston, MA 02199-8103**

Prepared by:
**Eric J. Las, P.E.
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772**

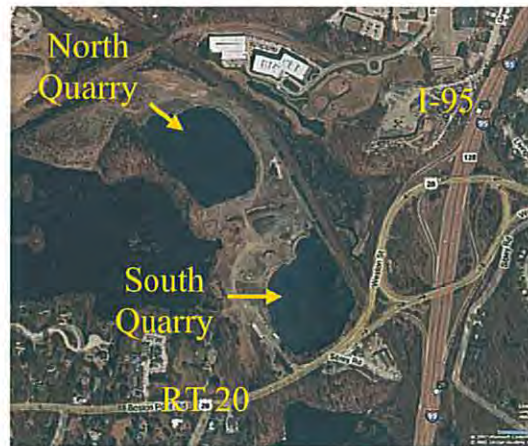
March 28, 2008

Introduction

Boston Properties has obtained municipal and state approvals to construct a 350,000-square-foot building with associated parking, drainage, and other site improvements, known as the Weston Corporate Center. The project is generally located northwest of the I-95 and Route 20 intersection within the town of Weston, near the town line of Waltham. A majority of the project development will be located between two quarry ponds on the site of the former Massachusetts Broken Stone mining operation.

The Massachusetts Department of Environmental Protection issued a Water Quality Certification for the proposed project on May 22, 2002, Transmittal No. W012668 for work associated with the relocation of a man made drainage ditch associated with the development of the proposed building and related improvements. Beals and Thomas, Inc. submitted a minor plan change request on May 17, 2004 and the DEP confirmed that the request was minor and did not require a formal modification to the Certification. The currently proposed site plan changes do not involve discharge from fill or excavation in waters subject to regulations of the U.S. Army Corps of Engineers, Federal Energy Regulatory Commission or other federal agencies, therefore, no further review under the Water Quality Certification is required.

The currently proposed changes to the original site plan include the potential water withdrawal from the north and/or south quarries for non-contact cooling purposes. Boston Properties is studying the feasibility of a deep water source cooling system, which would use water from the quarry ponds to cool the building. A small pump house structure (approximately 12 feet by 18 feet) will be located adjacent to one or both quarry ponds. In addition, intake and outflow piping will be installed in the quarry ponds. The quarry water will be pumped from the lower depths of the quarries to heat exchangers in the pump houses and returned to the quarry ponds near the surface. Supply and return piping in a separate loop will connect the pump houses to the building. Details regarding the cooling water are discussed in the Hydrothermal Study section of this report. It is not anticipated that the withdrawal of water for non-contact cooling purposes from the quarry ponds will warrant further review by DEP regarding the Water Quality Certification. The purpose of this report is to provide a qualitative assessment of the estimated macroinvertebrate habitat conditions within the quarries and potential implications of the cooling water withdrawal and discharge.



Site Aerial Photo

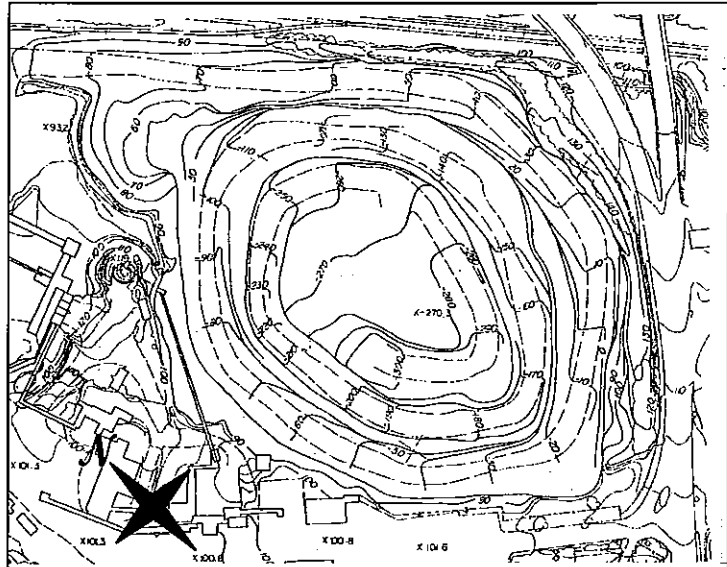
Source: Microsoft Live Maps, 2008

Historical Information

Massachusetts Broken Stone began mining operation at the site in 1902. Mining was conducted within two open-pit quarries, commonly referred to as the North Quarry and the South Quarry. Massachusetts Broken Stone concentrated on removing calcite and quartz from the two quarries. Calcite is extremely common and found in sedimentary, metamorphic and igneous rocks. Quartz is very durable, and is chemically inert with most substances.

Mining operations ended in 1985 at which point the natural flow of groundwater began to exfiltrate and started filling up the quarries.

Today both quarries have completely filled with water. The water elevation varies slightly with seasonal changes equal to the surrounding ground water at approximately 88-feet above mean sea level in the North Quarry and 84-feet above mean sea level in the South Quarry.



South Quarry Topography Circa 1986.

Site Conditions

For purposes of this report, only the South Quarry will be examined, although conditions within the North Quarry are generally similar. The South Quarry covers an area of approximately 10-acres. While the quarry was in operation, the South Quarry floor was accessed by a road originating in the northern most corner and spiraling along the outer wall. The quarry floor is located approximately 300 feet below mean sea level, therefore the quarry is over 380 feet deep. The quarry access road was often very steep reaching grades of 20-percent. During mining operations, a wall along the northwest edge of the quarry collapsed adjacent to the entrance road. The wall collapse left a steep slope of loose 1 to 2 inch diameter gravel instead of a typical vertical rock wall near the entrance of the quarry. With the exception of the collapse area, the quarry walls around the perimeter are vertical, with cliffs starting in the northeast corner and continuing in a clockwise manner to the southernmost portion of the quarry. The cliffs range in height from 5 to 80 feet above the water surface, with the highest cliffs on the eastern side of the quarry.

The terrain around the South Quarry is generally a barren landscape. Little vegetation has grown on the site or the area around the quarry, likely due to the lack of topsoil. There are a few poplar (*Populus spp.*), dogwoods (*Cornus spp.*), milkweeds (*Asclepias spp.*), and cattails (*Typha spp.*) along the perimeter of the quarry. With only a few large trees or other vegetation around the quarry, very little detritus is deposited within the pond. Also contributing to the lack of organic debris and nutrients is the absence of a fluvial tributary to the quarry which could contribute sediments or organic matter.



View of South Quarry

Source: BTI March 24, 2008

Aquatic Invertebrate Habit

Since the quarry has filled with water, little has changed in terms of suitable habitat. Although a detailed aquatic survey could not be conducted due to safety concerns, site visits along the periphery of the quarry were performed. Due to the excellent water clarity present within the pond, visual observations could be made from the shoreline. Aquatic macrophytes are non-existent within the limited areas that are shallow enough to support vegetative growth due to a lack of organic substrate. As seen in the photo



Typical pond substrate

Source: BTI March 24, 2008

below, the majority of the shallow quarry substrate consists of fine to coarse-grained gravel with few cobbles or boulders. The steep surrounding cliffs and deep conical shape of the quarry reduces light penetration in many areas. The littoral zone is generally the most suitable environment for invertebrates within aquatic environments. The low sunlight penetration however, combined with the steep quarry walls, extreme depth, infertile soils, lack of detritus food sources, and minimal structural habitat provides a diminutive and desolate littoral zone within the pond.

Due to the lack of aquatic macrophyte growth, with the exception of approximately 50 square feet of cattail growth, there is virtually no biotic habitat available for epiphytic macroinvertebrates within the pond. In addition, little non-biotic structural habitat was observed within the littoral zone of the pond, however the existing gravel substrate does offer a minimal amount of habitat for benthic macroinvertebrates. Macroinvertebrates consisting of molluscs,

nematodes, amphipods, isopods, crayfish, mysids, chironomids, and larvae of caddisfly, mayfly, dragonfly or others could therefore be present in low concentrations. Regardless of the water quality in the pond, since the pond lacks significant detritus, littoral zone area, and biotic/non-biotic structural habitat, it is unlikely that macroinvertebrates are present in the pond in significant numbers. In addition, anecdotal evidence from representatives of the Cambridge Water Department as well as observations of abandoned spawning beds by Beals and Thomas, Inc staff indicates that populations of fish (likely shiners *{Luxilus spp., Notemigonus spp.}* and sunfish *{Lepomis spp.}*) may be present within the pond. The presence of predatory fish would further reduce the potential for high concentrations of macroinvertebrates.

Hydrothermal Study

To better understand the potential effects on the South Quarry resulting from the proposed cooling system withdrawal and discharge, Boston Properties retained the services of Haley & Aldrich and TMP Consulting Engineers, Inc. to prepare a preliminary hydrothermal study for the project. It is proposed that water will be withdrawn from the hypolimnion layer of the quarry at a depth of approximately 245 feet below the water surface. The estimated temperature of the water at that depth is a constant temperature of approximately 40°F throughout the entire year. The water will be circulated through the pump house building and will be discharged back into the epilimnion layer of the quarry at a depth of approximately 25 feet. The estimated temperature of the returning water is 52°F to 54°F. The ambient water temperature near the discharge point was tested by Haley and Aldrich in the summer and fall of 2007 and found to range from 55°F to 59°F. The annual system circulation is estimated to be approximately 100 million gallons. The estimated total volume of the quarry is approximately 540 million gallons. Overall it is believed that the re-introduction of cooling water will have a negligible effect on the summer temperature profile. The temperature difference between the return water temperature and the ambient water temperature will be small and the reinjection water will be absorbed into the surroundings readily. TMP noted that the dynamics of the temperature profiles under summer conditions are more strongly influenced by the natural processes of wind, solar radiation, and evaporation.

Conclusions

Considering the lack of suitable habitat features and apparent absence of food sources within the littoral zone of the pond, as well as potential predation by vertebrate species, it is unlikely that the quarry supports robust macroinvertebrate populations. Based on the minimal anticipated thermal effect on water quality, it is further believed that the proposed cooling system component of the project will have a negligible effect on any macroinvertebrate populations that may be present within the South Quarry. Although not studied specifically, the same conclusions are supported for the North Quarry as well.



Enter your transmittal number

X232646

Transmittal Number

Your unique Transmittal Number can be accessed online: <http://mass.gov/dep/service/online/trasmfrm.shtml> or call MassDEP's InfoLine at 617-338-2255 or 800-462-0444 (from 508, 781, and 978 area codes).

Massachusetts Department of Environmental Protection Transmittal Form for Permit Application and Payment

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: DEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. Copy 2 must accompany your fee payment. Copy 3 should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

* Note:
For BWSC Permits,
enter the LSP.

A. Permit Information

BRP WM 11

Surface Water Discharge Permits

1. Permit Code: 7 or 8 character code from permit instructions

2. Name of Permit Category

General Permit for Non-Contact Cooling Water

3. Type of Project or Activity

B. Applicant Information – Firm or Individual

Boston Properties

1. Name of Firm - Or, if party needing this approval is an individual enter name below:

2. Last Name of Individual

3. First Name of Individual

4. MI

800 Boylston Street, Suite 1900

5. Street Address

Boston

MA

02199

617-236-3300

6. City/Town

7. State

8. Zip Code

9. Telephone #

10. Ext. #

Michael Cantalupa

mcantalupa@bostonproperties.com

11. Contact Person

12. e-mail address (optional)

C. Facility, Site or Individual Requiring Approval

Weston Corporate Center

1. Name of Facility, Site Or Individual

133 Boston Post Road

2. Street Address

Weston

MA

02493

--

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

8. DEP Facility Number (if Known)

9. Federal I.D. Number (if Known)

10. BWSC Tracking # (if Known)

D. Application Prepared by (if different from Section B)*

Beals and Thomas, Inc.

1. Name of Firm Or Individual

144 Turnpike Road, Suite 210

2. Address

Southborough

MA

01772

508-366-0560

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

John Bensley, P.E.

8. Contact Person

9. LSP Number (BWSC Permits only)

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☒ yes ☐ no
If yes, enter the project's EOE file number - assigned when an Environmental Notification Form is submitted to the MEPA unit:

10230

EOEA File Number

F. Amount Due

Special Provisions:

1. ☐ Fee Exempt (city, town or municipal housing authority)(state agency if fee is \$100 or less).
There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

15261

\$385

Check Number

Dollar Amount

Date

4/1/2010

BEALS AND THOMAS, INC.

Vendor ID: 0070 Commonwealth of Massachusetts
Check Amount: 385.00

Check #: 15261
Date: 04/01/2010

Invoice #	Date	Invoice Amount	Gross Payment	Discount	Net Payment	Notes
1009872	03/31/2010	\$385.00	\$385.00		\$385.00	

BEALS AND THOMAS, INC.

RESERVOIR CORPORATE CENTER
144 TURNPIKE ROAD
SOUTHBOROUGH, MASSACHUSETTS 01772

Middlesex Savings Bank 22
SOUTHBOROUGH, MA 01772

53-7122-2113

15261

DATE
04/01/2010

AMOUNT
\$385.00

THE SUM OF THREE HUNDRED EIGHTY-FIVE DOLLARS 00/100 ONLY

PAY
TO THE
ORDER
OF

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

M. J. O'Connell

AUTHORIZED SIGNATURE

⑈015261⑈ ⑆211371227⑆ 800308165⑈