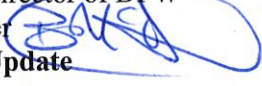


## TOWN OF NATICK MASSACHUSETTS

JEREMY T. MARSETTE, P.E.  
DIRECTOR

WILLIAM E. MCDOWELL, P.E.  
TOWN ENGINEER

### MEMORANDUM

To: Michael Hickey, Chairman, Board of Selectmen  
cc: Melissa Malone, Town Administrator  
Bill Chenard, Deputy Town Administrator, Operations  
Jeremy Marsette, P.E., Director of DPW  
From: Bill McDowell, Town Engineer   
**Re: Charles River Dam – Project Update**  
Date: January 14, 2020

The consulting engineers for the project, GZA Inc., have performed sediment sampling at six locations on the River and have summarized the laboratory analysis (please see attached summary). The sediment sampling was performed on December 10, 2019 at four upstream locations and two locations downstream of the dam (see attached Fig. 1).

The purpose of the sampling was to determine whether the river bottom sediment contained levels of chemical contaminants which might preclude the alternative of dam breach or spillway removal. Based on the results of the analysis, it is noted in the summary that the contaminant levels found in the sediment would not be an impediment to dam breach or removal.

The Engineering Division will request to withdraw the Notice of Intent Application for the dam maintenance project. The Division does not wish to continue the public hearing process for a specific repair project while an alternative is also being seriously considered. The Division will be required to file a new Notice of Intent Application when the project is ultimately selected.

The Engineering Division has contacted GZA and is currently drafting a scope of work for an alternatives analysis for the dam/spillway structure. At this time, the dam maintenance project is designed and requires no additional work. The alternative analysis would include detailed hydrological calculations based on current rainfall data, sediment volumes, river cross sections, river extents including photo renderings during normal and high water conditions and life cycle costs over an extended period. The DPW anticipates a contract and cost proposal to be available by Friday, January 24th.

The Engineering Division has also spoken with a representative from the Executive Office of Energy and Environmental Affairs regarding the possibility of funding assistance from the State. Based on a dam and seawall grant application currently on file at EOEEA as part of the maintenance project, funding may be available for the alternatives analysis for any work completed before June 30, 2020. No additional application would be required.



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www.gza.com



January 10, 2020  
File No. 01.0019114.80

Natick Department of Public Works  
75 West Street  
Natick, MA 01760

Attention: Mr. William E. McDowell, P.E.

Re: Sediment Sampling Results  
Charles River Dam at South Natick Dam  
Natick, Massachusetts

Dear Mr. McDowell:

In accordance with Amendment No. 1 of our contract, executed on December 16, 2019, GZA GeoEnvironmental, Inc. (GZA) is pleased to submit to the Town of Natick (Town) the results of the recent sediment sampling from the Charles River in the areas of the Charles River Dam in South Natick, Massachusetts. This letter is subject to the Limitations presented in **Appendix A** and the Terms and Conditions of our contract.

## BACKGROUND

Prior to proceeding with rehabilitation of the Charles River Dam, the Town of Natick would like to explore the option of dam removal/decommissioning. In order to evaluate the preliminary feasibility of a dam removal option, the Town wished to collect sediment samples and perform laboratory analyses on the sediment within the impoundment as well as downstream of the dam for comparison to the impoundment sediment.

## SEDIMENT SAMPLING

On December 10, 2019, GZA field staff collected a total of six sediment samples from within the Charles River in Natick, Massachusetts. Four samples were collected upstream of the existing dam and two samples were collected downstream of the dam. The attached **Figure 1** depicts the approximate locations of the six sediment samples.

The impoundment was accessed from the right abutment of the dam to collect samples S3 through S6. The downstream river was accessed from the southern shoreline downstream of the dam, adjacent to the Natick Little League baseball fields to collect samples S1 and S2. Samples were collected using a hand auger from a 12-foot aluminum Jon boat with outboard motor. The sample location points were logged using a Leica Viva Smartworx Real-Time Kinematic Global Positioning System (RTK GPS) unit. In general, the sampling depths ranged from 0 to 3 feet below top of sediment grade. Approximate water depth and depth of sediment sample obtained at each of the six locations is presented below in **Table 1**.





**Table 1: Sample Summary Table**

<i>Sample Number</i>	<i>Approximate Water Depth at time of sampling (feet)</i>	<i>Depth of Sample obtained (feet below grade)</i>
S-1 (Downstream)	4.0	0 to 1.0
S-2 (Downstream)	3.5	0 to 1.0
S-3 (Upstream)	3.5	0 to 3.0
S-4 (Upstream)	5.5	0 to 1.5
S-5 (Upstream)	4.0	0 to 1.5
S-6 (Upstream)	6.5	0 to 0.5

The composite samples at each location were deposited into the appropriate vessels (vials, jars, etc.) for transport to the lab for analysis. The samples were submitted to ESS Laboratory of Cranston, Rhode Island for the following environmental analyses which is consistent with the typical requirements necessary to submit an application for a Section 401 Water Quality Certification and the standards and guidance values developed for dam removal projects by the Massachusetts Department of Ecological Restoration (DER):

- The following metals: Arsenic, Cadmium, Total Chromium, Chromium V, Copper, Lead, Mercury, Nickel, Zinc,
- Extractable Petroleum Hydrocarbons (EPH),
- Volatile Organic Compounds (VOCs),
- Polycyclic Aromatic Hydrocarbons (PAHs),
- Polychlorinated Biphenyls (PCBs),
- Pesticides 8081,
- Total Petroleum Hydrocarbons (TPH) 8100,
- Total Organic Carbon (TOC),
- Percent Water Content,
- Grain Size Analyses.

Environmental Chemistry Laboratory results are included as **Appendix B**.

## **SUMMARY OF RESULTS**

The laboratory results for the sediment samples are summarized below and in **Table 2** (attached.)

- Low levels of acetone were detected in upstream samples S3 through S6. Otherwise, VOCs were not detected in the sediment samples.
- Low concentrations of PCBs were detected in upstream samples S3 through S6. Otherwise, PCBs were not detected in the sediment samples.
- Total petroleum hydrocarbons were detected at concentrations of 32.3 parts-per-million (ppm) in S1, 67.2 ppm in S2, 31.3 ppm in S5 and 56.2 ppm in S6. Total petroleum hydrocarbons were not detected in S3 and S4.
- Low concentrations of metals were detected in the sediment samples.
- Pesticides were not detected in any of the sediment samples.



The results are also presented in a table developed by the DER for sediment evaluation (**Table 3 - attached**). This table compares sediment results to Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup Soil Standards and Guidance Values including: Cleanup Standard (S1), Natural Soil Background, Urban Soil Background and Upper Concentration Limit. Concentrations of the sediment sample results are below the standard and guidance values for the analyses performed. Please note that even though S1 Cleanup Standards have been cited in the comparison table, sediment is specifically excluded from reporting requirements under the Massachusetts Contingency Plan (MCP) except under specific circumstances.

As additional background, the United States Environmental Protection Agency, Region I New England (EPA) performed an evaluation of the water and sediment quality of the Charles River and presented the results in a 1997 report which is included herein as **Appendix C**. Water and sediment samples were obtained from several locations along the Charles River including just upstream of the Charles River Dam in South Natick. This location is denoted CRWA04 in the report. The EPA analyzed the sediment sample collected at CRWA04 for TOC, Cadmium, Zinc, Lead, Copper, Chromium, Nickel, Mercury, PCBs and pesticides. The results of the samples analyzed by the EPA are similar to the results of the recent samples collected by GZA.

Based on laboratory analyses, samples downstream of the dam (S5 and S6) consisted of fine to coarse gravel and fine to coarse sand with trace amounts of silt. Samples S3 through S5 consisted of organic fine-grained peat. Sample S6 consisted of organic gravel and sand with trace amounts of silt.

## CONCLUSIONS

GZA collected six shallow sediment samples at the Site. Four samples were taken from upstream of the dam. Two samples were taken from downstream of the dam. GZA compared the results of sediment quality analytical testing to standards and guidance values developed by the DER for evaluation of contaminants in sediment.

Based on the laboratory results of the sediment samples collected at the Site and comparison to the standards and guidance values developed by the DER, it does not appear that contaminant levels of the sediment would be an impediment to dam removal. It should be noted that should the Town elect to move forward with dam removal, additional sediment sampling might be required by regulators. Sediment quality results could differ at different locations and at different depth horizons.

We understand the Town will be considering the options of dam removal and dam rehabilitation. GZA would be pleased to assist the Town with evaluating the dam removal and dam breach options. Our evaluation study would identify pros and cons for each option.



We appreciate the opportunity to assist the Town with engineering services for the dam project. Please contact Derek Schipper at 781-278-5792 if you have any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink that reads 'Derek Schipper'.

Derek J. Schipper, P.E.  
Senior Project Manager

A handwritten signature in blue ink that reads 'Chad Cox'.

Chad W. Cox, P.E.  
Consultant/Reviewer

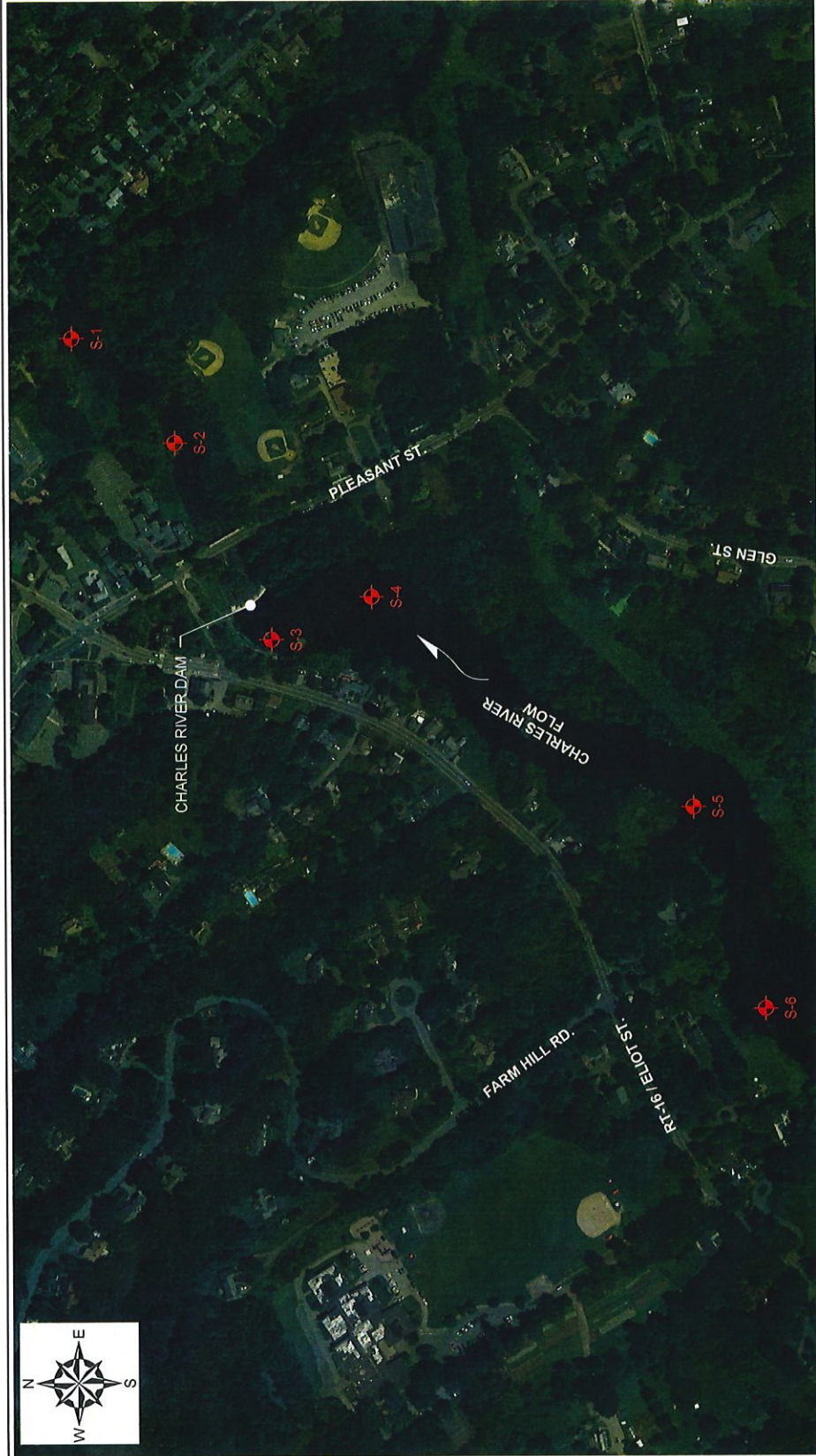
A handwritten signature in black ink that reads 'James P. Guarente'.

James P. Guarente, P.E.  
Principal-in-Charge

Attachments: Tables  
Figures  
Appendix A – Limitations  
Appendix B – Environmental Chemistry Laboratory Results  
Appendix C – USEPA Charles River Sediment Report (1997)

J:\19,000-20,999\19114\19114-80.CBN\Sediment Sampling\19114-80-sediment sampling results (final).docx





**GENERAL NOTES**

1. THE BACKGROUND IMAGERY WAS PROVIDED BY GOOGLE EARTH.
2. THE PURPOSE OF THIS DRAWING IS TO LOCATE THE POSITIONS OF THE SEDIMENT SAMPLES IN RELATION TO THE CHARLES RIVER DAM IN NATICK, MASSACHUSETTS. THIS DRAWING IS NOT CONSIDERED A LAND SURVEY. THE LOCATIONS OF THE SEDIMENT SAMPLES WERE LOGGED USING AN RTK GPS UNIT IN THE FIELD.

**LEGEND**



INDICATES SEDIMENT SAMPLE PERFORM BY GZA  
GEOENVIRONMENTAL, INC., ON DECEMBER 10, 2019.



CHARLES RIVER DAM REHABILITATION SERVICES		MILL LANE	
		NATICK, MASSACHUSETTS	
CHARLES RIVER SEDIMENT SAMPLE LOCATION PLAN			
PREPARED BY	GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR	TOWN OF NATICK DPW 75 WEST STREET NATICK, MASSACHUSETTS
PROJ. NO.	D-19	DESIGNED BY	JZ
DATE	12/10/19	DRAWN BY	AJP
		SCALE	AS SHOWN
		PROJECT NO.	01.0019114.80
		REVISION NO.	-
		FIGURE	1
		SHEET NO.	