

**BOARD OF WATER & WASTEWATER COMMISSIONER'S
MEETING AGENDA***
Harwich Water Department, 196 Chatham Road, Harwich MA
Wednesday, April 12, 2023
11:30 a.m.

**As required by Open Meeting Law, you are hereby informed that the Town will be video and audio taping as well as broadcasting this public meeting. In addition, anyone in the audience who plans to video or audio tape this meeting must notify the Chairman prior to the start of the meeting.*

- I. CALL TO ORDER
- II. EXECUTIVE SESSION
- III. PUBLIC COMMENTS / ANNOUNCEMENTS
- IV. CONSENT AGENDA
 - A. Minutes
 - 1. March 20, 2023- Special Meeting
 - 2. March 23, 2023
- V. ABATEMENTS
- VI. OLD BUSINESS
- VII. NEW BUSINESS
 - A. Route 28 Presentation- Nancy Heuman GHD
 - B. New Well Source Exploration- Phase 2
 - C. 2022 Water Restriction Hearings
 - D. Lothrop Law Project
- VIII. SUPERINTENDENT'S REPORT
- IX. COMMISSIONER'S REPORT
- X. CORRESPONDENCE / ANY OTHER BUSINESS
- XI. NEXT MEETING: TBD
- XII. ADJOURNMENT

**Per the Attorney General's Office: The Board of Water Commissioners may hold an open session for topics not reasonably anticipated by the Chair 48 hours in advance of the meeting following "New Business."
If you are deaf or hard of hearing or are a person with a disability who requires an accommodation, contact the Water Department Office at 508-432-0304 x.0 or by email at customerservice@harwichwater.com.*

Authorized Posting Officer:

Town Posting Date: _____

Tracey Alves | Board Secretary

_____ | Town Clerk

A. CONSENT AGENDA

A. Minutes

1. March 20, 2023- Special Meeting
2. March 23, 2023

MINUTES
HARWICH WATER DEPARTMENT
BOARD OF WATER/WASTEWATER COMMISSIONERS
Thursday, March 23, 2023
11:30 a.m.

WATER COMMISSIONER'S PRESENT: Chair Gary Carreiro, Vice Chair Allin Thompson, Clerk Noreen Donahue, Commissioner Judith Underwood, Commissioner John Gough

OTHERS PRESENT: Superintendent Dan Pelletier, Comptroller Sandra Sieger, Billing Administrator Wellesley Marsh, Administrative Assistant Tracey Alves

CALL TO ORDER

Chair Carreiro called the meeting to order at 11:30 a.m.

CONSENT AGENDA

A. Minutes

1. March 9, 2023

Clerk Carreiro entertained a motion to approve the consent agenda which contained the minutes of March 9, 2023. Vice Chair Thompson moved to approve the consent agenda with a second by Clerk Donahue; 5-0-0.

OLD/UNFINISHED BUSINESS

A. FY24 Assistant Wastewater Superintendent

Superintendent Pelletier discussed the draft job description as well as the memo that was put together for the Selectmen. The next hurdle will be Town Meeting. Superintendent Pelletier will include in the explanation for the Sewer operating budget that the figures in the warrant do include the addition of the new position.

B. FY24 Water & Wastewater Budgets

Superintendent Pelletier asked that the Board revote the Water Budget in the amount of \$4,552,834.

The changes that were made at the last meeting that changed the figure was the reduction in long term debt administrative fees in the addition of an additional \$6,000 debt item that was newly charged to us last year.

Clerk Donahue moved to reconsider a vote on the Water Enterprise Fund. Vice Chair Thompson seconded; 5-0-0.

Vice Chair Thompson moved to approve the Water Enterprise Fund budget in the amount of \$4,552,834. Commissioner Underwood seconded the motion; 5-0-0.

Superintendent Pelletier requested a similar action be taken related to the Wastewater Operating Budget for the revised total in the amount of \$1,993, 973.

Clerk Donahue moved to reconsider the vote from the last meeting on Wastewater Budget. Vice Chair Thompson seconded; 5-0-0.

Vice Chair Thompson motioned to approve the \$1,993,973 Wastewater Budget. Commissioner Underwood seconded; 5-0-0.

Superintendent Pelletier requested a reconsideration of the amount proposed at the last meeting to be transferred from the current operating budget with respect to the debt for phase 2 that was anticipated that did not hit. We voted last meeting to reappropriate \$857,446 which should be \$858,742 which balances \$1,993,973.

Clerk Donahue moved to reconsider the reappropriation vote from the last meeting which at last meeting was \$857k because it has been adjusted. Vice Chair Thompson seconded the motion 5-0-0.

Clerk Donahue moved to reappropriate \$858,742 from last years budgeted debt amount towards FY24 debt amount. Vice Chair Thompson seconded; 5-0-0. Clerk Donahue amended the vote and struck "debt amount." Clerk Donahue moved to reappropriate from the FY23 Sewer Operating budget in amount of \$858,742 towards the FY24 Wastewater Operating budget. Vice Chair Thompson seconded; 5-0-0.

C. 2023 Annual Town Meeting Articles

Superintendent Pelletier included the 2023 Annual Town Meeting Articles in case there were any questions.

D. Water Restrictions Bylaw & Special Legislation

The Board reviewed the revisions to the proposed bylaw changes.

NEW BUSINESS

A. ATM Article- *Discussion re: Regulating Private Wells*

Clerk Donahue motioned to reconsider the vote from the last meeting of adding private wells to the Department's jurisdiction. Vice Chair Thompson seconded; 5-0-0.

The Board discussed regulating private wells. Clerk Carreiro motioned to withdraw the regulating of private wells from this year's Town Meeting. Commissioner Gough seconded; 4-1-0.

B. Debrief from Joint Meeting with Board of Selectmen

The joint meeting with the Board of Water and Wastewater Commissioners and Board of Selectmen went well. It went well because Superintendent Pelletier was well prepared for the meeting.

C. 2022 Tank Inspection Reports

The Board reviewed the 2022 Annual Tank Inspection Reports. An overcoat will be needed on the Pleasant Lake tank. There was nothing of significance to note in terms of any of the tanks needing repairs.

COMMISSIONER'S REPORT

Clerk Donahue requested that the Board revisit the Sewer Regulations as well as Land Use Controls in the near future. These topics will be added to an upcoming agenda.

NEXT MEETING

The next Board meeting will be held on Thursday, April 6, 2023 at 11:30 a.m.

ADJOURNMENT

Chair Carreiro motioned to adjourn at 12:40 p.m. Moved by Vice Chair Thompson and seconded by Commissioner Underwood. All in favor; 5-0-0.

Gary Carreiro, Chairman

Dan Pelletier, Superintendent

Allin P. Thompson, Vice Chair

Tracey Alves, Board Secretary

Noreen Donahue, Clerk

Judith Underwood

John Gough

VII. NEW BUSINESS

A. Route 28 Presentation-Nancy Heuman GHD

Harwich Water Projects

Route 28 Waterline Replacement

GHD Update – April 11, 2023



Project Updates

- Phase 1 – Division Street to Herring River Bridge
- Phase 2 – Herring River Bridge to Lower County Road
- Phase 3 - Herring River Directional Drill

Phase 1 – Division Street to Herring River Bridge

→ Construction Cost Updates

Division
Herring
River
Bridge
Construction Cost Updates

Phase 1 – Division Street to Herring River Bridge

Cost Method:

- MassDOT publishes a Weighted Average Cost Table summarizing bid costs for their construction projects. These costs were used to estimate Phase 1 construction costs.

MASSHIGHWAY
WEIGHTED BID PRICES
ENGLISH UNITS
DISTRICT 5 Only
4/2022 - 4/2023

Location	Item #	Description	Units	Quantity	# of Projects	Median Price	Mean Price
All Districts	303.06	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	4,017	16	\$223.00	\$214.01
All Districts	303.08	8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	90	2	\$235.00	\$216.67
All Districts	303.1	10 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	3,070	2	\$287.50	\$263.55
All Districts	303.12	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	22,445	5	\$250.00	\$248.74
All Districts	303.18	18 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	1,140	1	\$306.50	\$307.00
All Districts	303.24	24 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)	FT	480	1	\$537.50	\$512.50
All Districts	309	DUCTILE IRON FITTINGS FOR WATER PIPE	LB	218,501	27	\$10.50	\$10.40
All Districts	313.08	8 INCH WATER MAIN REMOVED AND RELAID	FT	1,040	1	\$142.50	\$145.00
All Districts	315.08	8 INCH WATER MAIN REMOVED AND STACKED	FT	250	1	\$30.00	\$32.50
All Districts	315.12	12 INCH WATER MAIN REMOVED AND STACKED	FT	875	2	\$30.00	\$30.00
All Districts	315.18	18 INCH WATER MAIN REMOVED AND STACKED	FT	390	1	\$29.75	\$31.83
All Districts	336.1	1 INCH PLASTIC WATER PIPE	FT	5,215	4	\$103.00	\$91.81
All Districts	345.151	1-1/2 INCH TEMPORARY SERVICE PIPE	FT	180	1	\$85.50	\$85.50
All Districts	345.6	6 INCH TEMPORARY SERVICE PIPE	FT	1,400	1	\$269.50	\$269.25
All Districts	347.075	3/4 INCH COPPER TUBING TYPE K	FT	550	1	\$85.00	\$87.60
All Districts	347.1	1 INCH COPPER TUBING TYPE K	FT	22,819	9	\$100.00	\$107.07
All Districts	347.125	1-1/4 INCH COPPER TUBING TYPE K	FT	470	2	\$92.50	\$92.86
All Districts	347.15	1-1/2 INCH COPPER TUBING TYPE K	FT	430	3	\$115.00	\$109.09
All Districts	347.2	2 INCH COPPER TUBING TYPE K	FT	3,360	5	\$115.00	\$114.59
All Districts	349.06	6 INCH GATE VALVE	EA	3	1	\$2,750.00	\$2,800.00
All Districts	349.12	12 INCH GATE VALVE	EA	12	1	\$4,600.00	\$4,646.67
All Districts	350.04	4 INCH GATE AND GATE BOX	EA	13	2	\$2,900.00	\$2,903.13
All Districts	350.06	6 INCH GATE AND GATE BOX	EA	321	15	\$3,000.00	\$2,899.65
All Districts	350.08	8 INCH GATE AND GATE BOX	EA	130	6	\$3,900.00	\$3,826.74
All Districts	350.1	10 INCH GATE AND GATE BOX	EA	22	3	\$4,500.00	\$4,495.38
All Districts	350.12	12 INCH GATE AND GATE BOX	EA	360	9	\$6,000.00	\$5,710.29
All Districts	350.16	16 INCH GATE AND GATE BOX	EA	12	1	\$15,000.00	\$13,166.67
All Districts	355.06	6 INCH GATE AND GATE BOX REMOVED AND STACKED	EA	24	2	\$500.00	\$575.83
All Districts	355.08	8 INCH GATE AND GATE BOX REMOVED AND STACKED	EA	3	1	\$1,150.00	\$1,233.33
All Districts	355.1	10 INCH GATE AND GATE BOX REMOVED AND STACKED	EA	15	1	\$500.00	\$493.33
All Districts	357.06	6 INCH GATE BOX	EA	169	12	\$587.50	\$589.10
All Districts	357.08	8 INCH GATE BOX	EA	70	5	\$719.50	\$658.22
All Districts	357.1	10 INCH GATE BOX	EA	14	3	\$802.50	\$767.45

**Phase 1 - Updated Cost Estimate
50% Design
4/12/2023**

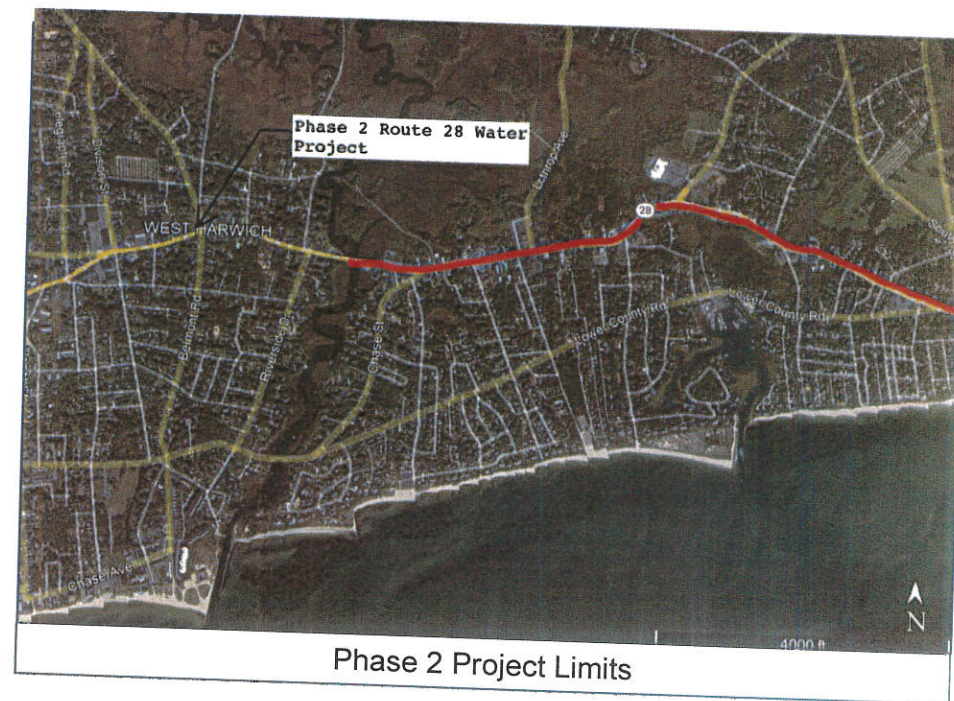
Contract Item	Costs
Phase 1 Construction Costs Subtotal	\$2,330,000
Contingency (10%), Construction Phase Services (8%)	\$440,000
Phase 1 Construction Costs TOTAL	\$2,770,000
Recommended Appropriation Request	\$ 3,200,000
<p style="text-align: center; color: lightgrey;">Phase 1 - Updated</p> <ul style="list-style-type: none"> - The Town, GHD and MassDOT held a meeting on March 30, 2023, to discuss the terms of the upcoming agreement between Harwich and MassDOT. This cost estimate has been revised based on this conversation. - The Town will only be responsible for the cost of installing the pipeline and appurtenances. - Costs are based on MassDOT Weighted Average Prices 4/2022 – 4/2023. - No controlled density fill required as MassDOT projects are exempt. 	

Phase 2 – Herring River Bridge to Lower County Road

→ Construction Cost Updates

Phase 2 – Herring River Bridge to Lower County Road

- Phase 2 construction project will be managed by the Town.
- MassDOT coordination and standards are required for design and construction.
- This project constructs approximately 9400 LF of 12-inch waterline.
- It is anticipated that this project could award construction earliest fall 2023.



Phase 2 – Herring River Bridge to Lower County Road

Cost Method:

- The cost estimate includes construction of this 12-inch waterline as well as other costs and pipeline for Phase 1 not allowed in that contract for MassDOT. For example, this project includes constructing 6-inch and 8-inch pipe on Division Street to loop into the waterlines on this street, and the bridge crossing on Herring River Bridge.
- We are in unknown times with the lingering effects of COVID on cost and timing of a limited supply chain. Two resources are used to estimate costs for Phase 2:
 - Historical bid costs for similar projects in the area, and then inflated over time.
 - MassDOT Weighted Average Book

**Phase 2 - Updated Cost Estimate
50% Design
4/12/2023**

Contract Item	Costs
Phase 2 Construction Cost Subtotal	\$7,716,000
Controlled Density Fill	\$ 780,000
Contingency (10%), Construction Management (12%), Police Detail	\$ 2,432,000
Phase 2 TOTAL CONSTRUCTION COST	\$10,928,000
Recommended Appropriation Request	\$12,000,000
<p>The following is included in this estimate:</p> <ul style="list-style-type: none"> - Purchase of insertion valves to be installed by Town on Phase 1 and Phase 2. - Purchase of fire hydrants for Phase 1 to be installed by MassDOT. - Controlled density fill backfill as required by MassDOT. The Town will apply for an exemption waiver. - Looping 6-inch and 8-inch pipeline on Division Street. - Herring River bridge crossing. - Restoration of MassDOT roadway – temporary trench paving and one lane paving. 	

Phase 3 Direction Drill Herring River Crossing

→ Construction Cost Update

Direction D
iver Cross
st Update

Phase 3 – Directional Drill Herring River Crossing

- West Harwich water system is supplied with two waterlines, both with bridge crossing across the Herring River.
- The pipelines across Herring River Bridge are highly susceptible to the impact of rising water levels due to extreme weather conditions such as sea level rise, hurricane, or flooding. This project provides redundancy and reliability for West Harwich water service.
- The cost estimate for Phase 3 is based on a detailed analysis by our directional drill lead engineer.
- Construction may occur during Phase 2 or as a separate Phase 3.



Phase 3 Herring River Bridge

**Phase 3 - Updated Cost Estimate
50% Design
4/12/2023**

Contract Item	Costs
Phase 3 Construction Subtotal (incl. 10% contingency)	\$1,300,000
Construction Management (12%), Police Detail,	\$176,000
PHASE 3 TOTAL CONSTRUCTION COST	\$1,476,000
Recommended Appropriation Request	\$1,750,000

Summary Route 28 Waterline Replacement Project 50% Design - 4/12/2023

Contract Item	Phase 1	Phase 2	Phase 3	Total
Construction Subtotal	\$2,330,000	\$6,915,000 \$780,000 (CDF)	\$1,300,000	\$12,328,000
Construction Management, Police, Contingency	\$440,000	\$2,246,000	\$176,000	\$1,857,000
Construction Total	\$2,770,000	\$9,941,000	\$1,476,000	\$14,185,000
Recommended Appropriation Request	\$3,200,000	\$10,800,000	\$1,750,000	\$15,570,000

GHD

*** Thank You**

→ ghd.com

VII. NEW BUSINESS

B. New Well Source Exploration- Phase 2



VIA EMAIL: dpelletier@harwichwater.com

March 15, 2023
File No. 01.P000921.23

Mr. Daniel Pelletier, Superintendent
Harwich Water & Sewer Department
P.O. Box 185
Harwich, Massachusetts 02645

Re: Professional Engineering Services for New Source Approval Permitting
Future Well Supply at GPW #10 Area
Harwich, Massachusetts

Dear Mr. Pelletier:

In response to your request, GZA GeoEnvironmental, Inc. (GZA) is pleased to offer the Harwich Water & Sewer Department (Harwich) this Technical Proposal and Fee Proposal for professional engineering services associated with the development and testing of a new groundwater supply well source at the Groundwater Production Well (GPW) #10 Area. The scope of work presented in this proposal, which follows previous groundwater test well investigations, is to further develop and test the proposed new groundwater supply source with the goal of obtaining Massachusetts Department of Environmental Protection (MassDEP) new source approval to develop a production well supply, GPW #12.

BACKGROUND

The Town of Harwich has identified a need to increase its water system resiliency to maintain supply capacity and meet peak summer water demands. The GPW#10 property currently includes a groundwater well supply operated by Harwich consisting of a gravel-packed production well referred to as GPW #10, or Well 10. Harwich has previously engaged GZA to perform exploratory test drilling and identify a potential location for a new water supply at the property, which was completed during 2021 and 2022. The test well exploration program was intended to identify the location of a new supply well location on the property.

The site exploratory work included the installation of two-inch-diameter test wells¹ (GZ-3-21 and GZ-4-21), both installed with screened depth intervals of 150-160 feet. The wells were developed and rated using a jet pump for a duration of 8 hours of surging and pumping. GZ-3-21 produced 62 gallons per minute (gpm) with 2 feet of drawdown, and GZ-4-21 produced 45 gpm with 4 feet of drawdown. Based on these observations, an observation well cluster consisting of shallow (above the confining unit) and deep observation wells was installed 4.5 feet away from GZ-3-21 (GZ-3-OB-S-21 and GZ-3-OB-D-21, respectively). A 6-hour pumping test was then performed at GZ-3-21 while measuring drawdown in the observation wells. After pumping at a continuous rate of 67 gpm for 6 hours, there was no measurable drawdown observed in observation well GZ-3-OB-S-21 and 0.43 feet of drawdown observed in observation well GZ-3-OB-D-21. The pumping test results provided early indication that additional groundwater supply capacity may be sustainable at the GPW #10 Site. The results of the exploratory testing and pumping test analysis is included in the November 11, 2022 *BRP WS 17 Permit Application for Site Examination*

¹ A total of four locations were investigated during test explorations performed in 2021 (GZ-1-21 through GZ-4-21). A 2-inch test well was installed at GZ-1-21 and was screened at a depth interval of 68-78 feet bgs. A boring to a depth of 100 feet was completed at GZ-2-21, however a test well was not installed.



Known for excellence.
Built on trust.

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION
MANAGEMENT

249 Vanderbilt Avenue
Norwood, MA 02062
T: 781.278.3700
F: 781.278.5701
F: 781.278.5702
www.gza.com



and Prolonged Pumping Test Proposal which was submitted to MassDEP. The BRP WS 17 Permit application was approved by MassDEP letter dated January 10, 2023.

WORK PLAN

The next phase of work includes a pumping test at the proposed new source well location (site of GZ-3-21) for a minimum duration of five days (120-hour). The purpose of the longer duration test will be to confirm aquifer properties and determine the safe yield of a new production well. The pumping test program will also evaluate other potential factors associated with the development of the new water source development, such as groundwater quality, potential water quality treatment needs, infrastructure conditions, watershed development issues, and interference with potential receptors and water users.

Our overall work plan for the project is as follows:

1. Conduct MESA consultations to allow the test work in mapped areas of endangered species, related to the previously-submitted filing. This does not include a future filing that will be required for the production well and pumping station construction.
2. Direct the well driller to install and develop an 8-inch-diameter, naturally-developed test well at the location of exploratory test well GZ-3-21. The driller is also to install and develop two new 2-inch-diameter observation wells to supplement the existing monitoring wells located near the proposed production well.
3. Complete a step-drawdown test at the well to confirm, and adjust if needed, the final rate to be used during the prolonged pumping test.
4. Complete a prolonged pumping test with a minimum duration of five days. Groundwater level monitoring will be completed before, during, and after the testing period using automated water level dataloggers in the test well and in several selected nearby monitoring wells to measure water levels under non-pumping and pumping conditions. The observation wells to be instrumented are selected to provide spatial coverage in the area surrounding the production well, as well as vertical coverage of hydrogeologic units: the upper unconfined aquifer, the confining layer and the lower confined aquifer (water supply aquifer). These data will be used to: a) evaluate the potential interference that might be occurring from off-site wells or the onsite existing water supply production well; b) evaluate the efficiency of the aquifer relative to the possible production rate; and c) provide an estimate of the maximum production rate from the aquifer based upon physical site conditions and the watershed.
5. Water quality samples will also be collected during the pumping test at selected intervals to characterize the chemical characteristics of the groundwater and to ensure it meets all regulatory requirements for a community supply well.
6. Conduct a preliminary GPS survey of the 8-inch test well and observation well locations and elevations (note that this does not include services of a professional land surveyor which will be required for final submittal, and GZA's survey will not include property line layout).
7. Submit a Source Final Report to MassDEP along with the associated permit application (BRPW19, Approval of Pump Test Report for Source Greater than 70 GPM). A draft version of the summary report will be circulated to Harwich for review and comment, prior to the final MassDEP submission.



8. Prepare and submit MEPA filing described below (no EIR assuming yield of less than 1.5 million gallons per day [mgd]).

9. Prepare and submit complete WMA Filing.

SCOPE OF SERVICES

GZA's more specific scope of services is as follows:

TASK 1 – MESA/NHESP FILING

The Massachusetts Endangered Species Act (MESA) and its implementing regulations (321 CMR 10.00) establish procedures for the listing and protection of rare plants and animals. As such, MESA plays an important role in maintaining biological diversity, preventing species extinctions, and contributing to rare species recovery in Massachusetts. The well site is located within a Natural Heritage and Endangered Species Program (NHESP) Estimated and Priority Habitats for Rare Species, due to potential habitat, or proximal habitat, for the eastern box turtle.

The MESA filing (Checklist Review) was previously submitted in the previous phase of this project, which included a provision for the second phase of work. As an outcome of the initial MESA review, a Turtle Protection Plan (TPP) was prepared for the first phase of this project. This proposal assumes that additional MESA consultations and monitoring will be required for work to resume. Budget has been included to update the work restriction plan accordance with the new scope of work. The proposal also includes costs associated with one site inspection performed by a qualified biologist to train the well drillers in turtle siting and protection. Following consultations with the NHESP, should additional filings, habitat assessments, and/or site inspections be required, GZA will advise Harwich that additional budget may be required.

TASK 2 – PROLONGED PUMPING TEST – ON-SITE FIELD WORK

1. Prepare a Health & Safety Plan for conducting field work. Prepare standard forms for record keeping and reporting.
2. Provide coordination with the well contractor for the drilling and installation of a naturally-developed 8-inch diameter test production well, using a dual-rotary drill rig (or other), at the location of exploratory test well GZ-3-21, installed with a 20-foot #20 slot-size well screen installed at an anticipated well depth of 165 ft bgs. The test well will be developed and rated, using a submersible or jet pump to extract groundwater (our understanding is that the depth to water is about 30 feet below grade).
3. Provide coordination for the drilling and installation of two 2-inch-diameter observation wells, to be used for monitoring water level drawdown during the 120-hour prolonged pumping test. Proposed new observation well OW-1-23 should be located within 5 feet of the new test production well and screened at a depth interval of 110-130 ft bgs, targeting the confining unit above the lower confined aquifer (to be used as an intermediate well for the nested observation wells GZ-3-OBS-S-21 and GZ-3-OBS-D-21). Proposed new observation well OW-2-23 should be located approximately 100 feet east of the new test production well, and screened at a depth interval of 150-160 ft bgs, targeting the lower confined aquifer. The observation wells will be developed using a submersible pump or by jetting with air.
4. Provide field oversight of drilling activities, construction and well development to review the work in progress. GZA site personnel will monitor and record the labor, equipment, and materials utilized by the well driller.



10. Direct the well driller, and provide field oversight, for a step-drawdown test on the 8-inch test well to estimate the constant-rate well yield to be maintained during the pumping test. The step-drawdown test is to be completed for four rated steps, each with a minimum sustained duration of 1 hour, at estimated pumping rates of 125 gpm, 250 gpm, 375 gpm and 500 gpm.
11. Provide direction and oversight for completing the driller's 120-hour (i.e., minimum duration) pumping test at the production well site. Work associated with the pumping tests will include measurement of drawdown and recovery readings in observation wells, staff gauges and piezometer well installations, as detailed in the *BRP WS17 Permit for Site Examination and Prolonged Pumping Test Proposal* which was approved by MassDEP. The proposed monitoring program includes the following:
 - a. Coordinate with Harwich to allow for the active production well GPW#10 to be shut down for several days prior to the pumping test, during the pumping period, and the 5-day post-test recovery for the prolonged pumping test.
 - b. Install vented, electronic water level pressure transducers and dataloggers in the production test well at GZ-3-21 and in the selected observation well locations (GZ-3-OBS-S-21, GZ-3-OBS-D-21, OW-1-23, OW-2-23, 1-03, GZ-4-21, 4-03, GZ-1-21, 3-03, 2-03, 2-73, 3-73, 1-73 and 16-87) to measure static and stabilized drawdowns. The dataloggers will be deployed at least 10-15 days prior to start of testing to allow for the collection of ambient baseline water levels. This proposal also assumes that active production well GPW#10 is already instrumented with water level logging equipment and that this data will be available to GZA. The frequency of readings from the dataloggers will be set to: six readings within the first minute after the start of the test, and at least ten per log cycle for the next three log cycles to 100 minutes, then every 30 minutes for the remainder of the test (at a minimum). This procedure will be repeated during the first 1,000 minutes of recovery after shutdown.
 - c. Install surface water staff gauges to measure surface water levels at the nearest surface water features, including two in Herring's River (one upgradient and one downgradient), one at Robbins Pond and one at Hinckley's River. Piezometer well pairs will also be installed next to each staff gauge location to measure vertical groundwater gradient. The piezometers and surface water level gauges will be instrumented with electronic water level pressure transducers and dataloggers, to record water levels prior to, during and following the pumping test. The data from these locations will be used to identify any potential seepage from nearby surface features as a result of pumping at the production well.
 - d. Install a rain gauge on-site to record precipitation prior to, throughout and during test recovery. The station will be installed near the location of the production well GZ-3-21 and will be installed at least 10-15 days prior to the start of the 120-hour pumping test.
 - e. Assist driller with collection of water quality samples at test production well GZ-3-21, completed in accordance with Federal and State Safe Drinking Water Standards. Field testing for carbon dioxide, pH, specific conductance and temperature will be completed one hour after start of test, every 24 hours thereafter and one hour before the end of the test. The analytical sample collection schedule at minimum will consist of:
 - i. Sampling 1 hour after start of the test (iron, manganese and secondary contaminants);
 - ii. Sampling 48 hours after start of the test (secondary contaminants);



- iii. Sampling at midpoint of the test, or 60 hours after start of the test (coliform bacteria, iron and manganese);
 - iv. Sampling 96 hours after start of the test (secondary contaminants);
 - v. Sampling just prior to the end of the test (coliform bacteria, iron, manganese, nitrate/nitrite, lead, perchlorate, inorganic compounds, secondary contaminants, volatile organic compounds, synthetic organic compounds, radionuclides, PFAS, 1,4-dioxane, MtBE, total fluorine and lithium).
12. Provide instrument survey of location and elevation of observation wells, piezometers, staff gauges and the production wells. Establish temporary benchmarks in the wellfield. Prepare a site plan showing the survey points and incorporating town and MA GIS information as appropriate. Prepare a plan of local static water table elevations and use the data to support a preliminary groundwater contour map. This would not be a survey by a professional land surveyor.
 13. Coordinate well installation and test pumping work with the well driller, Harwich, MassDEP, and other agencies. This includes responding to driller and Harwich questions that arise, as well as providing interpretation of contract specification for well installation.
 14. Prepare a brief letter report to Harwich summarizing the findings of above testing tasks. Provide tabular summaries of results as appropriate. Provide conclusions from the aforementioned data gathered including a summary of results of field data and analyses, including aquifer characteristics and profiles, aquifer thickness, estimate of approvable yield, and preliminary water quality analyses.

TASK 3 – WELL DRILLER’S WORK (subcontract for drilling and pumping test)

GZA will subcontract with a qualified water supply well driller to install the 8-inch-diameter test production well and 2-inch-diameter observation wells, provide development of wells, provide groundwater sampling and sample transportation during the pumping test, provide test pumping equipment including generator and discharge piping and provide environmental protections and mitigation. Laboratory costs for analytical water quality testing were assumed to be paid directly by Harwich and are not included within this Task.

Split spoon soil samples will be collected during the advancement of borings, to allow for the soil identification, logging and sampling. The target 8-inch-diameter test production well, located at GZ-3-21 is anticipated to be installed with a 20-foot #20 slot-size well screen and at a well depth of 165 ft bgs. The anticipated depths for the two proposed 2-inch-diameter observation wells are 130 ft and 160 ft, and these wells will be installed with a 10-foot length well screen. The new wells will be developed, and the test production well will be rated, using a centrifugal or submersible pump to extract groundwater. The well contractor will also be providing test pumping equipment and will be responsible for operation of the equipment during the stepped rate pumping test and prolonged pumping test. A minimum of 400 ft of discharge hosing is assumed to be required to direct pump test discharge and temporary discharge stilling basins will be installed in the western portion of the property for use during well testing.



TASK 4 – SOURCE FINAL HYDROGEOLOGICAL REPORT TO MASSDEP

1. Following the prolonged pumping test, a notice will be published in the Environmental Monitor, indicating the location and volume of the planned withdrawal for the new source. A copy of the published notice will be submitted with the Source Final Report.
2. Review water quality information for samples collected during pumping tests for compliance with drinking water standards. Review water quality information for samples collected before, and during pumping tests for compliance with drinking water standards.
3. Following the completion of the prolonged pumping test, groundwater sampling, and laboratory analytical work, GZA will prepare and submit a Source Final Report to MassDEP along with the associated permit application (BRP W19 – Approval of Pump Test Report for Source Greater than 70 GPM). The Source Final Report shall include the following information:
 - a. As-built construction diagrams;
 - b. Discussion of findings;
 - c. Pumping test data and analysis;
 - d. An estimate of approvable yield;
 - e. A plot plan of the Zone I for the existing and new proposed production wells²;
 - f. Final Zone II delineation; including an evaluation of the consequences of the proposed Zone II redelineation (i.e., impacts on Water Supply Protection Zoning District, etc.), discussion of the proposed methods of Zoning and other regulatory and non-regulatory controls for wellhead protection to demonstrate compliance with the DEP water supply regulations;
 - g. Discussion of water quality results and recommended treatment based on the water quality data gathered from the prolonged pumping test samples;
 - h. Status of source protection bylaw;
 - i. Demonstration that the well has acceptable water quality and is capable of producing the desired yield with no additional impacts;
 - j. Pumping test data and analyses of approvable yield;
 - k. Geographic coordinates of the well;
 - l. Characterization of land uses within the updated Zone II of the wellfield, including a 1:6,000 scale or larger map depicting the proposed well site and the area located within the existing Zone II of the proposed production wells. The submittal will include existing and potential sources of contamination, including any landfills and hazardous waste sites located within the Zone II for the wellfield.

² Using existing property line plans from others, and GPS well coordinates. To be in DEP Standard 11 by 17 template, with professional stamp.



- m. A proposed groundwater monitoring plan for source protection purposes.
 - n. The conceptual preliminary layout for connection to the existing pumping/treatment facility and opinion on the probable construction cost to complete the connection and other facility changes that would be required.
 - o. Copies, or reference to, relevant correspondence.
4. The Zone II delineation portion of the Source Final Report shall include the following:
- a. A static water table map based on available hydrologic information and test well data.
 - b. Surficial geology and stratigraphy, water quality and hydrology of the aquifer.
 - c. Geologic cross-sections through the wellfield site using conceptual model-generated graphics.
 - d. Discussion of the hydrogeologic system and likely sources of recharge.
 - e. Discussion of projected long-term effect of increased withdrawal on nearby sensitive receptors.
 - f. Analysis of aquifer characteristics based on pumping test results. This will include distance-drawdown analysis, time-drawdown analysis, and time-recovery analyses; and
 - g. A description of the numerical groundwater data used to map the Zone II areas. If a model is generated, it will be used to evaluate potential relationships between the groundwater supply withdrawal and nearby existing wells and sources of contamination.
 - h. Statistical and graphical analysis of actual-vs. model-predicted drawdowns for each observation well.
 - i. Discussion of the proposed methods and other regulatory and non-regulatory controls for wellhead protection to demonstrate compliance with the MassDEP water supply regulations.
5. The BRP WS 19 permit application and transmittal shall be submitted with the Source Final Report through the eDEP online system. Up to two paper copies of the Source Final Report may be produced for Harwich's use, should they request it.
6. Prepare an exemption application that the production well is not under the influence of surface water (EPA Surface Water Treatment Rule).

TASK 5 – MEPA ENF FILING

MEPA Environmental Notification Form (ENF) filing, associated notifications and meetings, may occur in this phase of the work. Cost is provided as an optional additional service in such situation. The Massachusetts Environmental Policy Act (MEPA) 301 CMR 11.03 (4)(b)1 states that an ENF is required for "New withdrawal or expansion in withdrawal of 100,000 or more gpd from a water source that requires new construction for the withdrawal". This proposal includes an optional MEPA ENF filing, assuming this will be required on the basis that this expansion is for a new well source well. We assume that Harwich intends to file a Water Management Act permit amendment concurrently with the Source Final Report. An Environmental Impact Report (EIR) is assumed not to be required for the project scope.



1. Prepare and submit a public notice of the expanded Environmental Notification Form to the MEPA Unit for publication in the Environmental Monitor. File the expanded ENF with MEPA. Present the conceptual plan and calculate the impact area, vehicle trips, tree loss, water use, environmental justice compliance and other aspects on the ENF form. Distribute electronic copies to the appropriate agencies as required by 301 CMR 11S.
2. Attend a virtual meeting with MEPA officials and Harwich representatives to address questions on the project scope.
3. Prepare an addendum to the expanded ENF to address any minor project modifications requested by MEPA.

TASK 6 – WATER MANAGEMENT ACT (WMA) PERMIT AMENDMENT APPLICATION (BUDGET FOR THIS TASK WILL BE DETERMINED BASED UPON THE RESULTS OF TASKS 1-5 and 7)

Due to the addition of the proposed new production well, Harwich must seek to amend its existing withdrawal permit. WMA Permit / DEP Water Management Program amendment permitting has not been included in our proposal (310 CMR 36.00). *The cost for this task will need to be based upon whether the prolonged pumping test investigations showed minimal effect on sensitive receptors. Following the completion of Tasks 1-5, GZA will advise the client of the scope of work that will be needed to satisfy Water Management Act permitting and provide a budget estimate to complete this work.* This could include additional field data and monitoring, hydrologic analyses, detailed 3-dimensional numerical modeling, reporting and permitting associated with local impact analysis on sensitive receptors. The scope of work presented under Task 6.1 below lists the typical requirements for these submissions, but not all of the items listed may be required.

Permit amendment will be based on estimated approvable yield, anticipated on the order of 1.0 to 1.3 mgd for the new source. MassDEP requires a permit amendment for the reallocation of withdrawal volume to a new well, as well an increase in volume sought above the previously-permitted volume. The intent would be to utilize the 10% buffer allowance for seasonal communities' demand variability, as permitted by MassDEP. It is assumed that a mitigation plan for the forecasted water would not be required since the submission is expected to be a Tier 1 application.

6.1 WMA PERMIT AMENDMENT

1. Prepare BRPWM02 Water Management Act Withdrawal Amendment Permit application, along with transmittal letter, supporting documentation, graphics and transmittals. Submit permit renewal and new permit applications for Owner's review. Upon the Owner's approval with any revisions, submit the Permit Amendment application package to MassDEP on behalf of the Water Division, including:
 - a. Form A – General Information
 - b. Form B – Groundwater Withdrawal Point (data for New Well)
 - c. Forms D1 and D2 – Historic and Future Water Needs for New Well, and the overall water system;
 - d. Form F – Evaluation of Potential Effects of Proposed Withdrawal. Information may be provided regarding the impact of the proposed withdrawal(s) on the following parameters:
 - I. Water quality
 - II. Effects of the withdrawal(s) on water-based recreation, fish, wildlife, floral habitat and agriculture.



- III. Effects on the floodplain in the area (NA).
 - IV. The water available within the subbasin.
 - V. Other previously allowable withdrawals, and their uses within the subbasin.
- e. Form G – Alternatives to the Proposed Withdrawal
 - f. A cost analysis of the withdrawal versus 2 or 3 alternatives: Additional supply from an existing well site area; additional supply from an alternative well site area.
 - g. A feasibility study that evaluates environmental alternatives such as:
 - I. Leak detection and repairs to the water system, using data from Harwich's most recent permit renewal.
 - II. Water conservation and demand management evaluations using data from most recent Cape Cod Basin permit renewal.
 - III. Additional supply development.
 - h. Form H – Groundwater Hydraulic Analysis (numerical MODFLOW model discussion and Zone II delineation from Source Final Report).
 - i. Submit DEP Bylaw Summary Form, Wellhead Protection Questionnaire (resubmitting same document from previous permit application).
2. Provide quality control review of the permit application and adjust the application accordingly.
 3. Submit the permit application to MassDEP. Distribute copies of the permit application to local officials as required by the permit process.
 4. Consult with the Owner and MassDEP staff to discuss permit application and potential permit conditions (1 virtual meeting assumed).
 5. Address questions on the application from MassDEP that are within our scope of work (the scope of the comments cannot be anticipated with confidence at this time).
 6. Review Draft Permit by MassDEP and offer comments on permit conditions to MassDEP on behalf of the Owner (the scope of the reviewer comments cannot be anticipated with confidence at this time).
 7. Conduct a virtual meeting with outside stakeholders (conservation or citizens groups) to discuss the draft permit issued by MassDEP. Prepare visual aids needed for presentation.
 8. Provide a follow-up response to stakeholder groups (the scope of the stakeholder/public comments cannot be anticipated with confidence at this time).



TASK 7 – EXTERNAL MEETINGS (OPTIONAL)

External meetings included in the scope of work for Tasks 1 through 6 include:

1. A preconstruction and testing site meeting with the well driller and Harwich, to discuss any project constraints, scheduling and other logistics associated with the prolonged pumping test. The site meeting should be used to identify the locations of the new wells to be installed and the test discharge location. The proposed discharge location is a minimum of 400 feet to the west of the production well, releasing to stilling basins flowing onto the land surface. While on-site, GZA will also inspect and confirm that the proposed existing observation wells and monitoring locations are acceptable and in good condition for monitoring use (Task 2; 1 meeting assumed).
2. Attendance to MEPA Unit meetings, if required (Task 5; 1 meeting assumed).
3. A site construction supervision and inspection visit performed by a GZA qualified biologist during the construction phase of the work, should it be required as part of the protection measures in the Turtle Protection Plan (TPP), in accordance with NHESP requirements. This was included considering the site is located within a Priority Habitat for Rare Species and Estimated Habitat of Rare Wildlife (Task 1; 1 site visit assumed).
4. Virtual meetings associated with the WMA permit amendment submission, including: two meetings with Harwich to discuss permit content and requirements; attendance to two MassDEP meetings; and one meeting with Harwich to discuss outside stakeholders (conservation or citizens groups) to discuss the draft WMA permit issued by MassDEP, if required (Task 6).

This proposal task (Task 7), is also available for GZA's attendance at additional external meetings, should they become required throughout the course of the project. These meetings could include the following:

1. Virtual meeting with Harwich officials to discuss project scope and plan for proceeding.
2. Virtual consultation meeting with Harwich and MassDEP staff to discuss the permit application (BRP WS 19) and potential approval conditions.
3. Attendance to a final site meeting with Harwich officials and the well driller.

The proposed budget includes attendance to an additional four (4) external project meetings attended by two GZA project team members.

ASSUMPTIONS AND/OR CONDITIONS OF ENGAGEMENT

For the investigation, we have made the following assumptions as a basis for GZA's costs:

1. GZA's proposal assumes that: 1) the installation of observation wells and the pumping test will be exempt from the Massachusetts Wetlands Protection Act, 2) delineation of wetlands areas will not be required, and 3) a Notice of Intent filing and resource area delineation with the Conservation Commission or other agency will not be required for this phase of the work. Based on the proposed production well location, which is more than 100 feet from a wetlands buffer zone, it is assumed that access through wetlands buffer zones for production well construction and testing would not be required.
2. Based on available mapping through MassGIS, the property is located within a Priority Habitat for Rare Species (PH#359) and Estimated Habitat of Rare Wildlife (EH#324). This area was identified as a potential habitat, or



proximal habitat, for the eastern box turtle, and as such this proposal assumes that the project is subject to Natural Heritage and Endangered Species Program (NHESP) filing requirements.

3. MEPA Environmental Notification Form (ENF) filing is assumed to be required on the basis that this expansion is for a new well source well. Harwich intends to file a Water Management Act permit amendment concurrently with the Source Final Report. An Environmental Impact Report (EIR) is assumed not be required, assuming the new source yield will be less than 1.5 mgd. We assumed that there will be no environmental justice concerns associated with the testing and proposed well site development.
4. Based on the distance between the proposed production well location and the nearest surface water feature (Robbins Pond to the south), this project meets the exemption criteria for Groundwater Under Direct Influence of Surface Water (GWUDI), as indicated in the MassDEP letter dated January 10, 2023. This source is therefore assumed to not be subject to Microparticulate Analysis testing (MPA) or the Surface Water Treatment Rule.
5. WMA Permit / DEP Water Management Program permitting has not been included in our proposal (310 CMR 36.00). *The cost for this task (Task 6 in this proposal) will need to be based upon whether the prolonged pumping test investigations showed minimal effect on sensitive receptors. Following the completion of Tasks 1-5, GZA will advise the client of the scope of work that will be needed to satisfy Water Management Act permitting and provide a budget estimate to complete this work.*
6. For the overall purpose of the Cape Cod Basin 20-year Permit Renewal, Harwich will be a Tier 1 applicant – no increase above baseline volume³ is sought and no increase in Groundwater and/or Biological Categories are expected. The presented scope of work also assumes that the final requested withdrawal volumes meet the requirements for a Tier 1 permit application and does not require a Mitigation Plan to offset forecasted water needs.
7. Harwich will pay for all water quality analyses directly.
8. The site work will be limited to Town of Harwich property.
9. This proposal assumes that a wetlands and water bodies monitoring plan will not be required by MassDEP.

This proposal **does not** include the following:

1. Services of a professional land surveyor (GZA will conduct a field survey for the new production well and observation well locations and elevations as conditions permit. GZA's survey will not include property line layout);
2. Reviewing zoning and non-zoning controls for wellhead protection, and reporting same to MassDEP;
3. Obtaining of construction easements, or Zone 1 easements, if applicable;
4. Wetlands or sensitive receptor (surface water features) field delineation or impact analysis;
5. Notice of Intent filing with the local conservation commission(s), meetings and communications;
6. More allowance than stated for meetings;

³ Harwich Water Department Baseline Volume is reported to be 2.16 mgd according to the Cape Cod Basin 20-Year Renewal Permit Meeting Update dated January 20, 2015.



7. Design/permitting of permanent infrastructure including transmission piping and pumping/treatment facilities;
8. Water Conservation Plan or other new source threshold permits, other than WMA permitting;
9. Treatment system design;
10. Well disinfection, wellhead repairs, pumping unit replacements or piping modifications;
11. Any long-term monitoring of production well water quality and quantity;
12. Permanent wellhead access design/construction/permitting; and
13. Any other services not specifically described herein.

ASSISTANCE FROM THE DEPARTMENT

Where certain aspects of the work can be performed effectively by the Harwich, resulting in cost and/or time savings, GZA assumed assistance will be provided from the Department. Specifically, GZA assumes that the Department will:

1. Provide available plans and data for the existing facility, production well and observation wells;
2. Following the installation of new site well, provide the services of a professional surveyor to prepared surveyed site plans including property line layout and well locations. The site survey should also provide the elevations of the site observation wells surveyed to a USGS benchmark relative to mean sea level. Provide a Zone I plot plan with public land surveyor stamp. Provide available information on existing utilities.
3. Provide available water supply data, reports, permits, conservation measures, water restrictions and statistics as needed relative to permitting;
4. Provide location for drainage/disposal of discharge water during the pumping test;
5. Pay any project-related permitting, recording and advertising fees;
6. Pay for any laboratory and all water quality analyses directly;
7. Provide available information on existing utilities around the well sites;
8. Provide legal and practical access to well sites and any monitoring locations. Clear vegetation as needed for foot or equipment access to well sites;
9. Operate the existing pumping station as needed for avoiding influencing the pumping test. Ideally, the existing production well should be shut down a minimum of 10 to 15 days prior to the test, and remain off for duration of the prolonged pumping test and the 5-day post-test recovery. This proposal also assumes that active production well GPW#10 is already instrumented with water level logging equipment and that this data will be made available to GZA.
10. Provide a water operator, to assist with water level measurements prior to, during and following production well pumping test(s), particularly for the existing production well.



FEE SCHEDULE

Billings for Tasks 1 through 5 and Task 7 will be based on a lump-sum basis, payable monthly and in accordance with the percentage complete. For additional work, GZA fees shall be in accordance with the attached Standard Schedule of Fees (MB-GOV 2023) under Appendix A.

TASK DESCRIPTION	COST
TASK 1: MESA/NHESP FILING (Budgeted for 47 hours) (including 1 biologist visit)	\$10,000
TASK 2: PROLONGED PUMPING TEST - ON-SITE FIELD WORK	
1A – Well Installations	\$26,000
1B – Pumping Test	\$74,000
TASK 3: WELL DRILLER’S WORK AND EQUIPMENT ⁴ (SUBCONTRACT) (based upon estimated quantities)	\$225,000*
TASK 4: SOURCE FINAL HYDROGEOLOGICAL REPORT TO MASSDEP (Budgeted for 412 hours)	
3A – Zone II Delineation	\$38,000
3B – Reporting	\$48,000
TASK 5: MEPA ENF FILING (Budgeted for 85 hours) (including 1 meeting)	\$15,000
TASK 6: WATER MANAGEMENT ACT (WMA) PERMITTING (Budget to be submitted after Tasks 1-5 are completed))	TBD
TASK 7: EXTERNAL MEETINGS (OPTIONAL)	\$15,500
TOTAL FEE:	\$451,500

This budget is based on the anticipated scope of work outlined above which represents our best judgment at this time as to the efforts required to achieve the stated objectives. It must be recognized, however, that unforeseen conditions which become evident during the course of the project which may alter or increase the scope of work required. Actual charges

⁴ Based estimated quantities and costs associated with the well driller’s work and rental/purchase of required pumping/monitoring equipment. This estimate is based on the anticipated scope of drilling work in the scope of work section of this proposal, which represents our best judgment at this time as to the efforts required to achieve the stated objectives.



may vary, either upward or downward, depending upon the execution of the work. You will be notified of any conditions requiring an increase in scope and budget for approval prior to GZA proceeding. GZA considers a substantial budget variance to be 5% and we will not exceed this variance without notifying the Department.

Tasks 1-7 will be charged on a lump sum basis. The rates for technical and support personnel will be charged for professional services work that are not part of Tasks 1-7 will be in accordance with GZA's Standard Schedule of Fees (MB-NS GOV 2023). For work requiring out-of-town overnight stay, the minimum charge for work on the project will be eight (8) hours per day.

The above-listed rates and fees are valid for 12 months from the date the work begins. GZA reserves the right to modify the fee and rate schedule on an annual basis to reflect changes in employee compensation and the Department acknowledges that labor rates may change during the execution of this project.

PROJECT SCHEDULE

GZA is prepared to initiate the proposed Scope of Services within 2 weeks of receipt of a signed contract. Duration of services will depend on Harwich's schedule, well drilling conditions, driller's schedules, permitting response time, and weather conditions, which are beyond our direct control. GZA is prepared to devote the resources required to support Harwich's goal of having the production well permitted as quickly as possible.

The following is a summary of activities, timeframes, and regulatory requirements typical for the development of new sources of municipal groundwater supply in Massachusetts. However, all new source approvals present a unique set of circumstances. The summary is not intended to cover all eventualities.

Activity	Time Frame	Regulatory Requirements
Initial 4-inch Test Wells and Observation Well Installations and Short-Duration Initial Pumping Tests	1.5 Years	Completed – Request for Site Examination, Prolonged Pumping Test Proposal, MassWildlife Notification, DEP approval of RFSE/PPTP
8-inch Test Well, 2-inch Observation Well Installations and Prolonged Pumping Test	2-4 Months	MassWildlife Notification
Tasks 3: New Source Final Report	3-4 Months	MassDEP Approval
Total New Source Approval Process	2-3 Years	
Regulatory Approvals:		
Task 5: MEPA ENF Filing	2 Months	MEPA Approval
Task 1: MESA Filing (NHESP)	3 Months	Mass Wildlife
Task 6: WMA Permit/Amendment	3-12 Months	MassDEP Approval
Design/Bid/Construct Permanent Well (if test well is sufficient, then substantial time can be saved on this project)	9-12 Months	MassDEP Approval
Design/Bid/Construct Pumping & Treatment Facilities (assumed expansion/connection of existing facilities which will save on time)	12-18 Months	DEP Approval
Totals	2-4 Years	



INVOICES

GZA will submit invoices periodically on a monthly basis for our services and reimbursable expenses. The above financial arrangements are on the basis of prompt payment within 30 days of our invoices and the orderly and continuous progress of the Project. GZA may terminate its services upon 10 days' written notice any time payment is overdue on this project. GZA services will be performed as expeditiously as is consistent with professional skill and care and with the orderly progress of the work.

QUALIFICATIONS

GZA GeoEnvironmental, Inc. (GZA) is an employee-owned, multi-disciplinary consulting firm offering services in the fields of geotechnical, water resources and environmental engineering, hazardous waste assessment and remediation, water and wastewater engineering, and construction management-related services. Headquartered in Norwood, Massachusetts, GZA employs over 700 engineers, scientists, and technical support staff in 30 offices.

Technical expertise, innovation, and responsiveness are the trademarks of GZA, which have earned us national recognition. GZA's technically sophisticated approach, extensive knowledge of geo/civil engineering and environmental services, and pragmatic focus on practical solutions for project evaluation, design, and construction has historically provided our clients with cost-effective solutions to their problems. Throughout GZA's over 50+ years of operation, we have developed several special areas of expertise including:

- Hydrology and Water Resources Management
- Natural Resource Impact and Mitigation Services
- Environmental Monitoring Services
- Pollution Prevention
- Environmental Chemistry Laboratory
- Soil and Groundwater Treatability Laboratory
- Regulatory Training and Compliance Division

GZA's long-standing capabilities in water resource sciences and management combined with our geo-civil engineering experience are perfectly suited water supply planning and implementation projects. We have taken our traditional expertise and have successfully adapted our multi-disciplinary capabilities to meet the changing environmental challenges of the new millennium. GZA's water resources-related disciplines include:

- New Drinking Water Source Approval
- Municipal and Commercial Water Supply Investigations
- Aquifer Protection Plans
- Aquatic Chemistry
- Surface Water Hydrology & Hydraulics
- Hydrogeology
- Groundwater Flow Modeling
- Civil & Geotechnical Engineering
- Environmental Permitting Support



- Wetlands & Soil Sciences
- Limnology
- GIS / Information Management
- Pumping and Treatment Facilities Design/Permitting/Construction Services

Our professional services are ideal to assist states and municipalities, local stakeholders, and developers in properly designing a site to accommodate protection of environmental resources. Unlike many firms, GZA has the ability to offer a full suite of relevant in-house services such as geotechnical, hydrogeologic, wetlands, and biohabitat assessment services. We have a project team of engineers, hydrologists, and wetland ecologists with the practical experience and academic training to take tough site conditions and provide design solutions sensitive to environmental concerns.

GZA has extensive experience with water supply development within regulatory programs. We have provided consulting services for large groundwater withdrawal permit applications at many stages of projects. GZA's work has included completion of numerous hydrogeologic investigations focused on evaluating aquifer properties, identifying groundwater supply sources, and designing groundwater pumping systems. GZA's hydrologists and water resource engineers are experienced in developing watershed water budgets and reservoir modeling, performing inflow/outflow analyses, estimating seasonal in-stream flows, and evaluating the safe yield of water supply reservoirs. We also have extensive experience with addressing a variety of contamination issues at many sites throughout the state, including source protection. All GZA staff assigned to the project have extensive personal professional experience in groundwater supply development, water supply engineering, groundwater modeling, water quality analysis, permitting and/or construction management.

Our multi-disciplinary project team has experience with advancing a potential source through the exploration, testing, and permitting phases to design and construction of a new active water supply source. Further, we bring experience to provide guidance to the project that will be important in subsequent phases such as evaluating water quality issues, emerging contaminant threats, and potentially delivering treatment solutions. The depth and breadth of our experience will allow our project team to cost effectively execute the current project scope, while proactively addressing potential future steps in the development of the resource. This facilitates expeditious resolution of potential project issues that could impact development and permitting of a new well supply.

GZA will provide the technical leadership required to perform exceptional project execution. The work will be managed primarily by GZA's James Emery, Daniel Tinkham and Sarah Dignard, P.E. Ms. Dignard has over 15 years of consulting experience in the Northeast U.S. and Canada, supporting well supply development projects, New Source Approvals, water withdrawal permitting and compliance studies, drinking water source protection studies, groundwater dewatering systems and assorted hydrogeological assessments. Mr. Emery has been responsible for the successful completion of more than 2,000 groundwater investigations throughout the Northeast and eastern United States over his nearly 40-year career. He founded Emery & Garrett Groundwater Investigations (EGGI) in 1989 which for nearly 30 years performed such groundwater services throughout the eastern seaboard. In 2018 GZA acquired EGGI as a Division of GZA. Mr. Tinkham has worked with EGGI for the past 30+ years and has been involved in more than 1,000 successful groundwater investigations and development projects in his career. He is a senior hydrogeologist who is highly skilled in groundwater testing and analyses, groundwater modeling and groundwater safe yield assessments.



March 15, 2023
File No. 01.P000921.23
Professional Engineering Services for New Source Approval Permitting
Groundwater Supply at GPW #10 Area
Harwich, Massachusetts
Page | 17

GZA appreciates this opportunity to assist the Department. We look forward to the opportunity to discuss our services with you personally. In the meantime, please feel free to contact Sarah Dignard at 781-364-5088 with any questions or requests for additional information.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Sarah Dignard'.

Sarah Dignard, P.E.
Senior Project Manager

A handwritten signature in black ink, appearing to read 'D.J. Tinkham'.

Daniel J. Tinkham, P.G.
Consultant/Reviewer

A handwritten signature in black ink, appearing to read 'James M. Emery'.

James M. Emery, P.G.
Principal-in-Charge
Senior Hydrogeologist

SD/DJT/JME:rlk

\\GZAHINGHAM1\RFPs\New Business\Proposals\FY 2023 Proposals\01.P000921.23 Harwich New Source Pumping Test Approval\2023.03.15 DRAFT GZA Harwich - Prolonged Pumping Test
Prop No. 01.P000921.23_final.docx

Attachment: Schedule of Fees (2023)



**GZA GEOENVIRONMENTAL, INC.
METRO BOSTON OFFICES**

**MUNICIPAL GOVERNMENT SERVICES
SCHEDULE OF FEES - CALENDAR YEAR 2023**

FOR PROPOSAL FOR SERVICES DATED March 15, 2023

FILE NO. 01.P000921.23

LABOR

	<u>Per Hour</u>
CAD/Technical Designer	\$120
Field Technician II	\$105
Field Technician I	\$110
Technical/Administrative Support	\$115
Engineer/Scientist/Geologist II	\$125
Engineer/Scientist/Geologist I	\$135
Assistant Project Manager	\$160
Senior CAD/Technical Designer	\$160
Project Manager/Technical Specialist	\$190
Senior Project Manager/Technical Specialist	\$200
Senior Consultant	\$230
Associate Principal	\$230
Principal	\$255
Senior Principal	\$280
Outside Services and Subcontractors	Cost Plus 10%
Expenses	Cost Plus 10%

The above rates for technical and support personnel will be charged for actual time worked on the project, including time required for travel from company office to job or meeting site and return. For work requiring out-of-town overnight stay, the minimum charge for work on the project will be eight (8) hours per day.

Overtime work by "Non-Exempt" personnel will be billed at 1.5 times the standard rate.

A fifty percent (50%) premium will be added to the above rates for expert witness and other special services.

The above-listed rates are valid for the calendar year in which the work is performed. GZA reserves the right to modify this rate schedule on an annual basis to reflect changes in employee compensation and Client acknowledges that labor rates may change during the execution of this project.

EXPENSES

- Rental of specialized field or monitoring equipment and vehicle charges based on standard unit prices
- Transportation, lodging and subsistence for out-of-town travel
- Printing, reproduction, plotting, and wide-format scanning
- Express mail and shipping charges
- Personal vehicle travel for projects at IRS rates
- Long distance, local and cellular telephone, facsimile and postage (via U.S. Postal Service) are included in a flat rate Communication Fee of 3 percent per invoice on labor only

INVOICES

GZA will submit invoices periodically and payment will be due within 20 days from invoice date. GZA may terminate its services upon 10 days' written notice any time your payment is overdue on this or any other project.



**GZA GEOENVIRONMENTAL, INC.
METRO BOSTON OFFICES**

**MUNICIPAL GOVERNMENT SERVICES
SCHEDULE OF FEES - CALENDAR YEAR 2023**

BUDGETS

The Budget contained within GZA's Proposal represents our estimate of the work involved. Actual charges can vary either upward or downward depending upon many factors. GZA considers a substantial budget variance to be 15% and we will not exceed this variance without notifying Client.

RETAINER

Any retainer specified in GZA's Proposal shall be due prior to the start of services and will be applied to the final invoice for services.

VII. NEW BUSINESS

C. 2022 Water Restrictions Hearings

VII. NEW BUSINESS

D. Lothrop Lawn Project