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# NOTICE OF INTENT APPLICATION FLOWERING POND DAM REHABILITATION PROJECT Maudslay State Park Newburyport, Massachusetts

February 2020  
File No. 01.0173790.00



**PREPARED FOR:**  
Commonwealth of Massachusetts  
Department of Conservation & Recreation  
Boston, Massachusetts

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February 13, 2020  
File No. 01.0173790.00

Newburyport Conservation Commission  
Newburyport City Hall  
60 Pleasant Street  
Newburyport, MA 01950

Re: Notice of Intent Application  
Flowering Pond Dam Rehabilitation Project  
Newburyport, Massachusetts

Dear Commissioners:

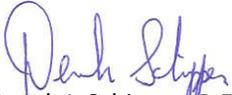
On behalf of our client, the Commonwealth of Massachusetts Department of Conservation & Recreation (DCR), GZA GeoEnvironmental Inc. (GZA) is pleased to submit this Notice of Intent (NOI) application for the proposed Flowering Pond Dam Rehabilitation project located in Maudslay State Park in Newburyport, Massachusetts. GZA has prepared this NOI application per the requirements of the Massachusetts Wetlands Protection Act (WPA; M.G.L. Chapter 131, Section 40) and the City of Newburyport – Wetlands Protection Ordinance and Regulations (Newburyport Code of Ordinances Chapter 6.5, Article II). In accordance with Section 9 of the City of Newburyport Wetlands Protection Regulations, GZA is submitting a request for variance for work within the 25-foot No-Disturbance Zone with this NOI application.

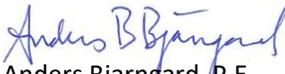
The DCR is partnering with the Friends of Maudslay State Park for the dam rehabilitation. The objective of this project is to rehabilitate the dam to meet current dam safety standards while maintaining the historical appearance of the structure. The project has been designed to limit impacts to the existing wetland and waterway resources supported by the dam, and to limit temporary construction impacts to the surrounding resource areas. Construction of the project is tentatively planned for the fall of 2020.

Please contact Derek Schipper, P.E., at GZA at (781) 278-5792 if you have any questions or require additional information regarding this application. We look forward to working with the Conservation Commission during the permitting process.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

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

  
Anders Bjarngard, P.E.  
Principal

  
Kimberly Degutis  
Consultant/Reviewer

CC: Mr. William Salomaa – DCR, Office of Dam Safety  
Mr. Dan Mortell – DCR, Dam Maintenance  
MassDEP – Northeast Regional Office



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## 1.0 INTRODUCTION

On behalf of the Commonwealth of Massachusetts Department of Conservation and Recreation (DCR, Applicant), GZA GeoEnvironmental, Inc. (GZA) has prepared this Notice of Intent (NOI) application to describe the proposed Project that includes rehabilitation of the existing Flowering Pond Dam. Flowering Pond Dam is located within Maudslay State Park along Curzon Mill Road in Newburyport, Massachusetts and is owned and operated by DCR (see Figure 1 – Site Locus and Figure 2 – Aerial Locus Map).

The DCR is partnering with the Friends of Maudslay Park for the dam rehabilitation. The objective of the project is to rehabilitate the dam while maintaining the historical appearance of the structure. The pond and dam provide recreation and aesthetic value to the park. This application is submitted in accordance with the requirements of the Wetlands Protection Act Regulations (WPA, 310 CMR 10.00) and the City of Newburyport – Wetlands Protection Ordinance.

## 2.0 EXISTING CONDITIONS

Flowering Pond Dam is located on an unnamed tributary to the Merrimack River and impounds Flowering Pond. The dam has a maximum height of approximately 18 feet and a total length of approximately 100 feet. It is an earthen embankment structure with a primary spillway located near the middle of the dam. The downstream face of the dam is a near-vertical, non-mortared boulder wall. Photos of the site and the Dam are included in **Appendix D**.

Flowering Pond Dam was constructed in 1898 and is associated with the former estate of the Moseley family. Currently, the purpose of the dam and its impoundment is for recreational and aesthetic value. The original purpose of the Flowering Pond Dam is unknown and design plans are not available. The dam is owned by DCR and is operated by DCR Maudslay State Park staff in Newburyport, MA.

The structure is currently judged to be in Fair condition by the DCR Office of Dam Safety. Noted deficiencies include deterioration of the primary spillway, erosion of the upstream embankment face, misalignment and bulging of the downstream non-mortared boulder wall, no operable low-level outlet, large trees on the downstream side of the dam and an irregular crest surface.

### 2.1 JURISDICTIONAL RESOURCE AREAS

A resource area delineation of the site was conducted by a GZA wetland scientist on April 5, 2018. The results of the resource area delineation are provided in **Appendix B**, and the limits of the resource areas delineated on site are shown on the project drawings in **Appendix F**. The resource areas within the site include the Riverfront Area (RA), Land Under Water and Waterbodies (LUWW), Bordering Land Subject to Flooding (BLSF), Inland Bank, Bordering Vegetated Wetlands (BVW), and Buffer Zone associated with the tributary to the Merrimack River and Flowering Pond.

The applicant is requesting an Order of Conditions for the proposed rehabilitation work. The proposed project includes the rehabilitation of the existing Dam within each of the resources on site, as listed above and described below.



### **3.0 PROPOSED PROJECT**

The Flowering Pond Dam is located within Maudslay State Park, with an entrance on Pine Hill Road, in Newburyport, Massachusetts. The proposed project has been designed to protect the existing wetland and waterway resources supported by the dam, and to limit temporary construction impacts to the surrounding resource areas. The proposed rehabilitation includes the following:

- Replacing the existing concrete spillway. The existing spillway is in poor condition. The new spillway will have the same width and invert elevation of the existing spillway;
- Removing the existing 12-inch-diameter low-level outlet pipe which is inoperable. The pipe will be replaced with a new 16-inch-diameter pipe installed at approximately the same location. The new pipe will be controlled by a sluiceway valve from the crest of the dam. The gate will be installed within a precast concrete manhole;
- A new concrete headwall will be constructed within the pond at the upstream end of the new low-level outlet pipe. The slab of the new headwall will be set at the invert of the new pipe at elevation 15 feet. The upstream end of the headwall will also be fitted with a stop log bay that can accommodate wooden stop logs from elevation 15 to 17.5 feet;
- Excavation to remove the existing pipe and install the new pipe will require temporary removal of a portion of the downstream non-mortared boulder wall and concrete core wall in the area of the pipes. The boulder wall and concrete core wall will be reconstructed after the new pipe is in place;
- Removing the existing timber boards along the upstream face of the dam which are in poor condition. The purpose of the boards was to protect the upstream slope from erosion due to wave action and burrowing animals. The timbers will be replaced with a 1-foot-thick stone layer underlain by a 6-inch-thick layer of crushed stone within the same footprint as the timber boards are currently located. The stone will be underlain by a geosynthetic clay liner which will reduce seepage through the embankment. The surface stone up to elevation 19 feet will consist of rip rap. From elevation 19 feet to the top of the dam, the stone layer will consist of placed river stone (rounded boulders); and
- Replacing the existing pedestrian access along the top of the dam with a new wooden footbridge over the new spillway (similar to the existing footbridge). A metal fence will be provided along the downstream side of the dam crest and around the spillway for fall protection. The fence will be a high-quality fence similar to ones used in several recent DCR projects (refer to Drawing S-1 for photographs of the proposed fencing). Handicap-accessible benches will also be provided along the top of the dam.

The Friends of Maudslay Park requested that the “waterfall” appearance at the downstream end of the spillway be maintained. The upstream and downstream inverts of the dam spillway will be reconstructed at the same elevation as the existing spillway. This will maintain the pond’s existing normal pool elevation and discharge from the spillway freefall for an approximately 15-foot drop. In order to prevent erosion of soils at the base of the spillway, boulders will be placed in the downstream channel to match the existing stream bottom elevation as shown on the drawings.

The project will protect the valuable environmental and recreational resources and maintain the dam’s historic appearance. The DCR and Friends of Maudslay State Park have allocated funding for this project and is in the process of obtaining permits for the proposed work. It is anticipated that the project will begin in the Fall of 2020.



### 3.1 AVOIDANCE AND MINIMIZATION

The proposed project has been designed to avoid and limit impacts to wetland resources to the extent possible and in the following ways:

- Prior to construction, site preparation will include installation of soil erosion and sedimentation controls as shown in the attached Permit Plans by hand preparation and use of a small excavator.
- Clearing, grubbing and / or selective removal of vegetation will be conducted by hand at the direction of the Engineer. Removal of vegetation will be limited to areas of construction access and areas required for safe excavation of timber planks on the upstream face of the dam and for access to the downstream spillway / waterfall area for placement of boulder stone and construction of the low flow outlet pipe.
- Restoration of the Dam's ability to safely and effectively impound Flowering Pond will avoid the potential environmental impacts of an uncontrolled failure of the structure;
- The proposed grading modifications to the upstream face of the dam have been limited to the extent practicable to allow for removal of the existing timber planks, placement of geotextile fabric and riprap and to create a flush surface.
- It is anticipated that pumping may be required to adequately dewater the work zone. Any fish trapped within the dewatering zone will be salvaged by a qualified person prior to dewatering operations and returned to the downstream channel. Any water removed from the work area will be pumped via controlled temporary discharge into a filter bag installed in adjacent uplands. Water will be allowed to settle and seep from the dirt bag to the uplands prior to contact with adjacent wetland areas.
- Impacts to wetland resources downstream of the Dam have been avoided through a final design for the Dam which maintains flow in the downstream channel and to the infiltration ponds and wetlands beyond. A boulder energy dissipation pad will be provided downstream of the spillway to limit scour from the waterfall of the dam;
- Direct impacts to BVW have been limited by limiting work areas around the BVW limits;
- Best management practices such as compost socks or berms will be used to reduce sedimentation into the waterway and erosion of soil.
- Loaming and seeding of embankments at all disturbed areas within work limits will precede removal of soil erosion and sediment control BMPs.

### 3.2 SITE RESTORATION AND STABILIZATION

Upon project completion, the cofferdam will be removed, and stream flow restored. The temporary stream diversion will be removed. Exposed soils will be stabilized with loam and seed as appropriate. The soil erosion and sediment controls will remain in place until exposed soils are permanently stabilized. Trees removed around the dam will be replaced within Maudslay State Park on a 1:1 basis. Trees to remain primarily at the right abutment will be protected as shown on the plans.



### 3.3 CONSTRUCTION PHASE SEDIMENT, EROSION, AND WATER CONTROLS

Prior to the start of construction, the Contractor will install sedimentation and erosion controls as shown on the plans. The Contractor will primarily utilize an area immediately east of the dam and an upland area outside the dam work area for a construction equipment staging, as noted on sheet C1 of the proposed project plans in **Appendix F**.

In order to limit the potential for secondary impacts beyond the limit of work, several sedimentation and erosion control techniques and Best Management Practices (BMPs) will be implemented. These will include the following:

- Erosion control barriers (such as compost socks or berms) in downgradient locations where sediment could enter waterways; and
- Stabilized construction entrance off of Pine Hill Road.

The Contractor will be required to inspect and maintain sediment and erosion control features for the full duration of the project. This will include periodic sediment removal and repair or replacement of the features, as needed. Once sedimentation and erosion controls are in place and inspected, the walking path on the east side of the unnamed tributary will be used to provide access to the dam and contractor staging area from the roadway.

### 4.0 **REGULATORY COMPLIANCE AND IMPACTS**

Work within resource areas and the buffer zone prescribed by the City of Newburyport Wetlands Ordinance and Regulations for the dam maintenance project is being proposed under the Limited Project status category (310 CMR 10.53(3)(i)). The project has been designed to limit both temporary and permanent impacts at the site. However, the proposed dam rehabilitation will result in unavoidable temporary impacts to RA, LUWW, BLSF, Bank, BVW, and associated Buffer Zone. Impacts to these resource areas are unavoidable due to the nature of the dam safety work, but the impacts to resource areas for this project are anticipated to be limited and temporary due primarily to the location of the staging area, erosion controls, and temporary lowering of the pond water elevation.

GZA and the DCR recognize the concerns about the effects of lowering the water elevation on the pond’s wildlife. However, in order to reconstruct the upstream slope and to remove the existing low-level outlet pipe and install the new pipe as described above, the pond will need to be lowered about 7 feet to elevation 13 feet. In addition, lowering the pond will provide safer conditions for workers and the downstream areas.

The total impacts proposed within each resource area are summarized in the table below.

**Table No. 1 – Summary of Resource Area Impacts**

Resource Area	Temporary Impact for Construction Access	Permanent Impact for Dam Rehabilitation
RA (100 ft.)	15,143 sq. ft.	0 sq. ft.
RA (200 ft.)	16,559 sq. ft.	0 sq. ft.



Resource Area	Temporary Impact for Construction Access	Permanent Impact for Dam Rehabilitation
LUWW (from drawdown)	55,390 sq. ft.	0 sq. ft.
BLSF	0 sq. ft.	0 sq. ft.
Bank	151 linear ft.	0 linear ft.
BVW	360 sq. ft.	0 sq. ft.
Buffer Zone	16,560 sq. ft.	0 sq. ft.

Performance standards for resource areas on site can largely be met by the project; however, the project will require approval under the Limited Project Provision of the MA Wetlands Protection Act (310 CMR 10.53 (3) (i)) relating to the “maintenance, repair, and improvement of structures, including dams, and reservoirs...” to overcome the performance standards that cannot be met by the proposed work. The project involves repair and improvement of the existing Dam, and the work is required for dam safety.

4.1 RIVERFRONT AREA (RA)

Massachusetts WPA Regulations define RA as, “the area of land between a river’s mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away.” As stated in 310 CMR 10.58 (4), the proposed project will address the following performance standards:

**Table No. 2 – Performance Standards for Work in RA**

Performance Standard	Proposed Project
<i>a. Protection of Other Resource Areas – the work shall meet the performance standards for all other resource areas within the RA, as identified in 310 CMR 10.30 (coastal bank), 10.32 (salt marsh), 10.55 (BVW), and 10.57 (BLSF).</i>	The proposed work in the Riverfront Area meets performance standards for BVW and BLSF resource areas.
<i>b. Protection of Rare Species.</i>	The Project Area is located within Priority Habitat 2122 and Estimated Habitat 1393. GZA is coordinating with the Natural Heritage and Endangered Species Program (NHESP) to protect the rare species listed in this area (see <b>Appendix G</b> ).



Performance Standard	Proposed Project
<i>c. Practicable and Substantially Equivalent Economic Alternatives – there must be no practicable and substantially equivalent economic alternative to the proposed project with less adverse effects on the interests identified in M.G.L. C. 131 § 40.</i>	An alternatives analysis was completed, and the proposed project is judged to be the project with the potential for the fewest adverse impacts. There is no practical alternative to working within the Riverfront Area due to the location of the work and project site. Impacts to resource areas will be temporary and limited in scope.
<i>d. No Significant Adverse Impacts.</i>	It is anticipated that the project will not result in significant adverse impacts within the RA with respect to stormwater management, wildlife habitat, or surface or groundwater quality. Temporary impacts to vegetation within 100 feet of the riverbank are unavoidable due to the nature of the work.

It is believed that RA performance standards will be substantially met. Where a standard cannot be fully met, we believe that it will be met under the project’s status as a Limited Project as per 310 CMR 10.53(3)(i).

**310 CMR 10.58(6) (Grandfathered or Exempted from Requirements for the Riverfront Area)**

Rehabilitation of the existing dam within the Riverfront Area would qualify for review as a grandfathered or exempted activity because the dam was constructed in 1898, prior to the 1996 required date of existence, and the project is not proposing to enlarge or extend the existing impervious surfaces.

**4.2 LAND UNDER WATER BODIES AND WATERWAYS (LUWW)**

Massachusetts WPA Regulations define LUWW as, “the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks, or bedrock.” As stated in 310 CMR 10.56(4), the proposed project will address the following performance standards:

**Table No. 3 – Performance Standards for Work in LUWW**

Performance Standard	Proposed Project
<i>a. The water carrying capacity within a defined channel.</i>	Installation of the proposed boulders at the base of the downstream spillway will be located within the bed and Bank of the stream channel; the vertical height of the boulders will not exceed the existing grade of the stream channel. Impacts to the water carrying capacity of the unnamed tributary to the Merrimack River are not anticipated upon project completion.
<i>b. The ground and/or surface water quality.</i>	Both the ground and surface water quality of the unnamed tributary to the Merrimack River will not be affected by the proposed improvements over the existing condition. Currently, no water quality BMPs are incorporated into the existing spillway design. The proposed spillway and waterfall base improvements will address velocity reduction, thereby preventing additional scour and incision of the associated downstream LUWW area and reduce sedimentation to downstream waters.



Performance Standard	Proposed Project
<i>c. The capacity of the area to provide breeding habitat, escape, cover, and food for fisheries.</i>	No permanent impacts to the capacity of the area to provide breeding habitat, escape, cover, or food generation are anticipated.
<i>d. The capacity of the area to provide important wildlife habitat functions.</i>	The proposed installation of boulders at the base of the spillway waterfall will provide additional cover for local aquatic and terrestrial wildlife over the existing condition. No permanent impacts to the capacity of the area to provide important wildlife habitat functions are anticipated.

It is believed that LUWW performance standards will be substantially met. Where a standard cannot be fully met, we believe that it will be met under the project’s status as a Limited Project as per 310 CMR 10.53(3)(i).

**4.3 BORDERING LAND SUBJECT TO FLOODING (BLSF)**

Massachusetts WPA Regulations define BLSF as, “an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds, or lakes. It extends from the banks of these waterways and waterbodies; where a bordering vegetated wetland occurs, it extends from said wetland.” As stated in 310 CMR 10.57(4), the proposed project will address the following performance standards:

**Table No. 4 – Performance Standards for Work in BLSF**

Performance Standard	Proposed Project
<i>a. Compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows.</i>	There is no anticipated filling of BLSF during the rehabilitation project.
<i>b. Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, shall not restrict flows so as to cause an increase in flood stage or velocity.</i>	The pond will be drawn down during construction until the new outlet pipe is in place and the upstream slope is restored. The water control plan to be submitted by the contractor will require handling of incoming flows. Work within the unnamed tributary to the Merrimack River will occur within a limited dewatered area. Flow regulation will be controlled via by-pass pumping through the spillway area for the duration of project activities.
<i>c. Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions.</i>	The work of this project will not impair the capacity of the BLSF to provide important wildlife habitat functions.



Performance Standard	Proposed Project
<i>d. No Significant Adverse Impacts.</i>	It is anticipated that the project will not result in significant adverse impacts within the BLSF with respect to stormwater management, wildlife habitat, or surface or groundwater quality.

It is believed that BLSF performance standards will be substantially met. Where a standard cannot be fully met, we believe that it will be met under the project’s status as a Limited Project as per 310 CMR 10.53(3)(i).

4.4 BANK

Massachusetts WPA Regulations define Bank as, “*the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland. A Bank may be partially or totally vegetated, or it may be comprised of exposed soil, gravel, or stone.*” As stated in 310 CMR 10.54 (4), the proposed project will address the following performance standards:

**Table No. 5 – Performance Standards for Work in Bank**

Performance Standard	Proposed Project
<i>a. The physical stability of the Bank.</i>	The proposed boulders within the stream bed will enhance the stability of the existing Bank by reducing the velocity of water from the existing waterfall and spillway into the unnamed tributary to the Merrimack River, reducing the occurrence of erosion during high flow / high velocity precipitation events.
<i>b. The water carrying capacity of the bank</i>	The limited area of impact will not affect the carrying capacity of the unnamed tributary to the Merrimack River Bank area as the total volume of water is not anticipated to increase.
<i>c. Ground and surface water quality.</i>	Both the ground and surface water quality of the receiving perennial stream will not be affected by the proposed improvements over the existing condition. Currently, no water quality BMPs are incorporated into the existing spillway design. The proposed spillway improvements will address velocity reduction, thereby preventing additional scour and incision of the associated downstream Bank area and reduce sedimentation to downstream waters.
<i>d. The capacity of the Bank to provide breeding habitat, escape cover, and food for fisheries.</i>	Bank habitat within the project area does not currently provide escape cover for fish. The Bank associated with the tributary to the Merrimack River will be not be modified and the capacity of the Bank to provide the necessary habitat, cover and food for wildlife will not be impeded by the dam rehabilitation.



Performance Standard	Proposed Project
<p><i>e. The capacity of the Bank to provide important wildlife habitat functions.</i></p>	<p>The existing conditions at the spillway outfall do not provide important wildlife habitat functions in its current state. The non-mortared rock and concrete wall does not provide important wildlife habitat function. The installation of large boulders at the base of the waterfall will provide higher water quality habitat to downstream receiving areas by preventing erosion of downstream Bank during rainfall or snowmelt (high velocity) events. The Bank associated with the tributary to the Merrimack River will be not be modified and the capacity of the Bank to provide the necessary habitat functions will not be impeded by the dam rehabilitation.</p>

As per section (b) of the performance standards for Bank resource, the performance standards above may be exceeded for “structures.... when required to prevent flood damage to facilities, buildings and roads constructed prior to the effective date of 310 CMR 10.51 through 10.60, including the renovation or reconstruction (but not substantial enlargement) of such facilities, buildings and roads, provided that the following requirements are met:

1. *The proposed protective structure, renovation or reconstruction is designed and constructed using best practical measures so as to minimize adverse effects on the characteristics and functions of the resource area;*
2. *The applicant demonstrates that there is no reasonable method of protecting, renovating or rebuilding the facility in question other than the one proposed.”*

It is believed that Bank performance standards will be substantially met. Where a standard cannot be fully met, we believe that it will be met under the project’s status as a Limited Project as per 310 CMR 10.53(3)(i).

**4.5 BORDERING VEGETATED WETLANDS (BVW)**

Massachusetts WPA Regulations define BVW as, “freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. *Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The ground and surface water regime and the vegetational community which occur in each type of freshwater wetland are specified in M.G.L. c. 131, § 40.*” As stated in 310 CMR 10.55 (4), the proposed project will address the following performance standards:

**Table No. 6 – Performance Standards for Work in BVW**

Performance Standard	Proposed Project
<p><i>a. Where the presumption set forth in 310 CMR 10.55(3) is not overcome, any proposed work in a BVW shall not destroy or otherwise impair any portion of said area.</i></p>	<p>The project proposes to temporarily impact approximately 360 SF of BVW to access the downstream side of the dam. The temporary impacts will be permitted by the OOC and wetland restoration of the same 360 SF of BVW will be conducted upon project completion, restoring the area to pre-construction conditions.</p>



Performance Standard	Proposed Project
<p><i>b. Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an OOC permitting work which results in the loss of up to 5,000 square feet of BVW when said area is replaced in accordance with the following general conditions and any additional, specific conditions the issuing authority deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost.</i></p>	<p>The project will comply with regulations under 310 CMR 10.55(4)(b) et. seq., <i>Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs)</i>, General Performance Standards for Mitigation of Bordering Vegetated Wetlands. Limited temporary impacts to BVW will be restored as shown on Permit Plans. Restoration of BVW will be conducted at a 1:1 ratio.</p>
<p><i>c. Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an OOC permitting work which results in the loss of a portion of BVW.</i></p>	<p>GZA will coordinate with the Newburyport Conservation Commission.</p>
<p><i>d. Notwithstanding the provisions of 310 CMR 10.55(4)(a), (b), and (c), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.</i></p>	<p>The Project Area is located within Priority Habitat 2122 and Estimated Habitat 1393. GZA will coordinate with the Natural Heritage and Endangered Species Program (NHESP) to protect the rare species listed in this area (see <b>Appendix G</b>).</p>
<p><i>e. Any proposed work shall not destroy or otherwise impair any portion of a BVW that is within an Area of Critical Environmental Concern (ACEC).</i></p>	<p>The project is not located within an ACEC.</p>

It is believed that BVW performance standards will be substantially met. Where a standard cannot be fully met, we believe that it will be met under the project’s status as a Limited Project as per 310 CMR 10.53(3)(i).

**4.6 100-FOOT BUFFER ZONE**

Massachusetts WPA Regulations define Buffer Zone as, “100-ft area horizontally (on a true lateral) landward of approved delineation of applicable wetland resource areas.” The WPA further states that any activities undertaken within 100 feet of an area specified in 310 CMR 10.02(1)(a) (e.g., Bank, Bordering Vegetated Wetland) will be conducted per (310 CMR 10.02(2)(b)), “in a manner so as to reduce the potential for any adverse impacts to the resource area during construction, and with post-construction measures implemented to stabilize any disturbed areas.”

Impacts to the Buffer Zone will occur as a result of temporary construction access, laydown, and staging needs. The staging area ground surface will be temporarily disturbed and use of the footpath area by workers will be temporarily disrupted. Temporary impacts to the Buffer Zone are unavoidable due to the location of the project work and access requirements. Temporary impacts have been limited to the extent practicable.

**4.7 TOWN OF NEWBURYPORT NO DISTURB ZONE**

A variance is being requested from the Newburyport Conservation Commission for work within the 25-foot No-Disturb Zone of the resource areas on site, including the wetlands, stream, and pond. The variance is required due to the physical



necessity of the work to be performed within the 25-foot No-Disturbance Zone that cannot be avoided during the dam maintenance activities.

#### 4.8 OTHER REGULATED RESOURCE AREAS

GZA has also considered whether the Project Site falls within other environmental regulatory boundaries that would require additional permits. There are no Outstanding Resource Waters, Areas of Critical Environmental Concern, Certified Vernal Pools, or Zone II water supply areas associated with the Project Site. However, there is Priority Habitat 2122 and Estimated Habitat 1393 mapped on the Project Site.

GZA is coordinating with the Natural Heritage and Endangered Species Program (NHESP) to protect the rare species listed in this area (see **Appendix G**). Impacts to aquatic, terrestrial, and avian wildlife are expected to be limited to a temporary loss of the use of the area within the project limits of construction. The two sturgeon species present in Priority Habitat 2122 and Estimated Habitat 1393 are not expected to be impacted by the proposed project. The habitat of these species is understood to be within the Merrimack River. The existing tributary from the Merrimack River to the existing dam typically does not carry enough water to support the sturgeon.

The dam is listed as a contributing feature in the inventory of the Massachusetts Cultural Resource Information System (MACRIS) record for Maudslay State Park. The dam is in the table of contents section C, item 39 as “Dam and waterfall.” The proposed work includes keeping the historic appearance of the dam as a part of the rehabilitation. As part of the permit process, the Massachusetts Historical Commission (MHC) is being consulted through the filing of a USACE Preconstruction Notification Form (PCN). After review of DCR and MHC files and permit drawings, the DCR archaeologist has determined this project is unlikely to affect significant historic or archaeological resources.

#### 4.9 COMPLIANCE WITH STORMWATER PERMITTING

The Stormwater Report and Checklist is provided in **Appendix E**.

##### 4.9.1 State

As a dam rehabilitation project, the majority of the WPA Stormwater Standards do not apply. The project is considered a redevelopment project; however, the project does not include the construction of any new impermeable surfaces or other stormwater elements. The project includes the use of best management practices for stormwater and erosion controls during the construction period. Following the completion of construction, the site will be restored as a recreation area with no formal stormwater structures.

The proposed project will not change river flow rates, river water surface elevations and will not affect water quality. The project will not generate additional runoff.

##### 4.9.2 Federal

Prior to the initiation of land disturbance activities, if required, this project shall obtain coverage under the EPA’s NPDES General Permit for Stormwater Discharges from Construction Sites, including the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). If required, this permit will cover stormwater and construction dewatering at the site under the Federal NPDES program.

As the project has been categorized as redevelopment, the project must comply with WPA Regulations, 310 CMR 10.05(6)(k) for Stormwater Management Standards. The project does not propose new impervious surfaces, no



new point source discharges, no expansion or alteration of the existing onsite stormwater management system, or changes to the existing local drainage patterns.

## **5.0 ALTERNATIVES ANALYSIS**

The Flowering Pond Dam, located on an unnamed tributary to the Merrimack River in Newburyport, Massachusetts, has been found to be in Fair condition. An analysis of potential actions to address this condition has been completed. The alternatives analysis developed for the proposed activities and has been summarized in a table included in **Appendix A**.

### **5.1 ALTERNATIVE 1 – NO ACTION (NOT SELECTED)**

The existing Flowering Pond Dam has been classified as being in Fair condition by the DCR Office of Dam Safety. However, the Friends of Maudslay State Park and the DCR wish to rehabilitate the dam to comply with current dam standards. The No Action alternative would leave the dam in its current Fair condition.

### **5.2 ALTERNATIVE 2 – BREACHING OF DAM (NOT SELECTED)**

Removal or breaching of the dam would restore the natural (pre-dam construction) stream channel of the unnamed tributary to the Merrimack River through the current impoundment area to free-flowing conditions. Removal/breach of the dam, if properly constructed, would improve water quality in the Merrimack River and Flowering Pond by restoring natural sediment transport and water temperatures. Removing the Dam would subsequently remove the recreation and aesthetic value of the Flowering Pond Dam.

Dam removal would significantly change the character of the existing site by converting portions of the existing Flowering Pond resources (Land Under Water and Bordering Vegetated Wetland) into upland areas. Depending on the configuration of the restored stream channel, and local groundwater conditions, some areas of Land Under Water may be converted into new areas of Bordering Vegetated Wetland along the new channel.

### **5.3 ALTERNATIVE 3 – REPAIR OF EXISTING DAM (SELECTED)**

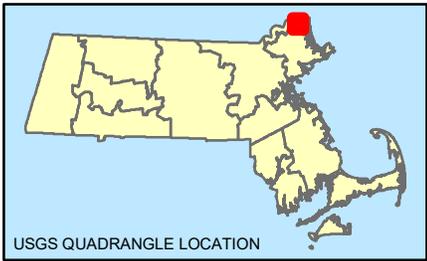
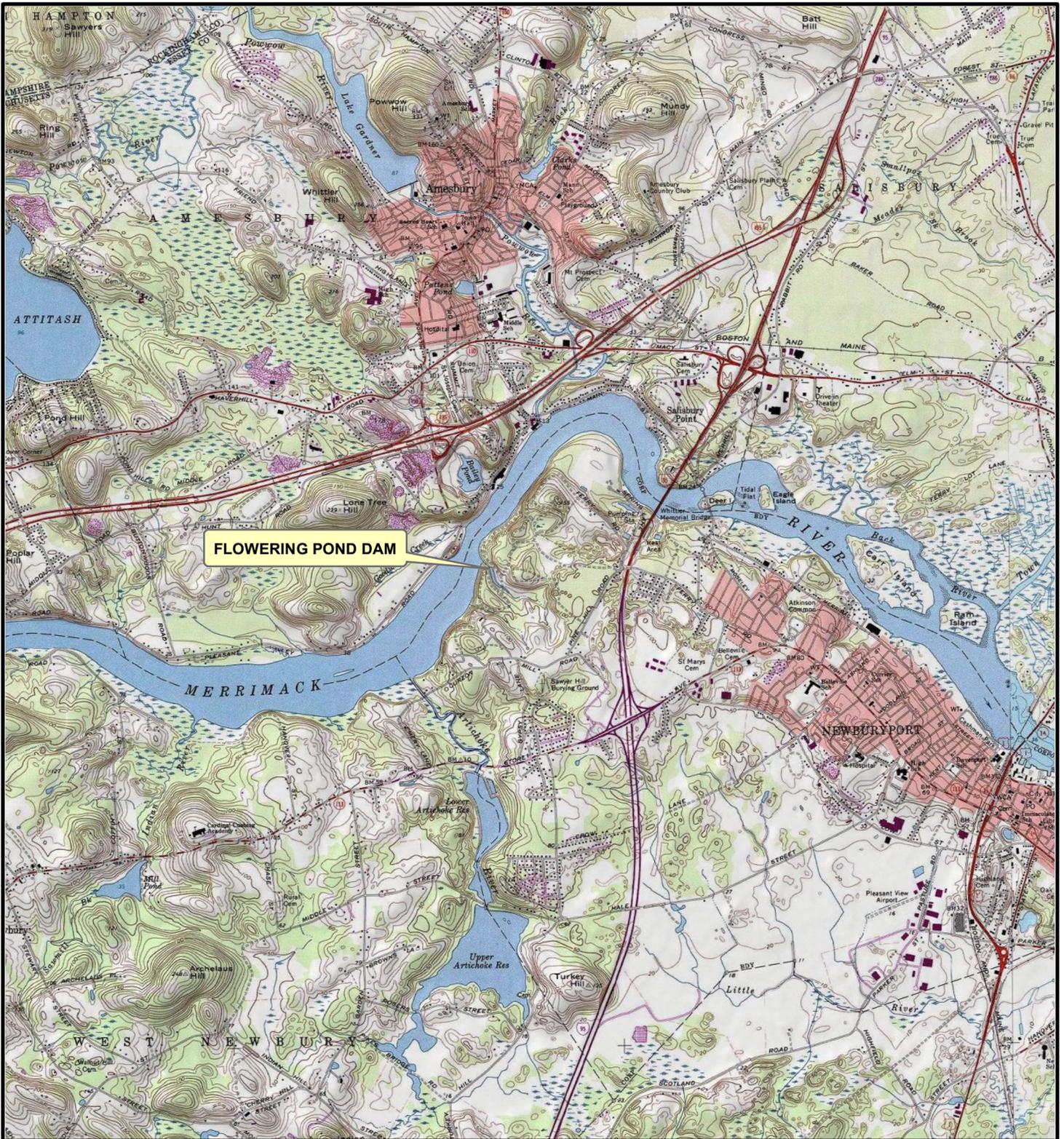
Repairing the dam would help prevent a potential failure of the dam and would maintain the dam's impoundment – Flowering Pond. It would also maintain the recreation and aesthetic value of the Flowering Pond Dam within Maudslay State Park.

## **6.0 CONCLUSION**

The proposed Project is required to perform dam maintenance at the Flowering Pond Dam within Maudslay Park in Newburyport, Massachusetts. The Project has been designed to limit impacts to regulated resource areas. Although temporary disturbance is unavoidable to complete the project activities, the resource areas will be restored upon project completion.



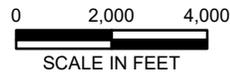
## Figures



USGS QUADRANGLE LOCATION

THIS MAP PRESENTS LAND COVER IMAGERY FOR THE WORLD AND DETAILED TOPOGRAPHIC MAPS FOR THE UNITED STATES. THE MAP IS PART OF SEAMLESS, SCANNED IMAGES OF UNITED STATES GEOLOGICAL SURVEY (USGS) PAPER TOPOGRAPHIC MAPS.

Data Supplied by :



SCALE IN FEET



PROJ. MGR.: DJS  
DESIGNED BY: DEM  
REVIEWED BY: CWC  
OPERATOR: DEM  
DATE: 8-14-2019

# LOCUS PLAN

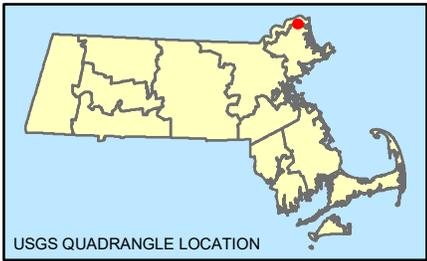
## FLOWERING POND DAM NEWBURYPORT, MASSACHUSETTS

JOB NO.  
01.173790.00

FIGURE NO.  
**1**

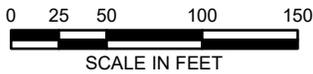


**FLOWERING POND DAM**



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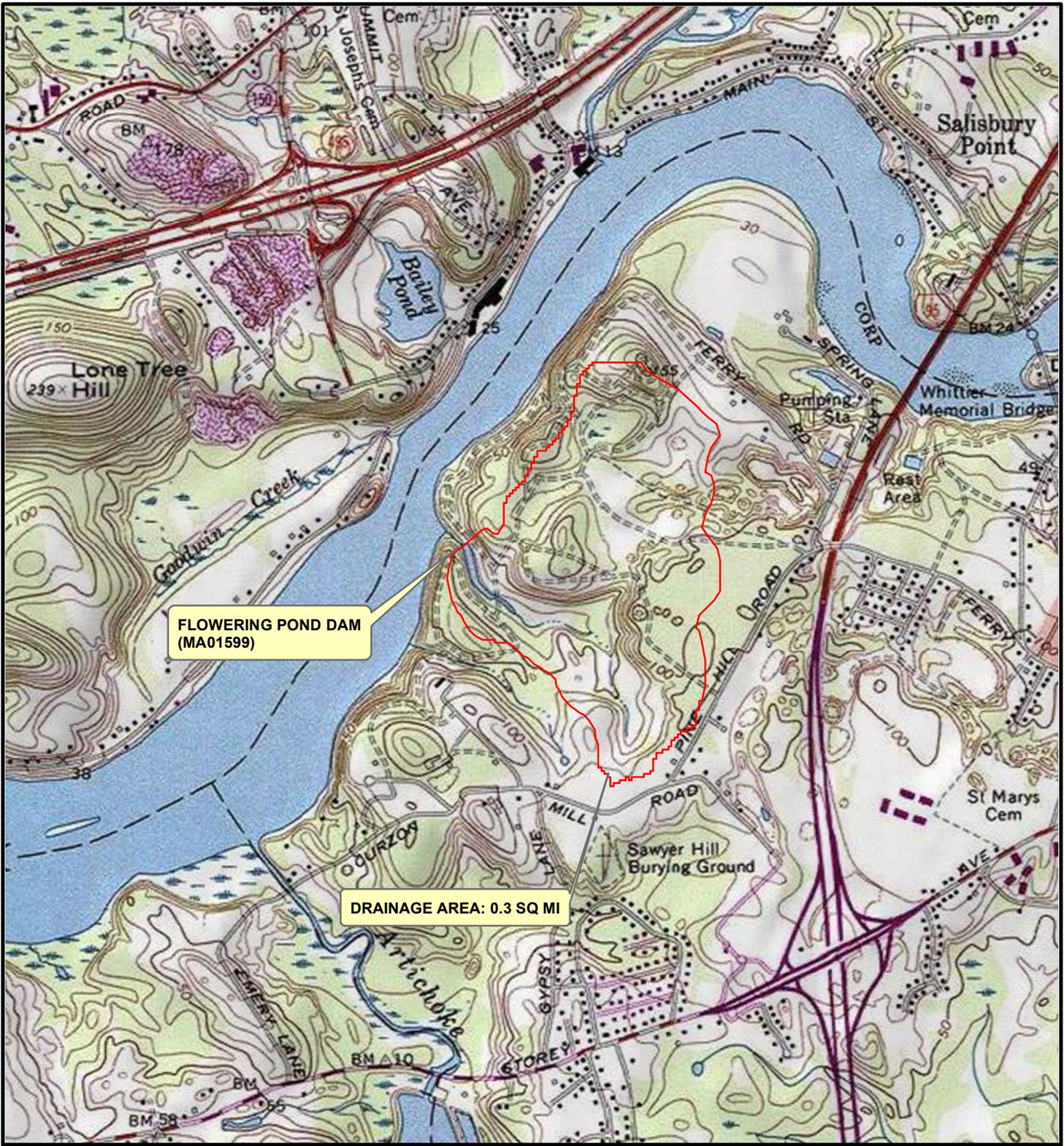
PROJ. MGR.: DJS  
DESIGNED BY: DEM  
REVIEWED BY: CWC  
OPERATOR: DEM  
DATE: 8-14-2019

# AERIAL LOCUS PLAN

FLOWERING POND DAM  
NEWBURYPORT, MASSACHUSETTS

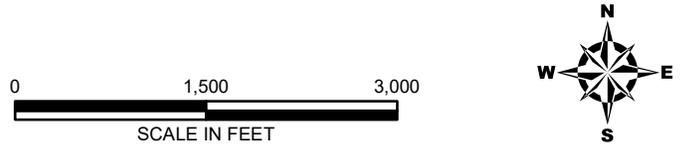
JOB NO.  
01.173790.00

FIGURE NO.  
**2**



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PROJ. MGR.: DJS  
 DESIGNED BY: DEM  
 REVIEWED BY: CWC  
 OPERATOR: DEM  
 DATE: 10/9/2019

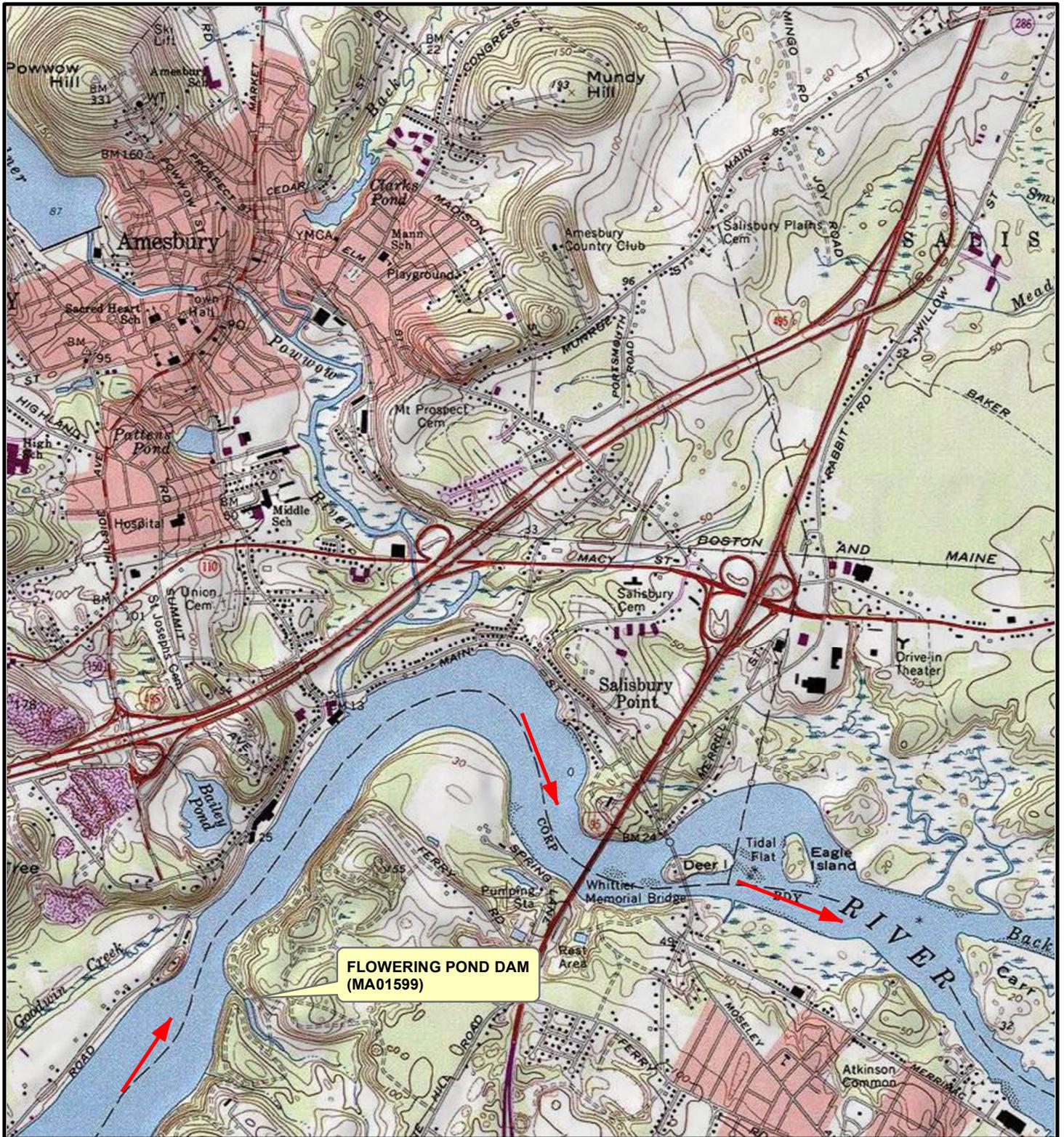
# DRAINAGE AREA MAP

## FLOWERING POND DAM NEWBURYPORT, MASSACHUSETTS

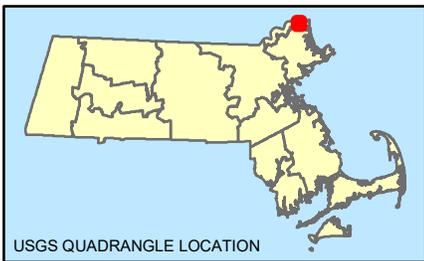
JOB NO.  
 01.173790.00

FIGURE NO.  
**3**

© 2019 - GZA GeoEnvironmental, Inc., \\GZANOR\Jobs\170,000-179,999\173790\173790-00.DS\Figures-GIS\mxd\Figure 4 - DOWNSTREAM AREA.mxd, 10/9/2019, 9:12:37 AM, daniel.mcgraw



**FLOWERING POND DAM  
(MA01599)**



USGS QUADRANGLE LOCATION

THIS MAP PRESENTS LAND COVER IMAGERY FOR THE WORLD AND DETAILED TOPOGRAPHIC MAPS FOR THE UNITED STATES. THE MAP IS PART OF SEAMLESS, SCANNED IMAGES OF UNITED STATES GEOLOGICAL SURVEY (USGS) PAPER TOPOGRAPHIC MAPS.

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SCALE IN FEET



PROJ. MGR.: DJS  
DESIGNED BY: DEM  
REVIEWED BY: CWC  
OPERATOR: DEM  
DATE: 10/9/2019

# DOWNSTREAM AREA MAP

## FLOWERING POND DAM NEWBURYPORT, MASSACHUSETTS

JOB NO.  
01.173790.00

FIGURE NO.  
**4**

# MassDEP - Bureau of Waste Site Cleanup

## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

**Site Information:**  
FLOWERING POND DAM  
NEWBURYPORT, MA

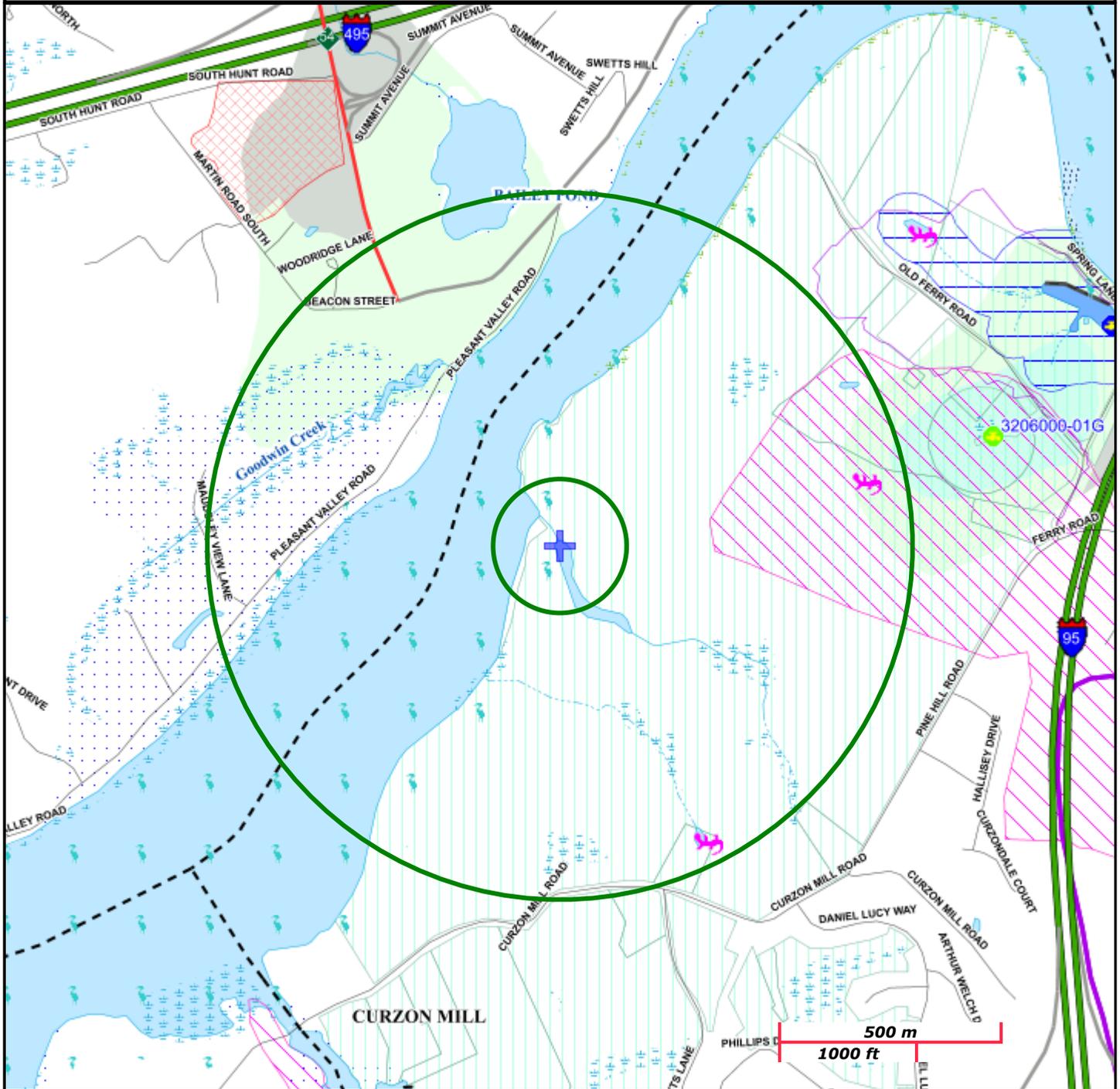
**NAD83 UTM Meters:**  
4743648mN , 342250mE (Zone: 19)  
October 9, 2019

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:  
<https://www.mass.gov/orgs/massgis-bureau-of-geographic-information>



# MassDEP

Commonwealth of Massachusetts  
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail	PWS Protection Areas: Zone II, IWPA, Zone A		
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct	Hydrography: Open Water, PWS Reservoir, Tidal Flat		
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam	Wetlands: Freshwater, Saltwater, Cranberry Bog		
Aquifers: Medium Yield, High Yield, EPA Sole Source	FEMA 100yr Floodplain; Protected Open Space; ACEC		
Non Potential Drinking Water Source Area: Medium, High (Yield)	Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential		
	Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.		

**Figure 5**

# National Flood Hazard Layer FIRMette



## Figure 6

### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- |                                    |  |  |
|------------------------------------|--|--|
| <b>SPECIAL FLOOD HAZARD AREAS</b>  |  | Without Base Flood Elevation (BFE)<br><i>Zone A, V, A99</i>  |
|                                    |  | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>   |
|                                    |  | Regulatory Floodway  |
| <b>OTHER AREAS OF FLOOD HAZARD</b> |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
|                                    |  | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>  |
|                                    |  | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>  |
|                                    |  | Area with Flood Risk due to Levee <i>Zone D</i>  |
| <b>OTHER AREAS</b>                 |  | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>   |
|                                    |  | Effective LOMRs  |
| <b>GENERAL STRUCTURES</b>          |  | Area of Undetermined Flood Hazard <i>Zone D</i>  |
|                                    |  | Channel, Culvert, or Storm Sewer   |
|                                    |  | Levee, Dike, or Floodwall  |
| <b>OTHER FEATURES</b>              |  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation  |
|                                    |  | 17.5 Coastal Transect  |
|                                    |  | Base Flood Elevation Line (BFE)  |
|                                    |  | Limit of Study   |
|                                    |  | Jurisdiction Boundary  |
| <b>MAP PANELS</b>                  |  | Coastal Transect Baseline  |
|                                    |  | Profile Baseline   |
|                                    |  | Hydrographic Feature   |
|                                    |  | Digital Data Available   |
|                                    |  | No Digital Data Available  |
|                                    |  | Unmapped   |
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

42°49'58.39"N



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/28/2019 at 2:09:26 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

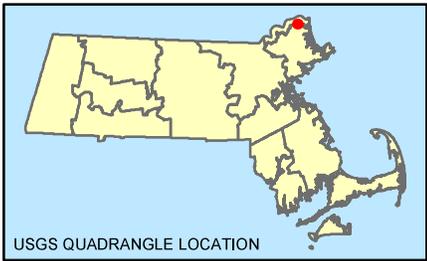
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



**FLOWERING POND DAM**

**Legend**

-  Project Boundary
-  NHESP Priority Habitats of Rare Species
-  NHESP Estimated Habitats of Rare Wildlife



THIS MAP PRESENTS GEOGRAPHIC EXTENT OF HABITAT OF STATE-LISTED RARE SPECIES IN MASSACHUSETTS BASED ON OBSERVATIONS DOCUMENTED WITHIN THE LAST 25 YEARS IN THE DATABASE OF THE NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP). THE ESTIMATED HABITATS OF RARE WILDLIFE DATALAYER CONTAINS POLYGONS THAT ARE A SUBSET OF THE PRIORITY HABITATS OF RARE SPECIES.



Data Supplied by :





PROJ. MGR.: DJS  
 DESIGNED BY: DEM  
 REVIEWED BY: CWC  
 OPERATOR: DEM  
 DATE: 2-12-2020

# NHESP HABITATS

FLOWERING POND DAM  
 NEWBURYPORT, MASSACHUSETTS

JOB NO.  
 01.173790.00

FIGURE NO.  
**7**



## **Appendix A - Alternatives Analysis Table**



Alternative	Type	Advantages	Disadvantages
Alternative 1 (Not Recommended)	No Action	<ul style="list-style-type: none"> <li>• No impact to resource areas</li> <li>• No cost</li> </ul>	<ul style="list-style-type: none"> <li>• Does not provide protection to the existing Flowering Pond</li> <li>• If no action is taken, a potential failure of the dam could occur</li> </ul>
Alternative 2 (Not Recommended)	Breaching of Dam	<ul style="list-style-type: none"> <li>• Improves water quality in the Merrimack River and Flowering Pond by restoring natural sediment transport and water temperatures</li> </ul>	<ul style="list-style-type: none"> <li>• Removing the dam would subsequently remove the recreation and aesthetic value of the Flowering Pond Dam</li> <li>• Greater disruption to natural resources</li> </ul>
Alternative 3 <b>(Recommended)</b>	Repair of Existing Dam	<ul style="list-style-type: none"> <li>• Would help prevent a potential failure of the dam and maintain the dam’s impoundment, Flowering Pond</li> <li>• Would maintain the recreation and aesthetic value of Flowering Pond Dam within Maudslay State Park</li> </ul>	<ul style="list-style-type: none"> <li>• Temporary access requires impacts to resource areas.</li> <li>• Temporary, limited drawdown required to provide worker safety.</li> </ul>



## **Appendix B - Wetland Delineation Report**



## 1.0 INTRODUCTION

On April 5, 2018, a Wetland Scientist from GZA GeoEnvironmental, Inc. (GZA) evaluated the jurisdictional wetland resources, as defined by the Massachusetts Wetlands Protection Act (WPA; MGL Chapter 131 §40) and its implementing regulations (310 CMR 10.00 *et seq*; the “Regulations”) and by the City of Newburyport Wetlands Ordinance and its associated Rules and Regulations (Chapter 6.5, Article 2 of the Newburyport Code of Ordinances), associated with Fed Maudslay Dam which impounds Flowering Pond along an unnamed tributary in Maudslay State Park in Newburyport, Massachusetts (Site). This wetland resources evaluation was conducted to support a Dam Rehabilitation Project so that the dam can be brought into compliance with existing Dam Safety Regulations.

## 2.0 METHODOLOGY

Delineated MA Wetlands Protection Act regulated (and equivalent wetland ordinance) wetland resource areas at the Site include Bordering Vegetated Wetland (BVW), Inland Bank (Bank), and Mean Annual High-Water Line (MAHWL) along an unnamed tributary to the Merrimack River. The unnamed tributary is mapped as perennial according to the USGS map and MAHWL is delineated for purposes of establishing the extent of Riverfront Area.

The upper limits of each resource type were delineated using sequentially numbered flagging tape with flag numbers and colors as indicated in the table below:

Resource Type	Flag Series	Marker
BANK	A1-A16	Light pink flagging tape
MAHWL	A10-A16	Light pink flagging tape
BVW	B1-B5 C1-C13	Bright pink flagging tape

BVW at the Site was delineated in accordance with the methodologies outlined in the 1987 Army Corps of Engineers Wetland Delineation Manual and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast (Version 2.0) as well as the MassDEP 1995 Massachusetts Handbook for Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act. Both methodologies rely on characterizing the vegetative community through plant identification and classification of dominant species in each stratum by their wetland indicator status as well as on signs of wetland hydrology including the presence of hydric soils, drainage patterns, water marks, etc. The Army Corps of Engineers delineation forms were used to record data collected at the Site since these forms are accepted by MassDEP to document vegetated wetland boundaries.

The plant community and soil profile was documented on the upland and wetland sides of the flagged BVW at C5. See *the attached field data forms for wetland indicator ratings for plants mentioned in this narrative.*

Bank and MAHWL were delineated per definitions found in 310 CMR 10.00.



### 3.0 RESOURCE AREA DESCRIPTIONS

Wetland resources associated with the Site include Riverfront Area (RA), Land Under Water Bodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), Inland Bank (Bank), and Bordering Vegetated Wetlands (BVW). Additionally, Buffer Zones are associated with the Bank and BVW. These resources are described in the following sections.

#### 3.1 RIVERFRONT AREA

According to 310 CMR 10.58(2)(a), RA is *“the area of land between a river’s mean annual high water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zones. The riverfront area does not have a buffer zone.”*

Additionally, per 310 CMR 10.58(2), the MAHWL is *“the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts.”*

The unnamed tributary that the dam is located on is mapped as perennial. Therefore, RA extends 200 feet (ft) outward from the MAHWL on each side of the river’s channel. At the Site, the MAHWL is coincident with the portion of the Bank along the unnamed tributary. RA at the Site is associated only with the portion of the unnamed tributary downstream of the dam impoundment; no RA exists at the Site upstream of the dam impoundment.

South of the unnamed tributary, RA at the Site is comprised of a white pine- and eastern hemlock-dominated forest with a green ash- and eastern hemlock-dominated understory. North of the unnamed tributary, RA at the Site consists of a steep, forested slope comprised of a white pine- and eastern hemlock-dominated forest with a sparsely vegetated understory. Refer to Section 3.4 for further details about the plant species observed on either side of the unnamed tributary.

#### 3.2 LAND UNDER WATER BODIES AND WATERWAYS

According to 310 CMR 10.56, LUWW is *“Land under Water Bodies and Waterways is the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of Land under Water Bodies and Waterways is the mean annual low water level.”*

LUWW exists within the Flowering Pond Dam below the elevation of the mean annual low flow level.

#### 3.3 BORDERING LAND SUBJECT TO FLOODING

According to 310 CMR 10.57(2)(a), BLSF is *“an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland.”* BLSF is further defined as the *“estimated maximum lateral extent of flood water which will theoretically result of the statistical 100-year frequency storm.”* This boundary is *“determined by reference to the most recently available flood profile data prepared for the community within which the work is proposed under the National Flood Insurance Program (NFIP).”* The NFIP is currently administered by the Federal Emergency Management Agency (FEMA).



Per Map Number 25009C0108F, which was revised on July 3, 2012 (see attached), BLSF in the form of a Zone AE Flood Zone with a Base Flood Elevation of 117 ft NAVD88 exists along portions of either side of the UNNAMED TRIBUTARY below the dam impoundment. No BLSF exists above the dam impoundment.

3.4 INLAND BANK

According to 310 CMR 10.54(2)(a), a Bank is “the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland. A Bank may be partially or totally vegetated, or it may be comprised of exposed soil, gravel or stone.” Furthermore, under 310 CMR 10.54(2)(c), “the upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower.”

At the Site, Bank exists along Maudslay Pond and the unnamed tributary. The upper limit of this resource was demarcated using sequentially numbered light pink flagging tape. Flags 1A through 26A follow the north bank. The south bank of the pond and river are too steep to flag in the field and the edge of water is coincident with where the flags would be placed.

The A-series flags are mainly along a near vertical break in slope both upstream and downstream of the dam impoundment. The face of the Bank along both sides of the pond and river are vegetated. Plant species observed down gradient and up gradient of the A-series flags (north side) include:

Down Gradient	Up Gradient
None observed (open water)	American basswood ( <i>Tilia americana</i> ) Arrow arum ( <i>Peltandra virginica</i> )* Blue-flag iris ( <i>Iris versicolor</i> )* Canada mayflower ( <i>Maianthemum canadense</i> ) Eastern hemlock ( <i>Tsuga canadensis</i> ) Fringed loosestrife ( <i>Lysimachia ciliata</i> ) Green ash ( <i>Fraxinus pennsylvanica</i> )* Hay-scented fern ( <i>Dennstaedtia punctilobula</i> ) Hog peanut ( <i>Amphicarpaea bracteata</i> ) Jack in the pulpit ( <i>Arisaema triphyllum</i> ) Japanese barberry ( <i>Berberis thunbergii</i> )** Jewelweed ( <i>Impatiens capensis</i> )* Multiflora rose ( <i>Rosa multiflora</i> )** New York aster ( <i>Symphyotrichum novi-belgii</i> )* Pin oak ( <i>Quercus palustris</i> )* Poison ivy ( <i>Toxicodendron radicans</i> )* Red oak ( <i>Quercus rubra</i> ) Red raspberry ( <i>Rubus idaeus</i> ) Rhododendron species ( <i>Rhododendron spp.</i> ) Rough-stemmed goldenrod ( <i>Solidago rugosa</i> )* Roundleaf green brier ( <i>Smilax rotundifolia</i> )* Sassafras ( <i>Sassafras</i> ) Sensitive fern ( <i>Onoclea sensibilis</i> )* Skunk cabbage ( <i>Symplocarpus foetidus</i> )* Slippery elm ( <i>Ulmus rubra</i> ) Soft rush ( <i>Juncus effusus</i> )* Speckled alder ( <i>Alnus incana</i> )* Sweet birch ( <i>Betula lenta</i> )



Down Gradient	Up Gradient
	Sweet pepperbush ( <i>Clethra alnifolia</i> )* Virginia creeper ( <i>Parthenocissus quinquefolia</i> ) White pine ( <i>Pinus strobus</i> ) Winged euonymus ( <i>Euonymus alatus</i> )

Plant species observed down gradient and up gradient of the south side of the Bank include:

Down Gradient	Up Gradient
None observed (open water)	Blue-flag iris ( <i>Iris versicolor</i> )* Canada mayflower ( <i>Maianthemum canadense</i> ) Dandelion ( <i>Taraxacum</i> ) Eastern hemlock ( <i>Tsuga canadensis</i> ) Green ash ( <i>Fraxinus pennsylvanica</i> )* Hay-scented fern ( <i>Dennstaedtia punctilobula</i> ) Jewelweed ( <i>Impatiens capensis</i> )* Lowbush blueberry ( <i>Vaccinium angustifolium</i> ) New York aster ( <i>Symphotrichum novi-belgii</i> )* Red maple ( <i>Acer rubrum</i> )* Red oak ( <i>Quercus rubra</i> ) Rhododendron species ( <i>Rhododendron spp.</i> ) Slippery elm ( <i>Ulmus rubra</i> ) White pine ( <i>Pinus strobus</i> ) Witch hazel ( <i>Hamamelis virginiana</i> )

An asterisk (\*) denotes plant species with a Wetland Indicator Status (WIS) of Facultative (FAC), Facultative Wetland FACW, or Obligate (OBL). The presence of these plants, when dominant, generally indicates that hydric conditions are present and that the area may be a wetland.

A double asterisk (\*\*) denotes plant species that are listed as invasive in Massachusetts. These species tend to spread rapidly and to out compete and overtake native vegetation. In the process, they decrease biodiversity within an area and generally lower that area’s value to wildlife as habitat.

3.5 BORDERING VEGETATED WETLAND

According to 310 CMR 10.55(2)(a), BVW are “freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs” and are areas “where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants.”

BVW exists in two locations at the Site. The upper limit of this resource was marked using sequentially numbered (B1 through B5 and C1 through C13) bright pink flagging tape. The B-series denotes a very small patch of BVW along the Bank and is located immediately east of the dam impoundment along the north side of the pond. Flags B1 and B5 connect to A2 and A4, respectively. The C-series flags are along a seep-fed BVW adjacent to the Bank immediately west of the dam impoundment along the north side of the river. Flags C1 and C13 connect to A11 and A15, respectively. The flags follow a clear break in slope and change in plant community.

Plant species observed down gradient and up gradient of the C-series flags include:



Down Gradient	Up Gradient
<p>Arrow arum (<i>Peltandra virginica</i>)*            Blue-flag iris (<i>Iris versicolor</i>)*            Green ash (<i>Fraxinus pennsylvanica</i>)*            Jewelweed (<i>Impatiens capensis</i>)*            New York aster (<i>Symphotrichum novi-belgii</i>)*            Poison ivy (<i>Toxicodendron radicans</i>)*            Rough-stemmed goldenrod (<i>Solidago rugosa</i>)*            Roundleaf green brier (<i>Smilax rotundifolia</i>)*            Sensitive fern (<i>Onoclea sensibilis</i>)*            Skunk cabbage (<i>Symplocarpus foetidus</i>)*            Soft rush (<i>Juncus effusus</i>)*            Speckled alder (<i>Alnus incana</i>)*            Sweet birch (<i>Betula lenta</i>)            Sweet pepperbush (<i>Clethra alnifolia</i>)*</p>	<p>American basswood (<i>Tilia americana</i>)            Canada mayflower (<i>Maianthemum canadense</i>)            Eastern hemlock (<i>Tsuga canadensis</i>)            Fringed loosestrife (<i>Lysimachia ciliata</i>)            Green ash (<i>Fraxinus pennsylvanica</i>)*            Hay-scented fern (<i>Dennstaedtia punctilobula</i>)            Hog peanut (<i>Amphicarpaea bracteata</i>)            Jack in the pulpit (<i>Arisaema triphyllum</i>)            Japanese barberry (<i>Berberis thunbergii</i>)**            Multiflora rose (<i>Rosa multiflora</i>)**            Pin oak (<i>Quercus palustris</i>)*            Poison ivy (<i>Toxicodendron radicans</i>)*            Red oak (<i>Quercus rubra</i>)            Red raspberry (<i>Rubus idaeus</i>)            Rhododendron species (<i>Rhododendron spp.</i>)            Rough-stemmed goldenrod (<i>Solidago rugosa</i>)*            Roundleaf green brier (<i>Smilax rotundifolia</i>)*            Sassafras (<i>Sassafras</i>)            Slippery elm (<i>Ulmus rubra</i>)            Sweet birch (<i>Betula lenta</i>)            Virginia creeper (<i>Parthenocissus quinquefolia</i>)            White pine (<i>Pinus strobus</i>)            Winged euonymus (<i>Euonymus alatus</i>)</p>

Refer to the attached field data forms for further documentation of the soils and plant community at flag C5.

### 3.6 BUFFER ZONE

Under the WPA, a Buffer Zone is associated with the Bank and BVW at the Site. This Buffer Zone extends horizontally outward for 100 ft from the Bank and BVW flags. Additionally, under the Newburyport Wetland Ordinance, a smaller Buffer Zone, referred to as “No-Disturb Zone,” extends horizontally outward for 25 ft from the Bank and BVW flags. These zones overlap the previously described RA.

### 4.0 **ADDITIONAL REGULATORY INFORMATION**

No Outstanding Resource Waters, Areas of Critical Environmental Concern, or Certified Vernal Pools area associated with the Site. Estimated and Priority Habitat areas for two species of Sturgeon (see the attached letter from the Massachusetts Division of Fisheries and Wildlife) are located northwest (downstream) of the Site along the Merrimack River.

<b>WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region</b>		Wetland <input checked="" type="checkbox"/> Upland
Project Site: <u>Maudslay Pond Dam</u>	City/County: <u>Newburyport</u>	Date: <u>7/10/2018</u>
Applicant/Owner: <u>0</u>	State: <u>MA</u>	Sampling Point: <u>C5 +5 ft</u>
Investigator(s): <u>Maria Firstenberg (GZA)</u>		Section/Township/Range: _____
Landform (hillslope, terrace, etc.): <u>Terrace</u>	Local Relief (concave, convex, none): <u>Concave</u>	Slope (%): <u>15%</u>
Subregion (LRR or MLRA): <u>LRR-L</u>	Latitude: _____	Longitude: _____ Datum: _____
Soil Map Unit Name: <u>Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes</u>	NWI Classification: <u>PSS1</u>	
Are climatic/hydrologic conditions on site typical for this time of year? Yes <input checked="" type="checkbox"/> No (explain) _____		
Is vegetation _____ Soil _____ Hydrology _____ Significantly Disturbed? (check if appropriate)		
Is vegetation _____ Soil _____ Hydrology _____ Naturally Problematic? (check if appropriate)		
Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes _____ No		
<b>SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.</b>		
Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes _____ No	Hydric Soil Present? _____ Yes <input checked="" type="checkbox"/> No	Wetland Hydrology Present? _____ Yes <input checked="" type="checkbox"/> No
Is the Sampled Area within a Wetland? _____ Yes <input checked="" type="checkbox"/> No		
Remarks:		
<b>HYDROLOGY</b>		
<b>Wetland Hydrology Indicators</b>		
<i>Primary Indicators (minimum of one is required; check all that apply)</i>		<i>Secondary Indicators (Min. 2 Required)</i>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations</b>		<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> No
Surface Water Present? _____ Yes <input checked="" type="checkbox"/> No	Depth (inches) _____	
Water Table Present? _____ Yes <input checked="" type="checkbox"/> No	Depth (inches) _____	
Saturation Present? _____ Yes <input checked="" type="checkbox"/> No	Depth (inches) _____	
<small>(Includes capillary fringe)</small>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION - Use scientific names				C5	Upland
<b>Tree Stratum (Plot Size: 30' )</b>				<b>Dominance Test Worksheet:</b>	
1 <u>Eastern White Pine (<i>Pinus strobus</i>)</u>	40	YES	FACU	7/10/2018	5 (A)
2 <u>Northern Red Oak (<i>Quercus rubra</i>)</u>	5	NO	FACU	<b>Total No. of Dominant Species</b>	
3 <u>Green Ash (<i>Fraxinus pennsylvanica</i>)</u>	5	NO	FACW	Across All Strata: 8 (B)	
4 <u>Slippery Elm (<i>Ulmus rubra</i>)</u>	5	NO	FAC	<b>Percent of Dominant Species That</b>	
5 <u>Eastern Hemlock (<i>Tsuga canadensis</i>)</u>	10	NO	FACU	are OBL, FACW, or FAC: 62.50 (C)	
6 --	--	--	--	<b>Prevalence Index Worksheet:</b>	
7 --	--	--	--	Total % Cover of:	Multiply by:
65 = <b>Total Tree Cover</b>				OBL species	0 x 1 = 0
				FACW species	55 x 2 = 110
				FAC species	40 x 3 = 120
				FACU species	60 x 4 = 240
				UPL species	15 x 5 = 75
				Column Totals	170 (A)      545 (B)
				<b>Prevalence Index = B/A = 3.2</b>	
<b>Sapling/Shrub Stratum (Plot Size: 15' )</b>				<b>Hydrophytic Vegetation Indicators:</b>	
1 <u>Eastern Hemlock (<i>Tsuga canadensis</i>)</u>	5	YES	FACU	<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation	
2 <u>Pin Oak (<i>Quercus palustris</i>)</u>	5	YES	FACW	<input checked="" type="checkbox"/> Dominance Test is >50%	
3 <u>Green Ash (<i>Fraxinus pennsylvanica</i>)</u>	15	YES	FACW	<input type="checkbox"/> Prevalence Index is $\leq 3.0^1$	
4 --	--	--	--	<input type="checkbox"/> Morphological Adaptations <sup>1</sup>	
5 --	--	--	--	<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
6 --	--	--	--	<sup>1</sup> Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic	
7 --	--	--	--	<b>Definitions of Vegetation Strata</b>	
25 = <b>Total Sapling/Shrub Cover</b>				<b>Tree-</b> Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height	
				<b>Sapling/shrub</b> - Woody plants less than 3 in. in DBH and greater than 3.28 ft. (1 m) tall.	
				<b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants < 3.28 ft tall	
				<b>Woody Vines</b> - All woody vines greater than 3.28 ft in height	
<b>Herb Stratum (Plot Size: 5' )</b>				<b>Hydrophytic Vegetation Present?</b>	
1 <u>Eastern Poison Ivy (<i>Toxicodendron radicans</i>)</u>	30	YES	FAC	<input checked="" type="checkbox"/> Yes	
2 <u>New Belgium American-Aster (<i>Symphyotrichum novi</i>)</u>	30	YES	FACW		<input type="checkbox"/> No
3 <u>Hay-Scented Fern (<i>Dennstaedtia punctilobula</i>)</u>	15	YES	UPL		
4 --	--	--	--		
5 --	--	--	--		
6 --	--	--	--		
7 --	--	--	--		
8 --	--	--	--		
9 --	--	--	--		
10 --	--	--	--		
11 --	--	--	--		
12 --	--	--	--		
75 = <b>Total Herb Cover</b>					
<b>Woody Vine Stratum (Plot Size: 30' )</b>					
1 <u>Eastern Poison Ivy (<i>Toxicodendron radicans</i>)</u>	5	YES	FAC		
2 --	--	--	--		
3 --	--	--	--		
4 --	--	--	--		
5 = <b>Total Woody Vine Cover</b>					

Remarks: (Include photo numbers here or on a separate sheet)



<b>WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region</b>		<input checked="" type="checkbox"/> Wetland
		<input type="checkbox"/> Upland
Project Site: <u>Maudslay Pond Dam</u>	City/County: <u>Newburyport</u>	Date: <u>7/10/2018</u>
Applicant/Owner: _____	State: <u>MA</u>	Sampling Point: <u>C5</u> <u>-5 ft</u>
Investigator(s): <u>Maria Firstenberg (GZA)</u>	Section/Township/Range: _____	
Landform (hillslope, terrace, etc.): <u>Terrace</u>	Local Relief (concave, convex, none): <u>Concave</u>	Slope (%): <u>15%</u>
Subregion (LRR or MLRA): <u>LRR-L</u>	Latitude: _____	Longitude: _____ Datum: _____
Soil Map Unit Name: <u>Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes</u>	NWI Classification: <u>PSS1</u>	
Are climatic/hydrologic conditions on site typical for this time of year? Yes <input checked="" type="checkbox"/> No (explain) _____		
Is vegetation _____ Soil _____ Hydrology _____ Significantly Disturbed? (check if appropriate)		
Is vegetation _____ Soil _____ Hydrology _____ Naturally Problematic? (check if appropriate)		
Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes _____ No		
<b>SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.</b>		
Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes _____ No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes _____ No	
Hydric Soil Present? <input checked="" type="checkbox"/> Yes _____ No		
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes _____ No		
Remarks:		
<b>HYDROLOGY</b>		
<b>Wetland Hydrology Indicators</b>		
<i>Primary Indicators (minimum of one is required; check all that apply)</i>		<i>Secondary Indicators (Min. 2 Required)</i>
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations</b>		<b>Wetland Hydrology Present?</b> <input checked="" type="checkbox"/> Yes _____ No
Surface Water Present? <input checked="" type="checkbox"/> Yes _____ No	Depth (inches) <u>0</u>	
Water Table Present? <input checked="" type="checkbox"/> Yes _____ No	Depth (inches) <u>0</u>	
Saturation Present? <input checked="" type="checkbox"/> Yes _____ No	Depth (inches) <u>0</u>	
<small>(Includes capillary fringe)</small>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION - Use scientific names				C5	Wetland
Tree Stratum (Plot Size: 30' )				<b>Dominance Test Worksheet:</b>	
1	--	Absolute % Cover	Dominant Species		
2	--				7/10/2018 <span style="float: right;">3 (A)</span>
3	--				<b>Total No.</b> of Dominant Species
4	--				Across All Strata: <span style="float: right;">3 (B)</span>
5	--				<b>Percent</b> of Dominant Species That
6	--				are OBL, FACW, or FAC: <span style="float: right;">100.00 (C)</span>
7	--				
0 = Total Tree Cover				<b>Prevalence Index Worksheet:</b>	
Sapling/Shrub Stratum (Plot Size: 15' )				Total % Cover of: <span style="margin-left: 100px;">Multiply by:</span>	
1	Speckled Alder ( <i>Alnus incana</i> )	Absolute % Cover	Dominant Species		
2	Sweet Birch ( <i>Betula lenta</i> )				OBL species <span style="float: right;">45</span> x 1 = <span style="float: right;">45</span>
3	Green Ash ( <i>Fraxinus pennsylvanica</i> )				FACW species <span style="float: right;">110</span> x 2 = <span style="float: right;">220</span>
4	--				FAC species <span style="float: right;">5</span> x 3 = <span style="float: right;">15</span>
5	--				FACU species <span style="float: right;">5</span> x 4 = <span style="float: right;">20</span>
6	--				UPL species <span style="float: right;">0</span> x 5 = <span style="float: right;">0</span>
7	--				Column Totals <span style="float: right;">165 (A)</span> <span style="float: right;">300 (B)</span>
70 = Total Sapling/Shrub Cover				<b>Prevalence Index = B/A = 1.8</b>	
Herb Stratum (Plot Size: 5' )				<b>Hydrophytic Vegetation Indicators:</b>	
1	Skunk-Cabbage ( <i>Symplocarpus foetidus</i> )	Absolute % Cover	Dominant Species		
2	Spotted Touch-Me-Not ( <i>Impatiens capensis</i> )				<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
3	Wrinkle-Leaf Goldenrod ( <i>Solidago rugosa</i> )				<input checked="" type="checkbox"/> Dominance Test is >50%
4	--				<input checked="" type="checkbox"/> Prevalence Index is $\leq 3.0^1$
5	--				<input type="checkbox"/> Morphological Adaptations <sup>1</sup>
6	--				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
7	--				<sup>1</sup> Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic
8	--				
9	--				
10	--				
11	--				
12	--				
95 = Total Herb Cover				<b>Definitions of Vegetation Strata</b>	
Woody Vine Stratum (Plot Size: 30' )				<b>Hydrophytic Vegetation Present?</b>	
1	--	Absolute % Cover	Dominant Species		
2	--				<input checked="" type="checkbox"/> Yes
3	--				
4	--				<input type="checkbox"/> No
0 = Total Woody Vine Cover					

Remarks: (Include photo numbers here or on a separate sheet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Horizon	y Pond Dam	Matrix		Redox Features		C5	Loc <sup>2</sup>	Texture	Remarks
		Color (moist)	%	Color (moist)	%				
A	0-8	10YR 4/1	70	10YR 4/6	30	C	M	Clay	Saturated
B	8-16+	5Y 4/3	80	5Y 4/2	20	PSS1	M	Medium sand	Saturated
--	--	0	--	--	--	--	--	--	--
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<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix

**Hydric Soil Indicators**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 2cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> (LRR R, MLRA 149 B)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> 5cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> (LRR R, MLRA 149B)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> LOAMY Mucky Mineral (F1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> (LRR K, L)	<input type="checkbox"/> Thin Dark Surface (S0) (LRR K, L)
<input type="checkbox"/> Thick Dark Surface(A12)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)		<input type="checkbox"/> Other (Explain in Remarks)

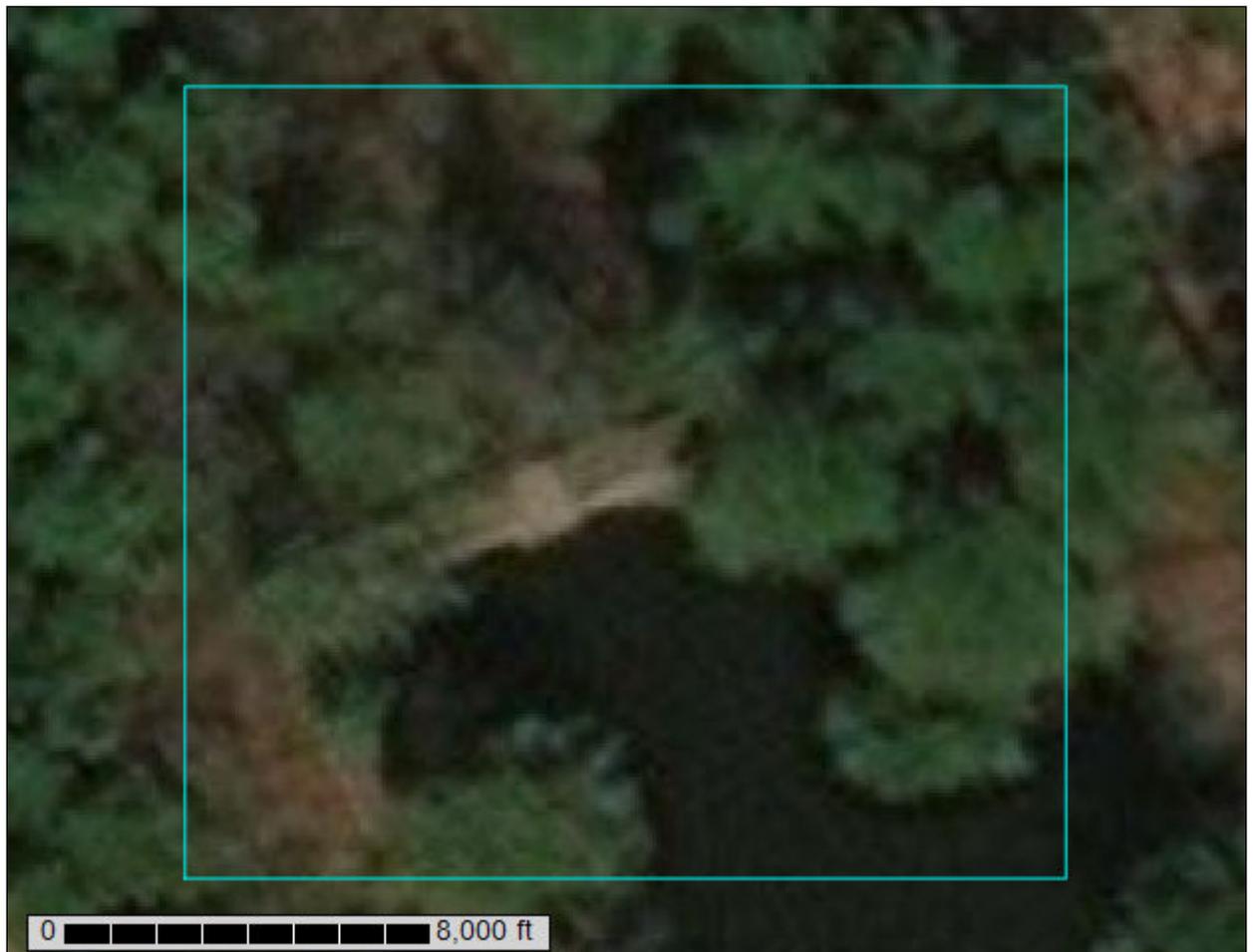
<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed)</b>	<b>Hydric Soil Present?</b>
Type: _____ Depth: _____ inches	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks:

# Custom Soil Resource Report for Essex County, Massachusetts, Northern Part

## Maudslay Pond Dam



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

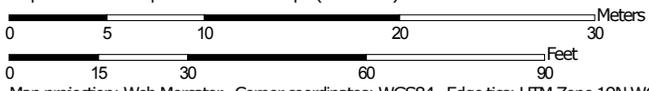
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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Map Scale: 1:385 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Northern Part  
 Survey Area Data: Version 13, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 12, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	0.1	10.9%
717E	Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes	0.5	89.1%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

## Custom Soil Resource Report

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Essex County, Massachusetts, Northern Part

### 306D—Paxton fine sandy loam, 15 to 25 percent slopes, very stony

#### Map Unit Setting

*National map unit symbol:* 2w67h  
*Elevation:* 0 to 1,400 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Paxton, very stony, and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Paxton, Very Stony

##### Setting

*Landform:* Hills, ground moraines, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear, convex  
*Across-slope shape:* Convex, linear  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

##### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 17 inches:* fine sandy loam  
*Bw2 - 17 to 28 inches:* fine sandy loam  
*Cd - 28 to 67 inches:* gravelly fine sandy loam

##### Properties and qualities

*Slope:* 15 to 25 percent  
*Percent of area covered with surface fragments:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Natural drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Salinity, maximum in profile:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water storage in profile:* Low (about 4.7 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No

**Minor Components**

**Woodbridge, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Charlton, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Ridgebury, very stony**

*Percent of map unit:* 1 percent  
*Landform:* Drainageways, hills, ground moraines, depressions, drumlins  
*Landform position (two-dimensional):* Toeslope, footslope  
*Landform position (three-dimensional):* Base slope, head slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**717E—Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes**

**Map Unit Setting**

*National map unit symbol:* vjrb  
*Mean annual precipitation:* 45 to 54 inches  
*Mean annual air temperature:* 43 to 54 degrees F  
*Frost-free period:* 125 to 240 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Rock outcrop:* 40 percent  
*Charlton and similar soils:* 30 percent  
*Hollis and similar soils:* 15 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Rock Outcrop**

**Setting**

*Parent material:* Granite and gneiss

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### Properties and qualities

*Slope:* 15 to 25 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

### Description of Charlton

#### Setting

*Landform:* Hills, ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Parent material:* Friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss

#### Typical profile

*H1 - 0 to 4 inches:* fine sandy loam

*H2 - 4 to 28 inches:* gravelly fine sandy loam

*H3 - 28 to 60 inches:* gravelly fine sandy loam

### Properties and qualities

*Slope:* 15 to 25 percent

*Percent of area covered with surface fragments:* 1.6 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Moderate (about 7.5 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

### Description of Hollis

#### Setting

*Landform:* Hills, ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Parent material:* Shallow, friable loamy eolian deposits over granite and gneiss

#### Typical profile

*O - 0 to 1 inches:* muck

*H2 - 1 to 6 inches:* fine sandy loam

*H3 - 6 to 17 inches:* gravelly fine sandy loam

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*H4 - 17 to 20 inches: unweathered bedrock*

### **Properties and qualities**

*Slope: 15 to 25 percent*

*Depth to restrictive feature: 10 to 60 inches to lithic bedrock*

*Natural drainage class: Somewhat excessively drained*

*Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Available water storage in profile: Very low (about 2.1 inches)*

### **Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6e*

*Hydrologic Soil Group: D*

*Hydric soil rating: No*

### **Minor Components**

#### **Chatfield**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*

#### **Leicester**

*Percent of map unit: 5 percent*

*Landform: Depressions*

*Hydric soil rating: Yes*

#### **Sutton**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*

# References

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- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)



## **Appendix C – Abutter Information**



# CITY OF NEWBURYPORT

OFFICE OF THE  
ASSESSOR

OCTOBER 17, 2019

JILL BRENNAN  
CITY ASSESSOR

TO: GZA GeoEnvironmental, INC

NEWBURYPORT CITY HALL

FROM: BOARD OF ASSESSORS

60 PLEASANT STREET

RE: ABUTTERS LIST FOR: Flowering Pond Dam, Maudslay State Park

NEWBURYPORT, MA 01950

TEL: 978-465-4403  
FAX: 978-462-8495

THE ATTACHED ARE THE ABUTTERS OF THE ABOVE MENTIONED PROPERTY:

[WWW.CITYOFNEWBURYPORT.COM](http://WWW.CITYOFNEWBURYPORT.COM)

BY CERTIFYING THAT THE PERSONS LISTED IN THE FOREGOING LIST OF ABUTTERS ARE THE OWNERS OF RECORD OF THE FOREGOING PROPERTIES AS OF JANUARY 1<sup>ST</sup>, 2019, THE CITY ASSESSOR IS NOT CERTIFYING THAT THE PERSONS SO LISTED ARE THE PERSONS WHO ARE REQUIRED TO RECEIVE NOTIFICATION UNDER APPLICABLE LAW.

*Jill Brennan*

111/ 52/ / /  
HARRISON DOUGLAS  
JOANNE C T/E  
3 PINE HILL ROAD  
NEWBURYPORT, MA 01950

106/ 1/ / /  
CAVANAGH LINDSAY H TRUSTEE  
85 CURZON MILL RD REALTY TRUST  
85 CURZON MILL RD  
NEWBURYPORT, MA 01950

108/ 13/ / /  
OUELLETTE DIANNA  
29 PINE HILL RD  
NEWBURYPORT, MA 01950

105/ 2/ / /  
WELCH CHRISTINA MARQUAND  
C/O CHRISTINA WELCH MATTHEWS  
252 HIGH ROAD  
NEWBURY, MA 01951

111/ 51/ / /  
DOUGHTY ERNEST L SR  
P J DOUGHTY & D C MURPHY J/T  
1 PINE HILL RD  
NEWBURYPORT, MA 01950

108/ 11/ / /  
COUGHLIN KEVIN F  
COUGHLIN NANCY L T/E  
35 PINE HILL RD  
NEWBURYPORT, MA 01950

105/ 4/ / /  
MULLIGAN E.W. & K.C. TRS.  
C/O RANDY MULLIGAN  
9265 STONEY RIDGE LN  
ALPHARETTA, GA 30022

115/ 2/B / /  
CHASE RICHARD M  
PAULA A T/E  
131 OLD FERRY ROAD  
NEWBURYPORT, MA 01950

108/ 6/ / /  
KUTCHER BRADLEY M TRS  
KIMBERLY REALTY TRUST  
242 MAIN ST #5  
AMESBURY, MA 01913-3721

108/ 4/ / /  
COLBY PAUL F  
ANN F J/T  
39 PINE HILL RD  
NEWBURYPORT, MA 01950

114/ 2/ / /  
CAPOLUPO WAYNE P TRUSTEE  
FERRY LANDING FARM REALTY TRUST  
130 OLD FERRY RD  
NEWBURYPORT, MA 01950

108/ 2/ / /  
PIKE WILLIAM JAMES II  
SIOBHAN M T/E  
65 CURZON MILL RD  
NEWBURYPORT, MA 01950

108/ 5/ / /  
CHAISSON, MARK A.  
EILEEN M. T/E  
41 PINE HILL RD  
NEWBURYPORT, MA 01950

105/ 5/ / /  
HALE EUNICE M TRS  
EVELYN E HALE & ALEXANDER C HALE  
78 CURZON MILL RD  
NEWBURYPORT, MA 01950

105/ 7/B / /  
CITY OF NEWBURYPORT  
60 PLEASANT ST  
NEWBURYPORT, MA 01950

108/ 3/ / /  
MORSE JANICE C TRS  
THE COLBY FAMILY NOMINEE TRUST  
37 PINE HILL RD  
NEWBURYPORT, MA 01950

107/ 2/A / /  
MACKAY CYNTHIA S TRS  
RIVERVIEW REALTY TRUST  
83 CURZON MILL RD  
NEWBURYPORT, MA 01950

108/ 7/ / /  
HUBERDEAU MELVIN J & LUCILLE P L/I  
CRAIG J HUBERDEAU  
45 PINE HILL RD  
NEWBURYPORT, MA 01950

111/ 54/ / /  
BURLINGAME EILEEN I  
7 PINE HILL RD  
NEWBURYPORT, MA 01950

108/ 12/ / /  
CASHMAN ROSEMARY R L/I  
CHRISTINE C CASHMAN  
31 PINE HILL RD  
NEWBURYPORT, MA 01950

111/ 55/ / /  
DRISCOLL DONALD T  
11 PINE HILL RD  
NEWBURYPORT, MA 01950

104/ 3/ / /  
COMMONWEALTH OF MASSACHUSETTS  
DEPT ENVIRONMENTAL MGMT  
100 CAMBRIDGE ST  
BOSTON, MA 02202

111/ 53/ / /  
KOLMAN INDIA  
5 PINE HILL RD  
NEWBURYPORT, MA 01950

111/ 57/A / /  
RESOLUTION PROPERTIES, INC.  
231 SUTTON ST. SUITE #1A  
NORTH ANDOVER, MA 01845

108/ 1/ / /  
VINCENT MARC L  
JENNIFER T/E  
1 HALLISEY DR  
NEWBURYPORT, MA 01950

111/ 56/ / /  
MARSHALL GORDON E & JUDITH L TRS  
13 PINE HILL RD REALTY TRUST  
13 PINE HILL RD  
NEWBURYPORT, MA 01950

111/ 57/ / /  
RESOLUTION PROPERTIES INC  
231 SUTTON ST SUITE 1A  
NORTH ANDOVER, MA 01845

**Notification to Abutters Under the  
Massachusetts Wetlands Protection Act and the  
Newburyport Wetlands Ordinance**

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 and the City of Newburyport's Wetlands Ordinance, you are hereby notified of the following.

Commonwealth of Massachusetts

- A. The name of the applicant is Department of Conservation & Recreation
- B. The applicant has filed a Notice of Intent with the Conservation Commission for the City of Newburyport seeking permission to remove, fill, dredge, or alter an Area subject to Protection Under the Wetlands Protection Act (General Laws Chapter 131, Section 40) and the City of Newburyport's Wetlands Ordinance.
- C. The address of the lot where the activity is proposed is:  
Flowering Pond Dam, Maudslay State Park, 74 Curzon Mill Rd, Newburyport, MA
- D. Copies of the Notice of Intent may be examined at the Newburyport Planning Office between the hours of 8am and 4pm Monday through Wednesdays, Thursdays from 8am to 8pm, and Fridays from 8am to noon.
- E. Copies of the Notice of Intent may be obtained from either (check one) the applicant \_\_\_\_\_ or the applicant's representative X, by calling this telephone number (781) 278 - 5792 between the hours of 8am and 5pm, on the following days of the week: Monday through Friday.
- F. The Public Hearing will be held on March 3, 2020 at 7pm at the Newburyport Senior/Community Center (or otherwise posted) located at 331 High Street, Newburyport, MA.

NOTE: Notice of the public hearing, including its date, time, and place, will be published at least five (5) days in advance in the Newburyport Daily News.

NOTE: Notice of the public hearing, including its date, time, and place, will be posted in Newburyport City Hall not less than forty-eight (48) hours in advance.

NOTE: You also may contact the Newburyport Conservation Commission or the Department of Environmental Protection Northeast Regional Office for more information about this application or the Wetlands Protection Act. To contact the Newburyport Conservation Commission, please call 978-465-4462. You may also contact the Newburyport Planning Office for meeting dates at 978-465-4400.

**AFFIDAVIT OF SERVICE**

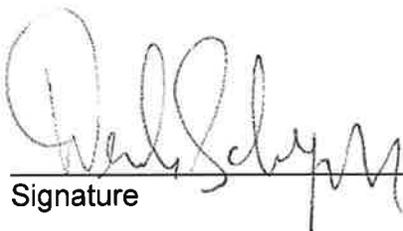
Under the Massachusetts Wetlands Protection Act

(to be submitted to the Massachusetts Department of Environmental Protection and the Conservation Commission when filing a Notice of Intent)

I, Derek Schipper, hereby certify under the pains and penalties of perjury that on February 14, 2020 I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the **DEP Guide to Abutter Notification** dated April 8, 1994, in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act and the Newburyport Wetlands Ordinance by Commonwealth of Massachusetts with the City of Newburyport on February 14, 2020 for property located at Flowering Pond Dam, Maudslay State Park, 74 Curzon Mill Rd, Newburyport, MA

The form of the notification, and a list of the abutters to whom it was given and their addresses are attached to this Affidavit of Service.

  
Signature

2/12/2020  
Date



## **Appendix D – Site Photos**

Flowering Pond Dam Photographs  
Maudslay State Park, Newburyport, MA



**Photograph 1:** Upstream side of Flowering Pond Dam.



**Photograph 2:** Downstream side of Flowering Pond Dam.



**Photograph 3:** Unnamed tributary downstream of dam.



**Photograph 4:** Unnamed tributary downstream of dam.



## **Appendix E – Stormwater Report and Checklist**



## 1.0 PROJECT INFORMATION

**Project Name:** Flowering Pond Dam Rehabilitation

**Project Location:**

Flowering Pond Dam  
Maudslay State Park  
Newburyport, Massachusetts 01950

**Owner's Name(s) and Address:**

Commonwealth of Massachusetts  
Department of Conservation & Recreation  
251 Causeway Street #900  
Boston, Massachusetts 02114

**Report Preparer(s) Name and Address:**

Derek J. Schipper, P.E.  
GZA GeoEnvironmental, Inc.  
249 Vanderbilt Avenue  
Norwood, Massachusetts 02062

In GZA's opinion, the proposed project is considered a limited project under CMR 10.53(4). The purpose of the dam rehabilitation project is to rehabilitate the dam to meet current dam safety standards while maintaining the historical appearance of the structure and to protect the wetland and waterway resources supported by the dam. The project is being performed to satisfy the requirements of the Department of Conservation & Recreation (DCR) Office of Dam Safety – Dam Safety Order, which mandates that the dam owner bring the dam into compliance with Dam Safety Regulations.

Regarding stormwater standards, the project is considered a redevelopment project. As such, many of the Stormwater Management Standards which are designed to protect natural resources from the potential impacts of site development do not apply to this project, in our opinion. This project has been designed to stabilize the dam, which will help prevent erosion and discharge of soils into adjacent wetlands and waterways.

Since the project is a dam rehabilitation project, it does not include the construction of stormwater treatment structures, systems, or Best Management Practices (BMPs) other than those temporary measures that will be utilized during the construction phase of the project.

## 2.0 STORMWATER STANDARDS

### 2.1 STANDARD 1 - NO NEW UNTREATED DISCHARGES

The project does not include new untreated discharges.

### 2.2 STANDARD 2 - PEAK RATE ATTENUATION

Peak outflow rates from the dam will not change as a result of this project. The project does not involve development activities, and all permanent disturbance areas will be restored with appropriate erosion protection materials including stone riprap, reinforced turf protection, upland seeding, and wetland restoration. Temporary disturbance areas will be stabilized, mulched, and re-vegetated.



### 2.3 STANDARD 3 - RECHARGE

The project will have no effect on groundwater recharge as it is a dam rehabilitation project which does not include the development of land or construction of impervious surfaces.

### 2.4 STANDARD 4 - WATER QUALITY

The project is not a development project and will not introduce new pollutants to the receiving stream. A long-term pollution prevention plan is not required, in GZA's opinion, as may be traditionally thought of as it relates to a development of previously undeveloped land. Erosion protection measures have been incorporated into the design with the intent of minimizing erosion of the stream channel and bank materials, which will protect water quality.

### 2.5 STANDARD 5 - LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

The project does not include construction of land uses with higher potential pollutant loads.

### 2.6 STANDARD 6 - CRITICAL AREAS

The project does not include new discharges.

### 2.7 STANDARD 7 - REDEVELOPMENTS AND OTHER PROJECTS SUBJECT TO THE STANDARDS ONLY TO THE MAXIMUM EXTENT PRACTICABLE

The project does not include development and is considered a limited project as aforementioned, in GZA's opinion. The project involves the rehabilitation of the existing dam and has been designed to protect the existing wetland and waterway resources to the extent practical. Stormwater Management Standards described previous and subsequent to this section apply only as noted herein.

### 2.8 STANDARD 8 - CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENT CONTROL

A Construction Period Pollution Prevention and Erosion and Sediment Control Plan has been prepared and is appended to the end of this Stormwater Report.

### 2.9 STANDARD 9 - OPERATIONS AND MAINTENANCE PLAN

No long-term stormwater management structures will be constructed or installed for the project, therefore there is no applicable plan for operations and maintenance for stormwater structures. An Operations and Maintenance Plan will be developed for the dam and appurtenant structures, which will include instructions for the operation and maintenance of the water control structures, embankment surfaces, and other applicable items at the dam. A copy of the Operations and Maintenance Plan can be provided to the Commission following completion of the dam rehabilitation project.

### 2.10 STANDARD 10 - PROHIBITION OF ILLICIT DISCHARGES

The prevention of illicit discharges to the stormwater management system is not applicable to this project because the project does not involve the implementation of any long-term stormwater management system. No structures will be constructed to which illicit discharges could be made. During the construction stage of the project, the project site will be delineated by construction fencing to prevent unauthorized access to the project area and to the construction phase



erosion and sediment control structures. Following completion of construction, no new stormwater management systems will be in place.

### 3.0 CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN

#### 3.1 PROJECT NARRATIVE

Flowering Pond Dam is located on an unnamed tributary to the Merrimack River and impounds Flowering Pond. The dam has a maximum height of approximately 18 feet and a total length of about 100 feet. It is an earthen embankment structure with a primary spillway located near the middle of the dam. The downstream face of the dam is a near-vertical, non-mortared border wall.

Flowering Pond Dam was constructed in 1898 and is associated with the former estate of the Moseley family. The Moseley family estate was acquired by the Commonwealth of Massachusetts in 1985 and is now known as Maudslay State Park. Currently, the purpose of the dam and its impoundment is for recreational and aesthetic value. The original purpose of the Flowering Pond Dam is unknown and design plans are not available. The dam is owned by DCR and is operated by DCR Maudslay State Park staff in Newburyport, Massachusetts.

The structure is currently judged to be in Fair condition by the DCR Office of Dam Safety. Noted deficiencies include deterioration of the primary spillway, erosion of the upstream slope, misalignment and bulging of the downstream boulder wall, no operable low-level outlet, large trees downstream of dam and an irregular crest surface.

The DCR is partnering with the Friends of Maudslay Park for the dam rehabilitation. The objective of the project is to rehabilitate the dam while maintaining the historical appearance of the structure. The pond and dam provide recreation and aesthetic value to the park.

The Flowering Pond Dam is located within Maudslay State Park, with an entrance on Pine Hill Road, in Newburyport, Massachusetts. The proposed project has been designed to protect the existing wetland and waterway resources supported by the dam, and to minimize temporary construction impacts to the surrounding resource areas. The proposed rehabilitation includes the following:

- Replacing the existing concrete spillway. The existing spillway is in poor condition. The new spillway will have the same width and invert elevation of the existing spillway.
- Removing the existing 12-inch-diameter low-level outlet pipe which is inoperable. The pipe will be replaced with a new 16-inch-diameter pipe installed at approximately the same location. Although the invert of the new pipe will be 2.5 feet higher than the existing pipe. The new pipe will be controlled by a sluiceway valve from the crest of the dam. The gate will be installed within a precast concrete manhole.
- A new concrete headwall will be constructed within the pond at the upstream end of the new low-level outlet pipe. The slab of the new headwall will be set at the invert of the new pipe at elevation 15 feet. The upstream end of the headwall will also be fitted with a stop log bay that can accommodate wooden stop logs from elevation 15 to 17.5 feet.



- Excavation to remove the existing pipe and install the new pipe will require temporary removal of a portion of the downstream boulder wall and concrete core wall in the area of the pipes. The boulder wall and concrete core wall will be reconstructed after the new pipe is in place.
- Removing the existing timber boards along the upstream face of the dam which are in poor condition. The purpose of the boards was to protect the upstream slope from erosion due to wave action and burrowing animals. The timbers will be replaced with a 1-foot-thick stone layer underlain by a 6-inch-thick layer of crushed stone. The stone will be underlain by a geosynthetic clay liner which will reduce seepage through the embankment. The surface stone up to elevation 19 feet will consist of rip rap. From elevation 19 feet to the top of the dam, the stone layer will consist of placed river stone (rounded boulders).
- Providing public (pedestrian) access along the top of the dam with a wooden footbridge over the new spillway (similar to the existing footbridge). A metal fence will be provided along the downstream side of the dam crest and around the spillway for fall protection. The fence will be a high-quality fence similar to ones used in several recent DCR projects (refer to Drawing S-1 for photographs of the proposed fencing). Handicap-accessible benches will also be provided along the top of the dam.

The upstream and downstream inverts of the dam spillway will be reconstructed at the same elevation as the existing spillway. This will maintain the pond's existing normal pool elevation and discharge from the spillway freefall for an approximately 15-foot drop. The Friends of Maudslay Park requested that the "waterfall" appearance at the downstream end of the spillway be maintained. In order prevent erosion of soils at the base of the spillway, an energy dissipation pad consisting of boulders will be placed in the downstream channel as shown on the drawings. The boulders will be partially submerged below grade.

The project will protect the valuable environmental and recreational resources and maintain the dam's historic appearance. The DCR and Friends of Maudslay State Park have allocated funding for this project and is in the process of obtaining permits for the proposed work.

#### **4.0 CONSTRUCTION PERIOD OPERATION AND MAINTENANCE PLAN**

Sedimentation and siltation control measures shall include, but not be limited to, use of filter socks, cofferdams, and other items as necessary to contain sediment and other deleterious material produced from excavation and filling, dewatering, and related contract operations. The Contractor will remove accumulated sediment as necessary and restore deteriorated sediment and erosion control items.

##### **Names of Persons or Entity Responsible for Plan Compliance:**

###### **Owner's Name(s) and Address:**

Commonwealth of Massachusetts  
Department of Conservation & Recreation  
251 Causeway Street #900  
Boston, Massachusetts 02114  
(617) 626-1250

###### **Engineer's Name and Address:**

Derek J. Schipper, P.E.  
GZA GeoEnvironmental, Inc.  
249 Vanderbilt Avenue  
Norwood, Massachusetts 02062

The Contractor who will perform the construction work has not been selected yet. Once selected, the Contractor's information may be forwarded to the Commission upon request.



#### 4.1 TRAFFIC CONTROL PLAN:

Road closure is not anticipated to be necessary for construction. The Contractor shall be required to procure and display appropriate signage and to coordinate with the Town and State regarding any other traffic control needs such as police details. Access by construction equipment and material transport vehicles will be via Pine Hill Road, Newburyport, Massachusetts.

#### 4.2 CONSTRUCTION PERIOD POLLUTION PREVENTION MEASURES

The following erosion and sediment control techniques will be employed to minimize erosion and transport of sediment to downstream areas, and to protect against pollution from hazardous materials during the construction phase of the project.

#### 4.3 STAGING AREA

A staging area will be established along the right embankment. The staging area will be within existing cleared, grass areas. Some tree removal and soil disturbance are anticipated. The area will be restored upon completion of the work.

#### 4.4 FILTER SOCKS

Filter Socks will be placed to trap sediment transported by overland runoff before it leaves the construction site, or enters into the nearby bordering vegetated wetland (BVW), pond or brook. Filter socks will also be placed in any areas where high runoff velocities or high sediment loads are expected. The filter socks will be continuously monitored throughout construction and will be repaired/replaced as necessary. Note that hay bales shall not be used on site due to the concern for introduction of invasive species.

#### 4.5 COFFERDAM

A cofferdam will be installed in the downstream channel to contain sediment that may become disturbed during construction. The cofferdam will be placed to conform with the approximate alignment of sediment erosion control shown on the project drawings.

#### 4.6 CONSTRUCTION SITE ENTRANCE AND ACCESS ROADS

To reduce the tracking of sediment from the construction site onto public ways, as well as the production of airborne dust, a stabilized construction entrance will be established at the immediate work site. The entrance will consist of a 2- to 3-inch thick pad of crushed stone underlain with a filter cloth or a bituminous concrete apron and will be constructed on level ground. The reduction of trackout sediments and other pollutants onto paved roads will minimize the release of sediment off-site and the production of airborne dust.

Access roads to be temporarily constructed during the course of the work within sensitive wetland areas will be composed of removable timber construction mats. The mats serve to distribute the weight of construction vehicles over a larger area and are removable such that stripping of wetland soil is not required. The mats will be removed permanently at the end of construction and disturbed areas re-vegetated.



#### 4.7 STOCKPILED MATERIALS

Stockpiles created during construction activities will be surrounded with filter socks, as appropriate. Stockpiles will be graded to shed water and covered as necessary with plastic prior to the onset of inclement weather.

#### 4.8 EQUIPMENT FUELING

Equipment fueling and other activities including petroleum, oil and other potentially hazardous substances will be performed at pre-approved, designated areas with appropriate spill prevention and control measures. These areas will be located away from catch basins and other drainage structures. Portable secondary containment will be used, and sorbent materials will typically be placed around the perimeter of the fueling area as necessary and appropriate during all fueling activities. Non-liquid hazardous materials (e.g., cement) will be stored in a protected area and covered.

#### 4.9 SEDIMENT AND EROSION CONTROL PLAN AND CONSTRUCTION SEQUENCE

Creating a project specific construction sequence with respect to proper handling of water, sediment and erosion control particularly at the beginning stages and throughout construction of the proposed development is of high importance. As the details for such are typically handled during final design drawing and specification document preparation, a final construction sequence and sediment and erosion control plan has yet to be developed. However, the Owner, or Contractor, responsible for the construction will be expected to fulfill all applicable provisions of the Order of Conditions.

In addition, final bid documentation will include a specification section solely addressing construction sequence requirements. Based on bid specifications prepared for similar projects, a draft construction sequence (to describe the construction process and controls that the Contractor will be required to follow during the construction phase) has been compiled.

The general sediment and erosion control plan are shown the plans. Construction period BMPs including filter socks and cofferdams will be used to prevent against the erosion and discharge of on-site sediment.

### 5.0 **OPERATIONS AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS**

Inspection and maintenance will be conducted during the construction period to ensure that the BMPs installed on-site have been installed correctly and are functioning as intended. Areas disturbed by the construction, including construction entrances, will be inspected to ensure that the Erosion and Sediment Control measures are correctly installed and maintained. Inspections of the active work area will occur weekly and after every significant precipitation event (exceeding 0.5-inch precipitation). Specific inspection and maintenance items are discussed below.

#### 5.1 EROSION CONTROL BARRIERS

The erosion control barriers will be installed prior to commencement of construction and inspected as described above. The integrity of the installation will be assessed based on visible damage to its components and sediment accumulation behind the installation. Portions of the barrier will be remedied as necessary to prevent erosion.



## 5.2 CONSTRUCTION ENTRANCE APRON

The construction entrance apron will be installed prior to commencement of construction. The entrance will be replaced when debris becomes noticeable on the existing pavement surfaces adjacent to the construction site.

## 5.3 CONSTRUCTION MATS

Construction mats, if used, will be visually inspected weekly for indications of wear and tear and effectiveness in protecting wetland areas. Access roads will also be visually inspected for indications of erosion or rutting. Access roads will be re-graded as needed and construction mats replaced such that they are functioning as intended and remain in good working condition.

## 5.4 SLOPE STABILIZATION

The slope stabilization controls will be installed immediately upon obtaining final grades as shown on the plans. Areas in failure will be re-graded to final grade and stabilized as necessary.

## 5.5 CONSTRUCTION COMPLETION

All permanent erosion control features will be inspected upon completion of construction.

## 5.6 LOG FORM

The Contractor shall keep a written record of inspection and maintenance routines, including the date the inspection/maintenance is performed, whether the BMP is functioning correctly, and what should be done to correct any problems with the measure. The Contractor shall also keep a record of the dates when major excavation and grading activities occur, as well as the dates when areas are stabilized, both temporarily and permanently. A construction BMP log form shall be completed on a weekly basis and after every significant precipitation event (exceeding ½-inch precipitation). The Contractor shall note compliance with the general sediment control performance outlines in 314 CMR 4.00:

- The general sediment control performance standard is outlined in the Massachusetts State Water Quality Standards (314 CMR 4.00). These regulations state the following regarding discharges into freshwater waterways. The Contractor shall ensure that temporary erosion and sediments controls are adequate to ensure compliance with these regulations, or other more stringent regulations, as needed.
- Solids - These waters shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to this class, that would cause aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom.
- Color and Turbidity - These waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this class.

## 5.7 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM CONSTRUCTION GENERAL PERMIT

Please note that the disturbance area at the site is less than one acre in total and therefore does not fall under the jurisdiction of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) process.



## **6.0 FINAL SITE RESTORATION AND MONITORING**

The Owner and/or Contractor will restore all adjacent areas and properties to pre-construction conditions or better at the conclusion of the project. The Owner and/or Contractor will restore any other public or private property that has been disturbed or damaged during the course of work. All disturbed areas will be restored to existing (pre-construction) conditions or better.

Attachments: Attachment I - Massachusetts Department of Environmental Protection Checklist for Stormwater Report

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**Attachment I - Massachusetts Department of Environmental Protection Checklist for  
Stormwater Report**



# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



# Checklist for Stormwater Report

## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

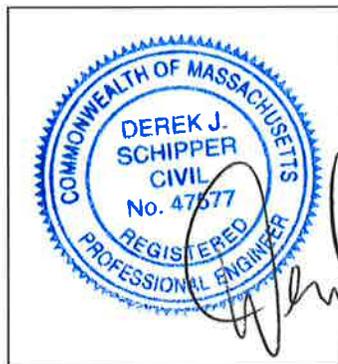
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



*Derek J. Schipper* 10/17/2019

Signature and Date

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



# Checklist for Stormwater Report

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## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of “country drainage” versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): Most LID approaches not applicable to this dam repair project

### Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - Static
  - Simple Dynamic
  - Dynamic Field<sup>1</sup>
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
  - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
    - is within the Zone II or Interim Wellhead Protection Area
    - is near or to other critical areas
    - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
    - involves runoff from land uses with higher potential pollutant loads.
  - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
  - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - Limited Project
    - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
    - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
    - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
    - Bike Path and/or Foot Path
  - Redevelopment Project
    - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.



## **Appendix F – Proposed Project Plans**

# FLOWERING POND DAM

## REHABILITATION PROJECT MAUDSLAY STATE PARK NEWBURYPORT, MASSACHUSETTS

NID # MA 01599

DEPARTMENT OF CONSERVATION AND RECREATION

DCR CONTRACT NO. **TBD**



### OWNER

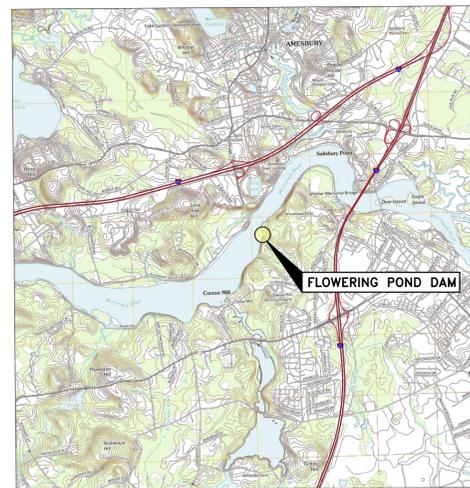
COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF CONSERVATION & RECREATION  
251 CAUSEWAY STREET  
BOSTON, MA 02114  
CHARLIE BAKER - GOVERNOR  
PRISCILLA GEIGIS - DEPUTY COMMISSIONER



### PROJECT ENGINEER

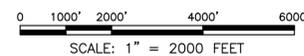
GZA GEOENVIRONMENTAL, INC.  
249 VANDERBILT AVENUE  
NORWOOD, MA 02062

144 ELM STREET  
AMESBURY, MA 01913



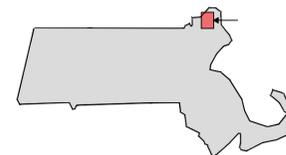
#### PROJECT LOCUS MAP

SOURCE: USGS TOPOGRAPHIC QUADRANGLES  
SCANNED BY MASSGIS AND DISTRIBUTED IN JUNE 2001



#### PROJECT PHOTOGRAPHIC LOCUS MAP

SOURCE: GOOGLE EARTH  
PHOTOGRAPH NOT TO SCALE



NEWBURYPORT, MASSACHUSETTS

NOTE: ALL SCALES APPLICABLE FOR 24" X 36" DRAWINGS. USE SCALE BAR FOR ALTERNATE SIZE DRAWINGS.

### INDEX OF DRAWINGS

- G1 TITLE SHEET AND INDEX OF DRAWINGS
- G2 LEGEND AND NOTES
- G3 EXISTING CONDITIONS AND RESOURCE DELINEATION PLAN
- G4 EXISTING CONDITIONS SECTIONS A AND B AND BORING LOGS
- G5 EXISTING CONDITIONS LAUREL WALK AND RIGHT ABUTMENT
- G6 CONSTRUCTION ACCESS TO DAM
- G7 FEMA ZONES AND RESOURCE BUFFERS
  
- C1 SEDIMENT, EROSION, AND WATER CONTROL PLAN
- C2 DEMOLITION AND EXCAVATION PLAN
- C3 FINAL CONDITIONS PLAN
- C4 FINAL CONDITIONS SECTIONS AND PROFILES
  
- S1 BENCH AND FENCE DETAIL

PERMIT DRAWINGS  
NOT FOR CONSTRUCTION

NO.	ISSUE/DESCRIPTION	BY	DATE
<small>UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.</small>			
<b>DAM REHABILITATION PROJECT FLOWERING POND DAM (MA01599) MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>TITLE SHEET AND INDEX OF DRAWINGS</b>			
<small>PREPARED BY:</small> <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		<small>PREPARED FOR:</small> DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY	
<small>PROJ MGR:</small> DS <small>DESIGNED BY:</small> DS <small>DATE:</small> MARCH 2020	<small>REVIEWED BY:</small> ### <small>DRAWN BY:</small> LFT <small>PROJECT NO.:</small> 01.0173790.00	<small>CHECKED BY:</small> ### <small>SCALE:</small> AS NOTED <small>REVISION NO.:</small>	<small>DRAWING</small> <b>G-1</b>

**GENERAL CONDITIONS**

- LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY, AND ARE NOT WARRANTED TO BE CORRECT. ALL EXISTING UTILITIES SHALL BE VERIFIED FOR SERVICE, SIZE, INVERT ELEVATION, LOCATIONS, ETC. PRIOR TO START OF ANY WORK IN THE GENERAL AREA. CONTRACTOR MUST NOTIFY DIG-SAFE AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO ANY CONSTRUCTION. NOTIFY ENGINEER IN WRITING OF ANY AND ALL DISCREPANCIES PRIOR TO COMMENCING ANY WORK.
- THE RESPONSIBILITY FOR SAFETY IN, ON, OR ABOUT THE JOBSITE SHALL BE THAT OF THE CONSTRUCTION CONTRACTOR. THESE DRAWINGS DO NOT INCLUDE COMPONENTS WHICH MAY BE NECESSARY FOR CONSTRUCTION SAFETY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION, EXCEPT WHERE SPECIFICALLY DETAILED IN THE PLANS AND SPECIFICATIONS. LIKEWISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SEQUENCE OF THE WORK, EXCEPT WHERE SPECIFICALLY DETAILED IN THE PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SURFACE AND GROUNDWATER CONTROL DURING THE WORK OF THE CONTRACT. TEMPORARY WATER CONTROL MEASURES SHALL BE, AT MINIMUM, AS REQUIRED BY THE PROJECT PLANS, SPECIFICATIONS, AND PERMIT CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ADDITIONAL MEASURES NECESSARY FOR WATER CONTROL NECESSARY TO EXECUTE THE WORK OF THE CONTRACT. WATER CONTROL MEASURES AND POND LEVEL MANIPULATION ARE SUBJECT TO SPECIFIC LIMITS AND CONDITIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL DURING THE WORK OF THE CONTRACT. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE, AT MINIMUM, AS REQUIRED BY THE PROJECT PLANS, SPECIFICATIONS, AND PERMIT CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL MEASURES NECESSARY FOR THE PREVENTION OF SEDIMENT DISCHARGE OR EROSION AT THE SITE.
- SPECIFIC AREAS HAVE BEEN DESIGNATED AND DELINEATED ON THE PLANS AS CONTRACTOR STAGING AREAS. THE CONTRACTOR SHALL USE THESE AREAS, AND THESE AREAS ONLY, FOR ON-SITE PARKING, OFFICE TRAILERS, EQUIPMENT AND MATERIAL STORAGE, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY NECESSARY SIGNAGE, FENCING, SAFETY, SEDIMENT/EROSION CONTROL, IMPROVEMENTS, RESTORATIONS ETC. IN THESE AREAS. AREA WITHIN THE LIMITS OF THE WORK MAY BE USED FOR TEMPORARY STORAGE, HAUL ROADS, PARKING, ETC.; HOWEVER, NO ADDITIONAL CONSIDERATION OR PAYMENT WILL BE MADE FOR WORK NECESSARY TO RE-GRADE SUCH AREAS OR RELOCATE ANY MATERIALS OR EQUIPMENT TEMPORARILY STORED WITHIN THE LIMITS OF THE WORK. IF THE CONTRACTOR REQUIRES AND IDENTIFIES ADDITIONAL STAGING AREAS ON THE OWNER'S PROPERTY, THE CONTRACTOR SHALL MAKE A WRITTEN REQUEST TO THE OWNER AND ENGINEER DESCRIBING THE NEED AND LOCATION OF THE PROPOSED AREA. NO GUARANTEE IS MADE THAT ADDITIONAL LAY-DOWN AREAS WILL BE MADE AVAILABLE.
- THE CONTRACTOR SHALL RESTORE AREAS DISTURBED BY CONSTRUCTION AS PER THE PLANS AND SPECIFICATIONS. WHERE NO SPECIFIC INSTRUCTION IS GIVEN, RESTORATION SHALL BE TO THE ORIGINAL CONDITION AND AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR IS SPECIFICALLY INFORMED THAT THE RESTORATION REQUIREMENT APPLIES TO ALL AREAS DISTURBED AS A RESULT OF THE PROJECT.
- IN THE EVENT OF THE DISCOVERY OF THE PRESENCE OF AN ENDANGERED PLANT OR ANIMAL IN THE WORK AREA OR STAGING AREAS, ALL WORK IN THE IMMEDIATE AREA OF THE FIND SHALL STOP AND THE OWNER AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY. WORK AND ENGINEER SHALL BE RESPONSIBLE FOR ENVIRONMENTAL COMPLIANCE. THE LIST SHALL BE PROVIDED TO THE OWNER, ENGINEER, AND CONSERVATION COMMISSION AND UPDATED AS NEEDED.
- IN THE EVENT OF THE DISCOVERY OF A PREVIOUSLY UNKNOWN ARCHEOLOGICAL SITE, POTENTIAL CULTURAL ARTIFACTS OR RESOURCES, OR ANY OTHER UNUSUAL ITEMS OR CONDITIONS, ALL WORK IN THE IMMEDIATE AREA OF THE FIND SHALL STOP AND THE OWNER AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY. WORK IN THE IMMEDIATE AREA SHALL BE DISCONTINUED UNTIL CLEARANCE IS GRANTED BY THE OWNER.
- PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL DEVELOP, SUBMIT, AND MAINTAIN AN EMERGENCY CONTACT LIST WITH NAMES AND PHONE NUMBERS (DAY AND NIGHT) OF ALL KEY PERSONNEL INVOLVED WITH THE PROJECT. THE LIST SHALL SPECIFICALLY INCLUDE THE PERSON FROM THE CONTRACTOR WHO IS RESPONSIBLE FOR ENVIRONMENTAL COMPLIANCE. THE LIST SHALL BE PROVIDED TO THE OWNER, ENGINEER, AND CONSERVATION COMMISSION AND UPDATED AS NEEDED.
- IN THE EVENT OF UNANTICIPATED ENVIRONMENTAL AND/OR ARCHEOLOGICAL CONDITIONS WHICH PREVENT CONTINUED WORK, THE DCR MAY DIRECT THE CONTRACTOR TO STOP WORK AND STABILIZE THE SITE. DCR RESERVES THE RIGHT TO TERMINATE THE CONTRACT IN SUCH A CASE.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL PENALTIES AND DELAYS DUE TO NON-COMPLIANCE WITH PERMIT CONDITIONS.
- ALL STATIONARY HEAVY EQUIPMENT AND PARKING AREAS SHALL BE PROVIDED WITH RIGID CONSTRUCTION MATS. ALL TRAVEL PATHS SHALL BE PAVED WITH A TEMPORARY LAYER OF WOOD CHIPS, 2" MINIMUM LAYER THICKNESS.

**GENERAL SCOPE OF WORK & ANTICIPATED CONSTRUCTION SEQUENCE**

THE GENERAL SCOPE OF WORK OF THIS CONTRACT IS TO REHABILITATE FLOWERING POND PER THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIAL, EQUIPMENT, AND LABOR NECESSARY TO CONSTRUCT THE PROJECT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND AS SHOWN ON THE FINAL CONDITIONS PLAN. THE INTENT OF THE ANTICIPATED CONSTRUCTION SEQUENCE IS TO PROVIDE GUIDANCE TO THE CONTRACTOR TOWARDS MEETING THE TERMS AND CONDITIONS OF ENVIRONMENTAL PROTECTION PERMITS AND BEST MANAGEMENT PRACTICES. CERTAIN ASPECTS OF THE ANTICIPATED CONSTRUCTION SEQUENCE MAY BE ALTERED BY THE CONTRACTOR WITH APPROVAL FROM THE OWNER, EXCEPT AS REQUIRED BY PERMIT CONDITIONS AND SPECIFIC INSTRUCTIONS CONTAINED IN THE SPECIFICATIONS. THE FOLLOWING LIST IS NOT COMPREHENSIVE AND DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR EXECUTING ALL REQUIRED WORK AS PER THE CONTRACT PLANS AND SPECIFICATIONS.

- MOBILIZE TO THE SITE AND DEPLOY TEMPORARY SEDIMENT AND EROSION CONTROLS, INCLUDING PERIMETER EROSION AND SEDIMENT CONTROL BARRIERS, TURBIDITY CURTAINS, AND OTHER BMPs. INSTALL TEMPORARY CONSTRUCTION PERIMETER FENCING, GATE, AND NECESSARY SIGNAGE. INSTALL TREE PROTECTION MEASURES, EXCLUSION FENCING AROUND TREES, WOOD CHIP SURFACING, AND NECESSARY MATTING. NO VEHICLE ACCESS IN AREAS WHERE TREES ARE PRESENT SHALL BE ALLOWED UNTIL ALL TREE AND ROOT PROTECTION MEASURES ARE IN PLACE.
- NOTIFY OWNER, ENGINEER, AND CONSERVATION COMMISSION, SCHEDULE AND CONDUCT SITE WALK TO INSPECT SEDIMENT AND EROSION CONTROL AND TREE PROTECTION MEASURES. MODIFY SEDIMENT AND EROSION CONTROL MEASURES AND TREE PROTECTION MEASURES AS REQUIRED. WORK MAY PROCEED ONCE APPROVAL HAS BEEN PROVIDED BY OWNER, ENGINEER, AND CONSERVATION COMMISSION.
- CLEAR ONLY INDICATED TREES. REMOVE STUMPS ONLY FROM AREAS WHERE EXCAVATION WILL OCCUR. STRIP TOPSOIL ONLY FROM AREAS WHERE EXCAVATION OR FILL WILL OCCUR.
- LOWER THE IMPOUNDMENT AND MAINTAIN THE IMPOUNDMENT AT A LOWERED STATE IN ACCORDANCE WITH THE APPROVED WATER CONTROL PLAN SUBMITTAL.
- ESTABLISH EXISTING AND PROPOSED CONTROL REFERENCE LINES AND STAKE WITH PROTECTED MARKERS PRIOR TO DEMOLITION OF EXISTING DAM.
- WORK WITH DEPARTMENT ARCHEOLOGIST TO MAKE EXPLORATORY EXCAVATIONS ON SITE AS DIRECTED BY THE ARCHEOLOGIST AND AS PER THE CONTRACT SPECIFICATIONS.
- DEMOLISH EXISTING CONCRETE SPILLWAY, FOOTBRIDGE AND WOODEN FENCE. LAWFULLY DISPOSE OF CONCRETE RUBBLE AND OTHER DEBRIS OFF-SITE.
- EXCAVATE TO REMOVE EXISTING LOW-LEVEL OUTLET PIPE AND TO INSTALL NEW LOW-LEVEL OUTLET PIPE. EXCAVATION WILL REQUIRE PARTIALLY DEMOLITION OF DOWNSTREAM BOULDER WALL AND CONCRETE CUT-OFF WALL. SALVAGE AND STOCKPILE STONE MASONRY FOR ON-SITE REUSE. LAWFULLY DISPOSE OF CONCRETE RUBBLE AND OTHER DEBRIS OFF-SITE.
- REMOVE EXISTING WOODEN PLANKING ALONG UPSTREAM SLOPE OF DAM AND LAWFULLY DISPOSE. REMOVE ACCUMULATED SEDIMENT ON TOP OF THE EXISTING BOARDS AND DISPOSE AT DESIGNATED ON-SITE SOIL MANAGEMENT AREA.
- INSTALL HEADWALL FOR NEW LOW-LEVEL OUTLET PIPE AND TRASHRACK.
- INSTALL NEW LOW-LEVEL OUTLET PIPE AND ASSOCIATED MANHOLE, GATE AND ELBOWS.
- BACKFILL EXCAVATION REQUIRED TO DEMOLISH EXISTING LOW-LEVEL OUTLET PIPE AND INSTALL NEW PIPE. CONCURRENTLY RECONSTRUCT DOWNSTREAM BOULDER WALL WHERE TEMPORARILY REMOVED.
- RECONSTRUCT CONCRETE CUT-OFF WALL WHERE TEMPORARILY REMOVED TO REMOVE EXISTING LOW-LEVEL OUTLET PIPE AND INSTALL NEW PIPE.
- CONSTRUCT NEW CAST-IN-PLACE CONCRETE SPILLWAY AND NEW FOOTBRIDGE.
- INSTALL GEOSYNTHETIC CLAY LINER ALONG UPSTREAM SLOPE WITH OVERLYING CRUSHED STONE LAYER. PLACE RIP RAP OVER CRUSHED STONE TO ELEVATION 19. PLACE ROUNDED RIVER STONE OVER THE CRUSHED STONE ABOVE ELEVATION 19.
- PLACE DENSE GRADE FILL AT TOP OF DAM.
- PLACE LOAM AND SEED AT TOP OF DAM.
- PROVIDE AND INSTALL NEW PERMANENT RAILINGS AT DAM.
- PROVIDE AND INSTALL HANDICAP ACCESSIBLE BENCHES.
- DECOMMISSION AND REMOVE TEMPORARY WATER CONTROL SYSTEMS AND TEMPORARY COFFERDAMS.
- REMOVE REMAINING EQUIPMENT AND MATERIALS FROM SITE. REMOVE MATTING AND WOODCHIP COVERING.
- REMOVE TREE PROTECTION AND TEMPORARY ACCESS CONTROLS. COMPLETE ALL OTHER SITE RESTORATIONS.
- NOTIFY OWNER, ENGINEER, AND CONSERVATION COMMISSION OF FINAL STABILIZATION. SCHEDULE AND CONDUCT SITE INSPECTION.
- MODIFY STABILIZATION MEASURES AS NECESSARY.
- COMPLETE DEMOBILIZATION.
- INSPECT, MAINTAIN, AND REPLACE PLANTINGS AND SEEDED AREAS AS NECESSARY THROUGH THE MAINTENANCE PERIOD

**GENERAL SEDIMENT AND EROSION CONTROL**

- CONTROL OF EROSION AND SEDIMENT DISCHARGE IS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT AND UNTIL FINAL STABILIZATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT THE AREAS WITHIN THE LIMITS OF WORK AND BEYOND FROM SEDIMENT AND/OR POLLUTANTS ORIGINATING FROM ANY WORK DONE ON OR IN SUPPORT OF THE PROJECT, INCLUDING SEDIMENT DUE TO EROSION FROM STORMWATER RUNOFF.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES NECESSARY TO EXECUTE AND COMPLETE THE WORK OF THE CONTRACT, IN COMPLIANCE WITH THE TERMS AND CONDITIONS CONTAINED IN THE CONTRACT, PROJECT PERMITS AND ALL STATE AND LOCAL ORDINANCES THAT APPLY. CONTROLS SHOWN ON THE CONTRACT DRAWINGS SHALL BE CONSIDERED MINIMUM REQUIREMENTS. THE CONTRACTOR SHALL EMPLOY WHATEVER SUPPLEMENTARY MEASURES NECESSARY TO PROTECT WETLANDS, WATERS, AND ADJACENT AREAS FROM DISTURBANCE OR DISCHARGE OF SEDIMENTS.
- THE CONTRACTOR SHALL NOT DISTURB VEGETATED AREAS OUTSIDE OF THE WORK ZONE, EXCEPT TO THE MINIMUM EXTENT NECESSARY FOR ACCESS AND ACCOMPLISHMENT OF THE WORK SHOWN.
- ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT MIGRATION INTO WATER BY SILT, SEDIMENT, FUELS, SOLVENTS, LUBRICANTS, CONCRETE, GROUT, OR ANY OTHER POLLUTANTS ASSOCIATED WITH CONSTRUCTION PROCEDURES.
- ACTUAL LOCATIONS OF EROSION CONTROLS AND BEST MANAGEMENT PRACTICES (BMPs) MAY VARY DUE TO FIELD CHANGES, ONGOING CONSTRUCTION, ACCESS NEEDS, WEATHER, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING THESE CHANGES AND ADJUSTING EROSION CONTROLS AND BMP LOCATIONS ACCORDINGLY. IN PARTICULAR, THE CONTRACTOR SHALL COORDINATE THE INSTALLATION AND RELOCATION OF BMPs WITH PROJECT PHASING, AS NECESSARY.
- ALL EROSION CONTROLS AND BMPs SHALL REMAIN IN PLACE, EXCEPT AS OTHERWISE NECESSARY, UNTIL CONSTRUCTION IS COMPLETED AND FINAL STABILIZATION IS ACHIEVED.
- THE CONTRACTOR IS RESPONSIBLE FOR PREPARING A PROJECT-SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PRIOR TO THE START OF CONSTRUCTION. A COPY OF THE SWPPP SHALL BE KEPT ON SITE AT ALL TIMES.
- EXCAVATED MATERIALS SUSPECTED OF CONTAMINATION SHALL BE STOCKPILED ON SITE FOR EVALUATION BY THE ENGINEER.
- ADDITIONAL EROSION CONTROL BARRIERS SHALL BE INSTALLED AT THE DIRECTION OF THE ENGINEER TO MINIMIZE THE THREAT OF ADVERSE IMPACT DURING THE CONSTRUCTION PROCESS. AN ADEQUATE SUPPLY OF REPLACEMENT EROSION CONTROL BARRIERS WILL BE AVAILABLE ON-SITE FOR EMERGENCY PURPOSES.
- SEDIMENT AND EROSION CONTROLS AND BMPs SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION AT THE SITE. NO WORK WHICH SHALL DISTURB THE SITE OR CREATE THE POTENTIAL FOR SEDIMENT RELEASE SHALL COMMENCE UNTIL THE SEDIMENT AND EROSION CONTROLS HAVE BEEN INSPECTED AND APPROVED BY THE OWNER AND ENGINEER. ALL CONTROLS AND BMPs SHALL BE SUBJECT TO INSPECTION BY THE OWNER AND HIS REPRESENTATIVE AT ANYTIME THEREAFTER.
- PERIODIC INSPECTION, MAINTENANCE, AND CLEANING OF TEMPORARY EROSION OF SEDIMENT CONTROL MEASURES AND BMPs ARE REQUIRED. ALL CONTROLS AND BMPs SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF RAINFALL EVENTS OF 0.5 INCHES OR GREATER. ROUTINE INSPECTION AND MAINTENANCE WILL REDUCE THE CHANCE OF POLLUTING STORMWATER BY FINDING AND CORRECTING PROBLEMS BEFORE THE NEXT RAIN EVENT. A SITE MAINTENANCE LOG SHALL BE PREPARED AND UPDATED.
- REPORTING AND RECORD KEEPING: IN ADDITION TO THE AFOREMENTIONED INSPECTION AND MAINTENANCE PROCEDURES, THE CONTRACTOR IS TO KEEP A RECORD OF THE FOLLOWING INFORMATION:
  - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR IN A PARTICULAR AREA;
  - THE DATES WHEN CONSTRUCTION ACTIVITIES CEASE IN AN AREA, TEMPORARILY OR PERMANENTLY;
  - THE DATES WHEN AN AREA IS STABILIZED, TEMPORARILY OR PERMANENTLY;
  - A COPY OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND ALL REPORTS GENERATED DURING CONSTRUCTION ACTIVITIES ARE TO BE RETAINED AS REQUIRED BY REGULATION.
- SITE CLEARING: PRIOR TO ANY SITE CLEARING ACTIVITIES, SEDIMENT CONTROL BARRIERS SHALL BE INSTALLED AS INDICATED ON THE PLANS. ALONG THE OUTER LIMIT OF DISTURBANCE, DISTURBED AREAS ARE TO BE KEPT TO A MINIMUM. NO CLEARING IS ALLOWED OUTSIDE THE WORK AREA WITHOUT PRIOR APPROVAL FROM THE OWNER.
- SEDIMENT AND EROSION CONTROL BARRIERS: SEDIMENT/EROSION CONTROL BARRIERS ARE INTENDED TO TRAP SEDIMENT TRANSPORTED BY RUNOFF BEFORE IT REACHES THE DRAINAGE FEATURES, WATERBODIES, OR WETLANDS, IN ADDITION TO AREAS WHERE HIGH RUNOFF VELOCITIES OR HIGH SEDIMENT LOADS ARE EXPECTED. THE SILT FENCES ARE TO BE REPLACED AS NEEDED AS DETERMINED BY PERIODIC FIELD INSPECTIONS.
- DUST CONTROL: DUST CONTROL SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
- STAGING AREAS: THE CONTRACTOR MAY ESTABLISH LAYDOWN AND STAGING AREAS IN WHICH TO STORE EQUIPMENT AND MATERIALS ONLY IN THOSE AREAS SPECIFICALLY INDICATED ON THE CONTRACT DRAWINGS OR SPECIFICATIONS OR AS DIRECTED BY THE OWNER. LOCATION OF ADDITIONAL AREAS, IF NEEDED, SHALL BE COORDINATED WITH AND SHALL BE SUBJECT TO APPROVAL BY THE OWNER. STAGING AREAS SHALL BE ENCLOSED WITH SEDIMENT/EROSION CONTROL BARRIERS. STAGING AREAS SHALL BE ENCLOSED BY ORANGE PLASTIC TEMPORARY CONSTRUCTION FENCING. AT THE CONTRACTOR'S OPTION, ADDITIONAL OR MORE STURDY BARRIERS MAY BE INCLUDED.
- STOCKPILED MATERIALS: STOCKPILES OF SOIL IN AREAS CREATED DURING CONSTRUCTION ACTIVITIES ARE TO BE SURROUNDED WITH SEDIMENT/EROSION CONTROL WHERE POSSIBLE. OTHER ALTERNATIVES UTILIZED MAY INCLUDE GRAVEL FILTER BERMS OR SIMILAR MEASURES LAID AROUND THE PERIMETER OF THE STOCKPILE.
- TEMPORARY STABILIZATION: WHEN NECESSARY, TEMPORARY SLOPE PROTECTION SHALL BE PROVIDED BY INSTALLING SEDIMENT/EROSION CONTROL BARRIERS AT THE TOE OF FILLS OR CUT SLOPES. IF ADDITIONAL STABILIZATION IS NEEDED, THEN THE CONTRACTOR SHALL INSTALL MATTING, SUCH AS HAY, JUTE, WOOD FIBER, OR BIO OR PHOTO-DEGRADABLE MESH. IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN TWO WEEKS, THE AREAS SHALL BE MULCHED WITH STRAW AT A RATE OF 100 LBS. PER 1,000 S.F. TO HELP CONTROL EROSION. TWO INCHES OF WOOD CHIP MULCH MAY ALSO BE USED AS TEMPORARY COVER. IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN ONE MONTH, THE AREAS SHALL BE TOPSOILED AND SEEDED AT NO ADDITIONAL COST TO THE OWNER. LEAVE THE SURFACE OF ALL EXCAVATIONS AND FILLS IN A FIRM AND STABLE CONDITION AT THE END OF EACH DAY. ROLL OR OTHERWISE TREAT THE SURFACE AS NEEDED.
- SITE RESTORATION: STABILIZATION OF DISTURBED AREAS OR NEW SOIL FILLS SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. APPROPRIATE VEGETATIVE SOIL STABILIZATION IS TO BE USED TO MINIMIZE EROSION. TEMPORARY AND PERMANENT VEGETATIVE COVER IS TO BE ESTABLISHED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, USING HYDRO-SEEDING, BROADCASTING, OR OTHER APPROVED TECHNIQUES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF PREVIOUSLY VEGETATED AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. UNLESS OTHERWISE SHOWN ON DRAWINGS, RESTORATION SHALL CONSIST OF REPLACEMENT OF TOPSOIL OR PLACEMENT OF IMPORTED LOAM AS NEEDED SUCH THAT A MINIMUM OF 6 INCHES OF SUITABLE MATERIAL IS PRESENT AND APPROPRIATELY LIMED, FERTILIZED, GRADED, AND SCRAPPED. WHERE NOT OTHERWISE SPECIFIED, DISTURBED UPLAND AREAS SHALL BE SEEDDED WITH AN APPROVED SEED MIX AND AT A RATE SHOWN ON THE PROJECT PLANS AND SPECIFICATIONS. SEEDING RATE SHALL BE DOUBLED FOR DORMANT SEEDING.

RESTORED AREAS SHALL BE ROLLED AND THEN APPROPRIATELY MULCHED WITH WOOD CHIPS. FINAL STABILIZATION SHALL BE CONSIDERED COMPLETE WHEN ALL SOIL-DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM, PERENNIAL VEGETATIVE COVER WITH A DENSITY OF EIGHTY PERCENT HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES (SUCH AS THE USE OF MULCHES OR EROSION CONTROL MATTING) HAVE BEEN EMPLOYED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL VEGETATED SURFACES AND PLANTINGS, INCLUDING WATERING, FERTILIZING, AND RE-SEEDING UNTIL ESTABLISHMENT CONDITIONS ARE MET AND UNTIL THE END OF THE CONTRACTUAL MAINTENANCE PERIOD.

ALL SLOPES WITHIN THE PROJECT LIMITS WILL BE STABILIZED WITHIN 2 WEEKS OF THE FINAL GRADING. AREAS FAILING TO BE STABILIZED SHALL BE RE-GRADED AND CONTINUED TO BE STABILIZED AS NEEDED.

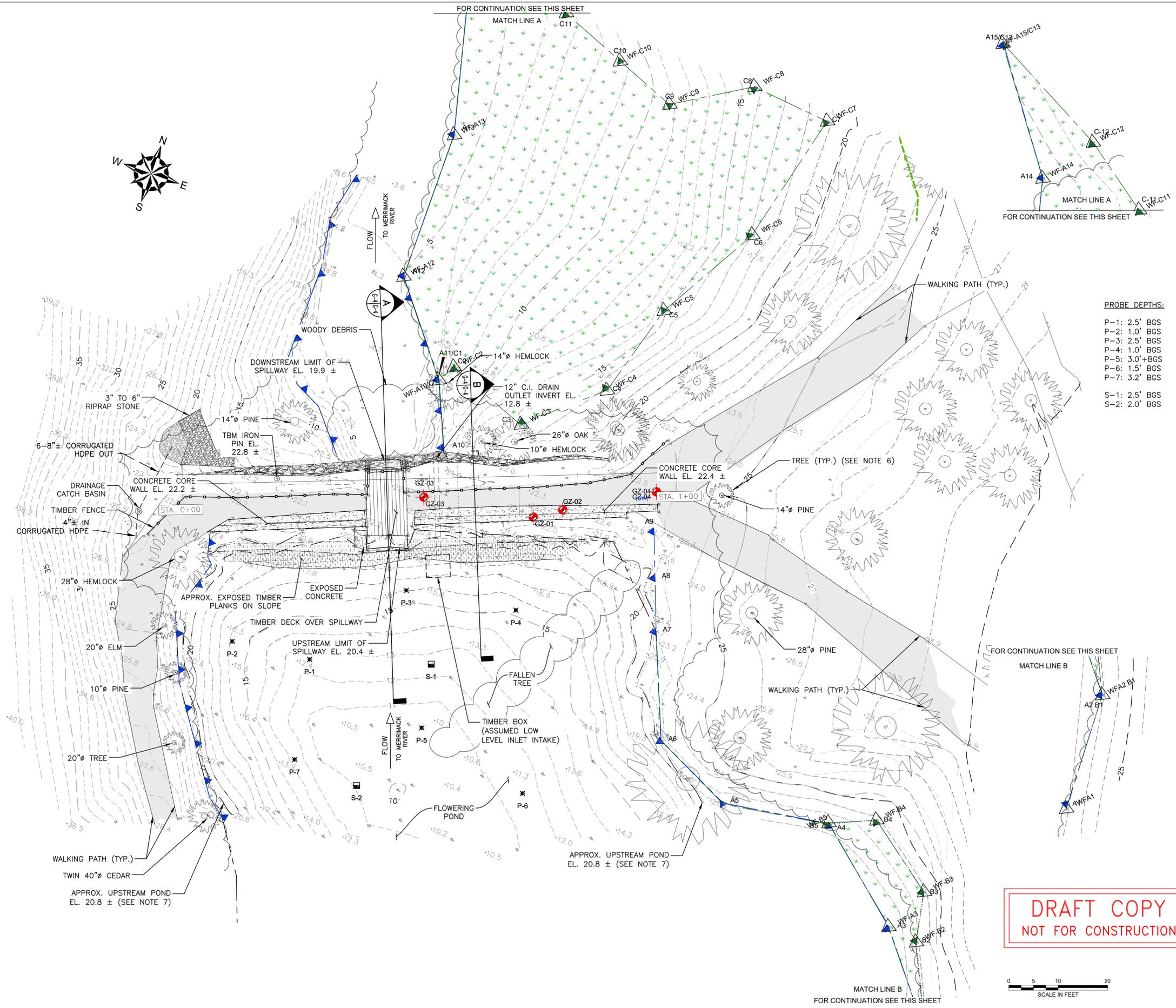
**WATER CONTROL NOTES**

- TEMPORARY WATER CONTROL BY THE CONTRACTOR SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 01565 OF THE SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WATER CONTROL, SURFACE WATER AND GROUNDWATER, NECESSARY TO EXECUTE AND COMPLETE THE WORK OF THE CONTRACT, SUBJECT TO THE RESTRICTIONS CONTAINED IN THE CONTRACT AND PROJECT PERMITS. CONTROLS SHOWN IN THE CONTRACT DRAWINGS AND MENTIONED IN THE TECHNICAL SPECIFICATIONS SHALL BE CONSIDERED MINIMUM REQUIREMENTS. THE CONTRACTOR SHALL EMPLOY WHATEVER SUPPLEMENTARY MEASURES NECESSARY TO PROTECT THE SITE AND THE WORKS.
- ALL TEMPORARY WATER CONTROL MEASURES SHALL BE IMPLEMENTED IN CONJUNCTION WITH APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES SO AS TO MITIGATE TO THE GREATEST EXTENT POSSIBLE RELEASE OF SEDIMENT INTO WATER BODIES AND POTENTIAL EROSION OF SOIL.
- THE CONTRACTOR IS HEREBY NOTIFIED ADHERENCE TO THE WATER CONTROL CONDITIONS AND LIMITATIONS AND USE OF BEST MANAGEMENT PRACTICES IS CRITICAL TO PREVENT POSSIBLE IMPACTS TO SENSITIVE ENVIRONMENTAL AREAS.
- THE IMPOUNDMENT WATER LEVEL TYPICALLY FLUCTUATES IN RESPONSE TO CLIMATE CONDITIONS. DURING THE WORK OF THIS PROJECT, DCR WILL MAINTAIN ITS TYPICAL FLOOD CONTROL PROTOCOLS WITH RESPECT TO OPERATING UPSTREAM AND DOWNSTREAM STRUCTURES.
- THE CONTRACTOR SHALL USE PUMPS, SIPHONS, OR OTHER MEANS TO MAINTAIN A MINIMUM DISCHARGE 25 GALLONS PER MINUTE OF WATER INTO THE DOWNSTREAM CHANNEL. DISCHARGE WATER SHALL MEET APPROPRIATE WATER QUALITY STANDARDS. MINIMUM DISCHARGE BYPASS FLOWS SHALL BE WITHDRAWN DIRECTLY FROM THE RIVER UPSTREAM OF THE UPSTREAM TEMPORARY COFFERDAM.
- ANY TEMPORARY PUMPS UTILIZED AT THE SITE MUST BE PROPERLY BAFLED AGAINST EXCESSIVE NOISE. PUMPS OR GENERATORS WHICH UTILIZE LIQUID FUEL MUST BE PLACED WITHIN AN IMPERMEABLE SECONDARY CONTAINMENT AREA WITH SUFFICIENT CAPACITY TO CONTAIN THE FULL VOLUME OF THE FUEL TANK.
- PUMP OR SIPHON INTAKES SHALL BE PLACED SUCH THAT SEDIMENT AND DEBRIS ENTRAINMENT IS MINIMIZED.
- WATER PUMPED FROM EXCAVATIONS MUST BE PASSED THROUGH A SEDIMENTATION TANK OR OTHER SUCH BEST MANAGEMENT PRACTICE (BMP) FEATURE PRIOR TO BEING DISCHARGED BACK TO A SURFACE WATER BODY. DISCHARGE WATER SHALL MEET APPROPRIATE WATER QUALITY STANDARDS.
- THE DISCHARGE AREA FOR THE PUMP OR SIPHON OUTLET MUST BE PROPERLY PROTECTED TO PREVENT EROSION BY HIGH VELOCITY FLOW.
- WATER CONTROL DURING CONSTRUCTION SHALL REQUIRE THE CONTRACTOR TO DEWATER THE POND TO ELEVATION 13 FEET. THE POND SHALL REMAIN DEWATERED TO ALLOW FOR COMPLETION OF THE WORK. DEWATERING MEANS AND METHODS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR SUBJECT TO THE APPROVED WATER CONTROL PLAN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION AND SUBMISSION OF A CONSTRUCTION-PHASE FLOOD CONTROL / EMERGENCY RESPONSE PLAN.
- THE CONTRACTOR IS SPECIFICALLY RESPONSIBLE FOR TEMPORARY GROUNDWATER CONTROL DURING CONSTRUCTION. THE CONTRACTOR'S SURFACE AND GROUNDWATER CONTROL SYSTEMS SHALL BE COMPATIBLE. THE CONTRACTOR IS SPECIFICALLY NOTIFIED THAT SEEPAGE SEEPAGE FROM THE ABUTMENT, EITHER FROM THE IMPOUNDMENT OR GENERAL GROUNDWATER, MUST BE EXPECTED. SEEPAGE THROUGH BEDROCK FRACTURES MAY ALSO OCCUR. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE SIZING AND OPERATION OF THE TEMPORARY GROUNDWATER CONTROL SYSTEM TO PROVIDE FOR APPROPRIATE CONDITIONS FOR CONSTRUCTION AND TO MEET ALL PERMIT OBLIGATIONS.

PERMIT DRAWINGS  
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NO.	ISSUE/DESCRIPTION	BY	DATE
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<b>DAM REHABILITATION PROJECT FLOWERING POND DAM (MA01599) MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>LEGEND AND NOTES</b>			
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		PREPARED FOR: DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY	
PROJ MGR: DS	DESIGNED BY: ###	REVIEWED BY: ###	CHECKED BY: ###
DATE: MARCH 2020	DRAWN BY: LFT	PROJECT NO. 01.0173790.00	SCALE: AS NOTED
			<b>G-2</b>

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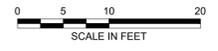


- GENERAL NOTES**
- ELEVATIONS ARE IN FEET BASED ON THE NAVD88 VERTICAL DATUM.
  - LIMITED TOPOGRAPHIC AND BATHYMETRIC SURVEY PERFORMED BY GZA GEOENVIRONMENTAL, INC. ON JULY 10, 2018 AND REPRESENTS CONDITIONS AT THE TIME OF THE SURVEY.
  - THE LOCATIONS OF THE SOIL PROBES AND THE SEDIMENT SAMPLES WERE APPROXIMATELY DETERMINED USING A TOTAL STATION SURVEY UNIT BY GZA PERSONNEL DURING A SITE VISIT ON JULY 10, 2018. THE LOCATION OF THE BORING EXPLORATIONS WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT AND/OR TAPE MEASUREMENTS FROM EXISTING SITE FEATURES, BY GZA PERSONNEL DURING SITE VISITS ON JULY 23 AND 24, 2018 AND 8/22/2018.
  - PROBES PERFORMED BY GZA PERSONNEL ON JULY 10, 2018 USING SURVEY RODS PUSHED BELOW GROUND SURFACE (BGS) BY HAND. RODS WERE ADVANCED UNTIL PRACTICAL REFUSAL WAS MET AND THE DEPTH WAS RECORDED.
  - ONLY TREES IN CLOSE PROXIMITY TO THE DAM WERE LOCATED.
  - POND ELEVATION AT THE TIME OF THE SURVEY = 20.8 FT NAVD88. THE UPSTREAM POND ELEVATION WAS APPROXIMATELY DETERMINED USING A TOTAL STATION SURVEY UNIT BY GZA PERSONNEL DURING A SITE VISIT ON JULY 10, 2018 AND REPRESENTS CONDITIONS AT THE TIME OF THE SURVEY.
  - TOP OF BANK AT LEFT SIDE OF POND AND TRIBUTARY BASED ON BASED ON TOPOGRAPHIC SURVEY. NO WETLAND VEGETATION OBSERVED ALONG THE STEEP/WOODED SLOPES AT LEFT SIDE.
  - WETLANDS WERE FLAGGED ON JULY 10, 2018 BY MARIA FIRSTENBERG (GZA)

- PROBE DEPTHS:**
- P-1: 2.5' BGS
  - P-2: 1.0' BGS
  - P-3: 2.5' BGS
  - P-4: 1.0' BGS
  - P-5: 3.0' BGS
  - P-6: 1.5' BGS
  - P-7: 3.2' BGS
- S-1: 2.5' BGS**  
**S-2: 2.0' BGS**

- LEGEND**
- BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS ON JULY 23 AND 24, 2018 AND AUGUST 22, 2018 AND OBSERVED BY GZA PERSONNEL.
  - GZ-01
  - (OW) INDICATES OBSERVATION WELL INSTALLED IN BORING.
  - SEDIMENT SAMPLES PERFORMED BY GZA PERSONNEL ON JULY 10, 2018.
  - SOIL PROBES PERFORMED BY GZA PERSONNEL ON JULY 10, 2018.
  - EXISTING TREE
  - EXISTING CONCRETE CORE WALL
  - TIMBER DECK OVER SPILLWAY
  - EXISTING TIMBER FENCE
  - EXISTING EXPOSED TIMBER PLANKS ALONG UPSTREAM SLOPE
  - STONE WALL ALONG DOWNSTREAM END OF THE DAM
  - WF-C1
  - A1
  - TOP OF BANK
  - APPROXIMATE TREE LINE
  - BORDERING VEGETATION WETLAND
  - FLOWERING POND/DOWNSTREAM TRIBUTARY (NORMAL POOL)

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NO.	ISSUE/DESCRIPTION	BY	DATE

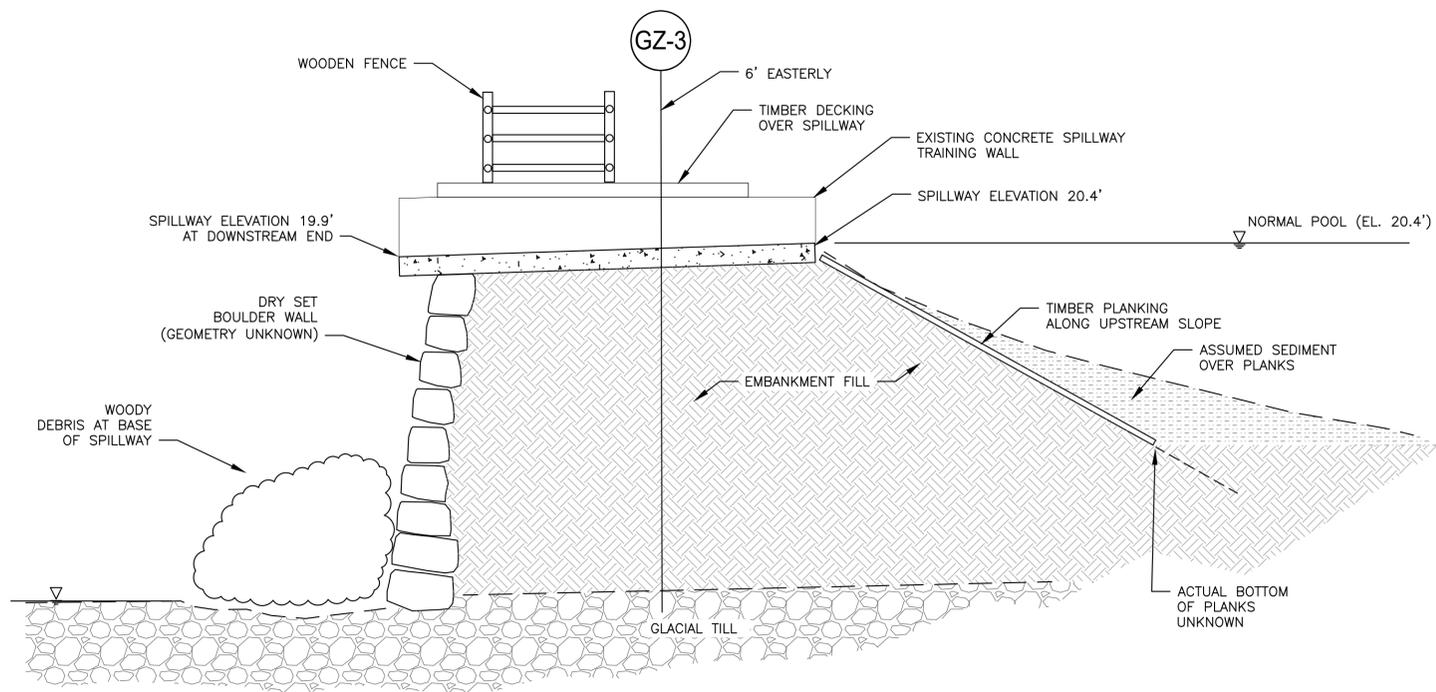
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**DAM REHABILITATION PROJECT  
FLOWERING POND DAM (MA01599)  
MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS**

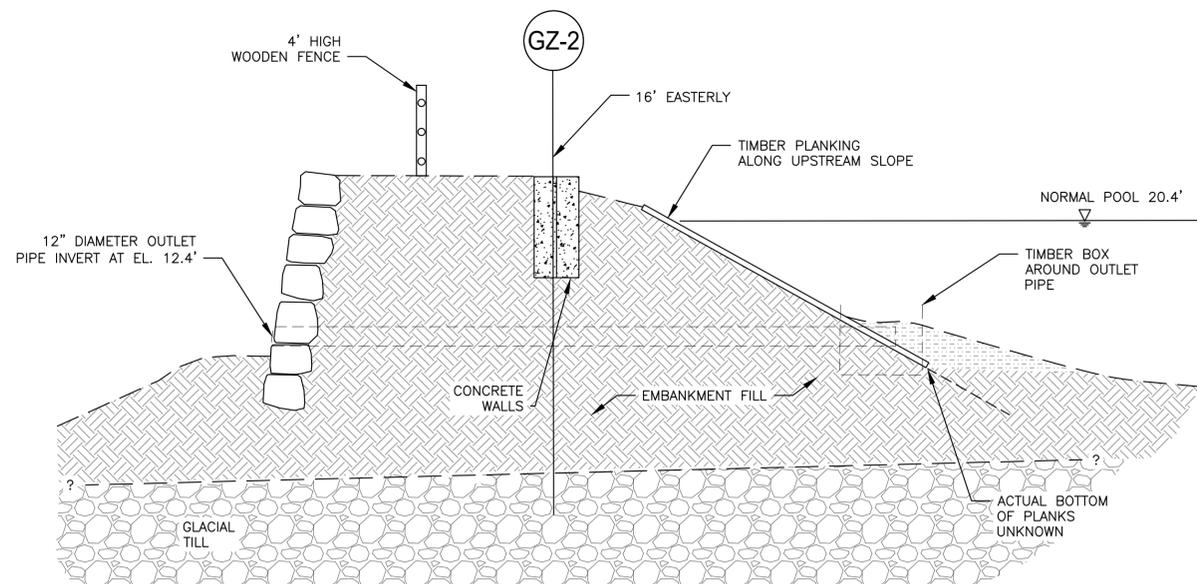
**EXISTING CONDITIONS AND  
RESOURCE AREA DELINEATION PLAN**

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY
PROJ MGR: DS DESIGNED BY: ### DATE: MARCH 2020	REVIEWED BY: ### DRAWN BY: LFT PROJECT NO. 01.0173790.00
CHECKED BY: ### SCALE: AS NOTED REVISION NO.	DRAWING <b>G-3</b>

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**EXISTING CONDITIONS PROFILE A-A'**



**EXISTING CONDITIONS PROFILE B-B'**



**LEGEND:**

GZ-2 TEST BORING LOCATION

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TEST BORING LOG											
GZA GeoEnvironmental, Inc. Engineers and Scientists			Department of Conservation & Recreation Maudslay Pond Dam Rehabilitation Maudslay State Park, Newburyport, MA			BORING NO.: GZ-01 SHEET: 1 of 1 PROJECT NO.: 173790-00 REVIEWED BY: DJS			DATE: 02/20/20		
Drilling Co.: New England Boring Contractors		Type of Rig: Tracked ATV		Boring Location: See Plan		Groundwater Depth (ft):		H. Datum: See Plan		V. Datum: NAVD83	
Foreman: Matt Sory		Rig Model: B33		Ground Surface Elev. (ft.): 22.4		Final Boring Depth (ft.): 13		Date Start - Finish: 7/23/2018 - 7/24/2018		V. Datum: NAVD83	
Logged By: Luke Taylor		Drilling Method: Wash		Date		Time		Water Depth		Casing	
Auger/Casing Type: Casing MW		Sampler Type: Split Spoon		Sampler ID (in.): 1.375"		Sampler Hw Wt (lb): 140		Sampler Hw Fall (ft): 30		Other: Safety Hammer	
ID/D (in.): 37.5		ID/O.D. (in.): 1.375"		Date		Time		Water Depth		Casing	
Hammer Weight (lb): 140		Sampler Hw Wt (lb): 140		Date		Time		Water Depth		Casing	
Hammer Fall (ft): 30		Sampler Hw Fall (ft): 30		Date		Time		Water Depth		Casing	
Other: NO Core Sample		Other: NO Core Sample		Date		Time		Water Depth		Casing	
Depth (ft)	Time (min)	Depth (ft)	Time (min)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmeister Procedure)	Remarks	Field Data	Stratum	Depth (ft)	Stratum
C-1	0:25	38	37	4	3	C-1: Upstream concrete core wall.					
C-2	3:25	45	45	7	7	C-2: Upstream concrete core wall.					
S-1	7:8	24	10	6	7	S-1A: Top 3" Silt, gray, SILT & CLAY, fine fine to medium Sand.					
S-2	9:11	24	14	5	5	S-1B: Bottom 7" Medium dense, gray, fine to medium SAND, some silt, trace Gravel.					
S-3	11:13	24	12	7	13	S-2A: Top 2" Gray, fine to medium SAND, some silt, trace Gravel.					
						S-2B: Bottom 12" Gray, Clayey SILT and fine to medium SAND.					
						S-2C: Medium dense, gray, fine to medium SAND, some Clayey SILT, trace (-) Gravel.					
						Rock fragment in top of sampler.					
						Bottom of boring at 13 feet.					

TEST BORING LOG											
GZA GeoEnvironmental, Inc. Engineers and Scientists			Department of Conservation & Recreation Maudslay Pond Dam Rehabilitation Maudslay State Park, Newburyport, MA			BORING NO.: GZ-03 SHEET: 1 of 1 PROJECT NO.: 173790-00 REVIEWED BY: DJS			DATE: 02/20/20		
Drilling Co.: New England Boring Contractors		Type of Rig: Tracked ATV		Boring Location: See Plan		Groundwater Depth (ft):		H. Datum: See Plan		V. Datum: NAVD83	
Foreman: Alex Korp		Rig Model: S33		Ground Surface Elev. (ft.): 22.4		Final Boring Depth (ft.): 19		Date Start - Finish: 8/22/2018 - 8/22/2018		V. Datum: NAVD83	
Logged By: Alex Korp		Drilling Method: Wash		Date		Time		Water Depth		Casing	
Auger/Casing Type: HW		Sampler Type: Split Spoon		Sampler ID (in.): 1.375"		Sampler Hw Wt (lb): 140		Sampler Hw Fall (ft): 30		Other: Safety Hammer	
ID/D (in.): 47.6		ID/O.D. (in.): 1.375"		Date		Time		Water Depth		Casing	
Hammer Weight (lb): 300		Sampler Hw Wt (lb): 140		Date		Time		Water Depth		Casing	
Hammer Fall (ft): 30		Sampler Hw Fall (ft): 30		Date		Time		Water Depth		Casing	
Other: Safety Hammer		Other: Safety Hammer		Date		Time		Water Depth		Casing	
Depth (ft)	Time (min)	Depth (ft)	Time (min)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmeister Procedure)	Remarks	Field Data	Stratum	Depth (ft)	Stratum
S-1	5:2	24	7	4	3	S-1: Dry loam, brown, fine to coarse SAND, some SILT, trace (-) Gravel, trace Root/Wood Fibers.					
S-2	2:4	24	4	4	5	S-2: Dry loam, brown, fine to coarse SAND, some SILT, trace (-) Gravel, trace Root/Wood Fibers.					
S-3	4:6	24	7	12	7	S-3: Moist, stiff, light brown, SILT, some fine to coarse Sand, trace Gravel, trace (-) Roots.					
S-4	6:4	24	7	6	5	S-4: Wet, medium dense, light brown, SILT & CLAY, parting of fine Sand space 1/4 to 1" throughout.					
S-5	8:0	17	3	7	5	S-5: Wet, very dense, light brown, fine to coarse Sand & Gravel, some SILT.					
S-6	11:13	1	0	80"	R	S-6: No Recovery.					
S-7	13:18	24	4	7	6	S-7: Wet, medium dense, gray, fine to coarse SAND & SILT.					
S-8	15:17	24	12	16	14	S-8: Wet, dense, gray, fine to coarse SAND & SILT, trace Gravel.					
S-9	17:18	24	11	28	48	S-9: Wet, very dense, gray, fine to coarse SAND & GRAVEL, some SILT.					
						Bottom of boring at 19 feet.					

TEST BORING LOG											
GZA GeoEnvironmental, Inc. Engineers and Scientists			Department of Conservation & Recreation Maudslay Pond Dam Rehabilitation Maudslay State Park, Newburyport, MA			BORING NO.: GZ-02 SHEET: 1 of 1 PROJECT NO.: 173790-00 REVIEWED BY: DJS			DATE: 02/20/20		
Drilling Co.: New England Boring Contractors		Type of Rig: Tracked ATV		Boring Location: See Plan		Groundwater Depth (ft):		H. Datum: See Plan		V. Datum: NAVD83	
Foreman: Matt Sory		Rig Model: B33		Ground Surface Elev. (ft.): 22.4		Final Boring Depth (ft.): 21		Date Start - Finish: 7/24/2018 - 7/24/2018		V. Datum: NAVD83	
Logged By: Luke Taylor		Drilling Method: Wash		Date		Time		Water Depth		Casing	
Auger/Casing Type: Casing MW		Sampler Type: Split Spoon		Sampler ID (in.): 1.375"		Sampler Hw Wt (lb): 140		Sampler Hw Fall (ft): 30		Other: Safety Hammer	
ID/D (in.): 37.5		ID/O.D. (in.): 1.375"		Date		Time		Water Depth		Casing	
Hammer Weight (lb): 140		Sampler Hw Wt (lb): 140		Date		Time		Water Depth		Casing	
Hammer Fall (ft): 30		Sampler Hw Fall (ft): 30		Date		Time		Water Depth		Casing	
Other: NO Core Sample		Other: NO Core Sample		Date		Time		Water Depth		Casing	
Depth (ft)	Time (min)	Depth (ft)	Time (min)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmeister Procedure)	Remarks	Field Data	Stratum	Depth (ft)	Stratum
C-1	0:4	30	5	5	5	C-1: Downstream concrete core wall.					
S-1	5:7	24	24	8	12	S-1: Very stiff, gray, SILT & CLAY, little fine to medium Sand, trace Gravel.					
S-2	7:6	24	2	11	13	S-2: Wet, dense, brown/gray, fine to medium SAND, little Gravel, little SILT.					
S-3	9:11	24	5	12	8	S-3: Medium dense, gray, SILT & GRAVEL, little Sand.					
S-4	11:13	24	12	10	14	S-4: Medium dense, gray, fine to coarse SAND & SILT, trace (-) Gravel at 9' from tip of spoon (fractured), 6' from tip of spoon black staining.					
S-5	13:18	24	2	8	15	S-5: Medium dense, gray/brown, fine to coarse SAND, some Gravel, trace SILT.					
S-6	15:17	24	12	20	21	S-6A: Top 11" Dense, gray, fine to medium SAND, some Clayey SIL, trace (-) Gravel.					
S-7	17:18	24	5	3	7	S-6B: Bottom 11" Dense, brown/gray, fine SAND, some SILT.					
S-8	19:21	21	6	13	20	S-7: Medium dense, gray, fine to coarse SAND, some Gravel, little SILT, black staining. Possible strata change.					
						S-8: Dense, gray, fine to coarse SAND, some Gravel (fractured), some SILT.					
						Bottom of boring at 21 feet.					

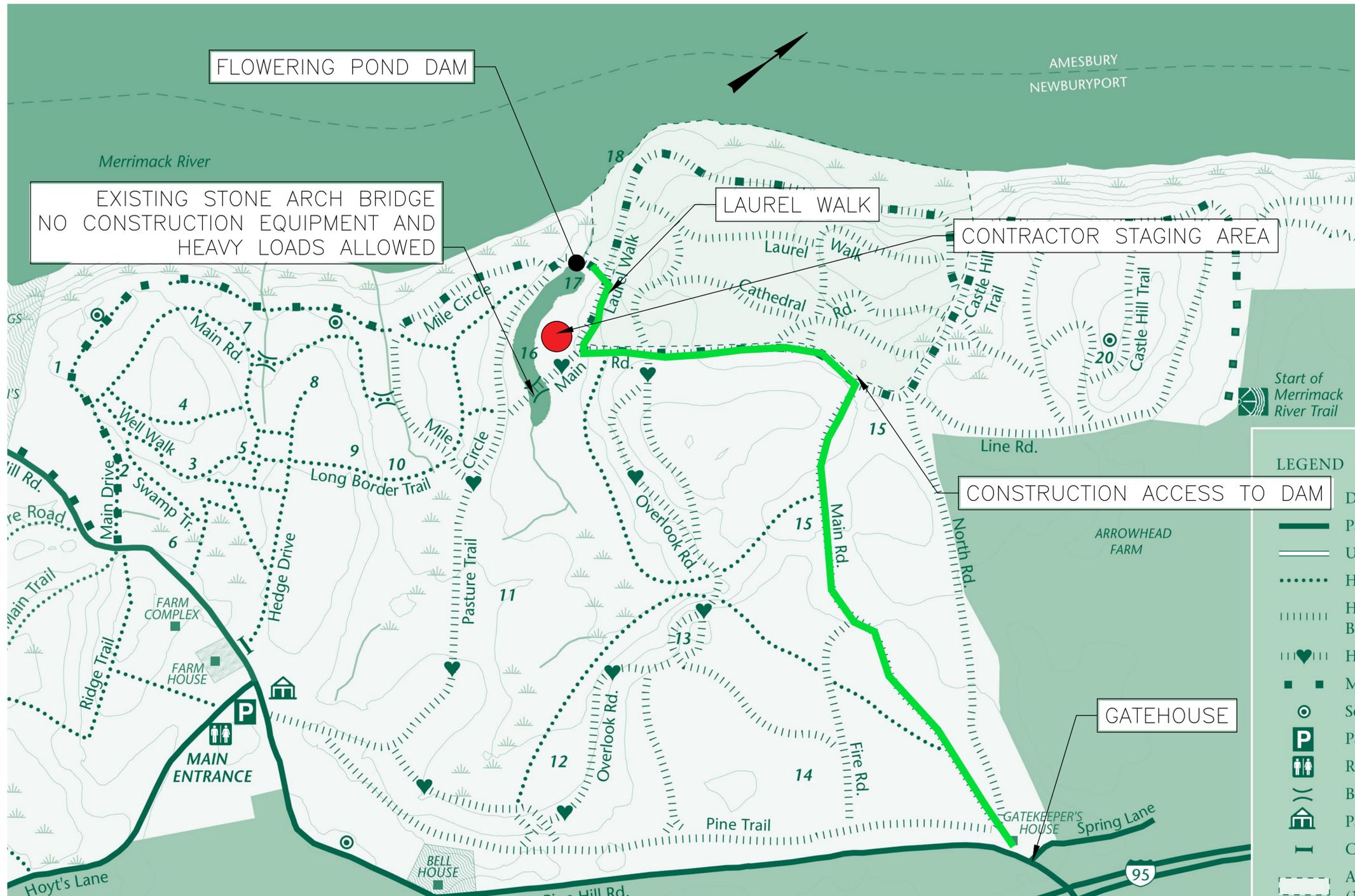
TEST BORING LOG											
GZA GeoEnvironmental, Inc. Engineers and Scientists			Department of Conservation & Recreation Maudslay Pond Dam Rehabilitation Maudslay State Park, Newburyport, MA			BORING NO.: GZ-04 SHEET: 1 of 1 PROJECT NO.: 173790-00 REVIEWED BY: DJS			DATE: 02/20/20		
Drilling Co.: New England Boring Contractors		Type of Rig: Tracked ATV		Boring Location: See Plan		Groundwater Depth (ft):		H. Datum: See Plan		V. Datum: NAVD83	
Foreman: Alex Korp		Rig Model: S33		Ground Surface Elev. (ft.): 22.4		Final Boring Depth (ft.): 23.5		Date Start - Finish: 8/22/2018 - 8/22/2018		V. Datum: NAVD83	
Logged By: Alex Korp		Drilling Method: Wash		Date		Time		Water Depth		Casing	
Auger/Casing Type: HW		Sampler Type: Split Spoon		Sampler ID (in.): 1.375"		Sampler Hw Wt (lb): 140		Sampler Hw Fall (ft): 30		Other: Safety Hammer	
ID/D (in.): 47.6		ID/O.D. (in.): 1.375"		Date		Time		Water Depth		Casing	
Hammer Weight (lb): 300		Sampler Hw Wt (lb): 140		Date		Time		Water Depth		Casing	
Hammer Fall (ft): 30		Sampler Hw Fall (ft): 30		Date		Time		Water Depth		Casing	
Other: Safety Hammer		Other: Safety Hammer		Date		Time		Water Depth		Casing	
Depth (ft)	Time (min)	Depth (ft)	Time (min)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmeister Procedure)	Remarks	Field Data	Stratum	Depth (ft)	Stratum
S-1	5:2	24	7	4	3	S-1: Dry loam, brown, fine to coarse SAND, some SILT, trace (-) Gravel, trace Root/Wood Fibers.					
S-2	2:4	24	4	4	5	S-2: Dry loam, brown, fine to coarse SAND, some SILT, trace (-) Gravel, trace Root/Wood Fibers.					
S-3	4:6	24	7	12	7	S-3: Moist, stiff, light brown, SILT, some fine to coarse Sand, trace Gravel, trace (-) Roots.					
S-4	6:4	24	7	6	5	S-4: Wet, medium dense, light brown, SILT & CLAY, parting of fine Sand space 1/4 to 1" throughout.					
S-5	8:0	17	3	7	5	S-5: Wet, very dense, light brown, fine to coarse Sand & Gravel, some SILT.					
S-6	10:12	24	13	11	17	S-6A: Top 9" Wet, light brown, fine to medium SAND, trace SILT.					
S-7	12:14	24	14	14	10	S-6B: Bottom 15" Wet, gray, fine SAND and SILT.					
S-8	15:17	24	12	16	14	S-7: Wet, medium dense, gray, fine to medium SAND, little SILT.					
S-9	17:18	24	10	14	14	S-8: Wet, medium dense, gray, fine to coarse SAND, some Gravel, little (-) SILT.					
						Bottom of boring at 23.5 feet.					

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<b>DAM REHABILITATION PROJECT FLOWERING POND DAM (MA01599) MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>EXISTING CONDITIONS SECTIONS A AND B AND BORING LOGS</b>			
PREPARED BY:	GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR:	DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY
PROJ MGR: DS	DESIGNED BY: ###	REVIEWED BY: ###	CHECKED BY: ###
DATE: MARCH 2020	DRAWN BY: LFT	PROJECT NO. 01.0173790.00	SCALE: AS NOTED
		REVISION NO.	DRAWING G-4



LEGEND

CONSTRUCTION ACCESS TO DAM



LEGEND

- Pav
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- ||||| Hi
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- Sce
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- ♿ Res
- ⌒ Bri
- ⌒ Par
- I Clo
- Are

GENERAL NOTES

- THE MAP WAS PROVIDED BY MASSACHUSETTS DCR

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**DAM REHABILITATION PROJECT  
FLOWERING POND DAM (MA01599)  
MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS**

**CONSTRUCTION ACCESS TO DAM**

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY	
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			<b>DRAWING G-6</b>

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BVW IMPACTS	
TEMPORARY	360 SQ. FT
PERMANENT	0 SQ. FT

WATERS OF THE US/LUWW  
(FROM DRAWDOWN)

LEGEND

- FEMA ZONE AE- 1% ANNUAL CHANCE OF FLOODING (100-YEAR FLOOD)
- FEMA ZONE AE- REGULATORY FLOODWAY
- 100-FOOT INNER RIPARIAN ZONE
- 100-FOOT BVW BUFFER ZONE
- 200-FOOT RIVERFRONT AREA
- LIMIT OF WORK
- WETLAND FLAG AND NUMBER (LOCATED FROM GZA SURVEY-SEE NOTE 2)
- TOP OF BANK/OHW
- 25' NO-DISTURB ZONE
- DRAWDOWN WATER SURFACE (EL. 13')
- BORDERING VEGETATION WETLAND

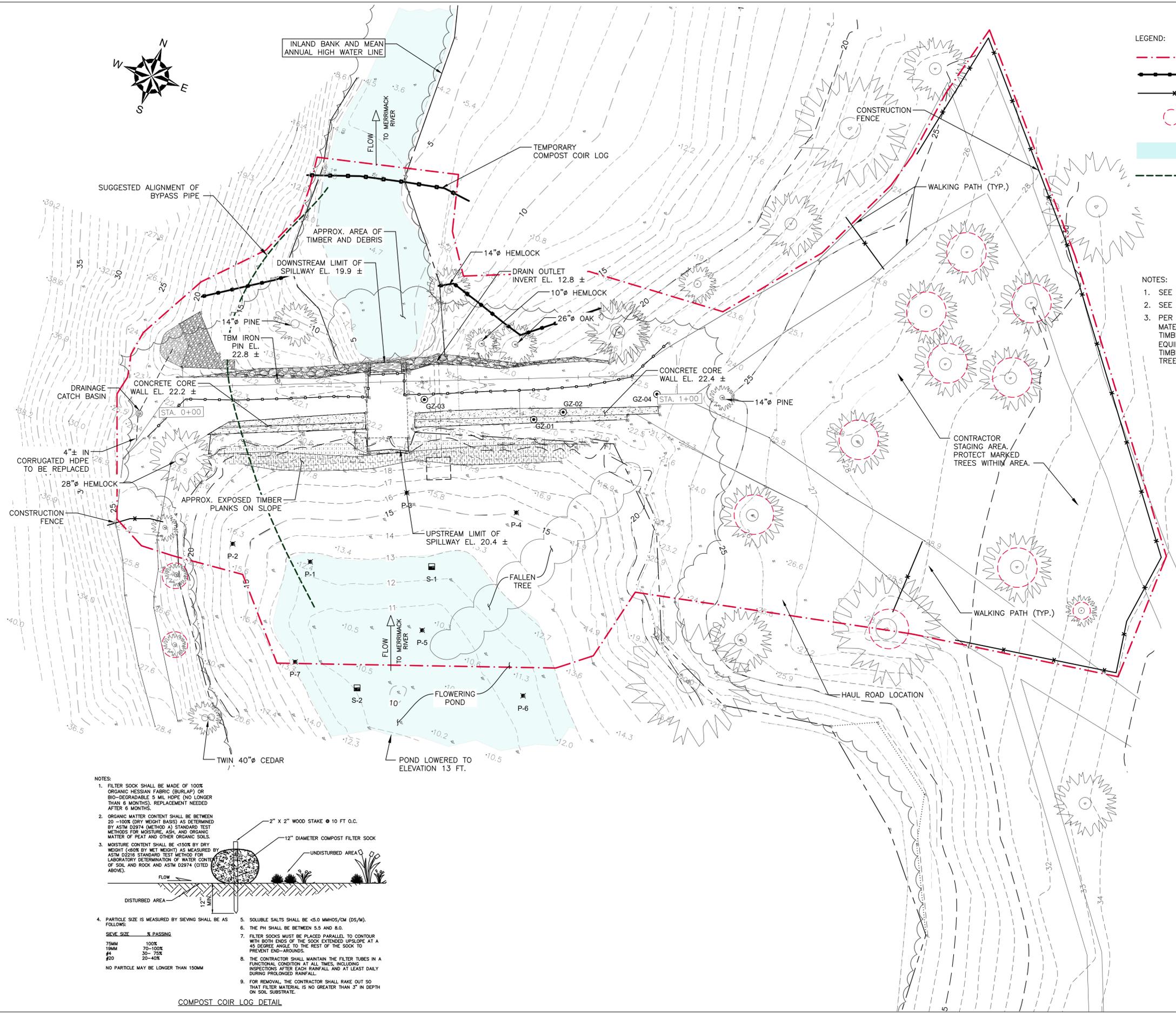
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<p><b>DAM REHABILITATION PROJECT</b> <b>FLOWERING POND DAM (MA01599)</b> <b>MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b></p>			
<p><b>FEMA ZONES AND RESOURCE AREAS</b></p>			
<p>PREPARED BY:  <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com</p>		<p>PREPARED FOR: DEPT. OF CONSERVATION &amp; RECREATION OFFICE OF DAM SAFETY</p>	
<p>PROJ MGR: DS DESIGNED BY: ### DATE: MARCH 2020</p>	<p>REVIEWED BY: ### DRAWN BY: LFT PROJECT NO. 01.0173790.00</p>	<p>CHECKED BY: ### SCALE: AS NOTED REVISION NO.</p>	<p>DRAWING <b>G-7</b></p>

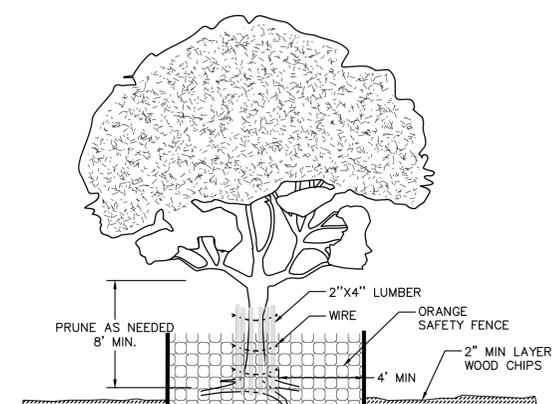
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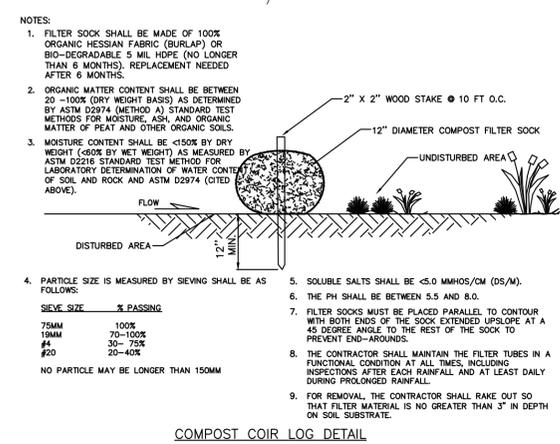


- LEGEND:**
- - - - - LIMIT OF WORK
  - TEMPORARY SEDIMENTATION AND EROSION CONTROL BARRIER (COMPOST COIR LOG)
  - TEMPORARY CONSTRUCTION FENCE (HEIGHT = 6 FT)
  - TREE PROTECTION (TREE TO REMAIN)
  - LAND UNDERWATER DURING CONSTRUCTION
  - BY-PASS FLOW PIPE

- NOTES:**
1. SEE SEDIMENT AND EROSION CONTROL NOTES ON DWG G2.
  2. SEE WATER CONTROL NOTES ON DWG G2.
  3. PER REGULATORY CONDITIONS, ALL CONSTRUCTION EQUIPMENT, VEHICLES, AND MATERIALS MUST BE PARKED, STORED, AND/OR STOCKPILED ON TEMPORARY TIMBER MATS. ALL AREAS TO BE ACCESSED BY CONSTRUCTION VEHICLES AND EQUIPMENT MUST BE PROTECTED WITH A 2" MINIMUM LAYER OF WOOD CHIPS. TIMBER MATS OR OTHER MEANS MAY BE REQUIRED TO PROTECT EXPOSED TREE ROOTS.



NOTE:  
IN SITUATIONS WHERE A PROTECTED TREE REMAINS IN THE IMMEDIATE AREA OF INTENDED CONSTRUCTION AND THE TREE MAY BE IN DANGER OF BEING DAMAGED BY CONSTRUCTION EQUIPMENT OR OTHER ACTIVITY, THE CONTRACTOR OR SUBCONTRACTOR SHALL PROTECT THE TREE WITH 2"x4" LUMBER ENCORCLED WITH WIRE OR OTHER MEANS THAT DO NOT DAMAGE THE TREE. THE INTENT IS TO PROTECT THE TRUNK OF THE TREE AGAINST INCIDENTAL CONTACT BY LARGE CONSTRUCTION EQUIPMENT.



- NOTES:**
1. FILTER SOCK SHALL BE MADE OF 100% ORGANIC HESSIAN FABRIC (BURLAP) OR BIO-DEGRADABLE 5 MIL HDPE (NO LONGER THAN 6 MONTHS). REPLACEMENT NEEDED AFTER 6 MONTHS.
  2. ORGANIC MATTER CONTENT SHALL BE BETWEEN 20 - 100% (DRY WEIGHT BASIS) AS DETERMINED BY ASTM D2974 (METHOD A) STANDARD TEST METHODS FOR MOISTURE, ASH, AND ORGANIC MATTER OF PEAT AND OTHER ORGANIC SOILS.
  3. MOISTURE CONTENT SHALL BE <math>\leq 50\%</math> BY DRY WEIGHT (<math>\leq 60\%</math> BY NET WEIGHT) AS MEASURED BY ASTM D2216 STANDARD TEST METHOD FOR LABORATORY DETERMINATION OF WATER CONTENT OF SOIL AND ROCK AND ASTM D2974 (CITED ABOVE).
  4. PARTICLE SIZE IS MEASURED BY SIEVING SHALL BE AS FOLLOWS:
 

SIEVE SIZE	% PASSING
75µM	100%
150µM	70-100%
#4	30-75%
#20	20-40%

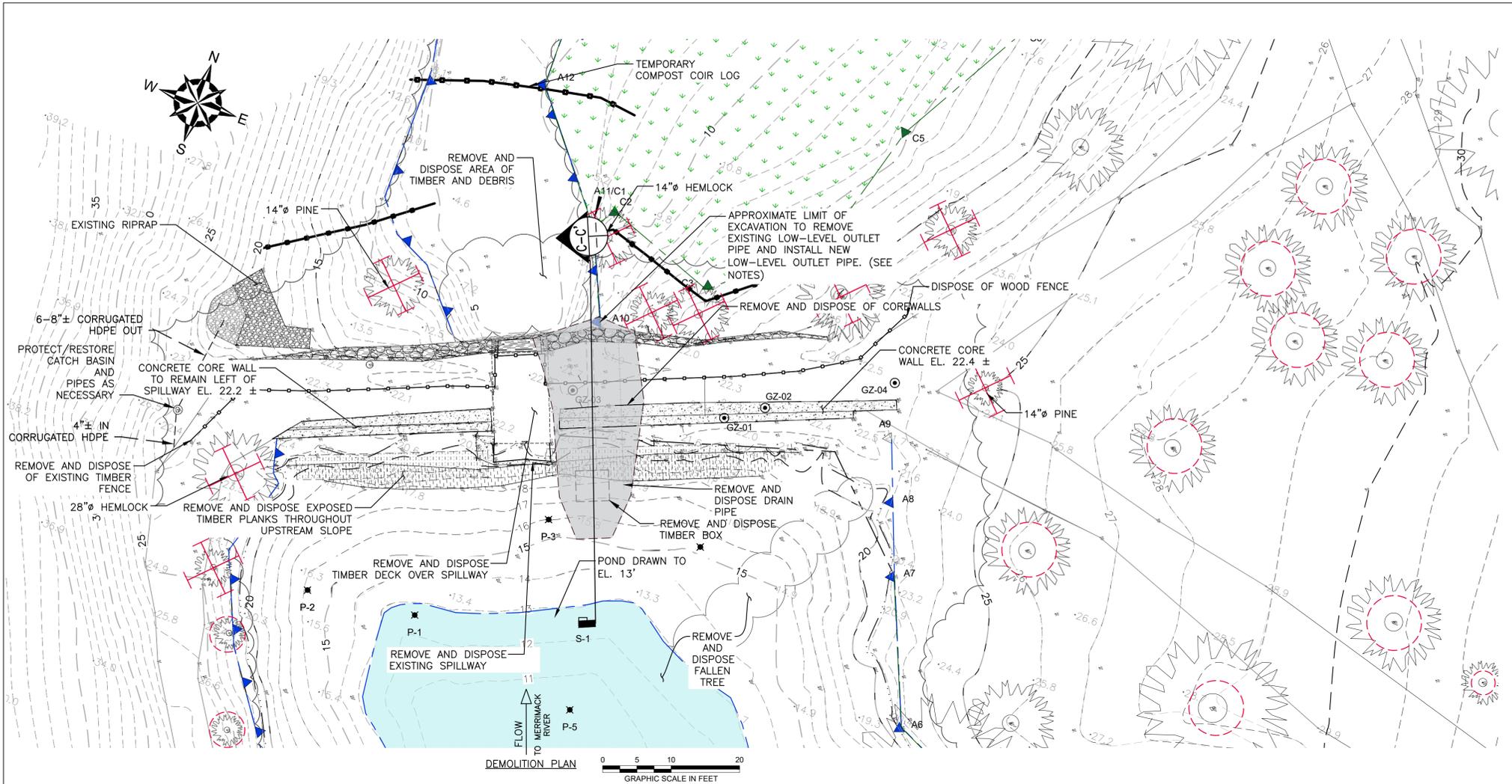
 NO PARTICLE MAY BE LONGER THAN 150MM
  5. SOLUBLE SALTS SHALL BE <math>\leq 5.0</math> MMHOS/CM (DS/M).
  6. THE PH SHALL BE BETWEEN 5.5 AND 8.0.
  7. FILTER SOCKS MUST BE PLACED PARALLEL TO CONTOUR WITH BOTH ENDS OF THE SOCK EXTENDED UPSLOPE AT A 45 DEGREE ANGLE TO THE REST OF THE SOCK TO PREVENT END-AROUNDS.
  8. THE CONTRACTOR SHALL MAINTAIN THE FILTER TUBES IN A FUNCTIONAL CONDITION AT ALL TIMES, INCLUDING INSPECTIONS AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
  9. FOR REMOVAL, THE CONTRACTOR SHALL RAKE OUT SO THAT FILTER MATERIAL IS NO GREATER THAN 3" IN DEPTH ON SOIL SUBSTRATE.



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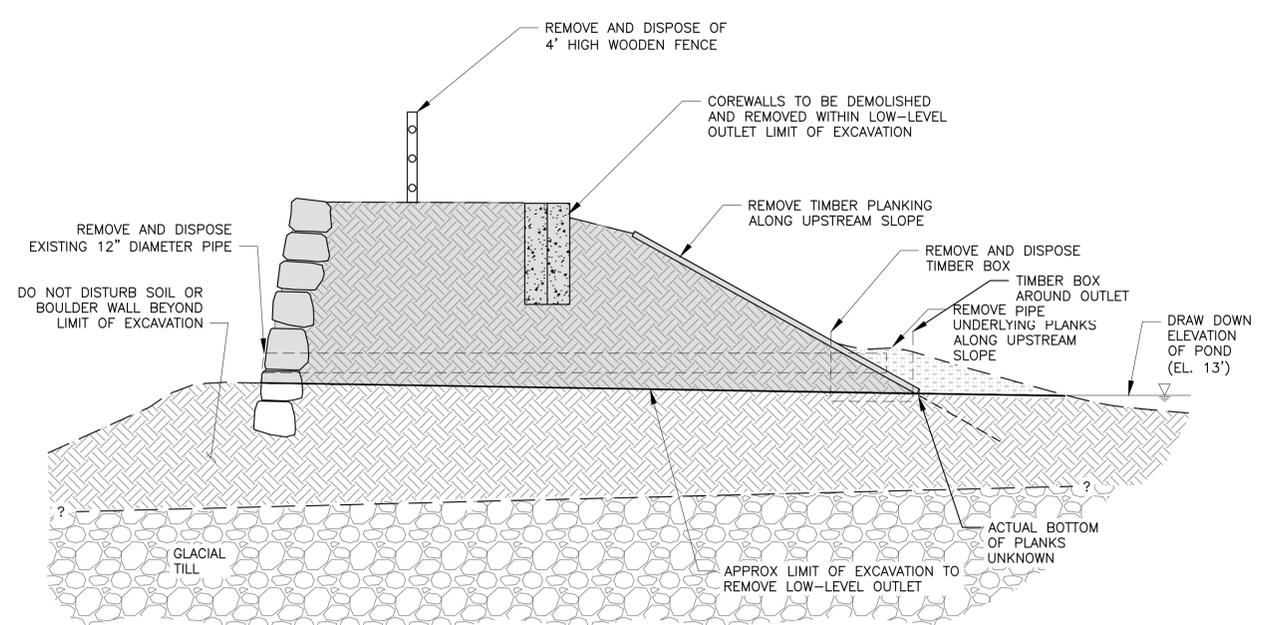
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<b>DAM REHABILITATION PROJECT</b> <b>FLOWERING POND DAM (MA01599)</b> <b>MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>SEDIMENT, EROSION &amp; WATER CONTROL PLAN</b>			
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		PREPARED FOR: <b>DEPT. OF CONSERVATION &amp; RECREATION</b> OFFICE OF DAM SAFETY	
PROJ MGR: DS	DESIGNED BY: ###	REVIEWED BY: ###	CHECKED BY: ###
DATE: MARCH 2020	DRAWN BY: LFT	PROJECT NO. 01.0173790.00	SCALE: AS NOTED
			<b>DRAWING</b> <b>C-1</b>

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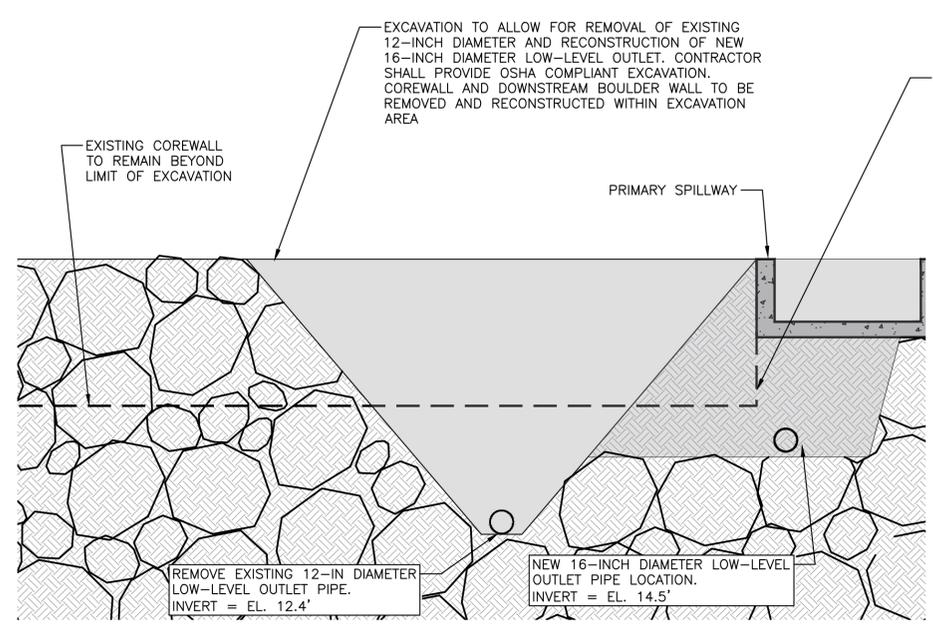


- LEGEND:**
- TEMPORARY SEDIMENTATION AND EROSION CONTROL BARRIER (COMPOST COIR LOG)
  - LAND UNDERWATER DURING CONSTRUCTION
  - APPROXIMATE AREA OF EXCAVATION TO REHABILITATE DAM
  - TREE TO BE REMOVED
  - TREE PROTECTION (TREE TO REMAIN)

- NOTES**
1. ACTUAL LIMITS SHALL BE ESTABLISHED BY CONTRACTOR AS NECESSARY TO PROVIDE OSHA COMPLIANT SIDE SLOPES.
  2. TEMPORARILY REMOVE DOWNSTREAM BOULDER WALL WITHIN LIMIT OF EXCAVATION. SALVAGE BOULDERS FOR RECONSTRUCTION OF WALL.
  3. DEMOLISH AND DISPOSE CORE WALLS WITHIN LIMIT OF EXCAVATION.



**DEMOLITION/EXCAVATION PROFILE C-C'**



**DEMOLITION/EXCAVATION ELEVATION**

(TO BE SPECIFIED BY CONTRACTOR)

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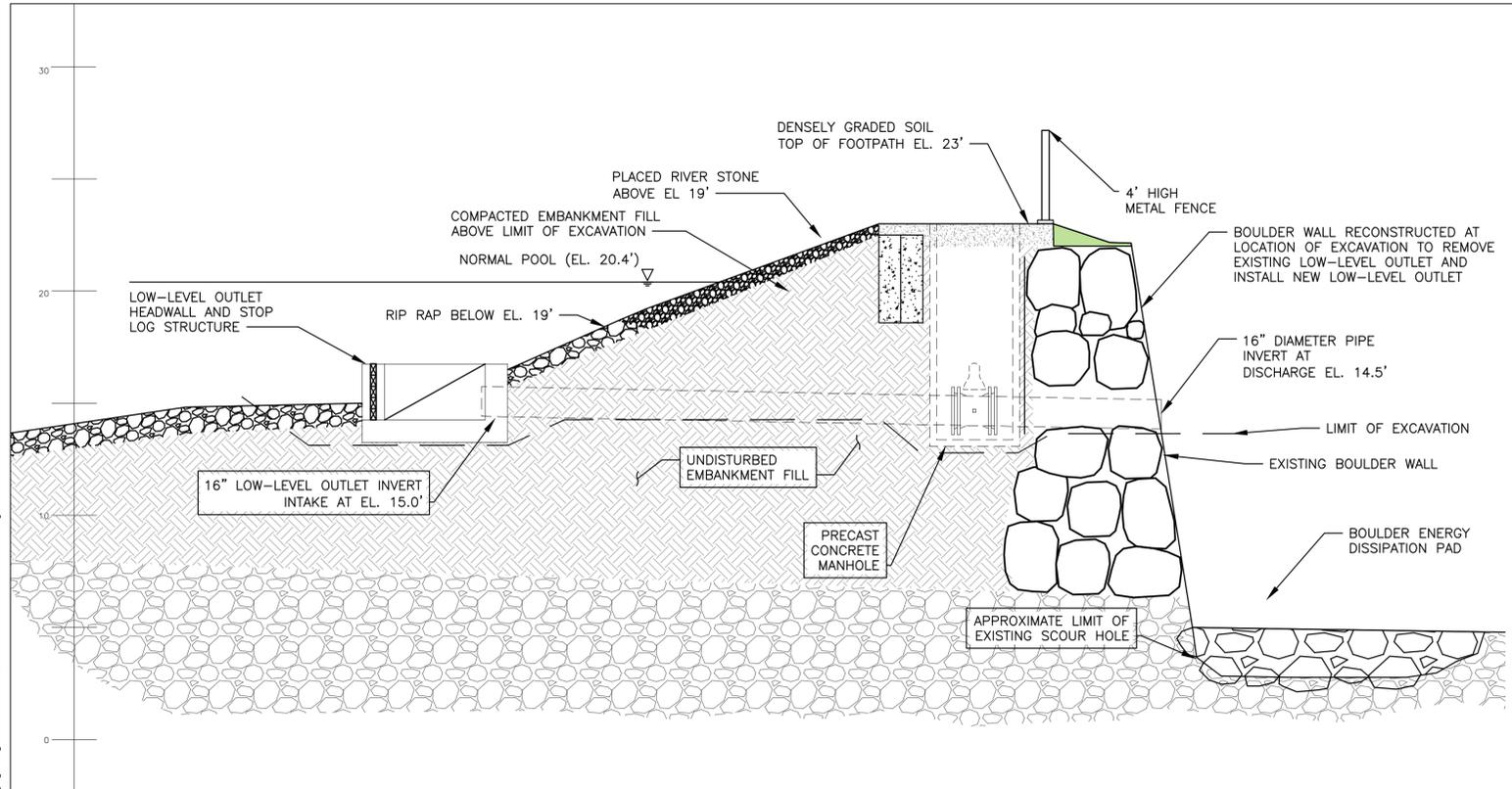
**DAM REHABILITATION PROJECT  
FLOWERING POND DAM (MA01599)  
MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS**

**DEMOLITION/EXCAVATION PLAN**

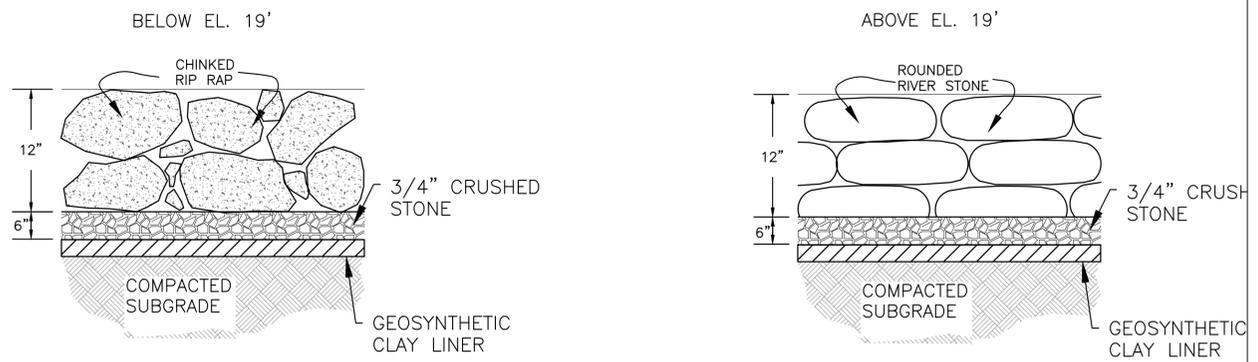
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com	PREPARED FOR: DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY
PROJ MGR: DS DESIGNED BY: ### DATE: MARCH 2020	REVIEWED BY: ### DRAWN BY: LFT PROJECT NO. 01.0173790.00
CHECKED BY: ### SCALE: AS NOTED REVISION NO.	<b>DRAWING C-2</b>



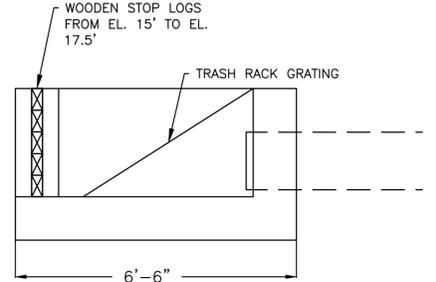
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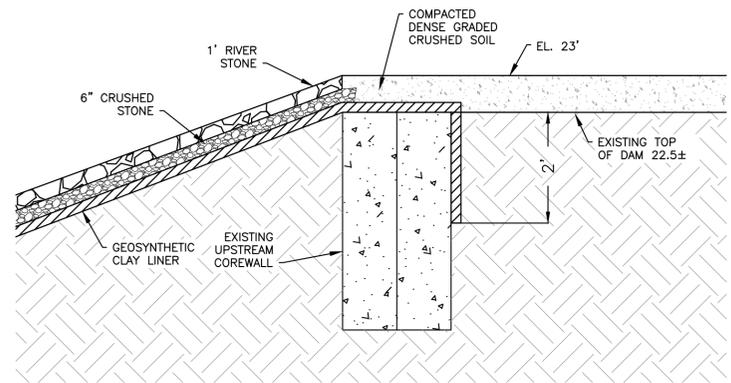
**FINAL CONDITIONS PROFILE C-C'**  
GRAPHIC SCALE IN FEET



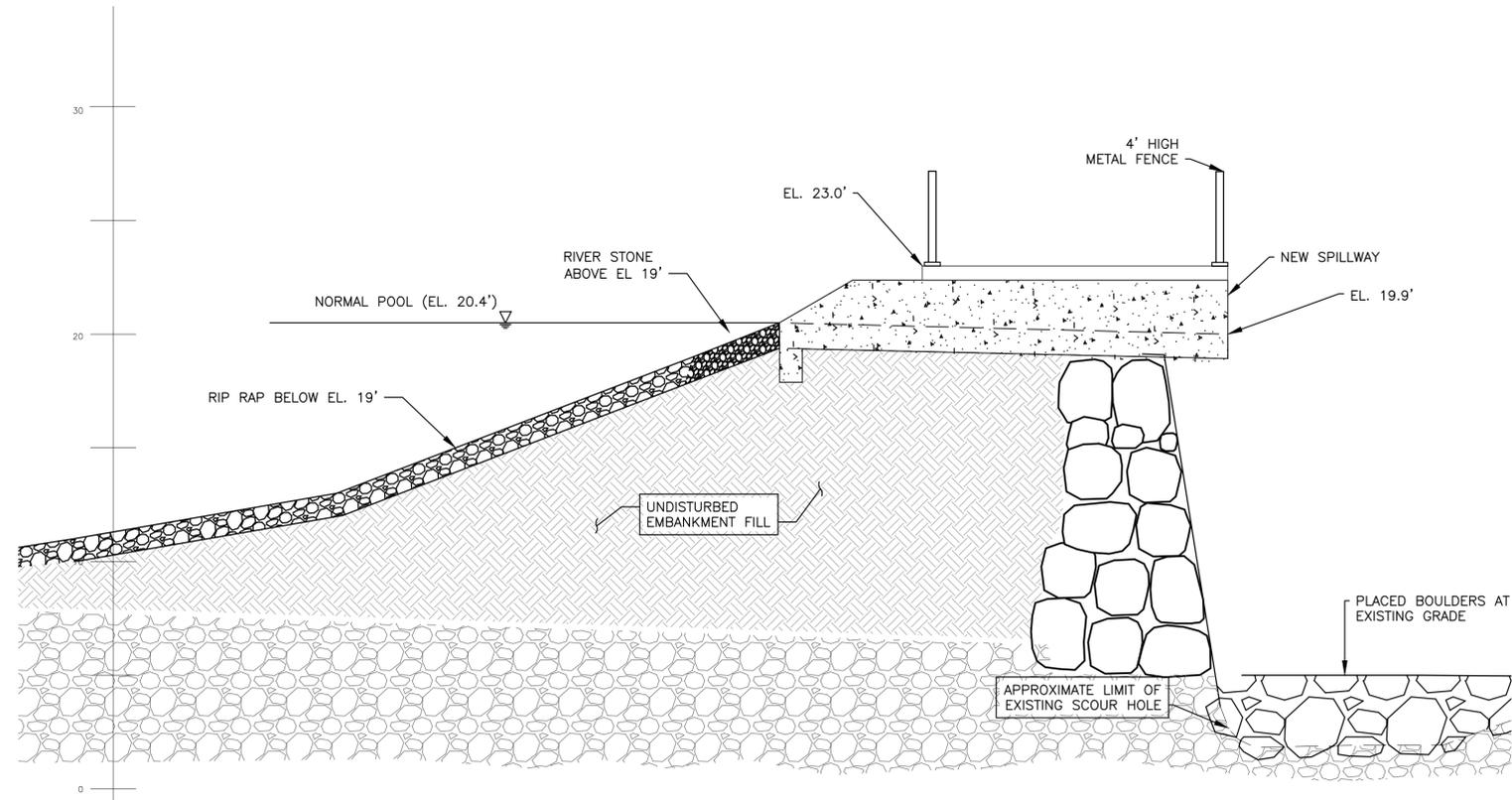
**FINAL CONDITIONS SLOPE DETAIL**  
NOT TO SCALE



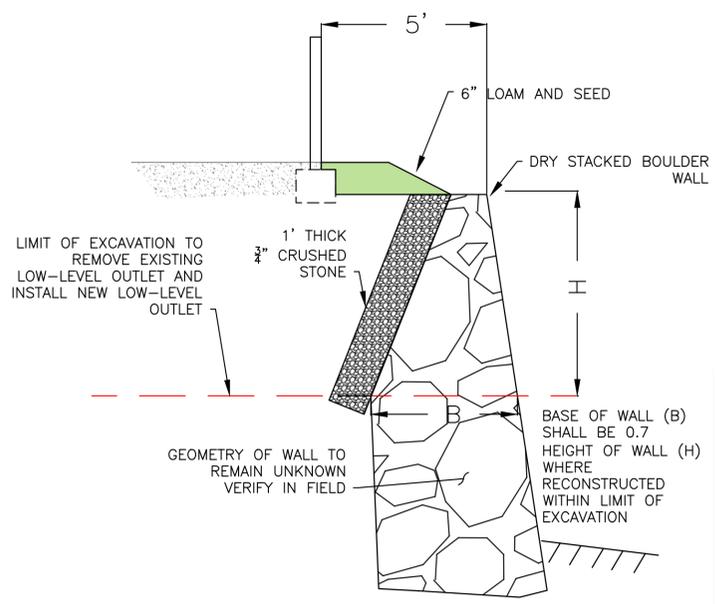
**HEADWALL DETAIL**  
NOT TO SCALE



**GCL DETAIL**  
NOT TO SCALE



**FINAL CONDITIONS PROFILE D-D'**  
GRAPHIC SCALE IN FEET

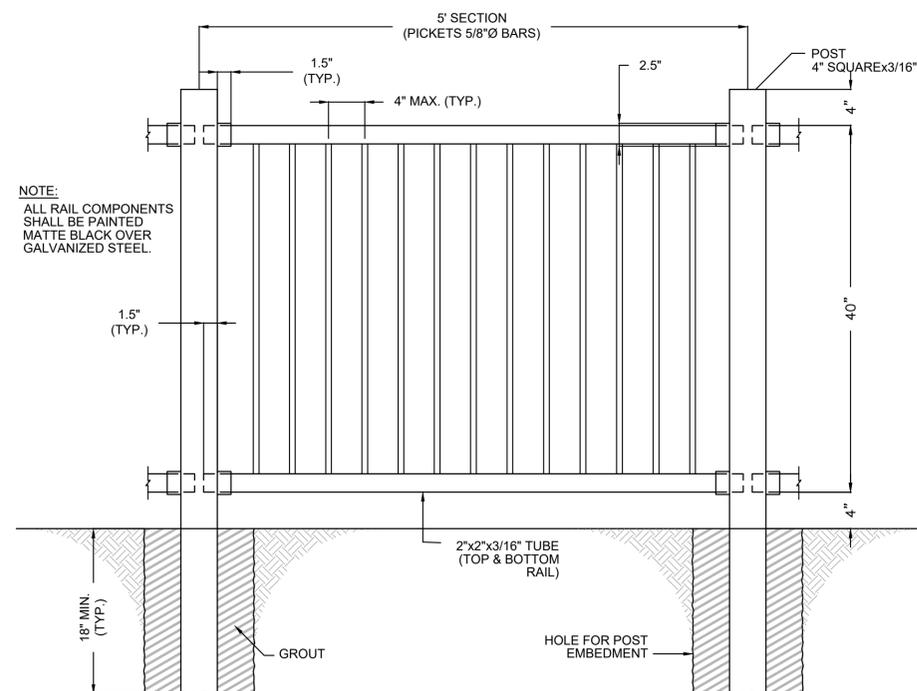
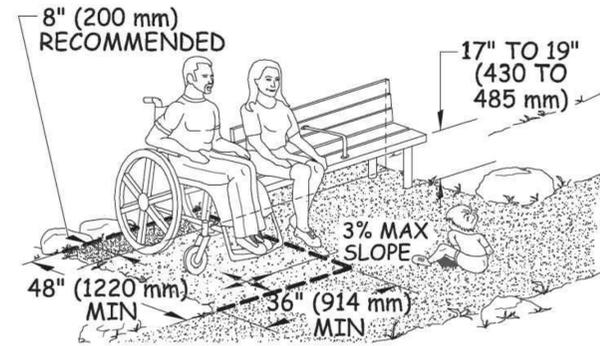


**BOULDER WALL DETAIL**  
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<b>DAM REHABILITATION PROJECT FLOWERING POND DAM (MA01599) MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>FINAL CONDITIONS SECTIONS AND PROFILES</b>			
<small>PREPARED FOR:</small> <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists <small>www.gza.com</small>		<small>PREPARED FOR:</small> <b>DEPT. OF CONSERVATION &amp; RECREATION</b> OFFICE OF DAM SAFETY	
<small>PROJ MGR:</small> DS <small>DESIGNED BY:</small> ### <small>DATE:</small> MARCH 2020	<small>REVIEWED BY:</small> ### <small>DRAWN BY:</small> LFT <small>PROJECT NO.:</small> 01.0173790.00	<small>CHECKED BY:</small> ### <small>SCALE:</small> AS NOTED <small>REVISION NO.:</small>	<b>DRAWING C-4</b>

# ACCESSIBLE BENCH DETAIL



NOTE:  
ALL RAIL COMPONENTS  
SHALL BE PAINTED  
MATTE BLACK OVER  
GALVANIZED STEEL.

# SAFETY RAILING DETAIL

NOT TO SCALE



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<b>DAM REHABILITATION PROJECT</b> <b>FLOWERING POND DAM (MA01599)</b> <b>MAUDSLAY STATE PARK, NEWBURYPORT, MASSACHUSETTS</b>			
<b>BENCH &amp; FENCE DETAIL</b>			
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		PREPARED FOR: DEPT. OF CONSERVATION & RECREATION OFFICE OF DAM SAFETY	
PROJ MGR: DS	DESIGNED BY: ###	REVIEWED BY: ###	CHECKED BY: ###
DATE: MARCH 2020	DRAWN BY: LFT	PROJECT NO. 01.0173790.00	SCALE: AS NOTED REVISION NO.
			<b>DRAWING S-1</b>



## **Appendix G – NHESP and USFWS Consultation**



MASSWILDLIFE

# DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581  
p: (508) 389-6300 | f: (508) 389-7890  
**MASS.GOV/MASSWILDLIFE**

July 20, 2018

Derek Schipper  
GZA GeoEnvironmental  
249 Vanderbilt Avenue  
Norwood MA 02062

RE: Project Location: Maudslay Pond Dam  
Town: NEWBURYPORT  
NHESP Tracking No.: 12-30577

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat 2122* (PH 2122) and *Estimated Habitat 1393* (EH 1393) as indicated in the *Massachusetts Natural Heritage Atlas* (14<sup>th</sup> Edition) for the following state-listed rare species:

<u>Scientific name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>
<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	Fish	Endangered
<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Fish	Endangered

The species listed above are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website ([www.mass.gov/nhesp](http://www.mass.gov/nhesp)).

Please note that projects and activities located within Priority and/or Estimated Habitat **must be reviewed by the Division** for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

### **Wetlands Protection Act (WPA)**

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission. If the Division determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the Division to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

MASSWILDLIFE

A streamlined joint MESA/WPA review process is available. When filing a Notice of Intent (NOI), the applicant may file concurrently under the MESA on the same NOI form and qualify for a 30-day streamlined joint review. For a copy of the NOI form, please visit the MA Department of Environmental Protection's website: <https://www.mass.gov/how-to/wpa-form-3-wetlands-notice-of-intent>.

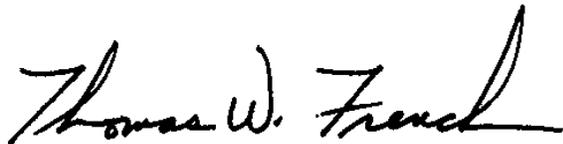
**MA Endangered Species Act (MESA)**

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be sent to Natural Heritage Regulatory Review to determine whether a probable Take under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). For a MESA filing checklist and additional information please see our website: <https://www.mass.gov/regulatory-review>.

We recommend that rare species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to rare species and their habitats is likely to expedite endangered species regulatory review.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If the purpose of your inquiry is to generate a species list to fulfill the federal Endangered Species Act (16 U.S.C. 1531 et seq.) information requirements for a permit, proposal, or authorization of any kind from a federal agency, we recommend that you contact the National Marine Fisheries Service at (978)281-9328 and use the U.S. Fish and Wildlife Service's Information for Planning and Conservation website (<https://ecos.fws.gov/ipac>). If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at (508) 389-6357.

Sincerely,



Thomas W. French, Ph.D.  
Assistant Director

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Essex County, Massachusetts



## Local office

New England Ecological Services Field Office

☎ (603) 223-2541

📅 (603) 223-0104

70 Commercial Street, Suite 300  
Concord, NH 03301-5094

<http://www.fws.gov/newengland>

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME

STATUS

Northern Long-eared Bat *Myotis septentrionalis*  
No critical habitat has been designated for this species.  
<https://ecos.fws.gov/ecp/species/9045>

Threatened

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

**Bald Eagle** *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Oct 15 to Aug 31

**Black-billed Cuckoo** *Coccyzus erythrophthalmus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9399>

Breeds May 15 to Oct 10

**Bobolink** *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

**Canada Warbler** *Cardellina canadensis*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Aug 10

**Clapper Rail** *Rallus crepitans*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 10 to Oct 31

**Dunlin** *Calidris alpina arctica*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

<b>Eastern Whip-poor-will</b> <i>Anrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
<b>Hudsonian Godwit</b> <i>Limosa haemastica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
<b>Least Tern</b> <i>Sterna antillarum</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 20 to Sep 10
<b>Lesser Yellowlegs</b> <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
<b>Long-eared Owl</b> <i>asio otus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/3631">https://ecos.fws.gov/ecp/species/3631</a>	Breeds elsewhere
<b>Nelson's Sparrow</b> <i>Ammodramus nelsoni</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Sep 5
<b>Prairie Warbler</b> <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
<b>Purple Sandpiper</b> <i>Calidris maritima</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
<b>Red-throated Loon</b> <i>Gavia stellata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
<b>Ruddy Turnstone</b> <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
<b>Rusty Blackbird</b> <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

<p><b>Seaside Sparrow</b> <i>Ammodramus maritimus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Aug 20
<p><b>Semipalmated Sandpiper</b> <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds elsewhere
<p><b>Short-billed Dowitcher</b> <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9480">https://ecos.fws.gov/ecp/species/9480</a></p>	Breeds elsewhere
<p><b>Snowy Owl</b> <i>Bubo scandiacus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds elsewhere
<p><b>Whimbrel</b> <i>Numenius phaeopus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9483">https://ecos.fws.gov/ecp/species/9483</a></p>	Breeds elsewhere
<p><b>Willet</b> <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 5
<p><b>Wood Thrush</b> <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Aug 31

## Probability of Presence Summary

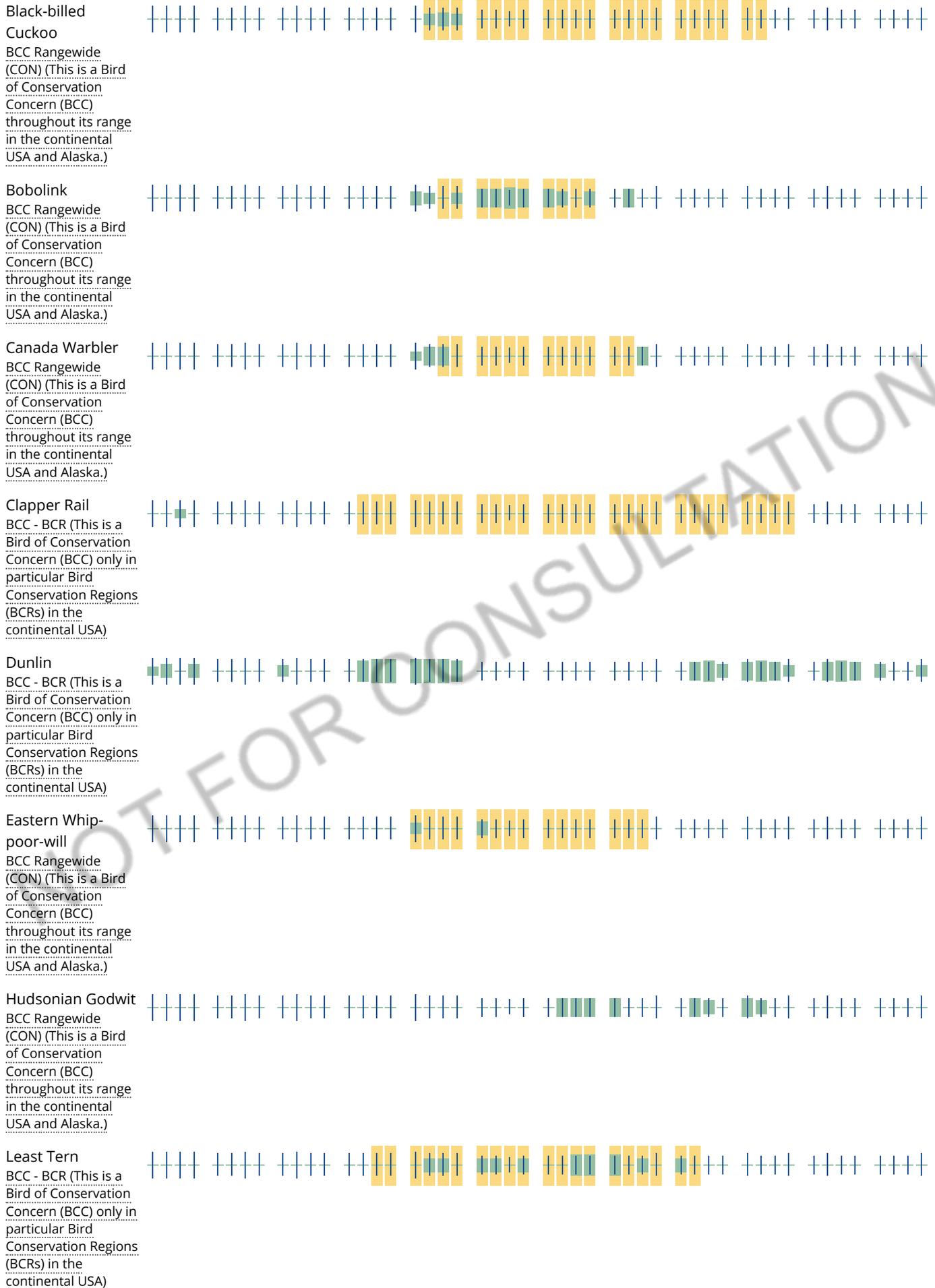
The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

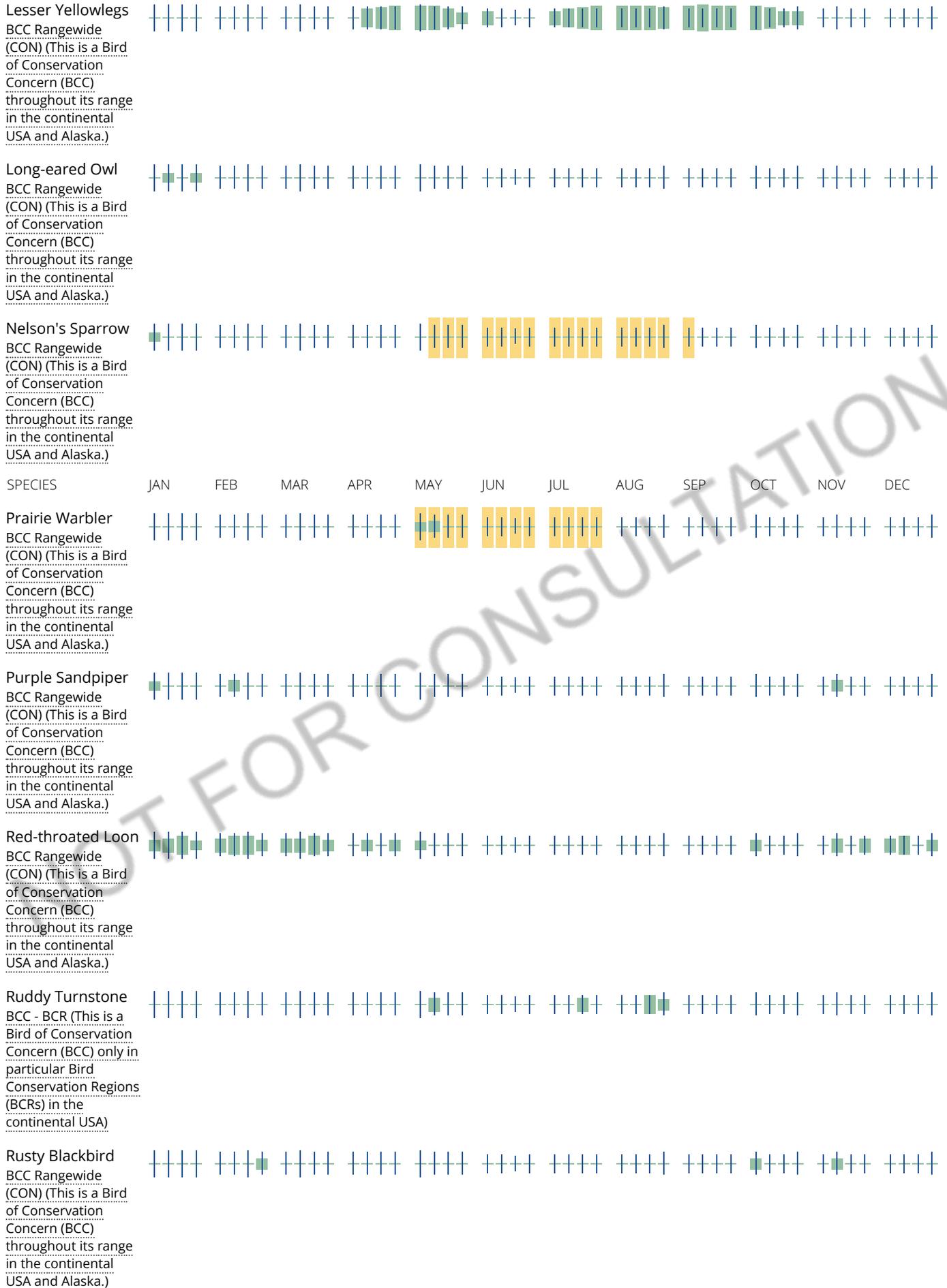
### Probability of Presence (■)

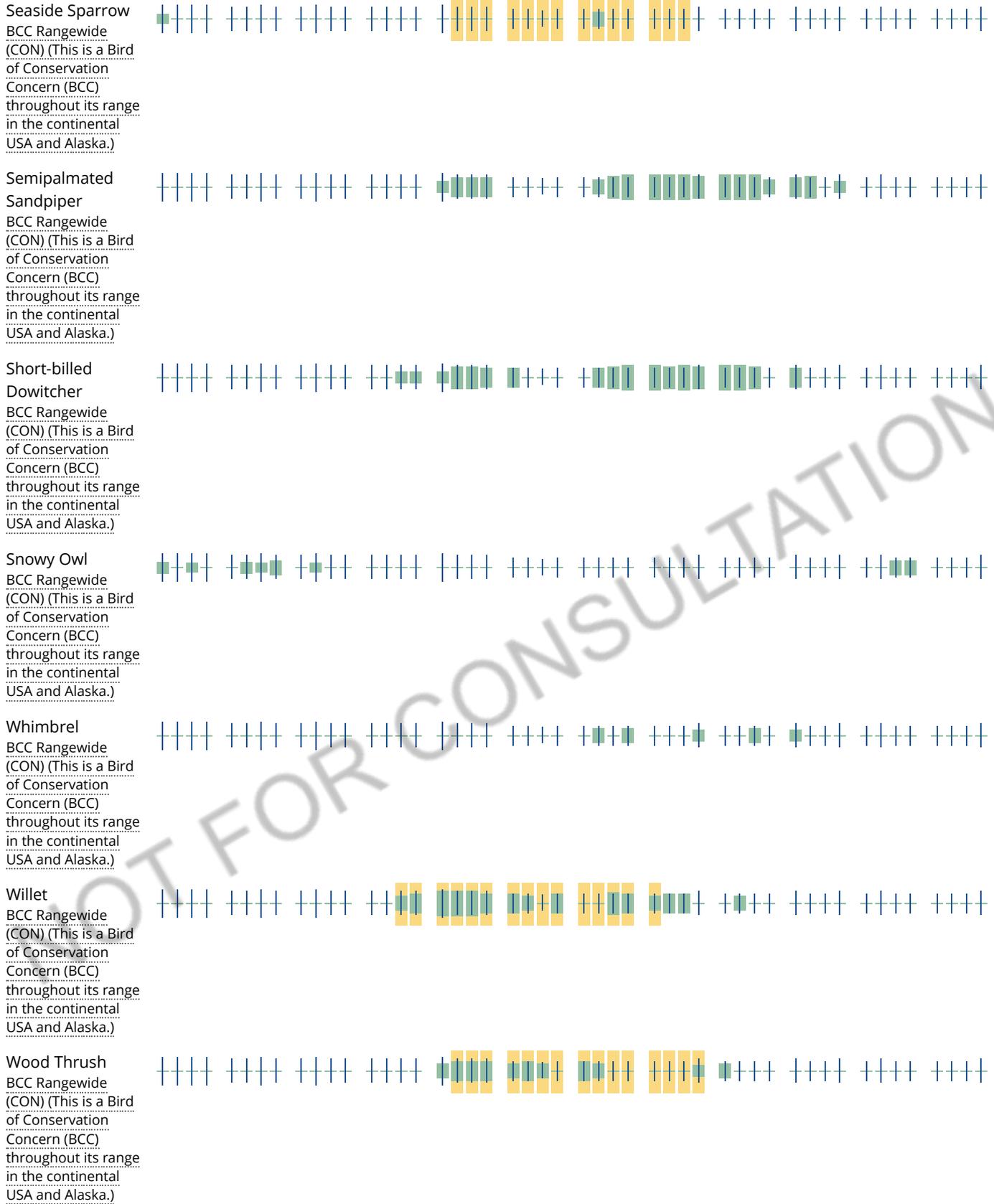
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:









**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to

occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

### What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

### What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

## Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

## What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

## Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

# Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1R](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PFO1E](#)

[PFO1/4E](#)

[PSS1E](#)

FRESHWATER POND

[PUBHh](#)

[PUBFh](#)

RIVERINE

[R1UBV](#)

[R4SBC](#)

[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### **Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



GZA GeoEnvironmental, Inc.