Uncle Harvey's Pond, Orleans

Notice of Intent Application

Proposed Alum Treatment

Town of Orleans
Conservation Commission
February 2021

Prepared for:
Town of Orleans
Orleans Marine and Freshwater Quality Committee
19 School Road
Orleans, MA 02653

BSC Job #50365.00

Prepared by:

BSC GROUP

349 Route 28, Unit D
W. Yarmouth, Massachusetts 02673

BSC GROUP
Transportation ▪ Energy ▪ Land Development

349 Main Street
(Route 28), Unit D
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MA 02673

Tel: 508-778-8919
800-288-8123

www.bscgroup.com

February 11, 2021

Town of Orleans
Conservation Commission
19 School Road
Orleans, MA 02653
Attn: John Jannell, Conservation Agent

RE: Revised Notice of Intent Application, Proposed Aluminum Treatment at Uncle Harvey's Pond, Uncle Harvey's Lane, Orleans, MA
BSC Job #50365.00

Dear Mr. Jannell and Members of the Conservation Commission:

BSC Group, Inc. (BSC) in coordination with SWCA Environmental Consultants, is pleased to submit this Revised Notice of Intent (NOI) Application on behalf of the Town of Orleans (the Applicant), for the property located at Uncle Harvey's Pond in Orleans, MA (the Site). The proposed project at the site involves the implementation of an alum treatment within Uncle Harvey's Pond resulting in the reduction of available phosphorus and significantly limiting the growth of cyanobacteria. Successive closures of the pond due to public safety concerns stemming from severe cyanobacteria blooms has resulted in the pond being listed on Massachusetts Department of Environmental Protection (MassDEP) Integrated List of Waters as a Category 5 Impaired Waterbody.

The proposed alum treatment, designed based on the recommendations made in a detailed study of Uncle Harvey's Pond conducted by the University of Massachusetts Dartmouth Coastal System Group, was highlighted as the most effective and cost-efficient method of phosphorus reduction and water quality improvement. The purpose of this proposed project is to initiate the immediate suppression of harmful cyanobacteria blooms through phosphorus reduction for the benefit of public safety and ecological health, as required under the Clean Water Act Section 303(d) for impaired waterbodies. Due to private ownership of the pond which extends from each parcel abutting the pond to the center of the pond, only those landowners who have approved of the proposed project will have treatment occur on their properties. At this time, 12 of the 15 landowners have consented to treatment on their properties. Therefore, a siltation curtain will be installed over a portion of Uncle Harvey's Pond to prevent treatment from being conducted on the three parcels who have not consented to the treatment.

Revisions to this NOI application include the following:

- Updated WPA NOI Application form with temporary impacts to LUW;
- Updated Project Description with additional requested information including treatment details, construction and staging information, additional information regarding the project alternatives, updated information regarding the scope of the treatment and mitigation measures;
- Additional photos showing the two proposed access points/staging areas;
- Photo pages showing siltation curtain and typical boat used for alum treatments;

Engineers
Environmental Scientists
Custom Software Developers
Landscape Architects
Planners
Surveyors

- Siltation curtain details;
- Revised Pond Remediation Figure showing access and staging areas on Site;
- Chemical Safety Sheets for chemicals proposed for use in the alum treatment.

For more information please refer to the enclosed NOI application and accompanying materials. If you have any questions or require additional information, please contact me at (508) 778 - 8919.

Truly yours,

BSC GROUP, INC. AND SWCA ENVIRONMENTAL CONSULTANTS

Matthew Creighton, PWS, MVP
Senior Associate/Coastal Scientist
Manager of Ecological Services – West Yarmouth

Scott Fisher
Team Lead – Ecological Restoration
SWCA Environmental Consultants

cc: Department of Environmental Protection, Southeast Regional Office, 20 Riverside Drive, Lakeville, MA 02347

Marine and Fresh Water Quality Committee, 19 School Road, Orleans, MA 02653

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BSC GROUP

Notice of Intent Form

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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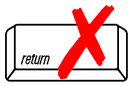
Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Uncle Harvey's Pond — a. Street Address
Orleans — b. City/Town
02653 — c. Zip Code

Latitude and Longitude:
41.779608 — d. Latitude
-69.955182 — e. Longitude

see attached list — f. Assessors Map/Plat Number
see attached list — g. Parcel /Lot Number

2. Applicant:

George — a. First Name
Meservey — b. Last Name
Town of Orleans — c. Organization
19 School Road — d. Street Address
Orleans — e. City/Town
MA — f. State
02653 — g. Zip Code
508-240-3700 — h. Phone Number
i. Fax Number
j. Email Address

3. Property owner (required if different from applicant): ☒ Check if more than one owner

see attached list — a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Matthew — a. First Name
Creighton — b. Last Name
BSC Group Inc. — c. Company
349 Route 28, Unit D — d. Street Address
West Yarmouth — e. City/Town
MA — f. State
02671 — g. Zip Code
508-778-8919 — h. Phone Number
i. Fax Number
mcreighton@bscgroup.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

Fee Exempt — a. Total Fee Paid
b. State Fee Paid
c. City/Town Fee Paid

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A. General Information (continued)

6. General Project Description:

Proposed alum treatment of all properties (extending to the center of the pond) abutting Uncle Harvey's Pond, except for those property owners which have declined to consent of the proposed alum treatment on their property, for the purpose of controlling cyanobacteria blooms. To separate these properties from the teatment area, a temporary siltation will be installed.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

a. County	b. Certificate # (if registered land)
Barnstable	
c. Book	**d. Page Number**
see attached list	see attached list

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☒ Bordering Vegetated Wetland	95 (temporary pruning) 1. square feet	2. square feet
c. ☒ Land Under Waterbodies and Waterways	1,244 (temporary) 1. square feet	2. square feet
	3. cubic yards dredged	

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☐ Riverfront Area

1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   Mass GIS 2020
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

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C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☒ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☐ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Pond Remediation - Uncle Harvey's Pond
a. Plan Title

SWCA Environmental Consultants
b. Prepared By

c. Signed and Stamped by

2/9/2021
d. Final Revision Date

1"=1,500'
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☒ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

John F Kelly — 1. Signature of Applicant

12/17/20 — 2. Date

3. Signature of Property Owner (if different)

4. Date

Matthew Creighton — 5. Signature of Representative (if any)

12/22/2020 — 6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

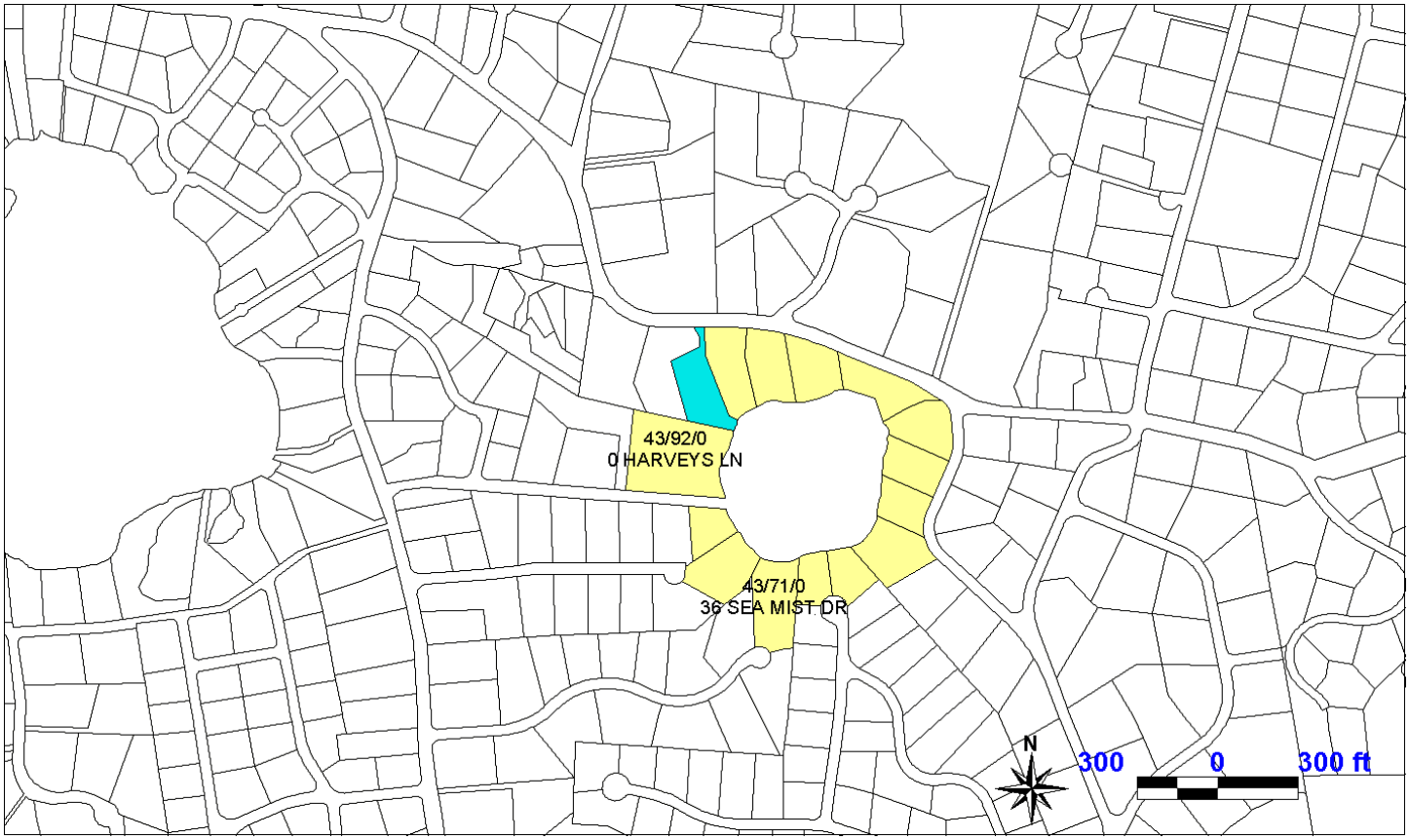
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Table of Uncle Harvey's Pond Property Owners

Map and Parcel	Address of Parcel	Registry of Deeds Information	Owner Name	Owner Mailing Address	Secondary Owner
44/138	75 Pochet Road		Town of Orleans	19 School Road, Orleans, MA 02653	
43/132	71 Pochet Road	14722/169	Betsy S Furtney	PO Box 1136, East Orleans, MA 02643	
43/131	57 Pochet Road	31130/287	Donald McMinn and Harold Lester	3104 Cleveland Ave NW, Washington, DC 20008	
43/130	55 Pochet Road	13198/084	Greg D and Michele Palmer	1901 Indian Head Road, Dayton, OH 45459-1221	
43/129	53 Pochet Road	31094/273	Mary and Jeffrey Heth	PO Box 1341 Orleans, MA 02653	
43/92	0 Harvey's Lane	18787/201	Orleans Conservation Trust	PO Box 1078 East Orleans, MA 02643	
43/91	33 Harvey's Lane	26621/166	Andrew C and Monica Cattano	218 Beach Road, Orleans, MA 02653	
43/73	31 Fisher Way	26594/268	Melissa A Keefe Trustee	PO Box 220, Orleans, MA 02653	Melissa Ann Keefe Trust
43/71	36 Sea Mist Drive	32253/206	John A Piccione and Noreen B Ferrante	231 Ridgeway Road, Weston, MA 02439	
43/70	24 Pleasant View Drive	31061/306	Lorraine E Ackerman TRS	460 Del Pond Dr, Canton, MA 02021	
43/69	25 Pleasant View Drive	29019/279	James F and Nance R Salmon	PO Box 105 East Orleans, MA, 02643	
44/142	17 Uncle Harvey's Way	Certificate #194946	Eleanor G Millard	25 Rocky Pond Road, Boylston, MA 01505	
44/141	15 Uncle Harvey's Way	Certificate #143747	Louis C and Marie E Morongell	15 Uncle Harvey's Way, Orleans, MA 02653	
44/140	11 Uncle Harvey's Way	22703/136	Elizabeth and Stuart Delima EST	PO Box 1524, East Orleans, MA 02643	Elizabeth and Stuart Delima Trust
44/139	1 Uncle Harvey's Way	28447/151	Christopher H Janssen	1 Uncle Harvey's Way, Orleans, MA 02653	

TOWN OF ORLEANS, MA
BOARD OF ASSESSORS
19 School Rd., Orleans, MA 02653

Custom Abutters List



Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
3578	43-69-0-R	SALMON JAMES F & NANCE R	25 PLEASANT VIEW DR	PO BOX 105	E ORLEANS	MA	02643
3579	43-70-0-R	ACKERMAN LORRAINE R TRS	24 PLEASANT VIEW DR	460 DEL POND DR	CANTON	MA	02021
3580	43-71-0-R	PICCIONE JOHN &FERRANTE NOREEN	36 SEA MIST DR	231 RIDGEWAY RD	WESTON	MA	02439
3582	43-73-0-R	KEEFFE MELISSA A TRUSTEE MELISSA ANN KEEFFE TRUST	31 FISHER WY	PO BOX 220	ORLEANS	MA	02653
3600	43-91-0-R	CATTANO ANDREW C & MONICA	33 HARVEYS LN	218 BEACH RD	ORLEANS	MA	02653
5983	43-92-0-E	ORLEANS CONSERVATION TRUST	0 HARVEYS LN	PO BOX 1078	E ORLEANS	MA	02643
3635	43-129-0-R	HETH JEFFREY & MARY	53 POCHET RD	PO BOX 1341	ORLEANS	MA	02653
3636	43-130-0-R	PALMER D GREG & MICHELE	55 POCHET RD	1901 INDIAN HEAD RD	DAYTON	OH	45459-1221
3637	43-131-0-R	MCMINN DONALD & LESTER HAROLD	57 POCHET RD	3104 CLEVELAND AVE NW	WASHINGTON	DC	20008
3638	43-132-0-R	FURTNEY BETSY S TRUSTEE BETSY S FURTNEY 2020 LIV TRUST	71 POCHET RD	PO BOX 1136	E ORLEANS	MA	02643
6001	44-138-0-E	TOWN OF ORLEANS	75 POCHET RD	19 SCHOOL RD	ORLEANS	MA	02653
3768	44-139-0-R	JANSSEN CHRISTOPHER H	1 UNCLE HARVEYS WY	1 UNCLE HARVEYS WY	ORLEANS	MA	02653
3769	44-140-0-R	DELIMA ELIZABETH & STUART EST STUART & ELIZABETH DELIMA TRUS	11 UNCLE HARVEYS WY	PO BOX 1524	E ORLEANS	MA	02643
3770	44-141-0-R	MORONGELL LOUIS & MARIE ETAL	15 UNCLE HARVEYS WY	15 UNCLE HARVEYS LN	ORLEANS	MA	02653
3771	44-142-0-R	MILLARD ELEANOR G TRUSTEE ELEANOR G MILLARD REVOC TR	17 UNCLE HARVEYS WY	25 ROCKY POND RD	BOYLSTON	MA	01505

Affidavits from Property Owners

BSC GROUP

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

36 SEA MIST DRIVE

Property Address

3580 — Map

43-710-R — Parcel

JOHN A PICCIONE
NORGEN B FERRANTE

Printed Name of Owner

12-16-2020

Date

Signature of Owner

June 15, 2020

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

57 Pochet Rd.

Property Address

3637 Map

43-131-0-R Parcel

Donald R. McMinn / Harold D. Lester, Jr. 11/25/2020

Printed Name of Owner Date

Signature of Owner

June 15, 2020
Salmon

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

25 Pleasant View Drive

Property Address

43 Map

69 Parcel

James F. Salmon

Printed Name of Owner

8/20/20

Date

James F Salmon

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

55 Pochet Road

Property Address

43	**130**
Map	Parcel

MICHELE PALMER

Printed Name of Owner

8/19/2020

Date

Michele Palmer

Signature of Owner

Ackerman
POA Baron

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

24 Pleasant View Drive

Property Address

43 70

Map Parcel

Lorraine Ackerman

Anne Baron, POA for 7.25.2020

Printed Name of Owner Lorraine Ackerman Date

Anne Baron, POA

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

33 Harvey's Lane

Property Address

43	**91**
Map	Parcel

Monica Cattano Andrew Cattano — 6/29/20

Printed Name of Owner — Date

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

11 Uncle Harvey's Way

Property Address

44	**140**
Map	Parcel

Elizabeth C. DeLima — June 23, 2020

Printed Name of Owner — Date

Elizabeth C. DeLima

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

1 Uncle Harvey's Way

Property Address

44	**139**
Map	Parcel

Christopher H. Janssen — 6/23/20

Printed Name of Owner — Date

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

71 Pochet Road

Property Address

43	**132**
Map	Parcel

Betsy S. Furtney — 6/22/20

Printed Name of Owner — Date

Betsy S. Furtney

Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

53 Pochet Road

Property Address

43	**129**
Map	Parcel

Jeffrey Heth — Printed Name of Owner

6/25/20 — Date

Jeffrey Heth — Signature of Owner

Affidavit to be signed by Land Owner(s) of Record for the Proposed Project at Uncle Harvey's Pond

To Whom It May Concern:

By this notice, I agree to allow SWCA Environmental Consultants and BSC Group Inc., acting on behalf of the Town of Orleans, to apply for any and all environmental permits necessary to undertake work associated with an alum treatment at my property located within Uncle Harvey's Pond located in Orleans, Massachusetts.

0 Harvey's Lane

Property Address

43	**92**
Map	Parcel

Stephen O'Grady for Orleans Conservation Trust
Printed Name of Owner

7/28/20
Date

Signature of Owner

Filing Fee Information

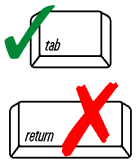
BSC GROUP

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

Uncle Harvey's Pond	Orleans
a. Street Address	b. City/Town
Fee Exempt	Fee Exempt
c. Check number	d. Fee amount

2. Applicant Mailing Address:

George		Meservey
a. First Name		b. Last Name
Town of Orleans		
c. Organization		
19 School Road		
d. Mailing Address		
Orleans	MA	02653
e. City/Town	f. State	g. Zip Code
508-240-3700		
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name		b. Last Name
see attached list		
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Fee Exempt: Municipal Project			

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee: _____ a. Total Fee from Step 5

State share of filing Fee: _____ b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: _____ c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Project Description

BSC GROUP

PROJECT DESCRIPTION

1.0 INTRODUCTION

The proposed project located at Uncle Harvey's Pond (UHP) in Orleans, MA involves the proposed alum treatment of a portion of Uncle Harvey's Pond. This application is being submitted in accordance with the Massachusetts Wetlands Protection Act and the Town of Orleans Wetlands Protection By-law.

2.0 SITE DESCRIPTION

The site located at UHP is a 7.5-acre freshwater pond and has a maximum depth of roughly 21 feet[1]. UHP is associated with a 29.5-acre watershed, based on water table rather than topography[1]. The pond is abutted by residential properties, town-owned land and public access, and conservation land located on the western side of the pond. The property boundaries of all parcels immediately abutting Uncle Harvey's Pond extend into the center of the pond. The wetland resource areas and areas of conservation jurisdiction on the site that are protected under the Wetlands Protection Act and the Town of Orleans's Wetland Protection Bylaw include:

- Land Under Water (LUW)
- Bordering Vegetated Wetland (BVW)

According to the study Uncle Harvey's Pond Management Plan and Diagnostic Assessment (UHP Report), UHP has shown impaired conditions, owing to high phosphorus and chlorophyll concentrations, as well as hypoxic and anoxic conditions at various depths.[1] Likely owing to these regular summertime conditions, cyanobacteria blooms in UHP have become increasingly frequent and severe.[1] These conditions have resulted closures of the pond due to harmful algal blooms; as such UHP was included as an impaired waterbody on the Massachusetts Year 2016 Integrated List of Waters, approved by the Environmental Protection Agency (EPA). The designation as an Impaired Waterbody constitutes a legal obligation under the Clean Water Act Section 303(d) for the municipality/owners to take action to improve water quality for the benefit of public and ecological health.

According to the UHP Report, reduction of phosphorus levels within the pond is vital to improving water quality.[1] Though major source of phosphorus within UHP can be attributed to the sediment regeneration within this historically shallow, kettle hole pond resulting from the yearly growth cycle, it was noted that an ongoing, significant source of phosphorous (likely dating back decades) has come from abutting properties within the watershed.[1] Given the limited filtering and flushing availability from the surrounding watershed and the relatively small size of UHP, the system will remain at risk of continuing eutrophication and sediment build-up if no action is taken to reverse the current cycle.

3.0 PROPOSED ACTIVITIES

The purpose of this application is to authorize the following activities:

Proposed Alum Treatment: In similar highly eutrophic kettle hole lakes on Cape Cod, where watershed management alone could not improve water quality sufficiently, alum treatments have been used in the past.[2] A study was conducted in 2016 focusing on the implementation of alum applications in 10 kettle hole lakes located within Cape Cod over the last 20 years[2]. According to

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

the aforementioned study by Wagner, et al, all treated lakes experienced a reduction of the total phosphorus level, relief from algae blooms, increased water clarity, and reduced oxygen demand for multiple years following the application[2]. Iron-bound phosphorus is the dominant form of mobile phosphorus in Cape Cod waterbodies.

Hypoxic (meaning below average oxygen concentrations in the water) dissolved oxygen concentrations in bottom waters of UHP are created through temperature stratification. This occurs traditionally from May-September of each year. These low oxygen conditions favor in-pond phosphorus regeneration from sediment found within the pond. When low oxygen levels exist near the sediment of the pond phosphorus becomes available within the water column for algae generation. The UHP Report indicates that sediment regeneration is the largest source of phosphorus to UHP. Data provided in the report also indicates that total phosphorus within UHP has been increasing since 2001, since said testing was first conducted, and the highest deep-water total phosphorus levels were recorded in September of 2017 at roughly 200 µg/L at a depth of roughly 5.5m. The report indicates that 67% of the total phosphorus load into UHP is from sediment regeneration. This load represents twice as much as the combined watershed load (external).

An alum application is proposed for UHP to achieve a desired total phosphorus level of 10µg/L, recommended by the UHP Report and backed by region-based recommendations by the EPA, which should greatly improve the overall water quality within UHP and eliminate harmful algal bloom development. It is proposed that the treatment occur in the spring and/or fall months when algae concentrations are lower, and less phosphorus will have been released from the sediment as dissolved oxygen levels will not be depleted early in the growing season. The alum treatment will occur over an estimated 3.0 acres of UHP (roughly 40% of the total acreage of UHP), focusing on the areas where water depths exceed 3 meters. At the time of the filing of this NOI application 13 of the 15 property owners of UHP have returned signed affidavits consenting to alum treatment on their property. Use of a siltation curtain to exclude an individual parcel is possible, but will reduce the overall effectiveness of the alum application. Our goal is to maximize total phosphorus reduction to restore a fully functioning pond ecosystem, as well as the protection of the health of all users.

In areas where treatment is not requested by property owners, which will be indicated by those who receive the full NOI application and did not return a signed affidavit consenting to the work, roughly 622 linear feet (lf) of floating siltation curtain will be installed roughly 10', at a minimum, outside of the boundary of the property for the duration of the alum treatment in a configuration designed to exclude properties not consenting to participate in the alum treatment on their property. The siltation curtain would be installed prior to the start of work and monitored twice daily from the start of treatment until the curtain is removed. The curtain will require tethering to a stake on shore or to a tree trunk, however no ground disturbance will be required to install these curtains. The curtain installation will begin and end at approximately the 5-foot water depth mark and will not continue onshore to allow wildlife and fish migration to occur. The curtain will be secured to the pond bottom as is typical in practice by way of weighted chain (inside the curtain) and concrete blocks. The curtain will have temporary impacts to land under water (curtain, concrete blocks, and chains) of approximately 1,244 sf. Upon project completion, the siltation curtain will remain in place for a minimum of two weeks to ensure all alum has had the opportunity to precipitate to the bottom and settle. Dissolved aluminum levels will be sampled weekly until the pre-treatment aluminum levels have been restored. The curtain will be removed following the confirmed achievement of these levels. Removal of the siltation curtain would only

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

incur temporary and minor sediment disturbance to land under water. Photographs of examples of the curtain are included in the attachment section of this application.

Alum can be applied in two manners, one as a powder from the surface or as an aqueous solution. We are proposing an application of an aqueous solution delivered under the surface by way of trailing hoses. The hoses are attached to two tanks on a small vessel such as a 23' Carolina Skiff. The application boat will be launched from the Town Landing off Pochet Road. The trailer will be towed by a standard pickup truck and is 8.5 feet wide and roughly 30 feet long. Currently there is a six to ten-foot clearance/opening at the boat access point associated with the Town Landing. If necessary, limited vegetation trimming within BVW will be conducted along the edge of the boat launch path to allow for the boat to pass. No damage to the roots of the vegetation lining the path is anticipated, therefore no detrimental or permanent impacts to BVW. The alum and sodium aluminate will be staged in a tanker truck either on Pochet Road above the Town Landing or at the end of Harvey's Lane. The material staging location will be determined by the tractor trailer operator and application company at the time of the application. The trailer will not be left on the road overnight. The chemicals come ready to apply in the tanker truck, mixing will not be conducted on site. The truck and application vehicle will both have spill containment kits on board in the event a spill occurs. One tank has the aluminum sulfate solution and the other has sodium aluminate. Planning a dose for an alum application is a combination of determining the proper amount of aluminum to inactivate the available phosphorus and the proper mix of aluminum salts to keep an acceptable pH level. The final determination of the alum dose is completed using a "Jar Test" of the pond water completed a few days prior to the application. For loading and refills, the solution will be pumped from the tanker truck into the storage tanks on board the vessel. In the event that the application boat cannot get close enough to the shoreline for the transfer of the mixture, temporary floating docks can be used to allow deeper water loading to occur.

The alum will be released in portions of the pond identified in the Pond Remediation figure that have a depth of over 3 meters. The UHP Report anticipates that an alum dose range over the treatment area between 5-10 mg/l. Alum will be applied at rates resulting in no more than 5 mg/L in the mixed zone behind the vessel. To aid in reducing potential negative environmental impacts, the alum will be applied during two applications separated by at least one day. The anticipated ratio is 2:1 aluminum sulfate to sodium aluminate at a rate of 326 gallons/acre of aluminum sulfate and 163 gallons/acre of sodium aluminate. This translates to a total volume of application for the entire treatment of 1,108/ gallons of alum and 554 gallons of sodium aluminate. This is considered a small application and will only require 6 refills of the storage tanks on the skiff to complete the application. With the application being split it is likely that the treatment will last roughly 2-3 hours per day (two days total application). It should be noted that alum typically precipitates out of the water column in less than an hour after the application, at which time it becomes inert and harmless to the surrounding ecosystem. Alum treatments do not have an exact lifespan for their effectiveness however, it is anticipated that one treatment should provide 10-15 years of effectiveness at UHP. This period of effectiveness could be altered by a reduction in the area of UHP that is able to be treated along with the rate and duration of inputs of new sources of phosphorus.

Water Quality Monitoring: Water quality within Uncle Harvey's Pond has been monitored extensively since 2001. The water quality monitoring program should continue to be implemented following the alum application at UHP for at least three years. Alum applications can alter pH levels within waterbodies which can result in toxic conditions for fish and invertebrates. To prevent toxic conditions, pH data will be collected throughout the duration of the alum application by the

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

applicator from a secondary boat that will solely focus on sampling during the treatment activities. Pre-treatment alum levels will be taken prior to the proposed alum treatment to establish a base level of alum within UHP. The siltation curtains will only be removed when water samples taken after the proposed treatment, which will be tested at an off-site lab, confirm that alum levels have returned to pre-treatment levels.

In addition, water quality data will be collected monthly at UHP for two years following the alum treatment. Data collection will occur from April to October. Data collected will include: surface and bottom total phosphorus, Secchi disk transparency, chlorophyll a, temperature, pH, conductivity, turbidity, and dissolved oxygen. These monitoring efforts will be essential in determining the success rate of treatment.

4.0 ALTERNATIVE ANALYSIS

The following alternatives have been presented to demonstrate the availability of other treatments options and compare the costs of and benefits of each.

Alternative #1 – No Action Taken: In this alternative, no actions would be taken to address the eutrophication and cyanobacteria blooms in UHP. As previously stated, taking no action will likely result in stasis or further deterioration of water quality within UHP. That will most likely lead to further closures of the pond from harmful cyanobacteria blooms. Furthermore, given that UHP is listed on the most recent 2016 updated list of Impaired Water Bodies within the Commonwealth of Massachusetts, there exists a legal obligation under the Clean Water Act Section 303(d) for the municipality to take some action to improve water quality. Given the noted and credible health risk posed by the recurring cyanobacteria blooms to both the public and the ecosystem, this alternative is not recommended or legally permissible.

Alternative #2 – Dredging: In this alternative, dredging would be undertaken to remove built-up sediments from UHP. According to the UHP Report, the removal of 90% of the average UHP phosphorus regeneration sediment would reduce the average summer total phosphorus concentration to around 14µg/L.[1] Although it was noted in the UHP Report that in order to maintain the targeted phosphorus limit, watershed alterations would be required, otherwise these conditions would be permanent.[1]

Several factors would be at play if the option of dredging was pursued as the chosen treatment method. Water levels in freshwater ponds and lakes are typically lowered to reduce water depths, thus simplifying the dredging process. However, because UHP is groundwater fed and has no outlet or inlet, water drawdown would be technically arduous and not practical.[1] In deeper water, which is present towards the center of UHP, the only practical dredge method would be through the use of a suction dredge directed by a diver.[1] Involving divers brings up added risks depending on the season during which the dredge operation would occur. In summer, the risk to human health due to the presence of cyanobacteria in the water would have to considered, while dredging in winter, which is the most likely scenario to reduce impacts on mussels, fish, and invertebrates, would introduce the risk of low temperatures, ice, and severe weather.

Furthermore, UHP and the surrounding areas lack appropriate space and conditions for staging and dewatering. The boat launch on Harvey's Lane and the water access off of Pochet Road both lack sufficient space for dewatering areas (using any method including pits, tanks, filtration bags, or truck beds) and would provide very little space for the required equipment needed for both the

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

dredging operation and the removal of dredge spoils. Critically, if dewatering were to occur near UHP, water containing suspended sediments could simply re-enter the watershed or flow directly back into UHP. The resuspension of sediments will also result from the dredge activities, regardless of the season or methods used. These two factors in combination could reduce the effectiveness of this treatment option by resuspending phosphorus within the water column, resulting in a subsequent cyanobacteria bloom.

Additionally, the disposal of the dredge spoils will require several factors at a significant cost. Testing of sediments would be required before a disposal site could be selected. The results of the sediment testing could potentially limit the disposal options for the dredge spoils. If a use of these dredge spoils was desired (or possible, pending the results of the sediment analysis) in an upland location, a Beneficial Use Determination under DEP would need to be filed for the disposal site. The BUD will require site analysis to include sampling of soils at the BUD site not just the soils within the pond to ensure compatibility. If the sediment analysis revealed one or multiple components which would limit the disposal site/use options available, an alternative disposal option would be required, such as a lined landfill or incineration. These types of disposal significantly increase the cost per cubic yard and trucking distance/cost.

Finally, the low-end cost estimate of dredging has been estimated at $350,000 without accounting for permitting, monitoring, or additional contingencies including divers, equipment, trucking, and disposal, while a high-end estimate could double that figure ($700,000 or more).[1] Taking all of these factors into account, this alternative is not recommended.

Alternative #3 – Aeration: In this alternative, an aeration system would be installed at UHP. Aeration would provide in-pond phosphorus control through enhanced circulation/aeration from the addition of air/oxygen. This activity would facilitate the chemical binding of sediment phosphorus, which will reduce regeneration and thus the frequency and intensity of cyanobacteria blooms.

There are multiple aeration system options, which have been described in detail in relation to their potential use in UHP within the UHP Report. A standard aeration system, which may require multiple units to treat a necessary area within UHP, and an updraft pumping system, which promotes atmospheric oxygen exchange and oxygen circulation through the water column. For both systems, potential system failure, too large of a treatment area of the unit(s) to effectively treat, and appropriate depth and location of installation could result in a failure to address the oxygen needs of the pond. This could result in cyanobacteria blooms during the summer months. The benefits of the aeration method include the restoration of natural levels oxygen level within the pond, which should have no negative impacts on the ecosystem.[1] However, the installation of the system, anchoring, electric installation could have minor impacts to Land Under Water, BVW, and buffer zone.

The cost for the installation of the standard aeration system is estimated to be $25,700 for at least the first 20 years, not taking into consideration any major equipment failure, damage, monitoring, or adjustments recalculation unit operation to compensate for a variety of environmental factors over time.[1] For the updraft pumping system, the 20-year cost estimate is estimated to be around $150,000, with a capitol cost of $50,000 and an operational cost of $100,000.[1]

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

The installation of an aeration system would require the installation of a structure on the pond shore and an electrical source, which would pose additional environmental permitting requirements to construct. Algae blooms could result if the system were to become inactive due to a malfunction with the equipment. The system would likely require complete replacement within 20 years of the initial installation.[1] Furthermore, the anticipated phosphorus reduction resulting from this alternative, with little deviation between the types of aeration systems which have been proposed within the UHP Report, is estimated to be 19µg/L, which does not meet the targeted limit.

As mentioned previously, with all potential aeration systems, water quality monitoring and calculation/recalibration factors such as operational times, placement of the unit(s), seasonal factors that naturally enhance or decrease oxygen mixing within the water column, as well as the efficiency of system/unit operation at the levels necessary to maintain targeted levels of oxygen within the pond would be required in perpetuity.[1] Even with systems which may be cheaper to operate or require less units within the pond, may have their cost saving benefits nullified as a result of staffing requirements for maintenance, reconfiguration, and monitoring. Taking all these factors into account, this alternative is not recommended.

Alternative #4 – Alum Treatment (Proposed): In this alternative, the project would proceed as proposed. Of all the previously proposed alternatives, the estimated cost is the lowest, at roughly $21,200 to achieve the targeted phosphorus levels in UHP of 10µg/L. The proposed alum treatment is likely the most effective method for the immediate treatment of UHP, with full pond treatment phosphorus reduction is estimated to be 7.6µg/L. As previously stated, this application is for 13 out of 15 property owners reducing the treatment area and thus reducing the anticipated phosphorus reduction to an estimated 14.3µg/L. At a reduction of 14.3µg/L Alternative #4 remains the best alternative to get closest to the target level of 10µg/L and remains the most cost-effective solution.

The use of alum treatment, preferably in the late spring/early summer, will result in the binding of excess phosphorous in the water column, resulting in the starvation of cyanobacteria.[1] If conducted at the appropriate time and using the methods stated Section 3, this treatment would likely result in a drastic reduction of cyanophytes for the duration of several years, potentially even decades based on information gathered from other treatments in Cape Cod Ponds[2]. It can be argued that this treatment will not solve the larger issue at hand, which has been found to be the result of septic leaching and sediment cycles within this relatively small, shallow, pond which is closed off from significant flushing or upland filtration. However, when compared with other in-pond chemical control options such as algaecide or the addition of settling agents, microbes, pathogens, zooplankton, fish, or plants, this treatment option would directly target the main cause of the cyanobacteria blooms without having any significant or unanticipated side effect to the environment.[1]

Alternatives Conclusion:

The alternatives presented in the section above were described in greater detail within the UHP Report under "V.B. Review of Management Options: Watershed and In-Pond Controls" which begins on page 66 of the report. A summary of these findings can be found under the Section "VI. Recommended Plan" which is included within this application as an attachment, along with the Executive Summary of the UHP Report. The treatment methods which were deemed most likely to address sediment phosphorus regeneration, while also considering cost and long-term effectiveness, for alum treatment and aeration. Alum treatment was chosen after weighing the costs

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

and benefits of both treatments as well as the requirements of the TMDL to provide a treatment. The UHP Report concluded after a review of the best case scenario in performance for both treatments that the likely best outcome for an alum treatment would be 8 µg/L TP, while the likely best outcome for an aeration system is 19 µg/L TP.[1] Given the results of the analysis contained within the UHP Report, alum treatment is most likely to meet the targeted 10 µg/L TP, while also having benefits of the anticipated longevity of the results, the cost efficient nature of the treatment, and the predicted immediacy of the results.[1]

5.0 PERFORMANCE STANDARDS

The following section will discuss the ways in which the proposed project will meet the performance standards laid out under the Wetlands Protection Act 310 CMR 10.00 for Bordering Vegetated Wetlands (310 CMR 10.55(4)) and Land Under Water Bodies and Waterways (310 CMR 10.56(4)).

Performance Standards for Bordering Vegetated Wetlands under 310 CMR 10.55(4):

(a) Where the presumption set forth in 310 CMR 10.55(3) is not overcome, any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impair any portion of said area.

- Only temporary impacts (approximately 95 square feet of vegetation pruning) to BVW are proposed as a part of this project. These temporary impacts consist of vegetation trimming along the boat launch off of the Town Access leading from Pochet Road, which has been deemed necessary to launch the boat for conducting the alum treatment application within UHP. The limited vegetation trimming will ensure that no permanent impacts within the BVW will occur.

(b) Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of up to 5000 square feet of Bordering Vegetated Wetland 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:

1. the surface of the replacement area to be created ("the replacement area") shall be equal to that of the area that will be lost ("the lost area");

2. the ground water and surface elevation of the replacement area shall be approximately equal to that of the lost area;

3. The overall horizontal configuration and location of the replacement area with respect to the bank shall be similar to that of the lost area;

4. the replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area;

5. the replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area;

6. at least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons, and prior to said vegetative reestablishment any exposed soil in the replacement area shall be temporarily stabilized to prevent erosion in accordance with standard U.S. Soil Conservation Service methods; and

7. the replacement area shall be provided in a manner which is consistent with all other General Performance Standards for each resource area in Part III of 310 CMR 10.00. In the exercise of this discretion, the issuing authority shall consider the magnitude of the

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

alteration and the significance of the project site to the interests identified in M.G.L. c. 131, § 40, the extent to which adverse impacts can be avoided, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.

- *The proposed project will not result in a permanent impact or result in a loss of BVW; therefore, this performance standard is not applicable to the proposed project.*

(c) Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of a portion of Bordering Vegetated Wetland when;

1. said portion has a surface area less than 500 square feet;

2. said portion extends in a distinct linear configuration ("finger-like") into adjacent uplands; and

3. in the judgment of the issuing authority it is not reasonable to scale down, redesign or otherwise change the proposed work so that it could be completed without loss of said wetland.

- *The proposed project will not result in a permanent impact to or result in a loss of BVW; therefore, this performance standard is not applicable to the proposed project.*

(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.

- *There are no known rare vertebrate or invertebrate species mapped under Estimated or Priority Habitat of Rare Species (according to 2021 Mass GIS data layers) within the boundary of the proposed project or within .25 miles of the proposed project site. Therefore, this performance standard is not applicable to the proposed project.*

(e) Any proposed work shall not destroy or otherwise impair any portion of a Bordering Vegetated Wetland that is within an Area of Critical Environmental Concern designated by the Secretary of Energy and Environmental Affairs under M.G.L. c. 21A, § 2(7) and 301 CMR 12.00: Areas of Critical Environmental Concern. 310 CMR 10.55(4)(e):

1. supersedes the provisions of 310 CMR 10.55(4)(b) and (c);

2. shall not apply if the presumption set forth at 310 CMR 10.55(3) is overcome;

3. shall not apply to work proposed under 310 CMR 10.53(3)(l); and

4. shall not apply to maintenance of stormwater detention, retention, or sedimentation ponds, or to maintenance of stormwater energy dissipating structures, that have been constructed in accordance with a valid order of conditions.

- *There are no known Areas of Critical Environmental Concern (according to 2021 Mass GIS data layers) within the boundary of the proposed project or within .25 miles of the proposed project site. Therefore, this performance standard is not applicable to the proposed project.*

Performance Standards for Land Under Waterbodies and Waterways under 310 CMR 10.56(4):

(a) Where the presumption set forth in 310 CMR 10.56(3) is not overcome, any proposed work within Land under Water Bodies and Waterways shall not impair the following:

1. The water carrying capacity within the defined channel, which is provided by said land in conjunction with the banks;

- There are no channels within UHP; therefore, this performance standard is not applicable to the proposed project.

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

2. Ground and surface water quality;

- The proposed project will not result in impacts to the ground water quality and will only result in temporary impacts to pH in a portion of UHP. In addition, the proposed alum application will result in significant improvements to the water quality of UHP through the inactivation of phosphorus within the water column of the pond, thus preventing or diminishing the likelihood of harmful cyanobacteria blooms.

3. The capacity of said land to provide breeding habitat, escape cover and food for fisheries; and

- No permanent physical impacts to LUW are proposed as the part of this project. Anchors associated with the installation of a siltation curtain will only have a temporary impact on LUW, totaling in 1,244 sf as they will not require excavation to install. The proposed alum application will not alter LUW in a capacity which will diminish the capacity for supporting breeding, escape cover, or food for fisheries. The alum application could result in a temporary change in water chemistry, namely a potential drop in the pH of the pond. Methods of preventing such a shift in pH within UHP can be addressed through use of a mix of alum salt during the application process and through monitoring of water quality before, during, and within the weeks following the alum application[1].

4. The capacity of said land to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures established under 310 CMR 10.60.

- The proposed alum application will occur over roughly 45%% of UHP. UHP can be categorized as a Class B waterbody by Mass DEP and the average temperature profile indicates that the waterbody is suitable for a warm water fishery[1]. However, as a designated Category 5 Impaired Waterbody (from the 2016 Massachusetts Integrated List), there are factors which diminish the quality of wildlife habitat for both the organisms living within/around the pond and migratory birds, namely due to the frequent occurrence of harmful cyanobacteria blooms.[1] This project seeks to improve the ecosystem within and surrounding UHP through an alum application. The only potential direct impact to wildlife would be an unlikely fish die off to do a sudden change in pH. However, with pH monitoring this is highly unlikely. To ensure minimal impacts to fish, fish die off is monitored throughout the project and the project can be stopped if more than 10 fish are found dead during treatment.

5. Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.56(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width. This presumption is rebuttable and may be overcome by the submittal of credible evidence from a competent source. Notwithstanding the requirements of 310 CMR 10.56(4)(a)4., the impact on

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

Land under Water Bodies and Waterways caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures established under 310 CMR 10.60.

- A stream crossing is not proposed; therefore, this performance standard is not applicable to the proposed project.

(b) Notwithstanding the provisions of 310 CMR 10.56(4)(a), the issuing authority may issue an Order in accordance with M.G.L. c. 131, § 40 to maintain or improve boat channels within Land under Water Bodies and Waterways when said work is designed and carried out using the best practical measures so as to minimize adverse effects such as the suspension or transport of pollutants, increases in turbidity, the smothering of bottom organisms, the accumulation of pollutants by organisms or the destruction of fisheries habitat or nutrient source areas.

- There are no designated boat channels within Uncle Harvey's Pond; therefore, this performance standard is not applicable to the proposed project. However, there is a small boat launch that will be used. Utilizing this access may temporarily impact (pruning) some BVW vegetation, which will be allowed to regrow following the project.

(c) Notwithstanding the provisions of 310 CMR 10.56(4)(a) or (b), 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.

- There are no known rare vertebrate or invertebrate species mapped under Estimated or Priority Habitat of Rare Species (according to 2021 Mass GIS data layers) within the boundary of the proposed project or within .25 miles of the proposed project site. Therefore, this performance standard is not applicable to the proposed project.

6.0 CONSTRUCTION DETAILS

The proposed construction access will be at the Town boat launch off Pochet Road with a staging area for chemicals at the eastern end of Harvey's Lane, which has a small, paved parking area and a trail and provides water access. The alum treatment is expected to be conducted from a 23' Carolina Skiff. The boat will be launched into UHP for the treatments using the boat launch, which requires access across a portion of BVW (currently about a 6 to 10-foot-wide channel exists, the boat trailer is approximately 8.5 feet wide). To prevent negative impacts to BVW during the boat launch and any necessary travel between the staging area and UHP, minor vegetation trimming along the existing access and temporary installation of up to three 10' long floats to assist in refilling of treatment solution.

Staging within the paved areas at the end of Uncle Harvey's Pond will consist of an area to mix the alum treatment and an area to stage all necessary equipment. The mixing of the treatment solution will occur over spill pads and spill kits will be available on site in the event of a spill. Any necessary washing of tools or equipment will be conducted over a container, which will be removed from the site. No washing or refueling will be allowed within 100-feet of UHP or a stormwater inlets/catch basin.

7.0 MITIGATION MEASURES

The potential for fish kill is possible, however it has been the experience of most application firms that fish kills resulting from alum applications are very rare. The pH will be monitored during the treatment process and the levels of the buffering solution can be adjusted to handle the pH alteration. As this project is being split across two days and because the portion of UHP to be treated is very limited (45% of the pond) it is unlikely that there would be considerable pH issue,

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

leading to a fish kill. However, should the treatment applicators note the death of up to 10 fish at any time during the treatment process, all operations will cease immediately, and measured will be taken to stabilize pH or any other factor which could be resulting in a fish die off.

The UHP Report recommended the development of on-going water quality monitoring of UHP and coordination with the Orleans Marine and Fresh Water Quality Committee to ensure the long-term success of the treatment.[1] The report recommends monthly monitoring of temperature, total phosphorus, dissolved oxygen profiles, Secchi clarity, and total depth readings, along with collection of water quality samples before and after each summer (April and August or September) for the first three years following the initial treatment.[1] Analysis of these data and results from laboratory testing of the samples, as suggested in the UHP Report, recommendations will serve to provide evidence of the treatments' effectiveness and/or allow for an understanding what issues may remain.

The proposed project, using an alum treatment, is designed to mitigate an existing public and environmental health threat quickly and efficiently. Treatment of phosphorus in the pond through the application of alum will reduce the usable phosphorus in the pond but will not control any new phosphorus entering the system following treatment. The input of phosphorus following treatment will increase the frequency of treatments needed to maintain overall pond health and stop cyanobacteria blooms. It is estimated that the proposed alum treatment will remain effective for 10-15 years, though its effects could continue for additional years beyond this estimate. Regular monitoring of the water quality with UHP, especially during summer months when cyanobacteria blooms are most likely to occur, will be necessary to determine if and when additional treatments will be necessary. The Coastal Systems Group School for Marine Science and Technology assessment addressed these concerns and recommended additional measures be taken to slow/stop the input of phosphorous into UHP.

These included:

- Sewering the properties within the UHP watershed or implementing a program to upgrade septic systems to reduce phosphorous loading, is also a high priority. Septic systems were listed as the largest input of phosphorus into the system outside of what already exists in the pond.
- Improving the existing stormwater system on Pochet Road by relocating the outlet draining into UHP and/or providing additional treatments before release into the pond. The stormwater runoff directed into the pond was listed as the second largest source of phosphorus entering UHP. However, this was minimal compared to the existing septic system loads.
- Providing additional public outreach on buffer zone management, native planting guidance, reduce lawn areas, and reduced fertilizer use. Because buffer zones already exist between properties and UHP and the Town has already implemented a fertilizer regulation, this recommendation was the least impactful to reduce nutrient loads. However, it is still a tool that will help reduce the overall nutrient load entering UHP.

These additional mitigation measures should also be considered to slow the input of nutrients entering the system.

[1]Eichner, E., B. Howes, and D. Schlezinger. 2018. Uncle Harvey's Pond Management Plan and Diagnostic Assessment. Town of Orleans, Massachusetts. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 106 pp.

[2]Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16.

Executive Summary of Uncle Harvey's Pond Management Plan And Diagnostic Assessment Report Excerpt

For full SMAST report can be found on the Town of Orleans Website:
https://www.town.orleans.ma.us/sites/g/files/vyhlif3631/f/uploads/uncleharveyspond_mgmtplan_orleans_final_march2018.pdf

For full Wagner KJ, Meringolo D, Mitchell DF, Moran E, and Smith S. 2017. Aluminum treatments to control internal phosphorus loading in lakes on Cape Cod Massachusetts. Lake Reserv Manage. 00:1-16: https://www.tandfonline.com/doi/full/10.1080/10402381.2017.1308449

BSC GROUP

Executive Summary

Uncle Harvey's Pond Management Plan
And Diagnostic Assessment
FINAL REPORT
March 2018

The Town of Orleans has over 60 freshwater ponds of various sizes and depths. These ponds and lakes are important recreational areas for swimming, fishing, and boating. Their natural habitats also provide important ecological and commercial services for cranberry bogs, herring runs, and nitrogen attenuation protecting estuaries. Orleans citizens have long recognized that ponds are important community resources and began pond monitoring water quality in 1999 and have continued have these efforts through both town and regional efforts like the Cape Cod Pond and Lake Stewards (PALS) program.

As the Town of Orleans has moved forward on development of comprehensive water quality management through the Orleans Water Quality Advisory Panel (OWQAP) efforts, the Town has benefited from its regular volunteer pond water quality monitoring. All available monitoring data was recently organized and reviewed by School for Marine Science and Technology, University of Massachusetts Dartmouth (CSP/SMAST) staff.[1] This review provided initial assessments of water quality conditions for the monitored ponds and identified data gaps that need to be addressed in order to develop and assess pond management options. Using local knowledge and the data review findings, the Freshwater Ponds Working Group and the Orleans Marine and Fresh Water Quality Committee (MFWQC) developed an initial prioritization for development and implementation of freshwater pond management activities.

Uncle Harvey's Pond (UHP) was selected through these prioritization discussions as the first Orleans fresh water pond for completion of a management and remediation plan. Among the primary issues identified during these discussions was the UHP history of blue-green algal blooms and associated Board of Health closures. As a follow-up, CSP/SMAST staff worked with the Ponds Working Group and the MFWQC to develop a series of data gap tasks for UHP during 2017, including: a) collection of phytoplankton samples to understand blue-green algae fluctuations, b) collection of sediment cores to understand how much phosphorus is released to the UHP water column in summer under aerobic (oxygenated) and anaerobic (anoxic) conditions, and c) measurement and chemical analysis of storm runoff into the pond to understand potential impacts from nearby roads.

UHP is a 7.5 acre pond located in the eastern portion of Orleans, just to the south of Pochet Road and east of Barley Neck Road. It has a maximum depth of 6.5 m and a volume of 100,383 cubic meters. Its watershed is 119,279 square meters (29.5 acres) and is based on water table, rather

[1] Eichner, E and B. Howes. 2017. Town of Orleans Freshwater Ponds, Water Quality Monitoring Database: Development and Review. Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. New Bedford, MA. 217 pp.

than land surface topography. Stormwater runoff from road areas outside of the watershed occasionally discharges into UHP from a pipe connected to a wetland on the north side of Pochet Road. Review of historic maps show that the area around the pond was mostly developed over the past 70 years.

Review of water quality data shows that UHP regularly has impaired conditions with anoxic conditions in deeper waters and high phosphorus and chlorophyll concentrations. Temporary temperature stratification at a variety of depths regularly occurs throughout the summer, creating hypoxic DO concentrations in bottom waters that sometimes rise to within 1.5 m of the surface. These low oxygen conditions favor phosphorus regeneration from the UHP sediments and the temporary isolation due to temperature stratification allows phosphorus concentrations to rise. Significant sediment phosphorus release into a temporarily isolated deeper layer followed by a mixing of the whole column is likely the cause of blue-green algal blooms. The frequency of these blooms and the associated Board of Health and Massachusetts Department of Public Health closure of the pond have caused UHP to be listed on Massachusetts Department of Environmental Protection (MassDEP) Integrated List of impaired waters. Phytoplankton monitoring during 2017 showed that blue-green/cyanophytes were the dominant species in June, July, August, and September and increased significantly in September when hypoxic conditions were measured throughout most of the UHP water column.

Review of water quality data also shows that phosphorus control is the key to restoring acceptable water quality conditions in UHP. Project staff developed a phosphorus budget that showed that 90% of the primary external/watershed sources of phosphorus to UHP were from septic system wastewater from 2 to 3 properties and phosphorus deposition on the pond surface. Stormwater runoff monitoring suggested it was not a significant source of phosphorus to UHP. Sediment regeneration, however, was the largest source of phosphorus to UHP; the sum of all external/watershed sources was only half of the average sediment regeneration. Overall total annual phosphorus loading to pond waters (both watershed and sediments) was 3.5 kg P/yr. Although sediment regeneration is a key for current water quality management, all sediment phosphorus originally came from watershed sources, so both should be addressed.

The phosphorus-enriched and eutrophic conditions in UHP are largely due to internal and external phosphorus additions combined with a relatively small watershed compared to the pond volume. The relatively small watershed creates a comparatively long residence time (slow turnover) for pond waters. Therefore reducing the phosphorus inputs to pond waters or enhancing the turnover of water within the pond will have similar effects on pond habitat and water quality.

Potential options to manage phosphorus sources were reviewed and focused on both external/watershed phosphorus management, as well as internal/in-pond phosphorus management. Wastewater control, which is the primary phosphorus source under local control, could be addressed through sewering or phosphorus-removal septic systems on properties within the UHP watershed. Sewering has been proposed in previous Town wastewater management strategies (there are 6 properties with the potential to eventually contribute wastewater phosphorus to UHP). There are some available phosphorus-removal septic system designs, but these are regarded by the MassDEP as experimental. Similarly, another alternative, but

unproven, approach may be to move leachfields to different locations/flowpaths on a 20 year cycle, but this would require additional assessment of each property to determine whether another suitable leachfield location was available. Whichever solution of these wastewater solutions is selected, UHP conditions would likely require at least a decade to experience the impacts. Further community discussion of these options will be required.

After reviewing internal/in-pond management options, three potential options were applicable to UHP: 1) aeration, 2) phosphorus inactivation ("alum treatment"), and 3) dredging. Using information from the monitoring and data gap task, costs were developed for each of these options based on a 20 year lifecycle: aeration, $25,717; alum, $21,211, and dredging (low estimate), $349,984. Dredging costs were so high largely because of the requirements of construction of dewatering areas and disposal of dredged materials. CSP/SMAST staff also developed likely ranges of phosphorus reduction for each option, which showed that the alum and dredging options were most likely to achieve the desired reduction in internal phosphorus release. The developed costs do not include costs for permitting, which will be required for any in-pond treatment, or follow-up/compliance monitoring that may be required by local or state regulators. At the Town level, in-pond approaches will require review and permitting by the Conservation Commission. All in-pond treatments on Cape Cod, regardless of type, have also required follow-up monitoring. If an alum treatment is selected, a MassDEP permit to apply chemicals will also be required. Additional contingency costs may also be anticipated.

After completion of the diagnostic review of UHP water quality and ecosystem function and the review of applicable management options, CSP/SMAST staff recommended a series of management steps to restore UHP, including the following:

1. Use UHP surface water planning/target TP concentration of 10 μg/L
2. Development of a UHP watershed wastewater management strategy.

   There are 6 properties most likely to eventually add wastewater phosphorus to UHP. Permanent phosphorus removal could be achieved by sewer connections, while experimental phosphorus removing septic systems may achieve >90% removal. Community discussions of the relative acceptance of options and difference in costs should help resolve which option is preferred.
3. Select and implement either an alum treatment or aeration as an in-pond treatment to address sediment phosphorus regeneration.

   The cost difference between these two options is relatively nominal, but they do have differing levels of maintenance, long-term commitment, and likely in-pond phosphorus reduction/performance. An aeration system will require Town commitment to operate forever, which means maintenance and energy costs will accrue every year for the foreseeable future with a planned capital cost for replacement after 20 years. The alum treatment will have a one-time cost for the application with no anticipated maintenance or energy costs and will sustain improved conditions for a decade or more. If the alum treatment last for 15 years or more, the alum treatment would definitely be more cost effective than the aeration system. Alum treatments generally have benefits beyond 15 years, but there are a variety of factors that may shorten their longevity, such as not addressing existing watershed phosphorus additions or adding new phosphorus additions, such as from new development or increased density of development

within the watershed. Review of remedial performance, based on implementation in other ponds, also shows that an alum treatment is more likely to attain the planning target of 10 μg/L TP. This review of performance found that the likely best outcome for an alum treatment would be 8 μg/L TP, while the likely best outcome for an aeration system is 19 μg/L TP. Community discussions of the relative acceptance of the two options and difference in costs schedules and performance should help resolve which option is preferred.

4. Develop and implement an adaptive management monitoring program.
   Regardless of the in-pond treatment that is selected, it is recommended that a tiered monitoring program be implemented once the treatment begins. The first tier should focus on monitoring for three years following the implementation of the in-pond option with a focus on feedback and adjustment. The second tier would be implemented after three years of acceptable results and return to April and August sampling following PALS protocols with data review with town-wide pond data every three years. Monitoring programs are typically required by regulatory agencies as conditions of approval for in-pond management activities.
5. Develop a pondshore education program for properties adjacent to UHP.
   Include details for landscaping management strategies, including specific species to plant, ways to maintain and minimize disturbance of natural buffers and ways to avoid direct stormwater inputs.

Implementation of these recommendations will require funding sources and close coordination among local project planners and local regulatory boards. Potential funding sources include local funds, state grants, state budget directives, and county funds. It is further recommended that the town contact appropriate officials to explore these options. CSP/SMAST staff is available to further assist the town with implementation and regulatory activities.

The Town of Orleans Marine and Fresh Water Quality Committee (MFWQC) conducted a number of public meetings to review the draft UHP Management Plan and discuss the Plan results and preferred management options. As a result, the MFWQC members adopted the following management goals for UHP:

a) Stop blue-green algal blooms and public exposure to toxins (reduce in-pond sediment phosphorus regeneration; improved dissolved oxygen),
b) Restore and then maintain the pond ecosystem (reduce watershed phosphorus inputs), and
c) Continue to provide public access for passive recreation.

Using these goals as guidance and considering the draft UHP management plan findings, as well as public input, the MFWQC members adopted the following management recommendations for inclusion in the final UHP Management Plan:

1) **Sewer connections should be prioritized for the properties contributing wastewater phosphorus to UHP.** The MFWQC members recognize that the installation of sewers will likely require a number of years to reach the UHP area, but regard this as the long-term solution to reduce wastewater phosphorus inputs to UHP. Prior to the installation of sewers, MFWQC would like to work with Town staff and other committees to evaluate potential options to require mandatory pumping of septic tanks every 2-3 years.

2) **The MFWQC and other community partners should work to organize and facilitate access to pond-side landscaping guidance.** MFWQC members have noted a number of recent efforts to provide guidance on landscaping and fertilizer usage to protect Orleans resources, including the 2014 Town fertilizer regulation. MFWQC would like to organize these materials and ensure that they are available in a section of the Town's website.
3) **The existing Pochet Road stormwater system should be refined to retain more runoff water in the wetland system north of the road.** Road runoff from a large area around UHP is currently collected in a wetland north of Pochet Road that has an overflow pipe that runs under the road and discharges onto the UHP landing property. Use of a boards or similar structures to decrease the overflow to UHP would address the majority of the stormwater phosphorus reaching UHP.
4) **An alum treatment should be the preferred option for addressing UHP internal phosphorus regeneration from the sediments**. The MFWQC considered the likely performance and costs associated with various options to reduce the regeneration of phosphorus from the UHP sediments (which represent 67% of the water column phosphorus). Based on this review in consultation with CSP/SMAST staff, MFWQC selected phosphorus inactivation through an alum application (addition of a mix of aluminum salts) as the preferred option.

MFWQC recognizes that additional steps will be necessary to complete community review and implementation of the UHP Management Plan. MFWQC will be discussing the Plan with UHP property abutters and the Orleans Board of Selectmen. Once the Plan and associated recommended actions have been accepted, regulatory review and approval, including review by the Orleans Conservation Commission, will be sought.

CSP/SMAST Recommended Treatment Plan Excerpt

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VI. Recommended Plan

Based on the above review of applicable options, CSP/SMAST staff recommends the following for management and restoration of UHP:

1. Use surface water planning/target TP concentration of 10 µg/L for UHP
2. Development of a wastewater management strategy within the UHP watershed. There are 6 properties most likely to eventually add wastewater phosphorus to UHP. Permanent phosphorus removal could be achieved by sewer connections, while experimental phosphorus removing septic systems may achieve >90% removal. Community discussions of the relative acceptance of options and difference in costs should help resolve which option is preferred.
3. Select and implement either an alum treatment or aeration as an in-pond treatment to address sediment phosphorus regeneration. The cost difference on an annual basis between these two options is relatively nominal, but they do have differing levels of maintenance, long-term commitment, and likely in-pond phosphorus reduction/performance . An aeration system will require Town commitment to operate forever, which means maintenance and energy costs will accrue every year for the foreseeable future with a planned capital cost for replacement after 20 years. The alum treatment will have a one-time cost for the application with no anticipated maintenance or energy costs and will sustain improved conditions for a decade or more. If the alum treatment lasts for 15 years or more, the alum treatment would definitely be more cost effective than the aeration system. Alum treatments generally have benefits beyond 15 years, but there are a variety of factors that may shorten their longevity, such as not addressing existing watershed phosphorus additions or adding new phosphorus additions, such as new development or increased density of development within the watershed. Review of remedial performance, based on implementation in other ponds, also shows that an alum treatment is more likely to attain the planning target of 10 µg/L TP. This review of performance found that the likely best outcome for an alum treatment would be 8 µg/L TP, while the likely best outcome for an aeration system is 19 µg/L TP. Community discussions of the relative acceptance of the two options and difference in costs schedules and performance should help resolve which option is preferred.
4. Develop and implement an adaptive management monitoring program with regular reporting to Orleans Marine and Fresh Water Quality Committee. Regardless of the in-pond treatment that is selected, it is recommended that a tiered monitoring program be implemented once the treatment begins. The first tier should focus on monitoring for three years following the implementation of the in-pond option. It is recommended that this tier include collection of monthly temperature and dissolved oxygen profiles and Secchi clarity and total depth readings, along with collection of water quality samples at every meter in April and August/September. Collected samples should be analyzed for standard PALS assays, including TP, TN, chlorophyll and pheophytin, alkalinity, and pH plus ortho-P. Laboratory procedures should be based on detection limits the same or lower than those used for PALS analyses. Data should be reviewed after the completion of each year and compared to baseline data discussed in this report, as well as previous years in the first tier sampling. If this review suggests adjustments to management efforts, these should be discussed at the Orleans Marine and Fresh Water Quality Committee. If no adjustments are suggested after three years of this monitoring, it is recommended that a second tier of monitoring be implemented returning to April and

August/September sampling following PALS protocols and that data be reviewed with town-wide pond data every three years. It is estimated that reasonable cost for annual monitoring and reporting during the recommended first tier would be approximately $5,000 provided volunteers collected all the samples and readings. Monitoring programs are typically required by regulatory agencies as conditions of approval for in-pond management activities.

5. Develop a pondshore education program for properties adjacent to UHP. Include details for landscaping management strategies, including specific species to plant, ways to maintain and minimize disturbance of natural buffers and ways to avoid direct stormwater inputs.

Permitting will be required for any in-pond treatment. At the Town level, either of the approaches will require review and permitting by the Conservation Commission. All in-pond treatments on Cape Cod, regardless of type, have generally required follow-up monitoring as a regulatory requirement. If an alum treatment is selected, a MassDEP permit to apply chemicals will also be required. A reasonable cost for standard permitting would be approximately $10,000 with some contingencies for additional meetings and application clarifications.

Funding for the implementation of the recommended management plan will require discussions. Potential funding sources for pond restoration/management activities typically include:

a) Town Budget,
b) directed funds from the state legislative budget,
c) Massachusetts Department of Environmental Protection (MassDEP) pass-through funding from EPA [*i.e.*, Section 319, 604b, or 104b(3) grants],
d) Massachusetts Department of Conservation Recreation (MassDCR) grants,
e) Massachusetts Coastal Zone Management (MassCZM) grants, and
f) Barnstable County funds.

The Town of Orleans Marine and Fresh Water Quality Committee (MFWQC) conducted a number of public meetings to review the draft UHP Management Plan and discuss the Plan results and preferred management options. As a result, the MFWQC members adopted the following management goals for UHP:

a) Stop blue-green algal blooms and public exposure to toxins (reduce in-pond sediment phosphorus regeneration; improved dissolved oxygen),
b) Restore and then maintain the pond ecosystem (reduce watershed phosphorus inputs), and
c) Provide public access for passive recreation.

Using these goals as guidance and considering the draft UHP management plan findings, as well as public input, the MFWQC members adopted the following management recommendations for inclusion in the final UHP Management Plan:

1) **Sewer connections should be prioritized for the properties contributing wastewater phosphorus to UHP.** The MFWQC members recognize that the installation of sewers will likely require a number of years to reach the UHP area, but regard this as the long-term solution to reduce wastewater phosphorus inputs to UHP. Prior to the installation of

sewers, MFWQC would like to work with Town staff and other committees to evaluate potential options to require mandatory pumping of septic tanks every 2-3 years.

2) T**he MFWQC and other community partners should work to organize and facilitate access to pond-side landscaping guidance.** MFWQC members have noted a number of recent efforts to provide guidance on landscaping and fertilizer usage to protect Orleans resources, including the 2014 Town fertilizer regulation. MFWQC would like to organize these materials and ensure that they are available in a section of the Town's website.
3) **An alum treatment should be the preferred option for addressing UHP internal phosphorus regeneration from the sediments**. The MFWQC considered the likely performance and costs associated with various options to reduce the regeneration of phosphorus from the UHP sediments (which represent 67% of the water column phosphorus). Based on this review in consultation with CSP/SMAST staff, MFWQC selected phosphorus inactivation through an alum application (addition of a mix of aluminum salts) as the preferred option.

MFWQC recognizes that additional steps will be necessary to complete community review and implementation of the UHP Management Plan. MFWQC will be discussing the Plan with UHP property abutters and the Orleans Board of Selectmen. Once the Plan and associated recommended actions have been accepted, regulatory review and approval, including review by the Orleans Conservation Commission, will be sought.

USGS Site Locus Map

BSC GROUP

Document Path: \\bscbos\yar\Projects-YAR\5036500\Environmental\GIS\Output\Maps\MXD\ReportMaps\LOCUS_UncleHarvey.mxd
Date Saved: 1/28/2020 8:50:10 AM

Scale:
1 inch = 1,500 feet
0 760 1,520
Feet
(page size: 8.5 X 11)

UNCLE HARVEY'S POND, ORLEANS MA

USGS Site Locus Map

Source: 2013 National Geographic Society, i-cubed

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THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

NHESP Priority & Estimated Habitat Map

BSC GROUP

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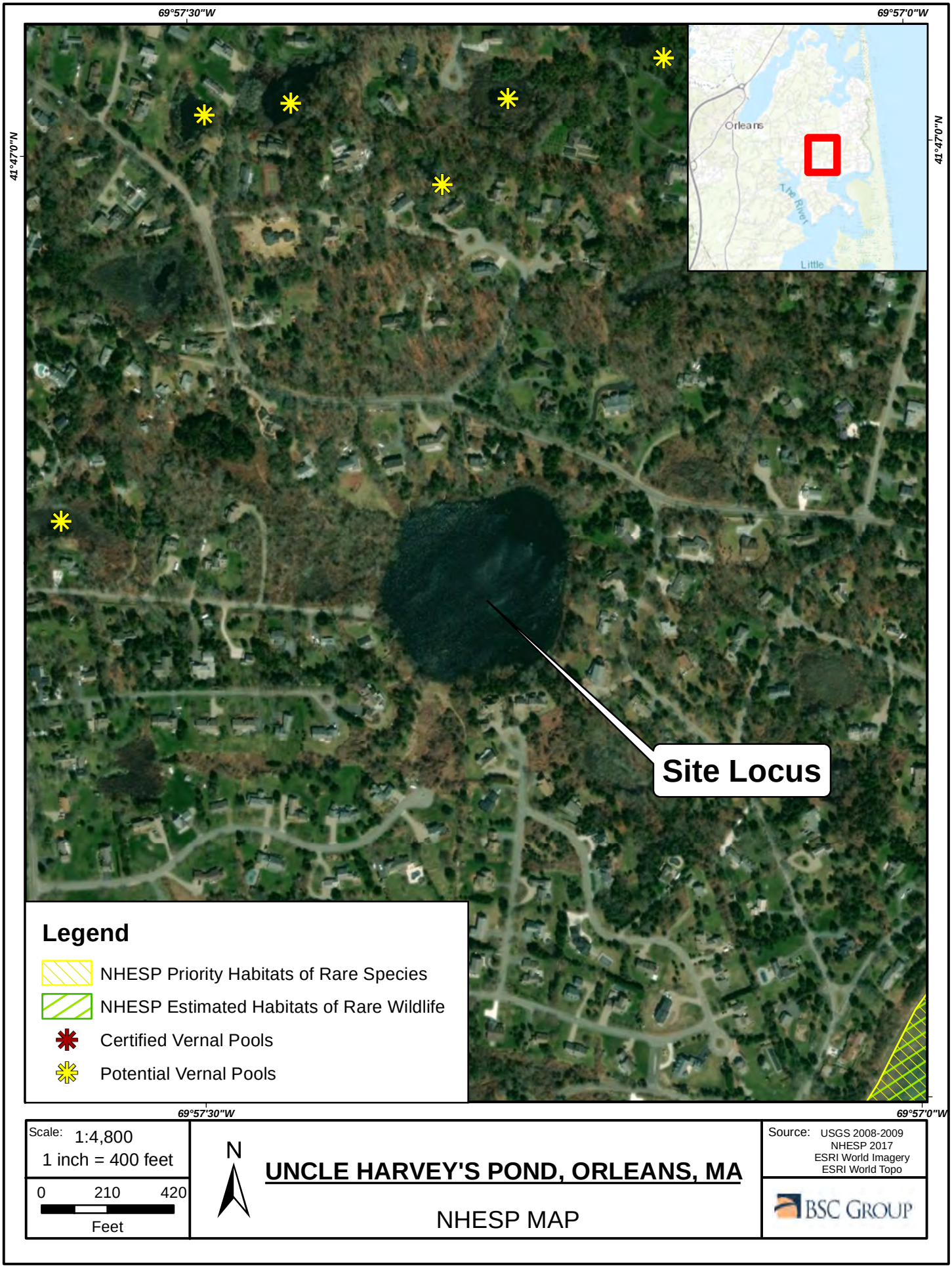
Date Saved: 1/28/2020 9:02:50 AM



Scale: 1:4,800
1 inch = 400 feet

0 210 420
Feet

N

UNCLE HARVEY'S POND, ORLEANS, MA

NHESP MAP

Source: USGS 2008-2009
NHESP 2017
ESRI World Imagery
ESRI World Topo

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THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

FEMA Map

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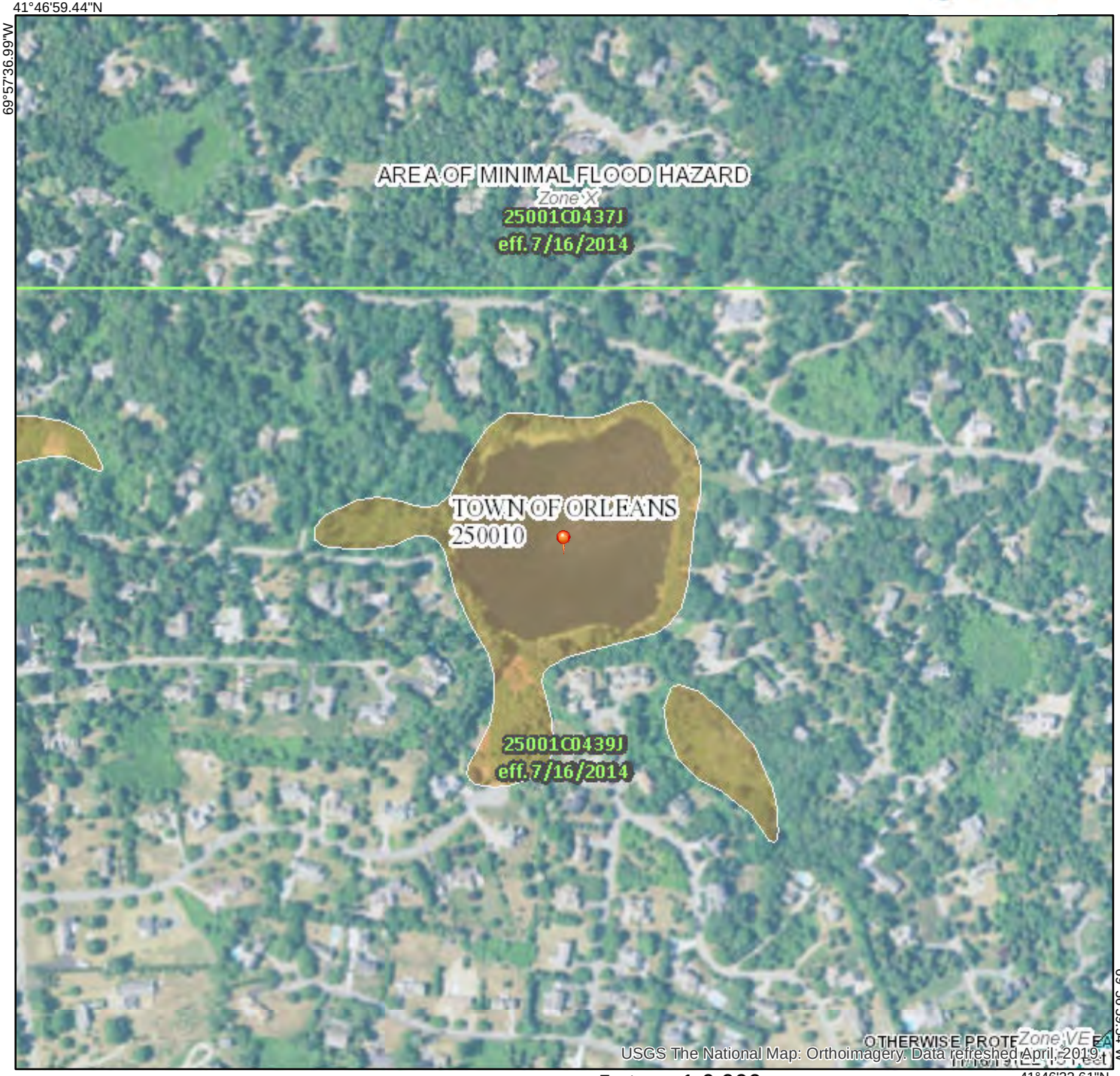
National Flood Hazard Layer FIRMette

FEMA

41°46'59.44"N

69°57'36.99"W



69°56'59.54"W

41°46'32.61"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 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 *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 1/27/2020 at 6:33:30 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.

Pond Remediation Figure

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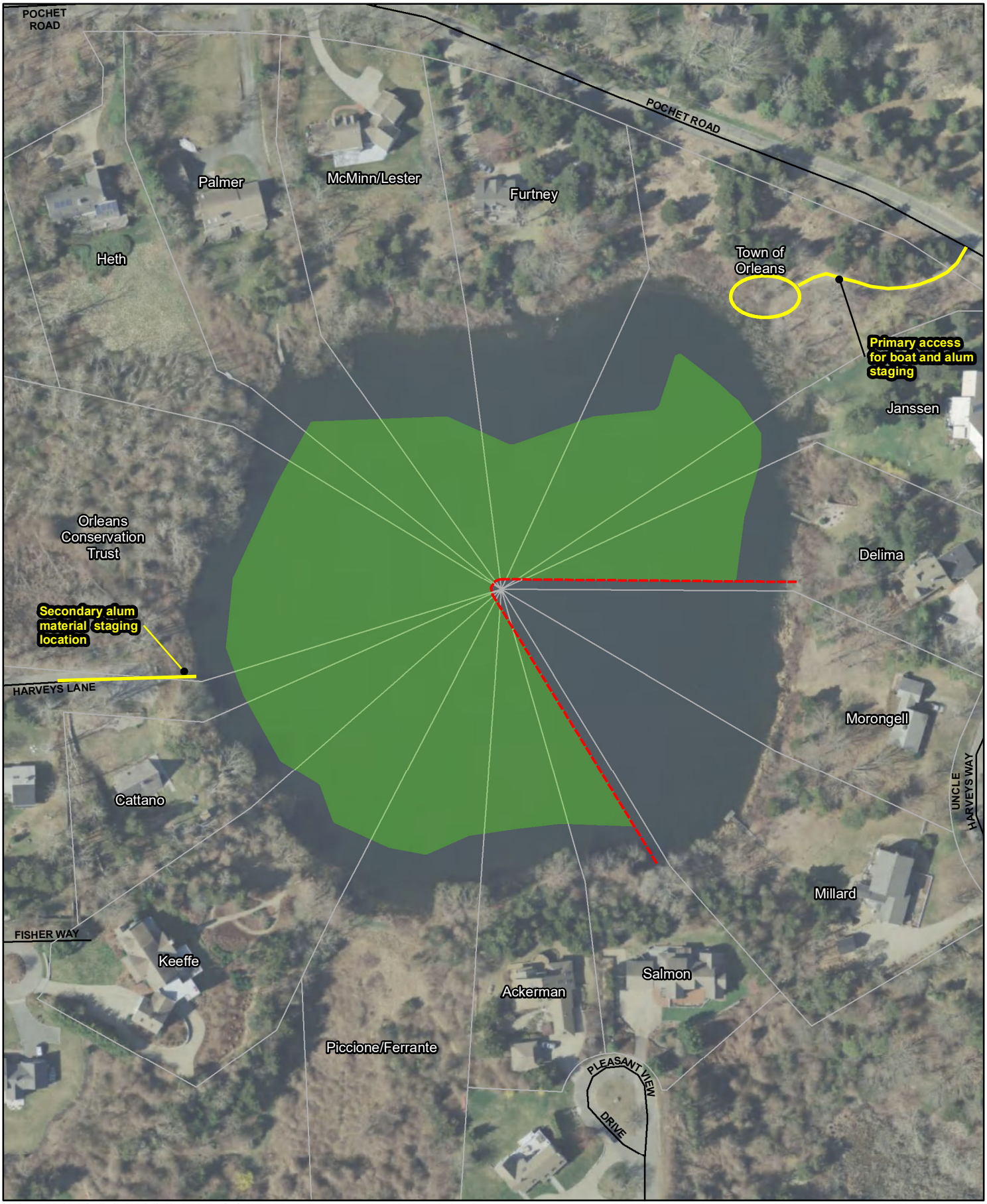

SWCA ENVIRONMENTAL CONSULTANTS

POND REMEDIATION
UNCLE HARVEY'S POND
ORLEANS, MASSACHUSETTS

Figure 1. Proposed Treatment

Floating Barrier
Alum Treatment Area (3.4 acres)
Approximate Property Boundary

1:1,500

Created By: L. Johnson
Project Number: 57850
Date: 2/9/2021
NAD 1983 StatePlane Massachusetts Mainland FIPS 2001

0 50 100 Feet
0 20 40 Meters

Groundwater Figure

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Uncle Harvey's Pond, Orleans, MA

Watershed Figure

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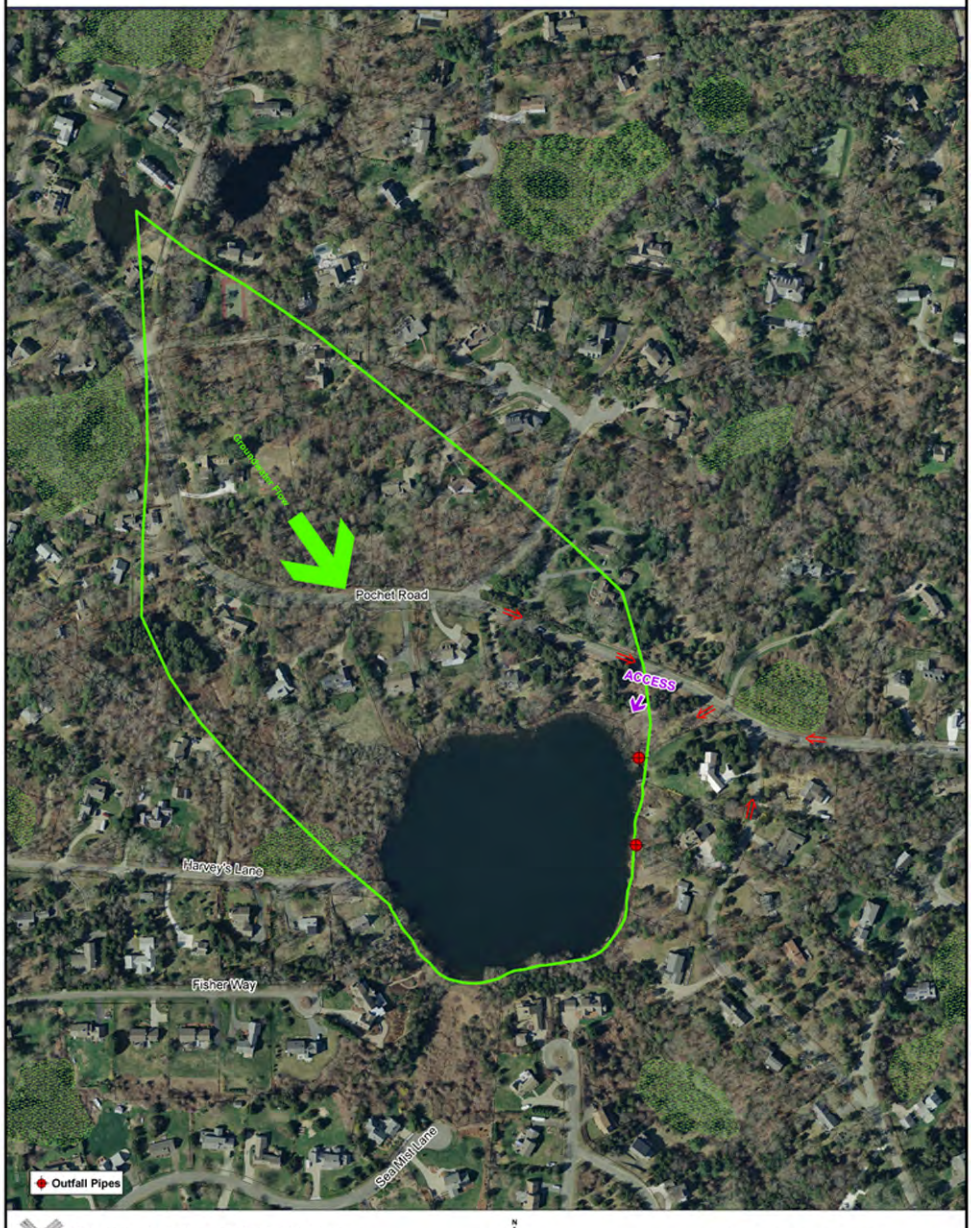
Inside the Uncle Harvey's Pond Watershed



This map is illustrative and intended for planning purposes only. Orleans GIS, 2016

0 100 200 400 Feet

Uncle Harvey's Pond Information

- 20 feet deep
- 6.95 acres in size
- Surrounded by residential development
- Impacted by septic systems, road run-off, fertilizers
- Fails to meet Dissolved Oxygen standards in bottom waters
- Fails to meet CCC Phosphorus standards
- Summer blooms of cyanobacteria (toxic)

Site Photographs

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Photo 1: View of Uncle Harvey's Pond with cyanobacteria bloom.

Photo 2: View of Uncle Harvey's Pond with cyanobacteria bloom amongst vegetation along the shore.

Photo 3: View of cyanobacteria bloom within Uncle Harvey's Pond.

Photo 4: View of cyanobacteria bloom within Uncle Harvey's Pond.

Siltation Curtain Details and Equipment Photos

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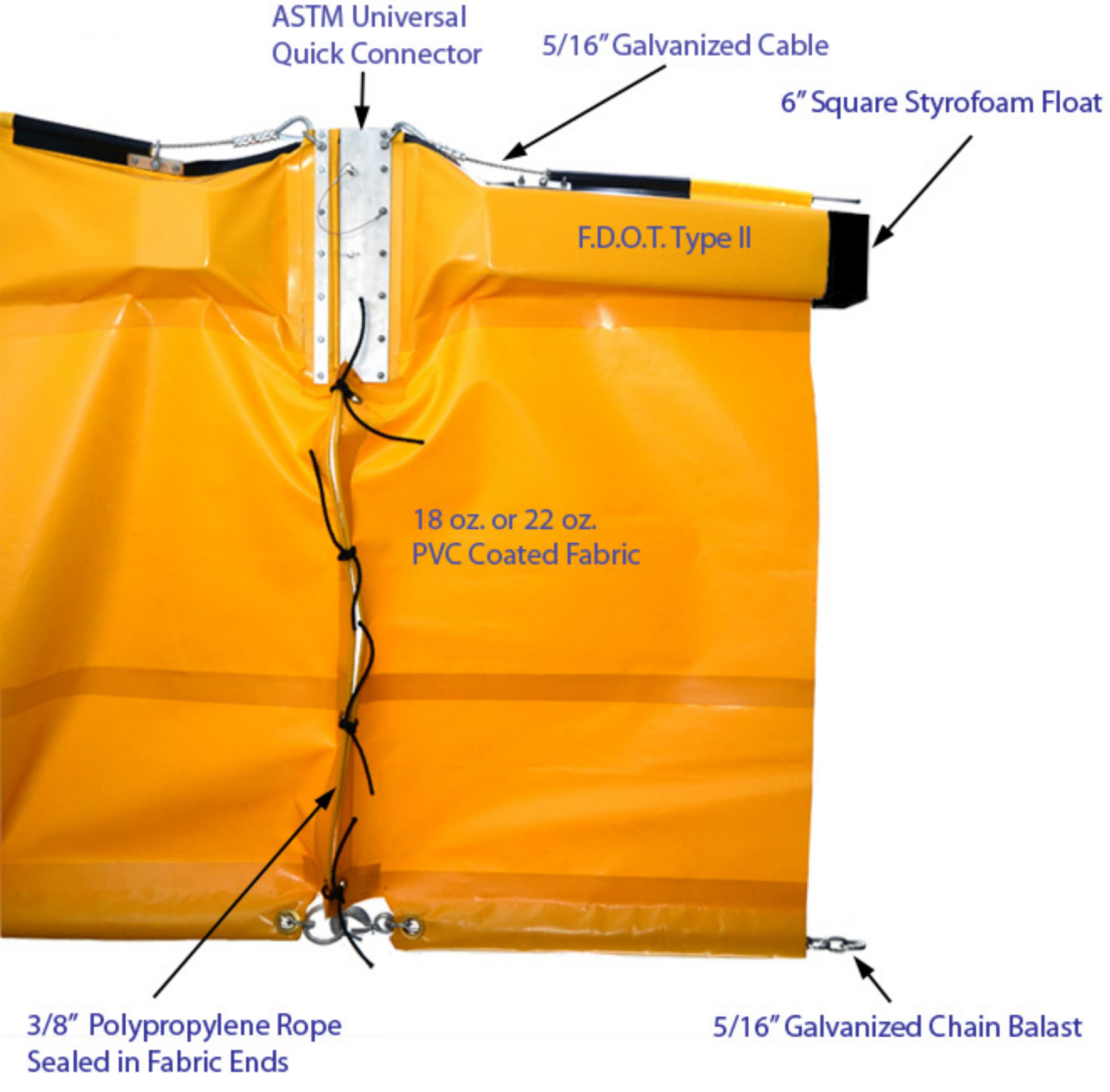
Photo 1: View of installed siltation barrier from above.

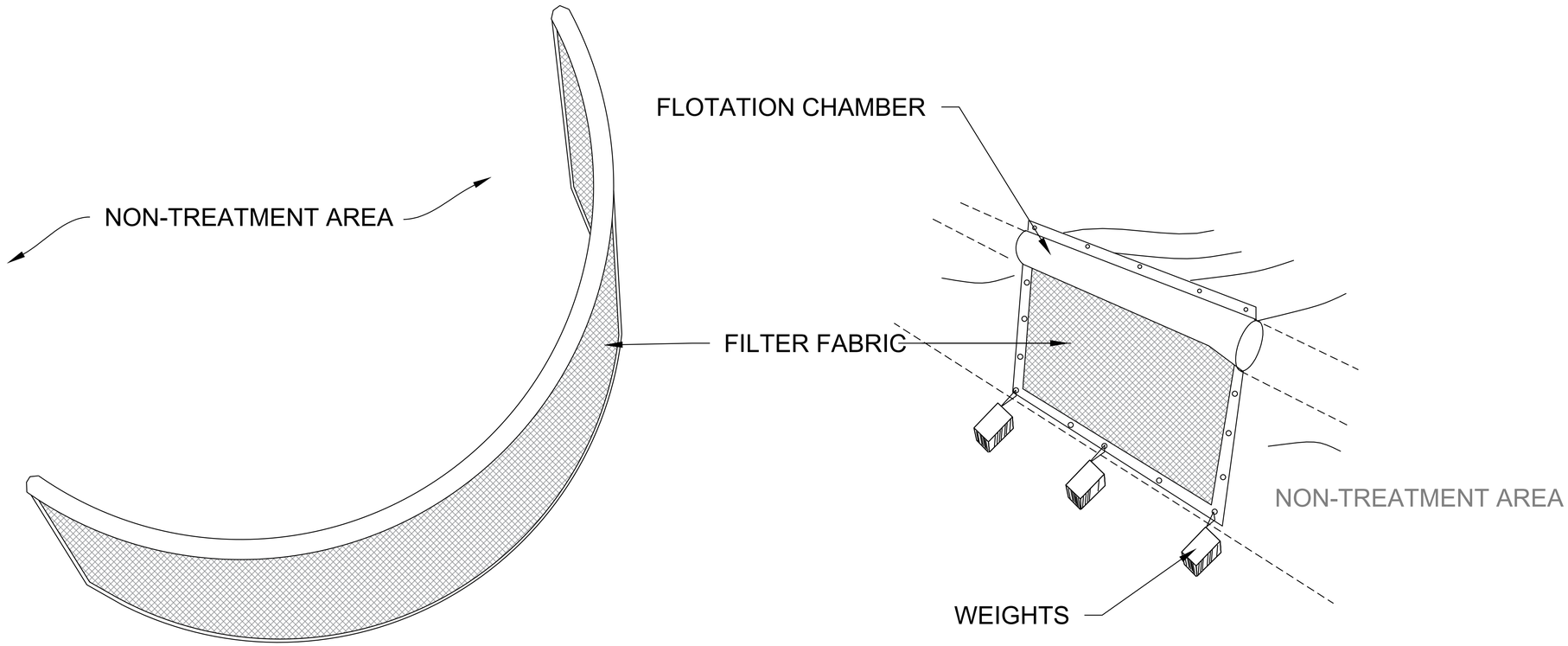
Photo 2: View of installed siltation barrier with the barrier's floatation visible.

Photo 3: View of installed siltation barrier with the barrier's floatation visible.

Photo 4: View of vessel often used for similar alum treatment applications.

Mark II Turbidity Barrier





2 SILTATION CURTAIN DETAIL FOR ALUMINUM APPLICATION (TYP.)

Scale: NTS

Safety Data Sheets for Proposed Treatment Chemicals

BSC GROUP

Since 1967

Holland Company

LIQUID ALUMINUM SULFATE

Aluminum Sulfate Hydrate – Basic

Safety Data Sheet

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product/Chemical Name: Liquid Aluminum Sulfate Hydrate - Basic
Chemical Family: Inorganic aluminum salt
General use: Water treatment and industrial applications

Company Information:
Holland Company, Inc.
153 Howland Avenue
Adams, MA 01220 U.S.A.
Phone: 413-743-1292 FAX: 413-743-1298

Emergency Phone:
1-800-424-9300 Chemtrac (USA)
1-613-996-6666 CANTUTEC (Canada)

SECTION 2. HAZARDS IDENTIFICATION

WARNING
IRRITANT AVOID CONTACT

WARNING
MAY BE CORROSIVE TO SOME METALS

Hazard Statements
Irritating to eyes. Category 2
Skin contact may result in mild irritation.
If inhaled mist may be irritating.
May be harmful if swallowed. Category 5
May be corrosive to some metals. Category 1

Precautionary Statements
Avoid direct contact.
Use protective equipment if direct contact is possible.
Wash hands and any exposed skin thoroughly after contact.
Store and transfer using equipment of appropriate materials of construction.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name: Aluminum soluble salts (liquid)
Name: Liquid Aluminum Sulfate Hydrate - Basic
CAS#: 17927-65-0
Impurities: NA. No impurities or additives which are themselves classified and which contribute to the classification of this substance.

SECTION 4. FIRST AID MEASURES

Eye contact: Irritating to eyes.
Immediately rinse eyes with water for an extended period.
If possible remove contacts. If irritation persists get medical attention.

Skin contact: May be mildly irritating.
Remove contaminated clothing - footwear and wash skin with water.
If irritation develops get medical attention. Skin abrasions may sting until thoroughly washed.

Inhalation of mist May be irritating to respiratory system.**:**
Remove from continued exposure.
If irritation persists get medical attention.

Ingestion: If a large amount is swallowed get medical attention.
Relative low acute oral toxicity.
Do not actively induce vomiting.
Rinse mouth and drink water.
If discomfort occurs get medical attention.

SECTION 5. FIRE FIGHTING MEASURES

Flammability:
Product is not flammable and will not burn.

Controls:
When possible remove portable product storage containers from areas under fire threat.
To maintain integrity of fixed tanks, containers, and transfer systems use water to cool.

Hazards:
In a fire dried product can decompose at elevated temperatures approximately 760˚C (1400˚F) potentially resulting in the formation of hazardous oxides of sulfur by products. Always avoid inhalation of combustion by products. Stay up wind and avoid low areas.

Special equipment:
In case of possible exposure to products of decomposition use appropriate self-contained or MSHA/NIOSH approved respiratory protection. Consult engineers if necessary.

Mechanical impact:
Not sensitive.

Static discharge:
Not sensitive**.**

SECTION 6. ACCIDENTIAL RELEASE MEASURES

General:
Site specific procedures to address accidental spills are necessary as dictated by facility design, location, staffing, containment structures, and regulatory requirements. Consult engineers if necessary.

Personal protection:
In the event of a spill clear unnecessary staff from spill area.
If direct contact with spilled material is likely use protective equipment.

Spills:
Manage spill using containment structures or inert materials and collect for reuse. Do not release into sewers or waterways. Product not reused can be neutralized and converted to aluminum hydroxide using a mild alkali such as soda ash, or calcium carbonate (agricultural lime). **Caution:** When neutralizing large spills CO_2 will be created and can be a breathing hazard. Take steps to provide adequate ventilation. Neutralized residue can be swept up or rinsed down with water and captured using absorbent materials for disposal in accordance with local, state, province, and federal regulations. Consult engineers if necessary.

SECTION 7. HANDLING AND STORAGE

Incompatible Chemicals and Materials:
Avoid contact with sodium hypochlorite (bleach), chlorites, sulfites, strong bases, aqua ammonia.
Avoid contact with common metals which may result in corrosion over time.

Containment:
Storage tanks should have a dedicated liquid tight secondary containment system to minimize the possibility of a release into the environment and to prevent contact with incompatible chemicals.

General hygiene:
Do not eat, drink, take medication or smoke when direct contact is possible.
Always thoroughly wash hands after leaving a work area where contact is possible or has occurred.

Storage and transfer: Keep product in a secure location using covered tanks. Limit access to those familiar with use and handling. Properly label storage tanks and transfer systems for contents. Have procedures to determine storage tank capacity for accepting deliveries.
It is recommended to empty storage tanks annually for inspection and cleaning as needed.
Use tanks, transfer lines, pumps valves and process instrumentation made of appropriate materials of construction. Some materials commonly used are FRP, various plastics, PVC, CPVC, Teflon®, and Stainless Steel alloys. Over time, common metals such as steel, iron, copper, and aluminum may experience corrosion and their use should be avoided. Consult engineers if needed.

Temperature for storage:
Preferred storage temperature range is 5˚C-38˚C (40˚F-100˚F).
Outside of these temperature ranges product handling and shelf life may be affected.

Ventilation:
No special requirements.

Personal protection:
If direct contact with material is likely use appropriate protective equipment.

SECTION 8. EXPOSURE CONTROL / PERSONNAL PROTECTION

Exposure Limits: No exposure limits noted for product**.**

Exposure limits for: Aluminum soluble salts

OSHA PEL	ACGIH TLV	NIOSH
TWA ST	TWA STEL	IDLH
2mg/m^3 as Al none est.	2mg/m^3 as Al none est.	none est.

Respiratory - Ventilation: Local passive ventilation is typically used.
Under normal conditions respiratory protective equipment is not needed. If work requires direct exposure to product mist use appropriate, approved respiratory protection.
Consult engineers if necessary.

Eye & Skin wash: Have an appropriate eye wash and safety shower stations available in the work area.

Eyes: Use protective eye glasses-goggles and face shield protection to prevent direct contact.

Skin: Use impervious gloves and foot covering. Wear long sleeve shirts and full length trousers.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid clear to slight haze, amber - green to colorless.
Flammability: Not flammable.
Upper/lower flammability limits: Will not burn.
Auto ignition: NA
Flash point: NA
Odor: Not significant.
Vapor density: NA
pH: >2.0 @ 25˚C (77˚F) liquid as is basis. Typical: 2.2 -2.6.
Density: 1.30-1.35 S.G. @ 21˚C (70˚F)
Freeze point: -16˚C (4˚F) + -
Boiling point-range: NA
Water Solubility: Complete.
Evaporation rate: NA
Partial coefficient: n-octanol/water; NA, inorganic compound column 2 of REACH Annex VII.
Decomposition temperature: approximately 760˚C (1400˚F)
Viscosity: 10 -30 centipoise
VOC: 0.0

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Not reactive under normal conditions.

Chemical stability: Product is chemically stable under normal ambient temperature and conditions.

Conditions to avoid: Do not freeze**.** Avoid temperatures of decomposition.

Materials to avoid:
Sodium hypochlorite (bleach), chlorites, sulfites, strong bases, aqua ammonia, Common metals

Hazardous reactions: Contact with strong bases may result in exothermic reactions.

Hazardous decomposition products: Thermal decomposition can release sulfur oxides.

SECTION 11. TOXICOLOGY INFORMATION

Toxicity: Low order of acute toxicity.

Oral (ingestion) estimate: LD_{50}/Oral Rat >5,000mg/kg

Dermal estimate: LD_{50}/dermal Rabbit: >5,000mg/kg

Effects of exposure

Eyes: Causes eye irritation. Rabbit: Minimal conjunctival irritation, normal appearance within 48hrs.

Skin: May be mildly irritating. Rabbit: Dermal application produced no evidence of irritation.

Ingestion: May be harmful if swallowed.

Respiratory: Inhalation of mist may be irritating.

Carcinogenicity: NTP: Not listed. IARC: Not listed. OSHA: Not listed.

Reproductive Toxicity, Mutagenic or teratogenic effects:
No known reproductive toxicity, mutagenic or teratogenic effects.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic toxicity: Material not neutralized may exhibit toxicity to some aquatic organisms in waters having a pH of <5.5 or >8.5.
With preapproval; Federal, State, and EU regulators allow the controlled application of aluminum salts into surface waters such as lakes, ponds, and streams for beneficial use in:
Phosphorus inactivation.
Cyanobacteria (Blue-Green Algae) control.
Turbidity reduction for improved water clarity.
Aluminum salts dissociate in water resulting in rapid formation and precipitation of aluminum hydroxides. Reported at the environmentally relevant pH range of 5.5-8.8 the solubility of aluminum is low. The addition or release of aluminum salts into aquatic environments in an uncontrolled way could result in a lowering of pH which may be harmful to aquatic organisms.

For Aluminum (read across analogy data)**:**
LC50/96h/Danio rerio guideline 203: >1,000 mg/l as Al
EC50/water flea/semi static test guideline 202: 98mg/l as Al

Toxicity to other plants and organisms: No data available

Bioaccumulation potential: This product is not expected to bioaccumulate.

Octanol-water coefficient: NA, inorganic compound.

Biodegradability: Not applicable to inorganic substances.

Chemical degradability: At pH range of 5.0-9.0 precipitates of aluminum hydroxide are formed.

Mobility in Soil: No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

RCRA Hazardous waste: Unused material is not listed as a hazardous waste. If pH < 2.0 May be hazard code D002. Consult engineers if necessary.

Neutralization:
Product can be neutralized and converted to aluminum hydroxide using a mild alkali such as calcium carbonate (agricultural lime) or soda ash. Neutralized residue can be swept up or rinsed down with water and captured using absorbent materials for reuse or disposal in accordance with applicable local, state, province, and federal regulations. Consult engineers if necessary.

Special precautions: None known

Container reuse: Containers that cannot be thoroughly cleaned must be disposed of in accordance with local, state, province, and federal regulations. Consult engineers if necessary.

SECTION 14. TRANSPORTATION INFORMATION

Land (DOT), Sea (IMDG), Air (ICAO/IATA)

UN number: UN3082

Shipping name: Environmentally Hazardous Substance (aluminum sulfate solution) N.O.S.

Hazard class: 9

Packing group: III

Environmental hazards: Not a marine pollutant

Special precautions: None known

SECTION 15. REGULATORY INFORMATION

RCRA Hazardous waste: Not Listed. Consult engineers if necessary.

CERCLA Hazardous substance: Not listed CWA, Sec.311 (b) (4)

CERCLA Reportable Quantity (RQ): 5,000lbs as $Al_2(SO_4)_3$ - anhydrous, containing 29.8% Al_2O_3 which is approximately equivalent to 1,600 gallons of liquid Aluminum Sulfate Hydrate - Basic (8.3% Al_2O_3).

SARA 311/312 Categories:

Acute (immediate) health effects: Yes, irritant

Chronic (delayed) health effects: No

Sudden release of pressure hazard: No

Reactivity hazard: No

SARA 313 Toxic Chemical listing: Not listed

SARA Extremely hazardous substance (EHS): Not listed

OSHA Air (29CFR 1910.10000, table Z-1, Z-1A): Not listed

OSHA Special Regulated Substance (29CFR 1910): Not listed

United States TSCA Status: Product name listed on TSCA Inventory.

Canada (DSL): Components are listed (DSL) or exempt from listing.

State, Province, local regulations: Have not been determined by the Holland Company.

SECTION 16. OTHER INFORMATION

NSF/ANSI: Certified by NSF International as meeting NSF/ANSI 60 Drinking Water Treatment Chemicals. Maximum use 150mg/L.

AWWA: Meets current AWWA Standards for Aluminum Sulfate - Liquid

NFPA Ratings: Health 1, Flammability 0, Instability 0, Special Hazards None determined

Preparatory statement:
The information in this Safety Data Sheet (SDS) is correct to the best of our knowledge, information we have available, and belief as of the publication date. The information is designed solely as guidance for handling, storage, transportation, release, and disposal and is not to be considered a warranty or quality specification. Reference OSHA guidance document 3695-03-2014 information for SDS preparation.

Date Sources for the SDS:
Literature, databases, direct manufacturing experience & practice, publications, own tests, regulations.

Revision:
March 2019 SDS ID: 03052019

Holland Company, Inc.
153 Howland Avenue
Adams, Massachusetts 01220
U.S.A.
800-639-9602

Rev.: March 2019 replaces all earlier

Holland Company

Since 1967

LIQUID SODIUM ALUMINATE

Safety Data Sheet

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product/Chemical Name: Liquid Sodium Aluminate
Chemical Family: Inorganic aluminum salt
General use: Water treatment and manufacturing applications

Company Information:
Holland Company, Inc.
153 Howland Avenue
Adams, MA 01220 U.S.A.
Phone: 413-743-1292 FAX: 413-743-1298

Emergency Phone:
1-800-424-9300 Chemtrac (USA)
1-613-996-6666 or Cell *666 CANTUTEC (Canada)

SECTION 2. HAZARDS IDENTIFICATION

DANGER - CORROSION
AVOID CONTACT

Hazard Statements
Chemical burns to eyes and skin can result from contact.
Serious eye damage/eye irritation - Category 1
Skin corrosion/irritation - Category 1, Sub-category C
Harmful if ingested.

Precautionary Statements
Avoid direct contact.
Use protective equipment if direct contact is possible.
Wash face, hands and any exposed skin thoroughly after contact.
Store in closed containers in a secure area.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance
Chemical name: Aluminum soluble salts (liquid)
Name: Liquid Sodium Aluminate
CAS#: 11138-49-1
Impurities: NA. No impurities or additives which are themselves classified and which contribute to the classification of the substance.

SECTION 4. FIRST AID MEASURES

Eye contact:
Immediately rinse eyes with water for an extended period.
Get immediate medical attention.

Skin contact:
Remove contaminated clothing - footwear.
Wash skin for extended period until no evidence of chemical remains.
After washing affected areas thoroughly if irritation develops get medical attention.

Inhalation of mist or liquid:
Remove from continued exposure.
Get immediate medical attention.

Ingestion:
Do not actively induce vomiting.
Rinse mouth and drink water.
Get immediate medical attention.

SECTION 5. FIRE FIGHTING MEASURES

Flammability:
Product is not flammable and will not burn.
Controls:
To maintain the integrity of storage containers use water to keep containers cool.
If possible remove portable containers from areas under fire threat.
Hazards:
In a fire dried product can decompose at elevated temperatures and may release toxic fumes Exposure to products of decomposition during a fire may be hazardous.
Special equipment:
In case of possible exposure to products of decomposition use appropriate self-contained or other approved respiratory protection. Consult engineers if necessary.
Mechanical impact:
Not sensitive.
Static discharge:
Not sensitive**.**

SECTION 6. ACCIDENTIAL RELEASE MEASURES

General:
Site specific procedures to address accidental spills are necessary as dictated by facility design, location, staffing, containment structures, and regulatory requirements. Consult engineers if needed.

Personal protection:
In the event of a spill clear unnecessary staff from spill area.
If direct contact with spilled material is likely use protective equipment.

Spills:
Manage spill using containment structures or inert materials and collect for reuse.
Product not reused can be neutralized and converted to aluminum hydroxide using a mild / diluted acid. Neutralized residue can be swept up or rinsed down with water and captured using absorbent materials for disposal in accordance with local, state, province, and federal regulations. Caution: When neutralizing chemicals take steps to provide adequate ventilation. Consult engineers if needed.

SECTION 7. HANDLING AND STORAGE

Incompatible Chemicals:
Avoid contact with acids and acidic (low pH) materials.

Containment:
To minimize the possibility of a release into the environment and contact with other incompatible chemicals, storage tanks and containers should have a dedicated liquid tight secondary containment system. Consult engineers if needed.

General hygiene:
Do not eat, drink, take medication or smoke when direct contact is possible.
Always thoroughly wash exposed skin after leaving a work area where contact is possible or has occurred.

Storage: Store in closed container in a secure area.
Keep tanks closed and contents protected from dust, dirt, and moisture.
Clean storage tanks on a regular schedule based on inspection and experience.
Have storage tanks, containers, and transfer systems properly labeled for contents.
Have procedures for determining product quantity in storage tanks and for accepting deliveries.
Use tanks, transfer lines, pumps valves and process instrumentation designed for this material using approved materials of construction. Some materials commonly used are mild steel, stainless steel, plastic, and FRP. Nonferrous metals will be damaged by corrosion. To maintain product stability it is important to: Avoid adding water to product. Do not agitate or recirculate material in storage tanks. Do not bubble air into material in storage tanks. Consult engineers if needed.

Temperature for storage: Preferred storage temperature range is 16˚C-43˚C (60˚F-110˚F).
Outside of these temperature ranges optimal product stability and shelf life may be affected.

Ventilation: No special requirements.

Personal protection: If direct contact with material is likely use protective equipment.

SECTION 8. EXPOSURE CONTROL / PERSONNAL PROTECTION

Exposure Limits

Ingredient: aluminum soluble salts

OSHA PEL		ACGIH TLV		NIOSH
TWA	STEL	TWA	STEL	IDLH
2mg/m^3 as Al	none est.	2mg/m^3 as Al	none est.	none est.

Respiratory - Ventilation: Local passive ventilation is typically used. Under normal conditions respiratory protective equipment is not needed. If work requires direct exposure to product mist use appropriate, approved respiratory protection. Consult engineers if necessary.
Eye - Skin wash: Have appropriate eye wash and safety shower stations available in the work area.
Eyes: Use protective eye glasses-goggles and face shield protection to prevent direct contact.
Skin: Use impervious gloves and foot covering. Wear long sleeve shirts and full length trousers.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid, clear to slight haze, off white to light amber tint.
Odor: Not significant. Free from organic or solvent odors.
Odor Threshold: NA
pH: >12.5 @ 25C (77F) as is basis.
Melting/Freeze point: -10˚C (15˚F) approximate
Boiling point-range: >110˚C (230˚F)
Flash point: NA
Evaporation rate: NA
Flammability: Not flammable.
Upper/lower flammability limits: NA
Vapor pressure/density: NA
Density: 1.4-1.6 S.G. @ 21˚C (70˚F)
Water Solubility: Complete.
Partial coefficient: n-octanol/water; NA, inorganic compound column 2 of REACH Annex VII.
Auto ignition: NA
Decomposition temperature: Not determined
Viscosity: 500-800cps @ 25˚C (77˚F)

SECTION 10. STABILITY AND REACTIVITY

Chemical stability:
Product is chemically stable under normal ambient temperature and conditions while stored or used.

Conditions to avoid:
None known.

Materials to avoid:
Acids and Acidic materials, Aldehydes, non-ferrous metals. Consult engineers if necessary.

Decomposition products:
None known.

SECTION 11. TOXICOLOGY INFORMATION

Toxicity: Numerical measures of toxicity not determined.

Effects of exposure:
Eyes: Causes chemical burns. Severe damage to the eye.

Skin: Can cause chemical burns and irritation.

Respiratory: Inhalation of liquid or mist can cause chemical burns and coughing.

Mucous membranes: Causes chemical burns.

Ingestion: Can cause vomiting, pain and discomfort to mouth, throat, and stomach.

Sensitization: Not sensitizing

Carcinogenicity: NTP Not listed. IARC Not listed. OSHA Not listed.

Reproductive Toxicity, Mutagenic or teratogenic effects:
No known reproductive toxicity, mutagenic or teratogenic effects in animal experiments are known.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic toxicity:
With preapproval; Federal, State, Provincial, and EU regulators allow the direct application of aluminum salts into surface waters such as lakes, ponds, and streams for beneficial uses such as:
Phosphorus inactivation.
Toxic Cyanobacteria (Blue-Green Algae) control.
Turbidity reduction for improved water clarity.
It is reported that at the environmentally relevant pH range of 5.5-8.8 the solubility of aluminum is low. Aluminum salts dissociate with water resulting in rapid formation and precipitation of aluminum hydroxides. Aluminum salts must not be introduced into surface waters in an uncontrolled way. In aquatic environments at a pH <5.5 and >8.8 the direct addition of aluminum salts may result in soluble aluminum, and until a pH range of 5.5-8.8 is reached could demonstrate toxicity and be harmful to aquatic organisms.

LC50 96hrs:
>110 mg/l mosquito fish.

Toxicity to other organisms:
No data available.

Bioaccumulation potential:
This product is not expected to bioaccumulate.

Octanol-water coefficient:
NA, inorganic compound.

Biodegradability:
Not applicable to inorganic substances.

Chemical degradability:
In water at pH range of 5.5-8.8 precipitates of aluminum hydroxide are formed.

Mobility in Soil:
No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

RCRA Hazardous waste: Not listed. Unused product that has not been neutralized ≥ 12.0pH is corrosive and a Characteristic waste (D002). Consult engineers if necessary.

Neutralization:

Product can be neutralized and converted to aluminum hydroxide using a mild / dilute acid. Neutralized residue can be swept up or rinsed down with water and captured using absorbent materials for reuse or disposal in accordance with local, state, province, and federal regulations. Consult engineers if necessary.

Special precautions:

None known

Container reuse:

Packaging and storage containers that cannot be thoroughly cleaned must be disposed of in accordance with local, state, province, and federal regulations. Consult engineers if necessary.

SECTION 14. TRANSPORTATION INFORMATION

DOT, IATA, IMDG, TDG
UN number: UN1819
Shipping name: Liquid Sodium Aluminate (sodium aluminate solution)
Hazard class: 8
Packing group: II
Environmental hazards: Not a marine pollutant
Special precautions: None known

SECTION 15. REGULATORY INFORMATION

RCRA Hazardous waste: Not Listed.
Unused, un-neutralized product may be a Characteristic Waste (D002). Consult engineers if necessary.
CERCLA Hazardous substance: Not listed CWA, Sec.311 (b) (4)
CERCLA Reportable Quantity (RQ): NA
SARA 311/312 Categories:
Acute (immediate) health effects: Yes
Chronic (delayed) health effects: No
Sudden release of pressure hazard: No
Reactivity hazard: No
SARA 313 Toxic Chemical listing: Not listed
SARA Extremely hazardous substance (EHS): Not listed
OSHA Air (29CFR 1910.10000, table Z-1, Z-1A): Not listed
OSHA Special Regulated Substance (29CFR 1910): Not listed
California prop 65 chemical: No
WHMIS: E corrosive
United States TSCA Section Inventory Status: Listed
Canada DSL/NDSL: Listed
State - Province regulations: State and Province specific regulations have not been determined by the Holland Company. Consult engineers if necessary.
Inventories (additional) listed: Philippines (PICCS), Japanese (ENCS), European (EINECS)

SECTION 16. OTHER INFORMATION

NSF International - NSF/ANSI Standard 60 Drinking Water Treatment Chemicals:
Maximum use (MUL): 40mg/L

HMIS Rating:
Health: 3
Flammability: 0
Reactivity: 0
NFPA Rating:
Health: 3
Fire: 0
Reactivity: 0
Special: NA

Preparatory statement:
The information in this Safety Data Sheet (SDS) is correct to the best of our knowledge, information we have available, and belief as of the publication date. The information is designed solely as guidance for handling, storage, transportation, release, and disposal and is not to be considered a warranty or quality specification.

Date Sources for the SDS:
Manufacturing experience, literature, databases, practice, publications, own tests, regulations

Revision:
Jan 2017 replaces all earlier
SDS ID: Liquid Sodium Aluminate

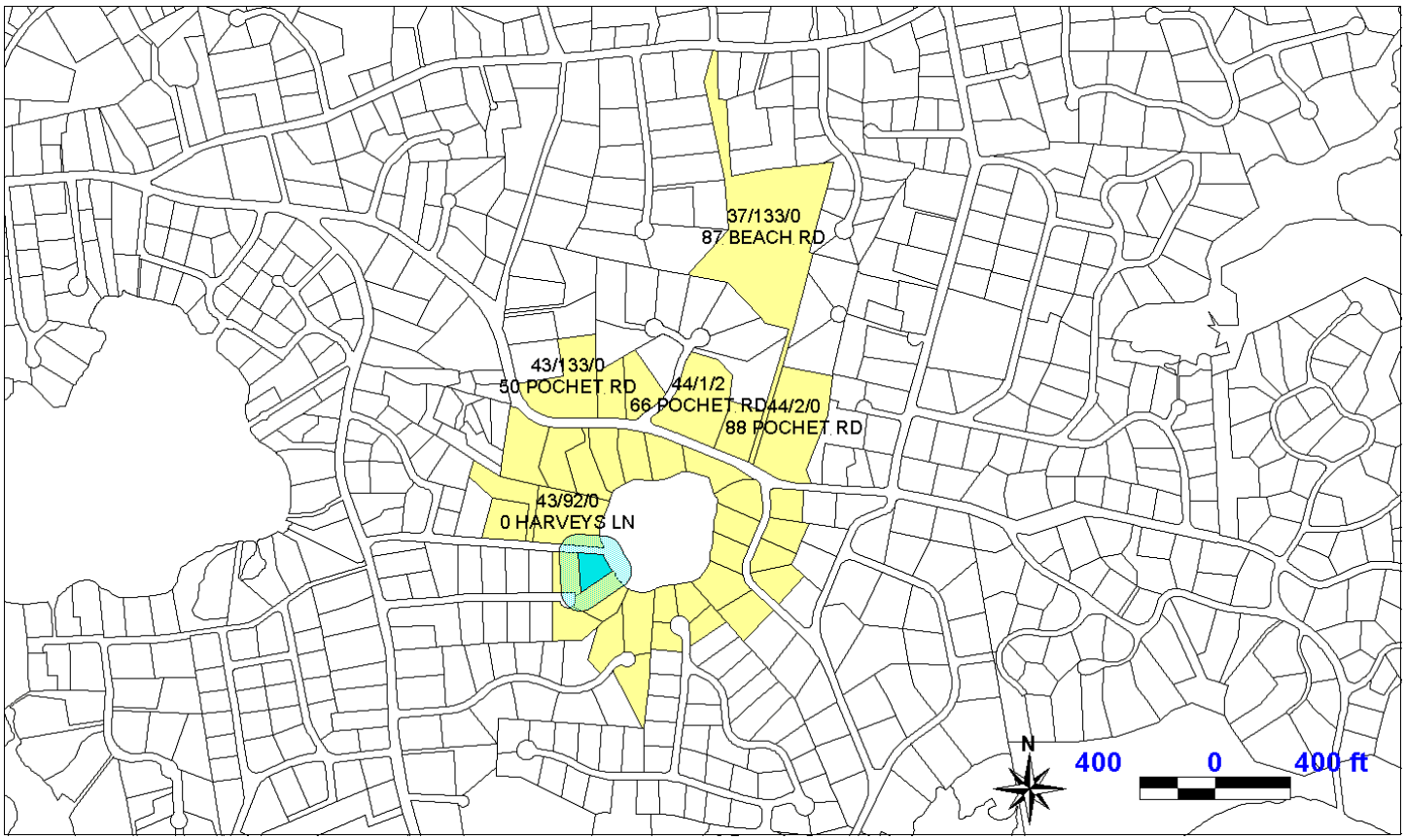
Holland Company, Inc.
153 Howland Avenue
Adams, Massachusetts 01220
U.S.A.
800-639-9602

Abutter Information

BSC GROUP

TOWN OF ORLEANS, MA
BOARD OF ASSESSORS
19 School Rd., Orleans, MA 02653

Abutters List Within 100 feet of Parcel 43/91/0



Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
3030	37-133-0-R	RING JAMES H & RAINA J TRS RING TRUST	87 BEACH RD	25304 PRADO DE LA FELICIDAD	CALABASAS	CA	91302
3574	43-65-0-R	MCNULTY PAUL E & KATHLEEN M	37 SEA MIST DR	37 SEA MIST DR	ORLEANS	MA	02653
3577	43-68-0-R	HOBERG WENZEL RB TRUSTEE 20 PLEASANT VIEW DR NOM TRUST	20 PLEASANT VIEW DR	123 BEATRICE ST	TORONTO ON		M6J2T2 CANADA
3578	43-69-0-R	SALMON JAMES F & NANCE R	25 PLEASANT VIEW DR	PO BOX 105	E ORLEANS	MA	02643
3579	43-70-0-R	ACKERMAN LORRAINE R TRS	24 PLEASANT VIEW DR	460 DEL POND DR	CANTON	MA	02021
3580	43-71-0-R	PICCIONE JOHN &FERRANTE NOREEN	36 SEA MIST DR	231 RIDGEWAY RD	WESTON	MA	02439
3581	43-72-0-R	DAVIS PAUL W & SHARON C	34 SEA MIST DR	PO BOX 731	E ORLEANS	MA	02643
3582	43-73-0-R	KEEFFE MELISSA A TRUSTEE MELISSA ANN KEEFFE TRUST	31 FISHER WY	PO BOX 220	ORLEANS	MA	02653
3583	43-74-0-R	SULLIVAN TERRENCE & KATHERINE	27 FISHER WY	PO BOX 838	E ORLEANS	MA	02643
3599	43-90-0-R	KRZEMINSKI GLENN & JACQUELINE	29 HARVEYS LN	29 HARVEYS LN	ORLEANS	MA	02653
3600	43-91-0-R	CATTANO ANDREW C & MONICA	33 HARVEYS LN	218 BEACH RD	ORLEANS	MA	02653
5983	43-92-0-E	ORLEANS CONSERVATION TRUST	0 HARVEYS LN	PO BOX 1078	E ORLEANS	MA	02643
3601	43-93-0-R	CHABOWSKI LEE C & MARGARET	26 HARVEYS LN	449 50TH ST	BROOKLYN	NY	11220
3602	43-94-0-R	HANSEN GERALD J TRUSTEE GERALD J HANSEN REVOABLE TR	24 HARVEYS LN	1400 WAVERLY RD V-6	GLADWYNE	PA	19035
3633	43-127-0-R	BONSCHER JOHN R & FRANCES TRS JOHN R BONSCHER TRUST	45 POCHET RD	PO BOX 463	E ORLEANS	MA	02643

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
3634	43-128-0-R	SAKLAD JOAN F	51 POCHET RD	51 POCHET RD	ORLEANS	MA	02653
3635	43-129-0-R	HETH JEFFREY & MARY	53 POCHET RD	PO BOX 1341	ORLEANS	MA	02653
3636	43-130-0-R	PALMER D GREG & MICHELE	55 POCHET RD	1901 INDIAN HEAD RD	DAYTON	OH	45459-1221
3637	43-131-0-R	MCMINN DONALD & LESTER HAROLD	57 POCHET RD	3104 CLEVELAND AVE NW	WASHINGTON	DC	20008
3638	43-132-0-R	FURTNEY BETSY S TRUSTEE BETSY S FURTNEY 2020 LIV TRUST	71 POCHET RD	PO BOX 1136	E ORLEANS	MA	02643
5986	43-133-0-E	ORLEANS CONSERVATION TRUST	50 POCHET RD	PO BOX 1078	E ORLEANS	MA	02643
3641	43-500-5-R	PAYZANT SANDRA J TR THE SPINNAKER TRAIL NOMINEE TR	3 SPINNAKER TRAIL	1035 S FEDERAL HWY PH11	DELRAY BEACH	FL	33483
3642	43-500-6-R	PITCHER EDMUND R TRUSTEE EDMUND R PITCHER REVOC TR	1 SPINNAKER TRAIL	PO BOX 1283	E ORLEANS	MA	02643
3645	44-1-2-R	KAMERSCHEN JUDITH A ET ALI TRS	66 POCHET RD	204 PARADE HILL RD	NEW CANAAN	CT	06840
11741	44-1-16-R	MORETON BARBARA ANN TRUSTEE DOG HOUSE REALTY TRUST	72 POCHET RD	72 POCHET RD	ORLEANS	MA	02653
3648	44-2-0-R	WILKINSON HAMISH A & KATHRYN S	88 POCHET RD	88 POCHET RD	ORLEANS	MA	02653
3764	44-134-0-R	GRADY JEAN L LIFE ESTATE	16 UNCLE HARVEYS WY	PO BOX 299	E ORLEANS	MA	02643
3765	44-135-0-R	NORRIS JEFFREY A & M KATHLEEN	12 UNCLE HARVEYS WY	4841 RODMAN ST N W	WASHINGTON	DC	20016
3766	44-136-0-R	PARK STEPHEN & VANTASSEL JANET	6 UNCLE HARVEYS WY	6 UNCLE HARVEYS WY	ORLEANS	MA	02653
3767	44-137-0-R	BEAVAN ALLISON M	4 UNCLE HARVEYS WY	4 UNCLE HARVEYS LN	ORLEANS	MA	02653
6001	44-138-0-E	TOWN OF ORLEANS	75 POCHET RD	19 SCHOOL RD	ORLEANS	MA	02653
3768	44-139-0-R	JANSSEN CHRISTOPHER H	1 UNCLE HARVEYS WY	1 UNCLE HARVEYS WY	ORLEANS	MA	02653
3769	44-140-0-R	DELIMA ELIZABETH & STUART EST STUART & ELIZABETH DELIMA TRUS	11 UNCLE HARVEYS WY	PO BOX 1524	E ORLEANS	MA	02643
3770	44-141-0-R	MORONGELL LOUIS & MARIE ETAL	15 UNCLE HARVEYS WY	15 UNCLE HARVEYS LN	ORLEANS	MA	02653
3771	44-142-0-R	MILLARD ELEANOR G TRUSTEE ELEANOR G MILLARD REVOC TR	17 UNCLE HARVEYS WY	25 ROCKY POND RD	BOYLSTON	MA	01505
3772	44-143-0-R	MINKOFF AMY W	19 UNCLE HARVEYS WY	24 ELM ST APT 2D	MONTCLAIR	NJ	07042
3780	44-151-0-R	CAVANAUGH RAYMOND &VIRGINIA TR RAYMOND &VIRGINIA CAVANAUGH TR	21 PLEASANT VIEW DR	16 OAKWOOD RD	SIMSBURY	CT	06070

NOTIFICATION TO ABUTTERS UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT AND THE ORLEANS WETLANDS PROTECTION BYLAW

In accordance with the second paragraph of the Massachusetts General Laws Chapter 131, Section 40, you are hereby notified of the following:

A. The name of the applicant is Town of Orleans.

B. The applicant has filed a Notice of Intent with the Orleans Conservation Commission for the municipality of Orleans 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 Town of Orleans Wetlands Protection Bylaw.

C. The address of the lot where the activity is proposed is Uncle Harvey's Pond, Orleans. The Town of Orleans Assessors Office references this lot as Uncle Harvey's Pond (lot and parcel not available).

D. Copies of the Notice of Intent may be examined at the Town of Orleans Conservation Commission, (508) 240-3700, 19 School Road, Orleans, MA 02653, between the hours of 8:30 AM and 4:30 PM Monday through Friday.

A. Copies of the Notice of Intent may be obtained from the applicant's representative (BSC Group, Inc., Attn: Matthew Creighton) by calling this telephone number (508) 778 – 8919 between the hours of 9:00 AM and 4:00 PM on the following days of the week Monday through Friday.

B. Information regarding the date, time and place of the public hearing may be obtained from the Orleans Conservation Commission by calling this telephone number (508) 240-3700 between the hours of 8:30 AM and 4:30 PM Monday through Friday.

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

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

NOTE: You may also contact your local Conservation Commission or the nearest Department of Environmental Protection Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP call the DEP Southeast Regional Office at (508) 946-2700, 20 Riverside Drive, Lakeville, MA 02347.