

SALEM AND BEVERLY WATER SUPPLY BOARD

THOMAS W. KNOWLTON, Superintendent

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December 28, 2009

United States Environmental Protection Agency, Region 1
PWTF GP Processing
Municipal Assistance Unit (CMU)
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Subject: NPDES General Permit NOI
Salem and Beverly Water Supply Board
NPDES Permit No. MAG640059

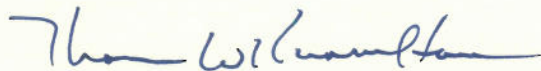
To Whom it May Concern:

The Salem and Beverly Water Supply Board (the Board) is requesting coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for the discharge from their Potable Water Treatment Facility (PWTF). The Salem and Beverly Water Supply Board has submitted a renewal application and was administratively continued under the general permit that expired in 2005. Please find enclosed the completed Notice of Intent (NOI) form and related documents for the NPDES GP.

In submitting this Notice of Intent the Board continues to reserve its rights with respect to the question of whether the receiving water, the Wenham Lake Reservoir, constitutes a water of the Commonwealth or of the United States as stated in the September 7, 2005 application.

We trust that this submittal meets all the requirements of the NOI. Please feel free to contact me with any comments or questions.

Very truly yours,



Thomas W. Knowlton
Superintendent
Salem and Beverly Water Supply Board

cc: John Gall, CDM
Anne Malenfant, CDM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
ONE CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

Request for General Permit Authorization to Discharge Wastewater
(Notice of Intent to be covered by the General Permit (NOI))

Potable Water Treatment Facility (PWTF)
NPDES General Permit No. MAG640000 and NHG640000

A. Facility Information

1. Facility Owner:

Name Salem and Beverly Water Supply Board e-mail _____
Street/PO Box 50 Arlington Avenue City Beverly
State MA Zip Code 01915
Contact Person Thomas Knowlton Telephone Number (978) 922-2600

2. Facility Operator (if different from above):

Name N/A e-mail (optional) _____
Street/PO Box _____ City _____
State _____ Zip Code _____
Contact Person _____ Telephone Number _____

3. Facility Data (attach topographic map or other map showing facility and discharge location(s)):

Name Arlington Avenue Water Treatment Plant e-mail (optional) _____
Street/PO Box 50 Arlington Avenue City Beverly
State MA Zip Code 01915
Contact Person Thomas Knowlton Telephone Number (978) 922-2600
Facility Latitude 42.583517 Facility Longitude -70.890806

4. Standard Industrial Classification (SIC Codes) and Descriptions of Processes:

SIC Code(s) 4941
Description(s) Water Supply

5. Current Permitting Status (please check yes or no):

1. Has a prior NPDES permit been granted for the discharge? Yes ☒ (Permit Number: MAG640059)
No _____
2. Is the discharge a "new discharge" as defined by 40 CFR Section 122.22? Yes _____ No ☒
3. Is the facility covered by an individual NPDES permit? Yes _____ (Permit Number _____) No ☒
4. Is there a pending application on file with EPA for this discharge? Yes ☒ (Date of submittal: 09/07/05) No _____

B. Discharge Information

1. Name of Receiving Waterbody Wenham Lake Reservoir
2. Type of Receiving Waterbody (e.g. stream, lake, reservoir, estuary etc) Reservoir
3. State Water Quality Classification: A _____ Freshwater: ☒ Marine Water: _____
4. Describe the discharge activities for which the owner/applicant is seeking coverage, including process discharges not specifically authorized in the PWTF GP which need to be authorized for discharge (and which attain the

effluent limits and other conditions of the general permit). This description should include all treatment methods used on the wastewater prior to discharge including lagoons, baffles, filter presses etc. If lagoons are used at the facility, please include the number and size of lagoons; the size and elevation of the entry pipe; the time of travel from the entry point of the discharge into the lagoon to the entry point to the receiving water; and the length of backwash cycle for any combination of number of filters. (attach extra sheets if necessary):

See Attachment 1.

5. Please provide a diagram depicting the treatment methods, outfalls, and receiving water. See Figure 1, 2 and 3

6. Number of outfalls: 1 Latitude and Longitude for each outfall (attach additional pages if necessary)

OUTFALL # 1 Latitude 42.583517

Longitude -70.890806

OUTFALL # _____ Latitude _____

Longitude _____

For each outfall:

7. What is the proposed sampling location(s) and proposed consistent times of the month for collecting samples:

4 samples are taken from the backwash lagoon overflow discharge. Samples are collected once a week, beginning on the first Tuesday of each month.

C. Effluent Characteristics

1. List here and attach information on any water additives used at the facility (Including chemicals for pH adjustment, dechlorination, control of biological growth, and control of corrosion and scale in water pipes): See Attachment 2.

2. Please report here any known remediation activities or water-quality issues in the vicinity of the discharge.

Yes, within a 1/2 mile radius there is a 21e site located at a Hess Station on Route 1A. Please see Figure 4.

3. Are aluminum-containing coagulants used at this facility? Yes ☒ No ☐

4. Does the discharge contain residual chlorine? Yes ☒ No ☐

5. Does the facility provide treatment to remove arsenic from the raw water source? Yes ☐ No ☒

6. Are phosphorus-containing chemicals added to the treated water at this facility? Yes ☒ No ☐

7. All applicants must attach a separate sheet listing all laboratory results (minimum of five) for total recoverable aluminum (in micrograms per liter) taken within the last six months. Do not include dilution when recording your results. See Section 4.4.5 of General Permit for more information. Please see Attachment 3.

8. Please include the following effluent data for each outfall:

<u>Characteristic (report if measured)</u>	<u>Average Monthly</u>	<u>Maximum Daily</u>
Discharge Flow (gpd)	<u>540,000</u>	<u>760,000</u>
TSS (mg/l)	<u>7</u>	<u>22</u>
pH (s.u.)	(min) <u>7.0</u>	(max) <u>9.1</u>
Total Recoverable Aluminum (ug/l)	<u>See Attachment 3.</u>	<u>See Attachment 3.</u>
Total Residual Chlorine (ug/l)	<u>0.26</u>	<u>1.55</u>

(continued on next page)

8. Continued

Characteristic (report if measured)

Whole Effluent Toxicity (%) LC50 N/A and/or C-NOEC N/A

9. If the discharge contains aluminum and/or residual chlorine, please provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water, the dilution factor, and attach any calculations used to support stream flow and dilution calculations (See Appendix VII for dilution calculations and additional information):

7Q10 cfs Dilution Factor 40:1 cfs

Awaiting information from the DEP and USGS. This value represents an approximation of the potential dilution derived using USGS methods.

D. Endangered Species Act Eligibility

1. Using the instructions in Appendix I of the PWTF GP, under which criterion listed in Part II are you eligible for coverage under this general permit?

A ☒ B ☐ C ☐ D ☐ E ☐ F ☐

The Board's discharge is in Beverly, and is not proximate to any of the listed cities and towns in Essex County. Please see Attachment 4.

2. If you selected criteria D or F, has consultation with the federal services been completed? Yes ☐ No ☐

3. If consultation with U.S. Fish and Wildlife Service and/or NOAA Fisheries Service was completed, was a written concurrence finding that the discharge is "not likely to adversely affect" listed species or critical habitat received? Yes ☐ No ☐

4. Attach documentation of ESA eligibility as described below and required at Part 3.4.1 and Appendix I, Part III, Step 4, of the General Permit.

Criterion A - No federally-listed threatened or endangered species or federally-designated critical habitat are present: A copy of the most current county species list pages for the county(ies) where your site or facility and discharges are located. You must also include a statement on how you determined that no listed species or critical habitat are in proximity to your site or facility or discharge locations.

Criterion B - Section 7 consultation completed with the Service(s) on a prior project: A copy of the USFWS's and/or NMFS's, as appropriate, biological opinion or concurrence on a finding of "unlikely to adversely effect" regarding the ESA Section 7 consultation.

Criterion C - Activities are covered by a Section 10 Permit: A copy of the USFWS's and/or the NMFS's, as appropriate, letter transmitting the ESA Section 10 authorization.

Criterion D - Concurrence from the Service(s) that the discharge is "not likely to adversely affect" federally-listed species or federally-designated critical habitat (not including the four species of concern identified in Section I of Appendix I): A copy of the USFWS's and/or the NMFS's, as appropriate, letter or memorandum concluding that the discharge is consistent with the general permit's "not likely to adversely affect" determination.

Criterion E - Activities are covered by certification of eligibility: A copy of the documents originally used by the other operator of your site or facility (or area including your site) to satisfy the documentation requirement of Criteria A, B, C or D.

Criterion F - Concurrence from the Service(s) that the discharge is "not likely to adversely affect" species of concern, as identified in Section I of Appendix I: A copy of the USFWS and/or the NMFS, as appropriate, concurrence with the applicant's determination that the discharge is "not likely to adversely affect" listed species.

E. National Historic Properties Act Eligibility

1. Using the instructions in Appendix III of the PWTf GP, under which criterion listed in Part III are you eligible for coverage under this general permit?

1 ☒ 2 ☐ 3 ☐

2. Have any State or Tribal historic preservation officers been consulted in this determination? Yes ☐ No ☒
If yes, attach the results of the consultation(s).

F. Certification

I certify that the discharge for which I am seeking coverage under the general permit consists solely of a surface water discharge from a potable water treatment facility. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature Thomas W. Knowlton Date Dec 28 2009
Printed Name and Title Thomas W. Knowlton, Superintendent

Federal regulations require this application to be signed as follows:

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

Note: Permits No. MAG640000 and NHG640000 may be found at www.epa.gov/region1/npdes/pwtfgp.html

Salem-Beverly Water Supply Board
NPDES GP NOI
Attachment 1
Discharge Activities

Raw water in Wenham Lake Reservoir is treated with copper sulfate as required to control algae. As raw water enters the treatment plant, it is further treated as needed with potassium permanganate and powdered activated carbon to remove manganese and taste and odor. The water is then treated with aluminum sulfate as a coagulant. The water then goes through mixing, flocculation and sedimentation steps. An anionic polymer is occasionally used as a coagulant aid.

After sedimentation, the settled water is treated with lime and chlorine (hypochlorite) and occasionally an anionic polymer. The water is then filtered through 8 parallel dual media (silica sand and anthracite coal) filters. After filtration, the water is again treated with chlorine (hypochlorite), hydrofluosilicic acid, and a 50/50 blend of poly/ortho phosphate for corrosion control. The water then enters a clear well from where it is pumped to the city distribution systems without further treatment.

The filters are periodically backwashed on a rotating schedule (each filter is usually backwashed at least once a day) to remove accumulated debris. The backwash water is pumped from the clear well. Polyaluminum chloride is added to the backwash water prior to it entering a filter. Filters are normally backwashed for 12 to 16 minutes at a time, with filter runs of 16 to 24 hours between backwashing. Filters are backwashed 2 at a time, but can handle between 1 and 3 at a time. Spent backwash water goes to backwash water holding tanks, from where it can be directed either to the intake wet well or to the backwash water lagoon. Normal operation is to direct backwash water to the lagoon.

Backwash water enters one side of the lagoon from a 24-inch pipe at elevation 40 and exits on the opposite side. The lagoon has a volume of approximately 3 million gallons, and an approximate residence time of 1 week. The polyaluminum chloride enhances settling of suspended material during passage of the water through the lagoon. The Board holds a NPDES general permit for water quality at the pipe exiting the lagoon, at which point the water is returned to Wenham Lake Reservoir.

Once a year, the lagoon is taken out of service and drained. During this time, backwash water is directed from the holding tanks to the intake wet well. The accumulated residuals on the bottom of the lagoon are pumped to a drying bed where they are freeze dried during the winter. The dried residuals are then used as road fill on the Board's properties under the conditions of a Best Use Determination (BUD) issued by the Mass DEP.

Salem-Beverly Water Supply Board
NPDES GP NOI
Attachment 2
Water Additives

The Salem and Beverly Water Supply Board operates a 24 million gallon per day full conventional surface water filtration plant. Water additives, listed below, are used at the facility to enhance the quality of the effluent water.

Copper Sulfate Pentahydrate: Raw water in Wenham Lake Reservoir is treated with copper sulfate as required to control biological growth.

Potassium Permanganate: Raw water is treated with potassium permanganate to remove manganese as well as address taste and odor.

Powdered Activated Carbon (PAC): Raw water is treated with PAC to address taste and odor.

Liquid Aluminum Sulfate: Aluminum sulfate is added as a coagulant to the raw water.

Anionic Polyacrylamine Polymer: An anionic polymer is occasionally used as a coagulant aid.

Slaked Quick Lime: The settled water is treated with lime for pH adjustment.

Chlorine (15 Percent Sodium Hypochlorite): Chlorine is added for oxidation of the settled water and disinfection of the filtered water.

Hydrofluosilicic Acid: Hydrofluosilicic acid is added to the filtered water for fluoride.

Poly/Ortho Phosphate: A 50/50 blend of poly/ortho phosphate is added to the filtered water for corrosion control.

Polyaluminum Chloride (PAC): PAC is added to the backwash water, prior to entering a filter, to enhance settling of suspended material during passage of the water through the lagoon.

Salem-Beverly Water Supply Board
NPDES GP NOI
Attachment 3

Laboratory Results: Total Recoverable Aluminum

Date	Units	Lagoon Eff. I, Al	Lagoon Eff. II, Al	Lagoon Eff. III, Al	Lagoon Eff. IV, Al	Average Monthly	Maximum Daily
6/2/2009	ug/L	340	520	890	710	615	890
7/7/2009	ug/L	920	1,000	1,500	1,000	1,105	1,500
8/4/2009	ug/L	440	1,000	1,200	880	880	1,200
9/1/2009	ug/L	400	340	790	690	555	790
10/6/2009	ug/L	630	680	710	640	665	710
11/3/2009	ug/L	450	440	720	680	573	720

Note:

- 1) The four samples (I, II, III and IV) represent four equally spaced grab samples of the lagoon effluent.

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES
IN MASSACHUSETTS**

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

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

7/31/2008

The Board's discharge is in Beverly, and is not proximate to any of the listed cities and towns in Essex County. Please see Attachment 4.



■ MassDEP Tier Classified Oil and/or
Hazardous Material Sites (MGL c. 21E)

Salem-Beverly Water Treatment Plant
50 Arlington Avenue
Beverly, Massachusetts

Figure 4
MassDEP Chapter 21E Sites

Basemap: 7.5-Minute USGS Topographic Quadrangle
Source: Mass GIS
Coordinate System: NAD83 Mass. State Plane Mainland
Units: meters

0 500 1,000
Feet

CDM

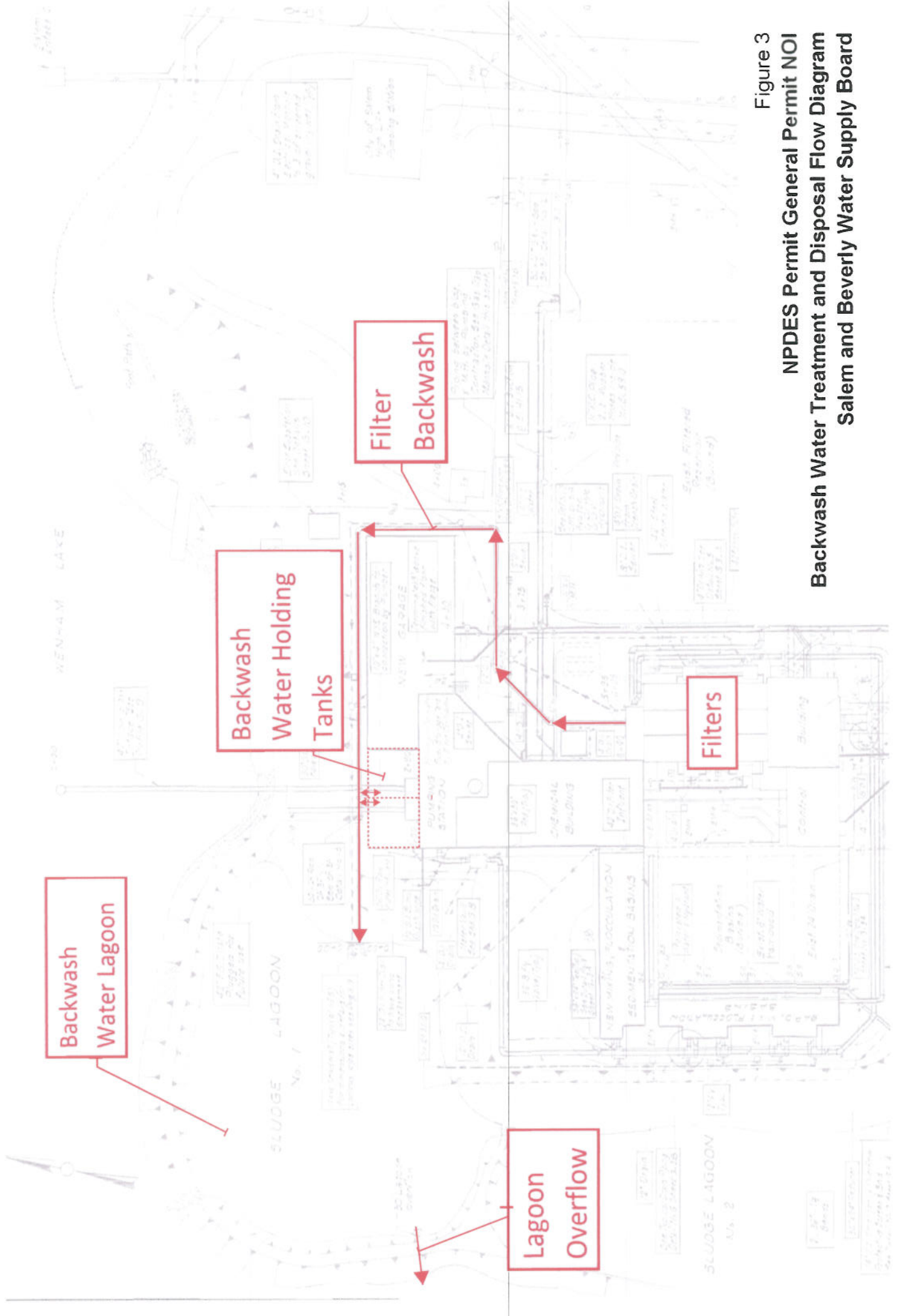


Figure 3
NPDES Permit General Permit NOI
Backwash Water Treatment and Disposal Flow Diagram
Salem and Beverly Water Supply Board

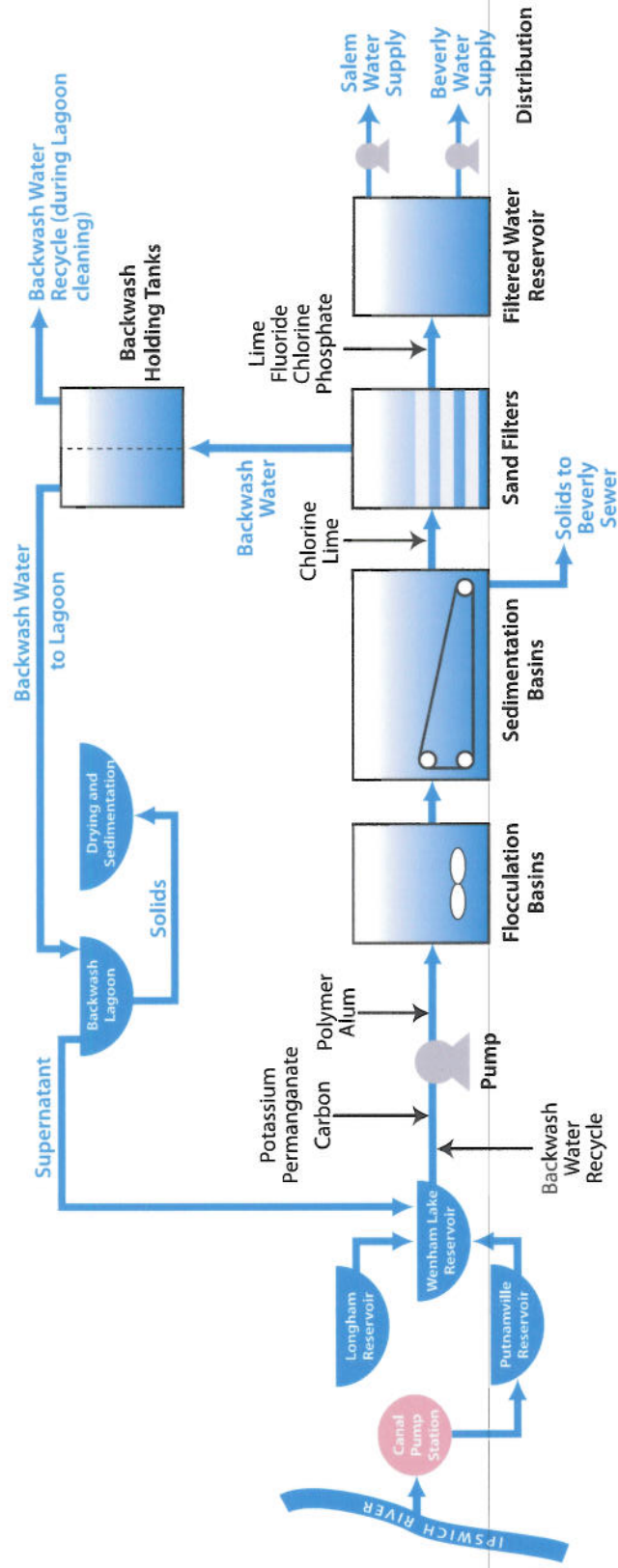
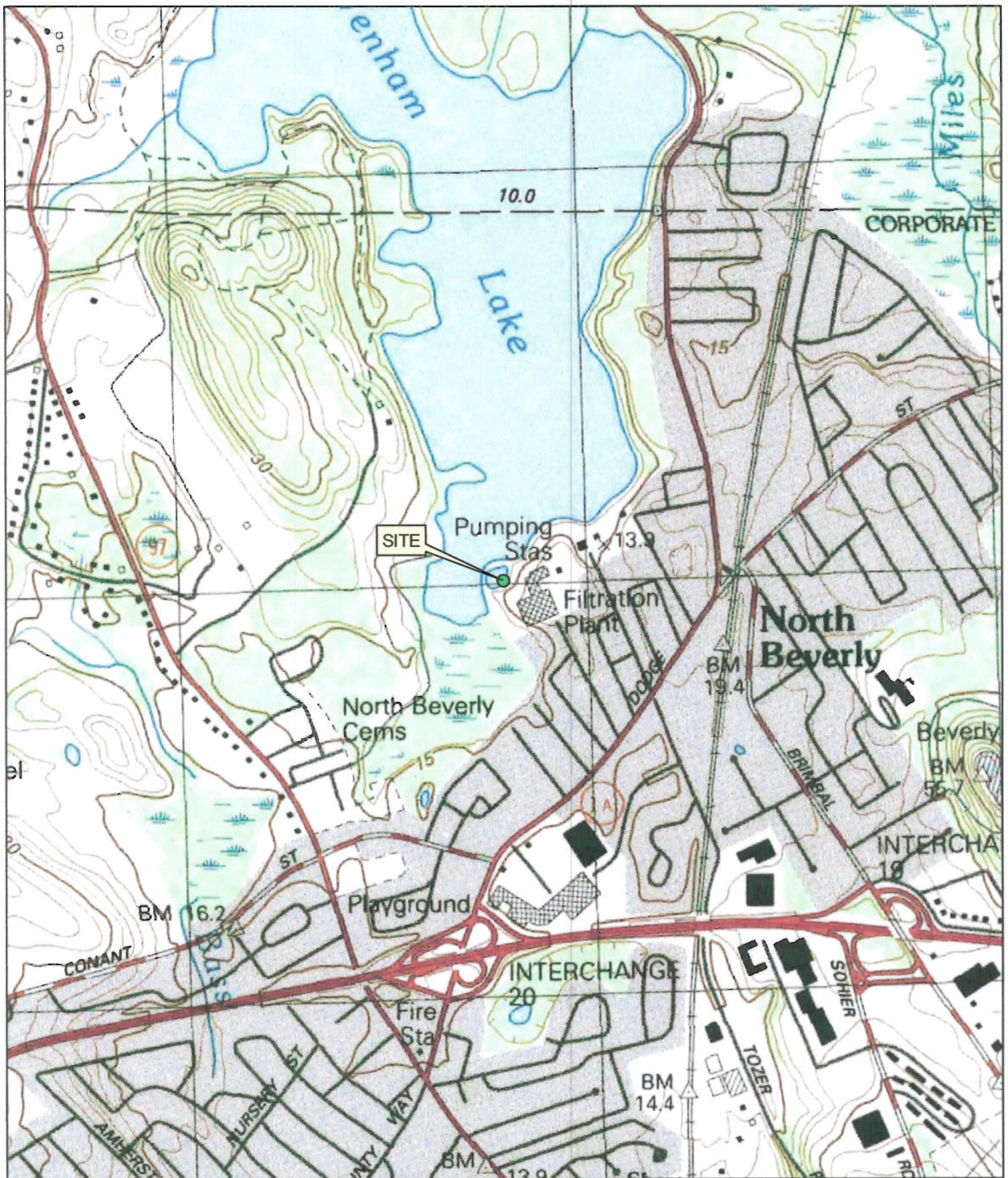
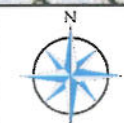


Figure 2
NPDES General Permit NOI
Source Water Supply and Treatment Schematic
Salem and Beverly Water Supply Board



Salem-Beverly Water Treatment Plant
50 Arlington Avenue
Beverly, Massachusetts

Figure 1
Site Location



0 500 1,000
Feet

Basemap: 7.5-Minute USGS Topographic Quadrangle
Source: Mass GIS
Coordinate System: NAD83 Mass. State Plane Mainland
Units: meters

CDM