

Loring Road Hydroelectric Facility Description

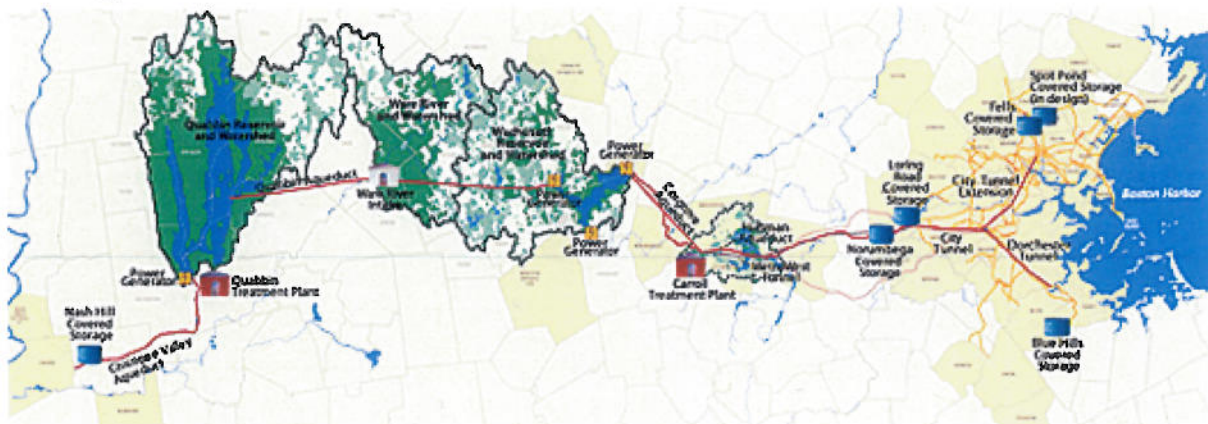
The Loring Road Small Conduit Hydroelectric Facility will be located in a valve chamber at the Massachusetts Water Resources Authority's (MWRA) Loring Road Covered Storage Facility in Weston, Massachusetts. The hydroelectric facility, now under construction, will generate power from fully treated potable water as it is transferred via a pipeline from one water supply storage tank in MWRA's water distribution system (Norumbega) to another storage tank (Loring Road). The hydro facility's operation will be driven by water demand in MWRA's Low Water Service area, and would not influence or affect withdrawals from MWRA's source reservoirs more than 30 miles away. To place this facility in context, a description of the MWRA water supply system and facilities upstream and downstream of Loring Road is provided below.

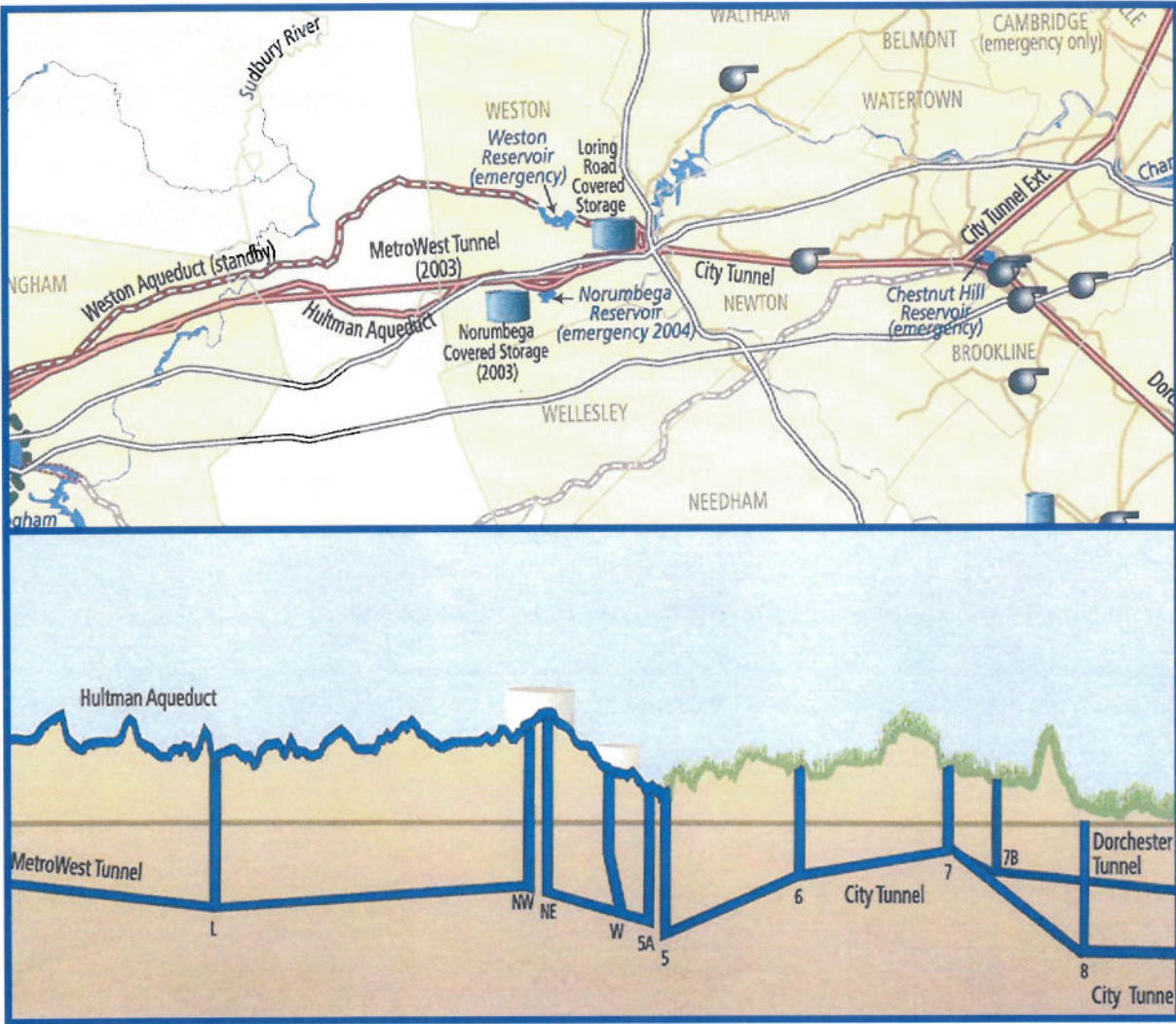
Background

The MWRA supplies wholesale water to local water departments in 50 communities, primarily in the Boston metropolitan area. MWRA's water comes from the Quabbin Reservoir, about 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston. The two reservoirs combined supplied an average of 200 million gallons per day to consumers in 2009. A transmission system consisting of over 100 miles of tunnels and aqueducts transport water largely by gravity to points of distribution within the MWRA service area. Water that is conveyed to the Boston Metropolitan area is treated at the John J. Carroll Water Treatment Plant (JJCWTP) in Marlborough, then sent eastward through either the new MetroWest Water Supply Tunnel or Hultman Aqueduct.

Downstream of JJCWTP and close to its centers of demand, MWRA has recently constructed a new network of tanks to protect and store treated drinking water in compliance with the Federal Safe Drinking Water Act. The network of new tanks includes the Norumbega and Loring Road Covered Storage Facilities. The tanks replace a 100-year old system of open reservoirs. The covered tanks protect drinking water from potential contamination. The water is continuously used and replenished. From the tanks, water is then distributed to member communities.

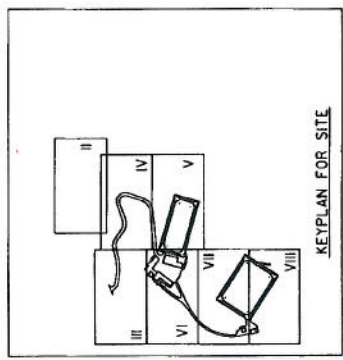
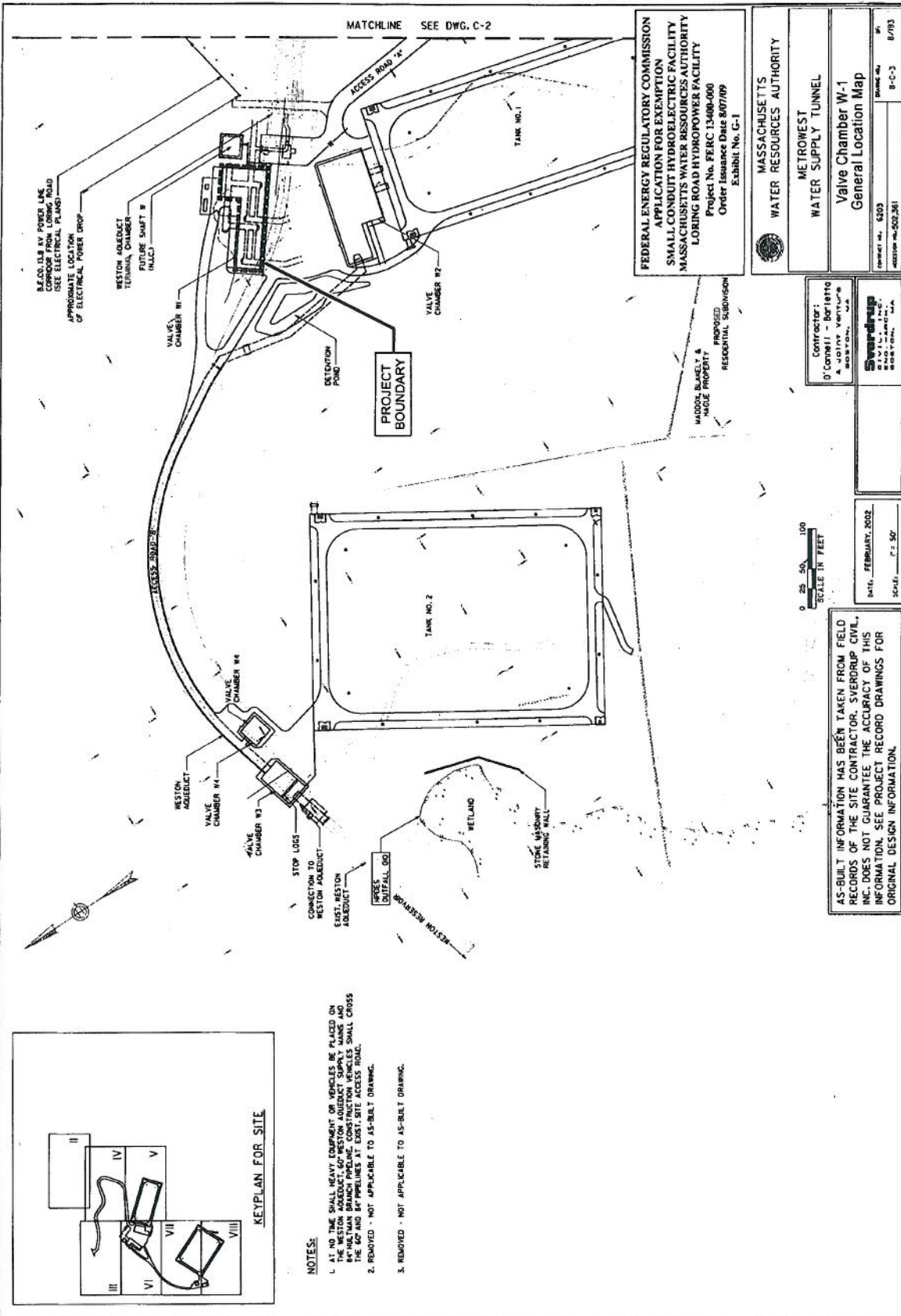
Schematics of the MWRA water transmission and distribution system are presented on the following pages, as are figures showing the project location and aerial views of the Loring Road site.





B-2
Schematic of MWRA
Distribution System

MATCHLINE SEE DWG. C-2



- NOTES:**
1. AT NO TIME SHALL HEAVY EQUIPMENT OR VEHICLES BE PLACED ON THE WESTON AERODUCT, WESTON AERODUCT SUPPLY MAINS AND CONDUITS. THE WESTON AERODUCT AND SUPPLY MAINS SHALL CROSS THE TUNNEL AND BE PROTECTED BY EAST SITE ACCESS ROAD.
 2. REMOVED - NOT APPLICABLE TO AS-BUILT DRAWING.
 3. REMOVED - NOT APPLICABLE TO AS-BUILT DRAWING.

FEDERAL ENERGY REGULATORY COMMISSION
 APPLICATION FOR EXEMPTION
 SMALL CONDUIT HYDROELECTRIC FACILITY
 MASSACHUSETTS WATER RESOURCES AUTHORITY
 LORING ROAD HYDROPOWER FACILITY
 Project No. FER-C 13489-000
 Order Issuance Date 8/07/09
 Exhibit No. G-1

MASSACHUSETTS
 WATER RESOURCES AUTHORITY
 METROWEST
 WATER SUPPLY TUNNEL
 Valve Chamber W-1
 General Location Map

Contractor:
 O'Connell - Borletto
 A Joint Venture
 SVERDRUP CORP.
 1000 BROADWAY
 SUITE 1000
 BOSTON, MA 02109

DATE: FEBRUARY, 2002
 SCALE: 1" = 50'

AS-BUILT INFORMATION HAS BEEN TAKEN FROM FIELD RECORDS OF THE SITE CONTRACTOR, SVERDRUP CIVIL, INC. DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION. SEE PROJECT RECORD DRAWINGS FOR ORIGINAL DESIGN INFORMATION.

PROJECT MANAGER	DRAWN BY	CHECKED BY	DATE	PROJECT NO.	DATE	CITY	STATE	COUNTY	PROJECT NAME



FEDERAL ENERGY REGULATORY COMMISSION
APPLICATION FOR EXEMPTION
SMALL CONDUIT HYDROELECTRIC FACILITY
MASSACHUSETTS WATER RESOURCES AUTHORITY
LORING ROAD HYDROPOWER FACILITY
EXHIBIT B-3 AUGUST 2008

Loring Road Hydroelectric Facility Operation

The Loring Road facility establishes the hydraulic grade line of the MWRA's Low Service Area (areas of lower elevation within the MWRA service area). The water reaches Loring Road at a hydraulic grade line of approximately 282 feet. At Loring Road, the flow is divided; some flow is directed to a supply pipeline serving MWRA's High Service System, while other flow is directed to pressure reducing valves inside Valve Chamber One, an underground valve chamber. The pressure reducing valves reduce the grade line to approximately 200 feet. After the pressure reducing valves, water is sent via a pipeline to a second valve chamber that directs flows to either Loring Road Storage Tank One or Two. A steady flow rate of 20 mgd can be discharged from Valve Chamber One into the tanks on a nearly constant basis. From the Tanks, flow is discharged to downstream pipelines (Weston Aqueduct Supply Mains) serving MWRA's Low Service Area. Instead of dissipating the energy with sleeve valves in Valve Chamber One, the energy available in this reduction will be recovered by a hydro-turbine generator. In this manner, the hydro turbine driven generator will provide energy recovery along with the primary purpose of the Loring Road facility to regulate flow and provide a constant pressure water supply to the low service system.

MWRA's objective will be to operate the turbine at a constant flow rate of 20 mgd (31 cfs) year-round except for those seasonal periods when potable water demand is below that rate. During periods of low demand, the turbine will operate at a flow that is slightly lower than 20 mgd. The net operating head will be 70-75 feet. A 200-kilowatt (kW) turbine-generator unit will be installed; it will be a compact design, horizontal Francis turbine (James Leffel) with wicket gates utilizing a Francis type runner. The average annual generation will be 1,207,000 kWh. The Loring Road Storage Facility operates 24/7, and the hydroelectric facility will be integrated into existing operations. Start up and testing of the hydroelectric facility is projected to be in Fall, 2010.

Loring Road Environs

Valve Chamber One is located at the top a hill in the northeast portion of the approximately 20 acre Loring Road site. The Valve Chamber is approximately 125 feet by 50 feet; it appears as a concrete slab at its surface extending a few feet above finished grade, with a number of access hatches and fencing on top. The Valve Chamber is part of an array of water supply infrastructure facilities on the Loring Road facility site, including two large buried water storage tanks (1.4 acres and 2.3 acres) that are covered with earth and vegetated with grass. There is also an existing twenty-foot wide access road. Valve Chamber One was built in 2002 and no additional excavation will be required to accommodate the hydroelectric equipment.

The valve chamber which houses the turbine is a restricted and secure facility that is not open to the public given that it is critical infrastructure. MWRA does, however, permit the public pedestrian access over the tanks and access road and trails of the Weston Forest and Trails Association traverse the top of one of the water storage tanks and connect to trails on adjacent wooded properties.

Federal Energy Regulatory Commission Process

On August 7, 2009, FERC issued MWRA an Order Granting Exemption from Licensing (Conduit) for the Loring Road Facility, Project No. 13400-000. Written comments received from review agencies during the FERC first stage of the consultation process are summarized below.

- United States Department of the Interior, Fish and Wildlife Service: “The proposed project appears to have minimal, if any, impacts to fish and wildlife resources. The construction activities would occur in an already disturbed area, and operation of the project would use water coming from a water supply pipeline and discharge to another water supply pipeline using a completely contained system that has no hydraulic connection to natural water bodies. As such, the U.S. Fish and Wildlife Service support this project, and concurs that a waiver of second stage consultation requirements is appropriate.”
- Commonwealth of Massachusetts Division of Fisheries and Wildlife. “The Fisheries section supports the project and is in favor of a waiver of the second stage consultation requirements. At this time, the site is not mapped as Priority or Estimated Habitat and the Natural Heritage and Endangered Species program does not have any rare species concerns associated with this site.”
- New England District Corps of Engineers: “We have determined that a Department of Army permit is not required for the construction of a hydroelectric facility within an existing valve chamber at the Loring Road Covered Storage Facility in Weston.”
- Massachusetts Department of Environmental Protection, Division of Watershed Management: The hydroelectric facility would not affect water levels in the local watershed or in source reservoirs. The Department supports this project and concurs a waiver of the second stage consultation requirements is appropriate.

The FERC second stage consultation process was waived, and the only comment received during the third stage was a comment from USFWS indicating they had reviewed the third stage application and had no comments