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

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO THE WATERS OF THE UNITED STATES

NPDES PERMIT NO.: **MA0040134**

NAME AND ADDRESS OF APPLICANT:

Massachusetts Water Resources Authority
100 First Avenue, Charlestown Navy Yard
Boston MA 02129

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Massachusetts Water Resources Authority
Cosgrove Intake Facility
301 Boylston Street
Clinton MA 01570

RECEIVING WATER: **North Brook in the Concord River Watershed**
Wachusett Reservoir in the Nashua River Watershed

CLASSIFICATION: **North Brook - B (High Quality Water)**
Wachusett Reservoir – A (Public Water Supply)

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency to issue an NPDES permit to discharge into the designated receiving waters. These are new discharges. This permit, after it becomes effective, will expire five (5) years from the effective date.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The Cosgrove Intake Facility is located on the shore of the Wachusett Reservoir in Clinton and is an integral component of MWRA's drinking water transmission system. At the facility, water is drawn from the Wachusett Reservoir and conveyed to the Cosgrove Tunnel, which transports the water by gravity toward treatment facilities and further on to the Boston metropolitan area (Figure 1).

As part of this function, the facility generates hydroelectric power. Outfall 001 includes discharges from the facility sump and on-site stormwater that had been previously treated by an existing leachfield, which has a subsurface discharge. However, the leachfield was determined to be too close to the reservoir, and its current condition makes it unacceptable for protection of reservoir water quality. Therefore, the sump and stormwater discharge will be relocated to the North Brook, a tributary of the Assabet River, in the Concord River watershed.

A second building at the facility, the Cosgrove Disinfection Facility, serves as a temporary water treatment facility where Wachusett Reservoir water is chlorinated prior to distribution via the Cosgrove Tunnel.

Additionally, a third building, the Pipe Loop Building, has been recently constructed to serve as a pilot treatment plant. Reservoir water will be treated with ozone and ultraviolet light for the purposes of evaluating their effectiveness. The operation consists of three (3) trains for primary disinfection: Train 1- UV only (200 gpm), Train 2 - Ozone and UV (200 gpm), and Train 3 - Ozone only with additional treatment (5.0 gpm) (Figure 3). The third train will be treated with sodium hydroxide and anhydrous ammonia for additional disinfection and fluoridation with hydrofluorosilicic acid. A small component of the UV-only and the UV/ozone treatment trains also receive this additional treatment. It is expected that a total flow of 1.5 to 5.0 gpm will receive additional treatment. The discharge for this operation, Outfall 002 discharges to the Wachusset Reservoir.

Outfall	Description of Discharge	Outfall Location
001	Sump water and stormwater	North Brook, Concord River Watershed
002	Disinfected Water from Pilot Plant	Wachusett Reservoir, Nashua River Watershed

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the discharges based on information submitted by the permittee in the permit application is shown on Attachment A and B of this fact sheet.

IV. LIMITATIONS AND CONDITIONS

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. PROCESS DESCRIPTION

OUTFALL 001 – The following is an itemization of the various components of the discharge to the facility sump (Figure 2). The given flows for each component are estimates.

1. Foundation leakage from the Wachusett Reservoir: 3 gpm
2. Continuous pH, turbidity and UV laboratory analyses water: 1-2 gpm water: intermittent
3. Condensation and leakage to drains: intermittent
4. Excess cooling and lubrication water for lower-most turbine bearing: less than 1 gpm
5. Screen wash water: 49 gpm for about 180 hours per year (In 2004, a change in the screen washing method will result in a flow of 90 gpm for about 78 hours per year).
6. Roof drains: intermittent

This new discharge will replace the existing discharge to the leachfield with a surface water discharge out of the Wachusett Reservoir drainage basin. The leachfield is to be replaced with a 52,360 gallon storage capacity pump station with 1,100 gpm primary and backup pumps. The pump station will pump the facility sump discharge and facility storm water approximately 860 feet via a 10-inch diameter force main to an outfall located in a wetland on the eastern side of Route 70.

The discharge is comprised of the following sources: foundation leakage from the reservoir, continuous sample stream from pH, turbidity and UV laboratory analyses (no reagents involved), intermittent sump pump seal water, condensation and leakage to floor and trench drains from valve chambers and other areas near the hydroelectric turbine generators, excess lubrication and cooling water from the lower-most bearing on each turbine, roof drains, intake screen wash water, and stormwater. The average and maximum daily flow is expected to be 14,410 gpd and 21,780 gpd respectively, not including storm water. The storm water contribution will be from a 3.22 acre area around the facility.

OUTFALL 002 - The Cosgrove Temporary Pilot Plant consists of three (3) trains for primary disinfection: Train 1- UV only (200 gpm), Train 2 - Ozone and UV (200 gpm), and Train 3 - Ozone only with additional treatment (5.0 gpm) (Figure 3). MS2, a non-pathogenic virus which exists naturally in the reservoir and is approved by EPA for testing UV, and will be used for testing UV effectiveness. The third train will be treated with sodium hydroxide and anhydrous ammonia for additional disinfection and fluoridation with hydrofluorosilicic acid. A small component of the UV-only and the UV/ozone treatment trains also receive this additional treatment. It is expected that a total flow of 1.5 to 5.0 gpm will receive additional treatment.

Fully treated water from the three trains will travel through corroded pipe racks to study old, unlined cast iron pipe's impacts on finished water quality.

According to information submitted by the permittee, the pilot plant is designed to treat approximately 1.5 to 5 gpm with sodium hydroxide and anhydrous ammonia to produce a residual chlorine concentration of 2 ppm. After testing, this water will be diluted with 400 gpm of water from Trains 1 and 2 which did not receive chlorination and then be dechlorinated prior to discharge.

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Overview of Federal and State Regulations

The CWA requires that dischargers satisfy both minimum technology and water quality requirements. The minimum technology requirements which are presently applicable are found in Section 301(b) of the CWA. Section 301 (b)(1)(A) of the CWA requires the application of Best Practicable Control Technology Currently Available (BPT) with the statutory deadline for compliance being, July 1, 1977, unless otherwise authorized by the CWA. Section (301)(b)(2) of the CWA requires the application of Best Conventional Control Technology for conventional pollutants, and Best Available Technology Economically Achievable (BAT) for non-conventional and toxic pollutants. The compliance deadline for BCT and BAT is as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated and no later than March 31, 1989.

Under 301(b)(1)(c) of the CWA, discharges are subject to effluent limitations based on water quality standards and to the conditions of State certifications under Section 401 of the CWA.

Receiving stream requirements are established according to numerical and narrative standards adopted under State and/or Federal law for each stream use classification. Furthermore the permit must conform to the conditions established pursuant to a State certification under Section 401 of the CWA that meet the requirements of 40 CFR §124.53 and §124.55. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR §122.44 (d).

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts. The State of Massachusetts has a similar narrative criteria in their water quality regulations that prohibits such discharges, see Massachusetts 314 CMR 4.05(e). The draft permit does not allow for the addition of chemicals in amounts which would produce a toxic effect to aquatic life.

The general conditions of the permit are based on 40 CFR §122.41 and consist primarily of management requirements common to all permits. The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA in accordance with 40 CFR §122.41(j), §122.44(i), and §122.48.

1. Water Quality Standards: Designated Uses

Outfall 001 - North Brook, a tributary to the Assabet River in the Concord River watershed, is classified as a Class B, high quality water by the Massachusetts Department of Environmental Protection at the point of discharge. Class B waters shall be of such quality that they are suitable for the designated uses of protection and propagation of fish, other aquatic life and wildlife; and for primary and secondary contact recreation.

High quality waters shall be protected and maintained for their existing level of quality unless limited degradation by a new or increased discharge is authorized by the MA DEP Limited degradation may be allowed by the MA DEP where it determines that a new or increased discharge is insignificant because it does not have the potential to impair any existing or designated water use and cause any significant lowering of water quality; also limited degradation may be allowed as provided in 314 CMR 4.04(4).

Outfall 002 - The Wachusett Reservoir is as Class A, Public Water Supply in the Massachusetts Surface Water Quality Standards. Class A waters are designated as a source of public water supply. To the extent compatible with this use they shall be an excellent habitat for fish, other aquatic life and wildlife, and suitable for primary and secondary contact recreation. These waters shall have excellent aesthetic value. These waters are designated for protection as Outstanding Resource Waters under 314 CMR 4.04(3).

<u>Available Dilution</u>
Outfall 001 – North River – Water quality based limitations are established with the use of a calculated available dilution. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10-year recurrence interval. Additionally, the facility design flow is used to calculate available effluent dilution. The point of discharge is to a wetland tributary to the North River, as such the dilution is estimated to be zero. The dilution factor is one.

Outfall 002 – Wachusett Reservoir - The Wachusett Reservoir has a total volume of 65 billion gallons. An estimate of the dilution of the discharge in the Wachusett Reservoir was not made however, since chlorine, the only pollutant of concern, is expected to be discharged at concentrations less than the ambient water quality criteria. The 5 gpm, maximum flow of chlorinated effluent is to be combined with an estimated 400 gpm from Trains 1 and 2,

achieving a dilution factor of 81 prior to discharge. . A further explanation of the chlorine requirements may be found below in the Section titled OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

OUTFALL 001 - CONVENTIONAL POLLUTANTS

The permit authorizes the discharge of sump facility water and stormwater, however, the monitoring requirements are limitations in the table are dry weather monitoring and therefore, only pertain to the sump facility discharge. Requirements for stormwater are found in Part I.B. of the draft permit and consist of a Storm Water Pollution Prevention Plan (SWPPP).

pH – The draft permit includes pH limitations which are required by state surface water quality standards. Monitoring for this parameter should occur during dry weather.

Oil and Grease – The draft permit includes a limit of 15 mg/l for oil and grease. Monitoring for this parameter should occur during dry weather.

Total Suspended Solids – Total suspended solids concentrations are expected to be at their highest levels during intake screen wash events. Monitoring for this parameter should occur during the washing event.

OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine – The applicant proposes to discontinue using chlorinated town water for intake screen washing and use raw Wachusett Reservoir water instead. By doing so, chlorine toxicity and testing issues are obviated. This proposed change has been made a condition of the permit. As part of the ongoing facility rehabilitation, the current intake screens that are manually washed with a fire hose about once per quarter are being replaced with traveling screens that will be washed with reservoir water at an approximate frequency of one screen per week. During each screen washing event approximately 8,100 gallons of water will be used. The revised average daily flow would be 14,117 gpd and the maximum daily flow would be 21,060 gpd. The replacement of the screens is scheduled to be complete in March 2004.

OUTFALL 001 - STORM WATER POLLUTION PREVENTION PLAN

Pursuant to Section 304 (e) of the CWA and 40 CFR §125.103(b), Best Management Practices (BMPs) may be expressly incorporated into a permit on a case by case basis where necessary to carry out Section 402(a)(1) of the CWA. The Cosgrove Intake facility engages in activities which could result in the storm water discharge of pollutants to waters of the United States. The permit requires this facility to develop a Storm Water Pollution Prevention Plan (SWPPP) which will include BMPs appropriate for this specific facility to control storm water discharges from these and other activities which could contribute pollutants to waters of the United States through storm water.

The MWRA is required to develop the SWPPP by 90 days after the effective date of the permit. The goal of the SWPPP is to eliminate or reduce the potential for discharge of pollutants through the storm water system. In the event the potential cannot be eliminated, the permittee should select BMPs to reduce or eliminate the pollutant loading to the receiving water. The SWPPP requirements direct the Permittee to review the physical equipment, the operation procedures, and the operator training at the facility. The objective of this review is to protect waters of the United States by eliminating or minimizing the potential discharge of any pollutants.

The SWPPP becomes an enforceable element of the permit upon the effective date of the permit. Consequently, the SWPPP is as enforceable as any effluent limits on the discharges.

OUTFALL 002 – CONVENTIONAL POLLUTANTS

Flow - The draft permit requires continuous monitoring of discharge flow. Monthly average and daily maximum should be reported quarterly.

pH - The draft permit includes pH limitations which are required by state surface water quality standards. Monitoring for this parameter should occur quarterly.

OUTFALL 002 – NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine - The acute water quality criteria for total chlorine residual found in the December 10, 1998 National Recommended Water Quality Criteria (FR Vol. 63 No.237) is 19 ug/l and the chronic criteria is 11 ug/l.

A maximum daily final effluent concentration of 0.1 ppm would be possible in a worst-case combination of events where the chlorination process malfunctioned and introduced chlorine at a concentration of 8 ppm (2 times the currently observed maximum of 4 ppm) at 5 gpm with the dechlorination process being off-line and 400 gpm of unchlorinated dilution flow discharged from Trains 1 and 2.

$$\frac{(5\text{gpm})(8\text{mg/l})+(400\text{gpm})(0\text{mg/l})}{405\text{gpm}} = 0.1 \text{ mg/l}$$

However, with the dechlorination system operating the average daily concentration of chlorine in the discharge should be zero and will always be less than 0.02 ppm, which represents the instrument detection limit. However, in the event that the dechlorination system is temporarily off-line while the rest of the plant is operating as designed, a theoretical chlorine concentration in the diluted discharge was calculated to be 0.009 ppm (2 ppm in the 1.8 gpm fully treated treatment train diluted with 400 gpm of unchlorinated water), still less than the 0.02 instrument detection limit, and the acute and chronic water quality criteria of 19 ug/l. and 11 ug/l respectively.

$$\frac{(1.8\text{gpm})(2\text{mg/l})+(400\text{gpm})(0\text{mg/l})}{405\text{gpm}} = 0.009 \text{ mg/l}$$

Therefore, the draft permit contains a monthly average effluent limit of 11 ug/l and a maximum daily effluent limit of 19 ug/l. Since the measurement level for total chlorine analyses is 50 ug/l, this will be the limit used for compliance purposes.

VI. ANTI-BACKSLIDING

EPA's anti-backsliding provision at 40 CFR §122.44(l) prohibit the relaxation of permit limits, standards, and conditions unless the circumstances on which previous permit was based have materially and substantially changed since the time the permit was issued. Therefore, technology based effluent limitations in the draft permit must be as stringent as those in the current permit. Relaxation of these limits is only allowed when cause for permit modification is met, see 40 CFR §122.62. Effluent limits based on BPJ, water quality, and State Certification requirements must also meet the anti-backsliding provisions found in Section 402(o) and 303(d)(4) of the CWA.

VII. ANTI-DEGRADATION

The Massachusetts Anti-degradation Policy is found at Title 314 CMR 4.04. All existing uses of the North River and Wachusett Reservoir must be protected. This permit is being issued to a new discharge. The public is invited to participate in the anti-degradation finding through the permit public notice procedure.

(1) Protection of Existing Uses. In all cases existing uses and level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Protection of High Quality and Other Significant Resource Waters. Certain waters shall be designated for protection under this provision in 314 CMR 4.06(2) and 4.06(3). These include waters whose quality exceeds minimum levels necessary to support national goal uses, low flow waters and other waters whose character cannot be adequately described or protected by traditional criteria. These waters shall be protected and maintained for their existing level of quality unless limited degradation by a new or increased discharge is authorized by the Department. Limited degradation may be allowed by the Department where it determines that a new or increased discharge is insignificant because it does not have the potential to impair any existing or designated water use and cause any significant lowering of water quality; also limited degradation may be allowed as provided in 314 CMR 4.04(4).

(3) Protection of Outstanding Resource Waters. Certain waters shall be designated for protection under this provision in 314 CMR 4.06(3) including Public Water Supplies (314 CMR 4.06(1)(d)1.). These waters constitute an outstanding resource as determined by their outstanding socio-economic, recreational, ecological and/or aesthetic values. The quality of these waters shall be protected and maintained.

(a) Any person having an existing discharge to these waters shall cease said discharge and connect to a publicly owned treatment works (POTW) unless it is shown by said person that such a connection is not reasonably available or feasible. Existing discharges not connected to a POTW shall be provided with the highest and best practical method of waste treatment determined by the Department as necessary to protect and maintain the outstanding resource.

(b) A new or increased discharge to an Outstanding Resource Water is prohibited unless:

(i) the discharge is determined by the Department to be for the express purpose and intent of maintaining or enhancing the resource for its designated use and a variance from this regulation is granted as provided in 314 CMR 4.04(4). The Department's determination to allow a new or increased discharge shall be made in agreement with the federal, state, local or private entity recognized by the Department as having direct control of the water resource or governing water use; or

(ii) the discharge is dredged or fill material for qualifying activities in limited circumstances, after an alternatives analysis which considers the Outstanding Resource Water designation and further minimization of any adverse impacts. Specifically, a discharge of dredged or fill material is allowed only to the limited extent specified in 314 CMR 9.00 and 314 CMR 4.06(1)(d). The Department retains the authority to deny discharges which meet the criteria of 314 CMR 9.00 but will result in substantial adverse impacts to the physical, chemical, or

biological integrity of surface waters of the Commonwealth.

(4) Authorizations.

(a) An authorization to discharge to waters designated for protection under 314 CMR 4.04(2) may be allowed by the Department where the applicant demonstrates that:

(i) The discharge is necessary to accommodate important economic or social development in the area in which the waters are located;

(ii) No less environmentally damaging alternative site for the activity, source for the disposal, or method of elimination of the discharge is reasonably available of feasible;

(iii) To the maximum extent feasible, the discharge and activity are designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices; and

(iv) The discharge will not impair existing water uses nor result in a level of water quality less than that specified for the Class.

(b) An authorization to discharge to the narrow extent allowed in 314 CMR 4.04(3) may be granted by the Department where the applicant demonstrates compliance with 314 CMR 4.04(4)(a)2. through 4.

(c) Where an authorization is at issue, the Department shall circulate a public notice in accordance with 314 CMR 2.06. Said notice shall state an authorization is under consideration by the Department, and indicate the Department's tentative determination. The applicant shall have the burden of justifying the authorization. Any authorization granted pursuant to 314 CMR 4.04 shall not extend beyond the expiration date of the permit.

(d) A discharge exempted from the permit requirement by 314 CMR 3.05(4) (discharge necessary to abate an imminent hazard) may be exempted from 314 CMR 4.04(4) by decision of the Department.

(5) A new or increased discharge specifically required as part of an enforcement order issued by the Massachusetts Department of Environmental Protection in order to improve existing water quality or prevent existing water quality from deteriorating may be exempted from 314 CMR 4.04(4) by decision of the Department.

(6) Control of Eutrophication. From and after the date 314 CMR 4.00 become effective there shall be no new or increased point source discharge of nutrients, primarily phosphorus and nitrogen, directly to lakes and ponds. There shall be no new or increased point source discharge to tributaries of lakes or ponds that would encourage cultural eutrophication or the growth of weeds or algae in these lakes or ponds. Any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients. Activities which result in the nonpoint source discharge of nutrients to lakes and ponds shall be provided with all reasonable best management practices for nonpoint source control.

(7) Discharge Criteria. In addition to the other provisions of 314 CMR 4.00, any authorized discharge shall be provided with a level of treatment equal to or exceeding the requirements of the Massachusetts Surface Water Discharge Permit Program (314 CMR 3.00). Before authorizing a discharge all appropriate public participation and intergovernmental coordination shall be conducted in accordance with Permit Procedures (314 CMR 2.00).

VIII. ESSENTIAL FISH HABITAT DETERMINATION

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq. (1998)), EPA is required to consult with NMFS if EPA's action or proposed action that it funds, permits, or undertakes, may adversely impact any essential fish habitat. 16 U.S.C. 1855(b). The Amendments broadly define essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50C.F.R. 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

EPA has determined that a formal EFH consultation with NMFS is not required because the discharge does not adversely impact EFH.

IX. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State and expects that the draft permit will be certified.

X. COMMENT PERIOD AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, MA Office of Ecosystem Protection (CMA), 1 Congress Street, Suite 1100, Boston, Massachusetts 02113-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice, whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XI. EPA CONTACT

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

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Date

Linda M. Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

Attachments: A& B - Summary of Discharge Data, not available electronically
Figures 1, 2 & 3 - not available electronically