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EPA NEW ENGLAND
OFFICE OF ECOSYSTEM PROTECTION
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FACT SHEET

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

PUBLIC NOTICE START AND END DATES:

PUBLIC NOTICE NUMBER:

CONTENTS: Twenty-nine pages including four Attachments A through D.

NPDES PERMIT NO.: NH0023469

NAME AND MAILING ADDRESS OF APPLICANT:

Brox Industries, Inc.
1471 Methuen Street
Dracut, Massachusetts 01826-5439

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Facility Location

Brox Industries, Inc.
Hudson Mining & Processing Facility
85 Greeley Street
Hudson, New Hampshire 03051

Mailing Address

Brox Industries, Inc.
Attn: Mr. George Hall, Division Manager
1471 Methuen Street
Dracut, Massachusetts 01826-5439

RECEIVING WATER: Glover Brook (Hydrologic Basin Code: 01070006)

CLASSIFICATION: Class B

I. Proposed Action, Type of Facility and Discharge Location.

The above named applicant, Brox Industries, Inc. (Brox), has applied to the U.S. Environmental Protection Agency, New England Office (EPA New England) for a first-time issuance of a NPDES permit to discharge treated aggregate wash water along with storm water into the designated receiving water. At Brox's Hudson, NH site, manufacturing consists of: commercial crushed stone products (various sized stone and sand) from mining of on-site granite; hot-mix asphalt from inert crushed stone and asphalt (binder) cement; and redi-mix concrete from Portland cement and inert crushed stone and sand. This facility is located on approximately 600 acres of land of which about 200 acres are considered active, the rest being undeveloped wooded areas.

Brox quarries bedrock on-site from March through December by blasting to obtain rock fragments which are then fed into various crushing and processing operations, both wet and dry, to produce a variety of construction grade aggregates (stone and sand). These aggregates are then screened and segregated (piled) according to fragment size. During the remaining period, there are no operations other than selling previously stockpiled stone, sand, and sand/salt mixture and performing equipment repair and maintenance. Also, at this site, Brox operates a hot-mix asphalt (bituminous concrete) plant as well as leases land for a redi-mix concrete plant to Aggregate Industries.

Overall this facility discharges three types of surface runoff that need to be permitted under the NPDES program. They are storm water runoff associated with industrial activity, mine dewatering drainage, and aggregate wash water (called process wash water) of which various combinations are discharged through four Outfalls (001 and 003-005). Outfall 002, which previously discharged only storm water, was eliminated by Brox on April 28, 2003. Presently, all remaining discharges (Outfalls 001 and 003-005) are covered under EPA's Storm Water Multi-Sector General Permit (MSGP); however, coverage of Outfall 001 is inappropriate given that the discharge contains process wash water, which is not an authorized discharge in the MSGP. Accordingly, an individual permit is being issued for the discharge of process wash water from Outfall 001 that will also cover storm water and mine dewatering drainage since the latter sources are commingled and cannot be sampled separately at discharge. Coverage of Outfall 001 under the MSGP will cease upon the effective date of the individual permit.

Due to the inappropriate coverage of Outfall 001 under the MSGP, Brox submitted to EPA-New England on January 24, 2002, an application for an individual permit for its aggregate wash water discharge including storm water runoff and mine dewatering drainage, which EPA-New England considered complete on April 9, 2002. These various flows are treated in a series of in-line settling pond, swales and lagoons (hereinafter referred to as in-line treatment system) prior to passing through Outfall 001 (also referred to by permittee as DSN 001) into the designated receiving water (Glover Brook, a tributary to the Merrimack River) on a continuous basis. This in-line treatment system removes suspended sediments (fine sands and clay-size particles).

Process wash water discharges to this in-line treatment system from two separate operations. They are: (1) aggregate wash water seepage from the base of the aggregate storage piles; and (2) aggregate wash water leakage from the screen/wash tower. Water lost from the aggregate wash system due to evaporation is made up with water pumped from one of the on-site settling lagoons. The facility also uses water for other incidental purposes. Incidental water is applied by tank trucks to the service roads within the facility in response to climatic conditions, all for dust control/suppression. Other incidental waters are used for equipment washing, with that excess water leaching into the ground at the wash site. According to Brox, the rate and volume of all those water applications are insufficient to generate any discharges to waters of the United States. Brox has a septic tank/leach field system for the treatment of any on-site generated domestic wastewater.

The flow of water through the facility's in-line treatment system is as follows: process wash waters (seepages and leakages) discharge along with storm water runoff flow first through the primary settling pond which is periodically cleaned of accumulated sediments to retain its sediment removal efficiency. From primary settling, this water flows through a grassy swale into two back to back in-line settling lagoons from which it then flows through a swaled area containing three back to back in-line dikes with each dike made of erosion stone and silt fencing ending up at a culvert pipe that discharges to Glover Brook. A portion of the water from the most downstream in-line settling lagoon is diverted (pumped back) to the aggregate wash system for make-up water. Storm water runoff and mine dewatering drainage also discharge to the in-line treatment system as overland runoff and ground-water seepage at various points. On the inlet side of the culvert pipe, there is an inverted tee that prevents floating oil and debris from entering Glover Brook.

The two process wash water discharges, storm water runoff and mine dewatering drainage are the site's existing discharges at permit issuance. During the winter of 2003-2004, Brox eliminated its treated process wash water overflow from the Aggregate Wash Water Treatment Recycling System's (AWWTRS) clarifier and changed its source of make-up water from Glover Brook to the most downstream in-line settling lagoon. Thus, Glover Brook will no longer be the source of make-up water for aggregate washing and there will only be two minor process wash water discharges remaining (aggregate wash water seepage from the base of the aggregate piles and from the base of the screen/wash tower). At this time, it's uncertain whether the elimination of the clarifier overflow water coupled with the removal of the make-up water from the second in-line treatment lagoon will result in an intermittent or a smaller but continuous discharge to Glover Brook until operations resume again in March of 2004. However, at a minimum, it is reasonable to assume that the discharge would be intermittent during periods of operation (basically, March through November) and continuous during periods of no operation (basically, December through February).

The location of the site, Outfall 001 and the receiving water are shown in **Attachment A** and a generalized water-flow diagram of process operations/flow including various treatment units are depicted in **Attachment B**.

As additional information/clarification for the reader, storm water coverage under EPA's MSGP is based on the facility's individual Standard Industrial Classification (SIC) code(s) [see 40 Code of Federal Regulations (CFR) Section 122.26(b)(14)] for facilities who discharge storm water to waters of the United States and who cannot make a "no exposure" showing for their specific industrial products or activities to precipitation. Because this site's SIC codes of 1429 (Aggregate Supply), 2951 (Asphalt Paving Supply), 3272 (Concrete Products, except Block and Brick) and 3273 (Ready Mix Concrete) are all listed under 40 CFR Section 122.26(b)(14) as needing storm water coverage, Brox filed a Notice of Intent (NOI) for coverage under the MSGP on June 20, 2002, as did the on-site Ready-Mix Concrete Manufacturing Plant owned by Aggregate Industries. The Agency issued MSGP coverage to both firms at this site with certificate numbers NHRO5A722 to Brox Industries, and NHR05A362 to Wakefield Materials Corporation which is now Aggregate Industries.

Within the MSGP, there are various permit requirements broken down by industrial sector/category (A through Z followed by AA through AD) and within each industrial sector there is a further breakdown by SIC code. Given that this site has industrial operations involving asphalt paving; rock quarry with conversion to stone and sand; and concrete making, it is covered by three of these sectors. Specifically, Sector D –Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers; Sector E –Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing; and Sector J –Mineral Mining and Dressing. Broken-down by outfall: Outfall 001 is covered by Sector J up until the individual permit becomes effective; Outfall 003 is covered by Sector D; Outfall 004 is covered by Sectors E and J; and Outfall 005 is covered by Sectors J, D and E. Outfall 005 is the only outfall receiving storm water runoff from the ready-mix plant; therefore, Outfall 005 is covered by two MSGPs, one for Brox Industries and one for Aggregate Industries.

Description of Aggregate Wash Water and Associated Treatment Recycling System

Aggregate washing is conducted by spraying water from a series of spray nozzles located above the screen deck of the screen/wash tower to remove fines, including clay-size particles, and/or other impurities from the various sized aggregates (stone and sand) being produced. The finer materials and excess water pass through the bottom screen into a sand screw which separates the coarser material (sand size or slightly larger) from the slurry which is then funneled by chute to a conveyor for transport to the appropriate stockpile. At this stage, water is lost from the wash water system through absorption onto the aggregate particles and leakage (drips and overspray) from the screen/wash tower. Overflow water from the sand screw is piped to the AWWTRS plant for cleaning prior to its return to the screen/wash tower for reuse in the sprayers.

During the stockpiling operation, the aggregate contains water adsorbed onto the product's surface (surface film). Excess drains to the base of the pile, leaching into the ground beneath/around the pile, with the surface discharge flowing overland to the in-line treatment system for treatment prior to discharge. The rate and volume of this overland flow varies with air temperature because during hot summer days a larger percentage of the adsorbed water is evaporated during the stockpiling phase than during cooler spring and fall days. In addition, there are various quantities of wash water that leak (drips and overspray) from the screen/wash tower to the ground beneath, with the rate and volume of that overland runoff varying with air temperature in the same manner as process wash

water leached from the storage piles.

The AWWTRS is a closed-looped system where all the treated (clarified) water collected from the wash-water operation is recycled to the spray nozzles for another wash cycle. There is no longer any discharge of overflow water from the AWWTRS's clarifier. At the AWWTRS's plant, make-up water is added from the second in-line settling lagoon to compensate for the various water losses.

Treatment at the AWWTRS consists of a two-stage process where the wash water is first subject to centrifuging and then to clarifying. First, four cyclones and a high-frequency screen remove the larger fines from the wash water with those fines stockpiled on-site. Then the centrifuged water is sent to a large clarifier where a flocculant (anionic polyacrylamide copolymer, a settling agent known as Callaway 3702R) is added to enhance settling. Solids, which settle to the bottom of the clarifier, are removed and mixed with another flocculant (cationic polyelectrolyte, a water clarifier known as Rockfloc 3719R) prior to dewatering by belt presses. Decanted water is recycled back to the head of the clarifier for re-treatment with the solids being stockpiled on-site.

II. Description of Discharge.

Recent effluent monitoring data for pollutants likely present in the discharge from upstream operations are summarized in **Attachment C**. The permittee submitted these data as part of their permit application and in response to information request letters issued by EPA-New England pursuant to Section 308 of the Clean Water Act (ACT). These are current data covering the period November 2001 thorough August 6, 2003, which also coincided with the period when the discharge contained treated overflow wash water from the AWWTRS clarifier. The treated clarifier overflow discharge was eliminated during the winter 2003/2004.

III. Limitations and Conditions.

Effluent limitations, monitoring requirements, and any implementation schedule (if required) are found in PART I of the draft NPDES permit. The basis for each limit and condition is discussed in Section IV of this Fact Sheet.

IV. Permit Basis and Explanation of Effluent Limitations Derivation.

A. Background

The ACT prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the ACT. The NPDES permit is the mechanism used to implement technology and water-quality based effluent limitations and other requirements including monitoring and reporting. As a matter of law, EPA is required to consider technology and water-quality based criteria when developing permit limits.

Section 301(b)(2)(A) and (E) of the ACT provides that by March 31, 1989, industry must meet

limitations based on Best Conventional Pollutant Control Technology (BCT) for conventional pollutants (Biochemical Oxygen Demand [BOD], Total Suspended Solids [TSS], pH, Oil and Grease [O&G] and Fecal Coliform) and Best Available Technology Economically Achievable (BAT) for toxic pollutants. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the ACT (See 40 CFR Part 125, Subpart A).

On July 12, 1977, EPA promulgated technology-based effluent limitation guidelines (ELGs) for the Mineral Mining and Processing Point Source Category, 40 CFR Part 436, Subpart C –Construction Sand and Gravel Subcategory which are applicable to the operations at this site and represent the minimum level of control required for this facility. The promulgated ELGs contained limitations on the discharge of pH 6.0 to 9.0 Standard Units (S.U.) and TSS of 25 mg/l for the average monthly and of 45 mg/l for the maximum daily. However, on June 18, 1979, the TSS limits for the crushed stone (Subpart B) and construction sand and gravel (Subpart C) categories were remanded by Court Order to EPA for reconsideration and, as of this writing, have not been re-proposed. The current ELGs for these categories, therefore, only contain discharge limitations for pH as mentioned above.

In the absence of published technology-based effluent limitations, the permit writer is authorized under Section 402(a)(1)(B) of the ACT to establish effluent limitations on a case-by-case basis using Best Professional Judgement (BPJ).

In general, all statutory deadlines for meeting various technology-based guidelines (effluent limitations) established pursuant to the ACT have expired. For instance, compliance with the Mineral Mining and Processing Point Source Category technology-based effluent limitations is, effectively, from date of permit issuance (40 CFR §125.3(a)(1)). Compliance schedules and deadlines not in accordance with the statutory provisions of the ACT cannot be authorized by a NPDES permit.

Water-quality based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards. See Section 301(b) (1)(C) of the ACT. A water-quality standard consists of three elements: (1) beneficial designated use or uses for a water body or a segment of a water body; (2) a numeric or narrative water-quality criteria sufficient to protect the assigned designated use(s); and (3) an antidegradation requirement to ensure that once a use is attained it will not be eroded. Receiving water requirements are established according to numerical and narrative standards in the state's water quality standards adopted under state law for each stream classification. When using chemical-specific numeric criteria to develop permit limits both the acute and chronic aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentration, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 CFR 122.44 (d)(1) and are implemented under 40 CFR §122.45(d). Also, the dilution provided by the receiving water is factored into this process. Furthermore, narrative criteria from the state's water-quality standards are often used to limit toxicity in discharges where: (1) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (2) toxicity cannot

be traced to a specific pollutant.

The NPDES permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water-quality criterion. See CFR Section 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion. In determining reasonable potential, EPA considers: (1) existing and planned controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit's reissuance application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in **Technical Support Document for Water Quality-based Toxics Control**, **March 1991**, **EPA/505/2-90-001** (hereinafter referred to as the **TSD**) in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire statutes and administrative rules (50 RSA 485-A:8, Env-Ws 1705.02), available dilution for discharges to freshwater receiving waters is based on a known or estimated value of the annual seven (7) consecutive-day mean low flow at the 10-year recurrence interval (7Q10) for aquatic life or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the discharge. Furthermore, 10 % of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01. The current set of these Regulations, newly revised, were adopted on December 3, 1999, and became effective on December 10, 1999. Hereinafter, these New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

The permit may not be renewed, reissued or modified with less stringent limitations or conditions than those conditions in the previous permit unless in compliance with the antibacksliding requirement of the ACT (See Sections 402(o) and 303(d)(4) of the ACT and 40 CFR §122.44(l)(1 and 2). EPA's antibacksliding provisions found in 40 CFR §122.44(l) prohibit the relaxation of permit limits, standards, and conditions unless certain conditions are met. Therefore, unless those conditions are met the limits in the reissued permit must be at least as stringent as those in the previous permit.

The ACT requires that EPA obtain state certification which states that all water-quality standards will be satisfied. The permit must conform to the conditions established pursuant to a State Certification under Section 401 of the ACT (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).

The conditions of the permit reflect the goal of the ACT and EPA to achieve and then to maintain water quality standards. To protect the existing quality of the State's receiving waters, the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) adopted Antidegradation requirements (Env-Ws 1708) in their NH Standards.
This draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the ACT and any applicable State administrative rules. The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124,

125 and 136. Many of these regulations consist primarily of management requirements common to all permits.

B. Effluent Limits and Monitorings for Parameters in Draft Permit

A review of the permit application and manufacturing process including effluent data submitted in response to various information request letters issued by EPA-New England pursuant to Section 308 of the ACT, indicate the pollutants (ammonia, nitrate and nitrite all as nitrogen, arsenic, lead, iron, pH, TSS and turbidity) are or might be anticipated in the discharge. The effluent limits and monitoring requirements for those pollutants, as well as flow and storm water pollution prevention plan are described below. Additionally, as part of one of the Section 308 letter requests, Brox conducted whole effluent toxicity (WET) testing on their discharge. Test results show the discharge has no reasonable potential for toxicity; therefore, no additional WET testing requirements are needed.

The monitoring requirements for arsenic and iron in the draft permit as described below including conditions to allow EPA-New England to modify, or alternatively, revoke and reissue to incorporate chemical specific limits, if the results of the sampling indicate the discharge causes an exceedance of any of the applicable water-quality criterion in the NH Standards. Results from these samples are considered "New Information" and the permit may be modified as provided in 40 CFR §122.62(a)(2). Alternately, if a permittee has consistently demonstrated that its discharge, based on data for the most recent two-year period shows no reasonable potential for exceedances of the applicable State water quality criterion, the monitoring frequency will be considered eligible for a reduced frequency including complete elimination.

Accordingly, a special condition is added to the draft permit that allows for a reduction in monitoring frequency for all parameters, except flow, using a certified letter approval from EPA-New England. Frequency reductions to include elimination would be considered for iron, and arsenic in the effluent and in Glover Brook, and frequency reductions to a minimum of once per quarter would be considered for pH, lead, TSS, all turbidity and nitrate plus nitrite. This permit provision anticipates a time when a reduction/elimination of monitoring frequency would be approvable by both EPA-New England and the NHDES-WD. The permittee is required to continue testing at the frequency specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA-New England indicating a change in the permit condition. This special condition does not negate the permittee's right to request a permit modification pursuant to 40 CFR Section 122.62 at any time prior to the permit's expiration.

Available Dilution

Available dilution of the receiving water is determined using the facility's long-term average daily discharge along with either the: (1) annual 7Q10 low flow of the receiving water just above the facility's outfall for the protection of aquatic organisms; or (2) harmonic mean of the receiving water just above the facility's outfall for the protection of human health. Available dilution is reduced by 10 % to account for the State's reserve capacity rule. The State's requirement to reserve 10 % of the Assimilative Capacity of the receiving water for future needs is pursuant to New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01 and was first included with the State's Surface Water Quality Regulations beginning with the April 1990 revisions.

Frequently, gaged values of streamflow at the outfall are not available; therefore, other methods are utilized, such as determining an estimated annual 7Q10 low flow and/or harmonic mean from a gaged location elsewhere on the receiving water or on a nearby river thought to have similar hydrologic characteristics as the receiving water and transferring each value using a drainage area ratio. Regression equations can also be employed, such as the "Dingman Equation" that utilizes drainage area, mean basin elevation and percent of stratified drift to total drainage area to estimate 7Q10 flow or "EPA's **TSD** Equation" that utilizes arithmetic mean flow and the 7Q10 to estimate a harmonic mean flow (See equation in EPA's **TSD** on page 89). EPA-New England and NHDES-WD have estimated the 7Q10 and harmonic mean flows in Glover Brook just upstream of the outfall to be 0.011 cubic feet per second (CFS) using the "Dingman Equation" and 0.12 CFS using "EPA's **TSD** Equation", respectively, however, given that site operations contributing flow to Outfall 001 have undergone significant renovations during the winter of 2003/2004 it is nearly impossible to properly estimate the long-term average daily discharge until operations resume this spring. See **Attachment D** for specifics of "Dingman Equation" (estimate low-flow) and the "EPA's **TSD** Equation" (estimate harmonic mean).

In summary, available dilution (also referred to as dilution factor) in the receiving water would be determined using the facility's long-term average daily flow rate, an estimated 7Q10 low flow and/or harmonic mean in Glover Brook just above the outfall, and a 10 % reserve of assimilative capacity for future needs in New Hampshire streams. See **Attachment D** for the equation used to determine available dilution.

Flow

The majority of the discharge at outfall 001 is composed of storm water runoff and mine dewatering drainage, all of which are beyond the control of the permittee; therefore, no flow limit is being established. Instead, a monitoring-only requirement is being added to determine the daily discharge from the series of in-line ponds, swales and lagoons upgradient of the outfall. Presently, Brox uses a rating curve (depth versus flow) developed for the outfall pipe in which the measured depth of flow at the end of the discharge pipe is translated into a flow rate in gallons per minute which then can be used to calculate the flow on a gallons per day basis.

Flow monitoring frequency has been set at daily measurements to estimate the long-term average

daily flow at Outfall 001 because that flow component may be needed to determine how much available dilution can be provided by Glover Brook should a water-quality or human-health limit be needed. Presently, it is impossible to obtain a reasonable estimate of the flow rate at Outfall 001 until the facility resumes operation this spring due to the recent changes made to the facility's aggregate wash water operations. This past winter the facility eliminated the discharge from its AWWTRS's plant clarifier, estimated at 130 gallons per minute (gpm), and ceased diverting make-up water from Glover Brook, estimated at 500 gpm. It is currently unknown how much water will now be needed from the most downstream treatment lagoon to account for the evaporative losses in the wash operations that were previously accounted for by the diversion of Glover Brook water. The outfall will likely discharge significantly less water than previously, and the discharge will be composed almost entirely of storm water runoff and mine-dewatering drainage, of which a component will be used for make-up water in the process wash water system. Obviously, there will still be a small component of process wash water seeping from the base of the aggregate storage piles and the screen/wash tower. The Agency theorizes that the revised flows at Outfall 001 will likely be intermittent during periods of operation (basically, March through November) and continuous during periods of no operation (basically, December through February).

pH

Although the applicable ELGs (40 CFR Part 436, Subpart C) require an effluent pH limit of 6.0 to 9.0 S.U., the pH range in the NH Standards [Env-Ws 1703.18(b)] of 6.5 to 8.0 S.U., unless due to natural causes, is more stringent than the ELG's, therefore it applies. Historically, the NHDES-WD has required pH limits to be satisfied at end-of-pipe with no allowance for dilution. Therefore, these limitations are based on State certification requirements under section 401(d) of the ACT, 40 CFR §§124.53 and 124.55.

However, a change in pH limit(s) in the permit due to in-stream dilution would be considered if the applicant can demonstrate, to the satisfaction of NHDES-WD, that the in-stream NH Standards for pH would be protected. Upon satisfactory completion of a demonstration study, the applicant or NHDES-WD may request in writing that the permit limits be modified by EPA-New England to incorporate the results of the demonstration.

Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit(s) to outside the 6.5 to 8.0 S.U. (See STATE PERMIT CONDITIONS in the draft permit), EPA-New England has added a provision to this draft permit (See SPECIAL CONDITIONS section). That provision will allow EPA-New England to modify the pH limit(s) using a certified letter approach. However, the pH limit range cannot be less restrictive than 6.0 - 9.0 S.U. found in the applicable ELG (Mineral Mining and Processing Point Source Category, Subpart C –Construction Sand and Gravel Subcategory [40 CFR Section 436.32]) for the facility.

If the State approves results from a pH demonstration study, this permit's pH limit range can be relaxed in accordance with 40 CFR 122.44(l)(2)(i)(B) because it will be based on new information not available at the time of permit issuance. This new information includes results from the pH demonstration study that justifies the application of a less stringent effluent limitation. EPA-New England anticipates that the limit determined from the demonstration study as approved by the NHDES-WD will satisfy all effluent requirements for this discharge category and will comply with NH Standards.

Total Suspended Solids

As discussed previously, there is no ELG for TSS for the construction sand and gravel subcategory. However, EPA-New England has made a BPJ determination setting TSS limits in the draft permit at 25 mg/l for average monthly and 45 mg/l for maximum daily time periods. This BPJ determination is based on a review of the current MSGP to determine what technology-based limits were set in that permit for discharges for the industrial sector upgradient of Outfall 001 because, absent the process wash water discharges, that sector's limits for storm water and mine dewatering would apply to Outfall 001. As previously stated, Sector J is the applicable industrial sector and the MSGP contains effluent limits for mine dewatering activities at construction sand and gravel facilities as well as a benchmark monitoring concentration for storm water runoff (See MSGP, Table J-1 on page 64831). The limitations for mine dewatering activities include TSS of 25 mg/l for monthly average and 45 mg/l for maximum daily periods and pH of 6.0 to 9.0 S.U. Because none of the discharges (process wash water, storm water runoff and mine dewatering drainage) can be separated from each other following treatment, then the most stringent limit applies, thus ensuring compliance for the mine dewatering drainage component. Accordingly, all discharges from Outfall 001 must meet a TSS of 25 mg/l for monthly average and 45 mg/l for maximum daily period to be consistent with MSGP.

The EPA-New England has reviewed other individual NPDES permits recently issued for crushed stone activities in Massachusetts as well as general NPDES permits recently issued for *sand and gravel mining and processing* activities in the States of Michigan and Colorado. These permits included limits for TSS between 20 and 30 mg/l for monthly average and between 40 and 45 mg/l for maximum daily time periods for discharges of commingled storm water runoff, mine dewatering drainage and process wash-water treated or otherwise.

Turbidity

Due to the nature of the operation, which involves washing fines including clay-size particles from sands and gravels manufactured by crushing rock fragments, there is the potential for turbidity in the discharge. Turbidity of water is related to the amount of suspended and colloidal material present in the water column. Aside from the aesthetic problems of color that a turbid discharge can create, turbidity reduces water clarity; therefore, the penetration of light into that water column is reduced, negatively impacting the growth and life cycles of various aquatic species (plants and animals). Given the detention time afforded by the in-line treatment system, there should be minimal suspended material left in the water column by the time the discharge passes Outfall 001; however, a significant amount of colloidal particles could remain since longer detention times are required to

settle out colloidal size particles than coarser ones. The turbidity standard from the NH Standards is found at Env-Ws 1703.11(b), and requires that turbidity in the receiving water shall not exceed natural occurring conditions by 10 Nephelometric Turbidity Units (NTUs) as the result of a discharge. Because turbidity does not lend itself to a mass balance analysis, i.e., dilution of turbidity is site specific and not a one to one relationship, EPA-New England and the NHDES-WD require turbidity measurements in the receiving water just upstream and downstream of the outfall in order to determine whether this discharge exceeds NH Standards. Turbidity measurements just upstream of where the outfall discharges into Glover Brook are being used to satisfy the "naturally occurring condition" specified in the NH Standards.

Results of turbidity samples collected in response to a Section 308 information letter request shows that on one occasion the discharge from Outfall 001 caused Glover Brook to exceed natural occurring conditions by more than 10 Nephelometric Turbidity Units (NTUs). Specifically, on August 6, 2003, a comparison of turbidity in Glover Brook just upstream and downstream of Outfall 001 revealed an increase in turbidity of 11.6 NTU's that was attributed to the discharge of Outfall 001. Turbidity results at the upstream, downstream and outfall locations were 2.4, 14 and 15 NTUs, respectively. This one exceedance is sufficient justification to establish that this discharge, as presently configured, has demonstrated "reasonable potential" to cause or contribute to an exceedance of the state's water-quality criteria for turbidity; therefore, a turbidity limit of "not to exceed 10 NTUs" has been established in this draft permit as per 40 CFR 122.44(d)(1).

Selected Nitrogen Compounds --Ammonia, Nitrate and Nitrite

Nitrogen compounds are a normal component of explosive materials used to fragment (blast) bedrock into rock chunks suitable for crushing. Not all these nitrogen compounds are vaporized in the denotation process; therefore, residuals of nitrate, nitrite and ammonia compounds are available for dissolution in storm water runoff, mine dewatering drainage and/or process wash water that come in contact with any of blasted material (rocks and blast residue). According, EPA-New England and the NHDES-WD are concerned that this blasting, which occurs once or twice a week from March through December could lead to exceedances of the: (1) ammonia criteria in the NH Standards (See Env-Ws 1703.25) or EPA's newly revised ammonia criteria as allowed under NH Standards Alternate Site Specific Criteria approach (See Env-Ws 1704.01(c); and (2) benchmark monitoring concentration for nitrate plus nitrite as nitrogen of 0.68 mg/l found in the MSGP (See Table J-1, page 64831) as a signal that modifications to the Storm Water Pollution Prevention Plan (SWPPP) may be necessary.

EPA's newly revised ammonia criteria can be found in an EPA document titled 1999 Update of Ambient Water Quality Criteria for Ammonia. For a point of reference, ammonia's chronic aquatic-life criteria for fish when early life stages are present as taken from the 1999 Update coupled with no available dilution in the receiving water, would yield an average monthly ammonia limit of 3.39 mg/l as N for the summer period (May through October) and 6.67 mg/l as N for the winter period (November through April) should one be needed. The aquatic-life chronic criteria for ammonia as N for the summer period (instream pH of 6.5 S.U. and water temperature of 25 degrees Celsius) is 3.39 mg/l and for the winter period (instream pH of 6.5 S.U. and water temperature of 10 degrees

Celsius) is 6.67 mg/l to comply with NH Standards. The 7Q10 flow in Glover Brook at the Outfall 001 is likely to be essentially zero for it is a small headwater stream; therefore, if permit limits are deemed necessary as a result of these monitoring activities, the limit would likely be set at criteria or a value slightly above that.

Results of four ammonia samples collected through a Section 308 information letter request shows that ammonia in the discharge does not exceed its method detection limit of 1.0 mg/l. Therefore, there is no "reasonable potential" to equal or exceed the State's water-quality standard for ammonia. Accordingly, no limit or monitoring requirement for ammonia is needed in this draft permit.

EPA's newly issued MSGP contains a requirement to monitor nitrate plus nitrite as nitrogen concentrations for Sector J facilities with sand and gravel operations and use those results as a yardstick to judge the overall effectiveness of their SWPPP at controlling those pollutants in the discharge. The MSGP sets a benchmark concentration level of 0.68 mg/l for nitrate plus nitrite as nitrogen, above which the permittee should institute a review of their SWPPP to see which, if any, of the best management practice(s) in the SWPPP should be revised, or new ones possibly added, to bring the nitrate plus nitrite levels below 0.68 mg/l. To quote from the MSGP, Part 5.1.2 on page 64816, "While exceedance of a benchmark value does not automatically indicate that violation of a water quality standard has occurred, it does signal that modifications to the SWPPP may be necessary." Because the Agency intends to require the permittee to develop a SWPPP for those areas discharging to Outfall 001 by reference to the MSGP (See Section following on Storm Water Pollution Prevention Plan) and because the MSGP has selected certain parameters with associated benchmark concentrations as signals for the permittee to consider revising their SWPPP, the Agency has decided to include a nitrate plus nitrite monitoring-only requirement in this draft permit. Furthermore, the Agency believes these requirements are no more restrictive than those found in the applicable MSGP for this facility and discharge type which would have been required under the MSGP had the Agency not decided an individual permit was necessary for this facility due to its process wash water discharge. The decision to monitor for nitrate plus nitrite is further reinforced by the fact that samples collected for just nitrate nitrogen (absent the nitrite portion) show exceedances of the 0.68 mg/l benchmark value. Specifically, on February 27 and June 25, 2002, nitrate nitrogen was found at 0.9 and 1.0 mg/l levels, respectively, in the discharge from Outfall 001.

Iron

The permittee's sampling has shown that the discharge contains concentrations of iron that approach or exceed the aquatic-life chronic criteria for iron of 1.0 mg/l in the NH Standards. Of the three iron samples evaluated in developing this portion of the draft permit (See **Attachment B**), two (August 29, 2002 and February 5, 2003) show iron concentrations at 0.79 and 2.3 mg/l, respectively. While there are no aquatic-life **acute** criteria for iron in the NH standards, the Agency is concerned that if these concentration levels are persistent, the State's aquatic-life **chronic** criteria value for iron of 1.0 mg/l could be exceeded. The literature indicates that water containing iron concentrations of greater than 1.0 mg/l on a consistent basis are toxic to trout and other fish as well as to mayflies, stoneflies and caddisflies, all of which are important food organisms for these fish.

Because of the limited amount of data available, the draft permit does not contain effluent limits; however, a monitoring requirement for iron is included to determine if an average monthly limit for iron is necessary.

Lead

The NH Standards contain arsenic criteria for the protection of human health and for the protection of aquatic organisms. Monitoring of the discharge from outfall 001, and in the receiving water, shows levels of lead that equal or exceed aquatic-life acute and chronic dissolved lead criteria in the NH Standards (Table 1703.1)

The NH Standards contain dissolved lead aquatic-life chronic criteria of 0.54 micrograms per liter (*u*g/l) and acute criteria of 14 *u*g/l (see Table 1703.1). These criteria are based on a hardness of 25 mg/l and were adopted from EPA's recommended criteria for total recoverable lead, which were converted to dissolved criteria through the use of a conversion factor (CF). Section 1703.23 of the NH Standards requires the use of the CF as found in Table 1703.2 to convert total recoverable metals to dissolved metals for the purposes of reasonable potential determinations during permit development as well as to convert the dissolved criteria in NH Standards to total recoverable criteria for expressly limiting total recoverable metal in NPDES permits. If the permittee wishes to use a CF different from the one shown in Table 1703.2, they should contact the NHDES-WD for the appropriate procedures that should be followed under the Alternative Site Specific Criteria Section of the NH Standards (See Env-Ws 1704).

Federal regulations found at 40 CFR Section 122.45(c) require that all effluent limitations for metals be expressed in terms of total recoverable metals in NPDES permits.

The basic equations for converting dissolved criteria to total recoverable criteria are found in Env-Ws 1703.23 and 1703.24 of the NH Standards. Equations under Env-Ws 1703.23 yield the appropriate CF for various hardnesses and equations under Env-Ws 1703.24 are used to calculate dissolved metal criteria, both acute and chronic, at hardnesses other than that shown in Table 1703.1. These equations are applicable for a hardness range between 25 and 400 mg/l [See Env-Ws 1703.22(f)].

The CF equation for lead from Table 1703.2 is shown and is the same equation for both acute and chronic criteria.

CF = 1.46203-[(Ln hardness)(0.145712)]
CF = 1.46203-[(Ln 25)(0.145712)]
CF = 1.46203-[0.469]
CF = 0.993 for a default hardness 25 mg/l

Therefore, the dissolved acute criteria of 14 *u*g/l from Table 1703.1 is divided by 0.993 to get 14.1 *u*g/l which is rounded to 14 *u*g/l and the dissolved chronic criteria of 0.54 *u*g/l from Table 1703.1 is divided by 0.993 is 0.544 *u*g/l which is rounded to 0.54 *u*g/l. The conversion factor for lead is a function of hardness and as the hardness values approaches 25 mg/l, the CF approaches 1.

A number of lead samples have been collected from outfall 001 and from Glover Brook, both upstream and downstream of that discharge. The most recent samples were collected in May and June of 2003 in conjunction with WET testing. In the May sample, the total recoverable lead concentration in the discharge was 11 *u*g/l, and the concentration in the receiving water upstream of the discharge was 8 *u*g/l. In June, the total recoverable lead concentration in the discharge was 11 *u*g/l and the upstream concentration was 14 *u*g/l. All of these values exceed the chronic water quality criteria, and the upstream concentration in the June sample is equal to the acute criteria (at 25 mg/l hardness and using the CF to convert from total recoverable metals to dissolved metals). It should be pointed out that at the time these lead samples were collected Brox was diverting water from Glover Brook at a point about 1,000 feet (ft) downstream of Outfall 001 for use as make-up water in the process wash water operations; and, therefore, the lead levels in the discharge at outfall 001 could be recycled lead from Glover Brook due to the discharge of a portion of the process wash water, and not from any other source on the site.

Other older data show lead concentrations that exceed the State's criteria. Samples collected on February 12, 1999, by Brownstone Environmental Services(BES) for a study commissioned by Brox show total recoverable lead in the discharge from outfall 001 and in Glover Brook about 1,200 ft downstream of the outfall, but none in Glover Brook about 1,200 ft upstream of the outfall at the detection level of 1 *u*g/l. No dissolved lead was found at any of these three sites at that detection level. During this study, water samples were collected and were split for analyses by three separate laboratories. At outfall 001, total recoverable lead was detected at 12 and 10 *u*g/l by two of the laboratories and in Glover Brook downstream of the outfall, total recoverable lead was detected at 2 *u*g/l by one of those laboratories. See ***Report of Groundwater and Surface Water Quality Study February 1999***, dated May 10, 1999.

It should be noted that the February 1999 sample of Glover Brook collected 1,200 ft upstream of the outfall was taken in about the same place as the samples for the WET tests. According to the facility, all these Glover Brook samples were collected at the outlet of a swamp (base of beaver dam) that constitutes the headwaters of Glover Brook, which Brox claims is above all influences of the facility's current activities.

While the older data overall shows lower lead concentrations than the 2003 samples, it does indicate that the lead translator (CF) used in the NH Standards may be more conservative than the partitioning which is actually occurring in-stream. However, EPA-New England believes that the current data do show that the receiving water clearly exceeds the State's water-quality criteria upstream of the discharge, and both the older and current sets of data show that the discharge at outfall 001 has a reasonable potential to cause or contribute to an exceedance of those criteria. Therefore, the draft permit includes monthly average and daily maximum limits for total recoverable lead, which are equal to the chronic and acute criteria of 14 and 0.54 *u*g/l, respectively. If the permittee wishes to submit information in support of a site-specific approach to developing a lead limit for this outfall that would be consistent with the New Hampshire Water Quality Regulations (Env-Ws 1704), it may do so. If the standard developed through that approach is approved by the NHDES-WD and EPA-New England, this permit will be reopened and modified accordingly.

EPA- New England has established that the minimum level (ML) for lead is 3 *u*g/l, using the Furnace Atomic Absorption (Furnace AA) method. The ML is the level at which the entire analytical system gives recognizable mass spectra and acceptable calibration points when analyzing for pollutant of concern. This level corresponds to the lowest point at which the calibration curve is determined. Since the monthly average permit limit is less than the ML, the draft permit requires that lead analyses be performed using the Furnace AA method, and establishes that compliance with the permit will be based on the ML. EPA-New England recommends that Clean Techniques, as described in EPA Method 1669 be used when sampling, and that consideration should also be given to Clean Analytical Techniques for the laboratory setting to ensure data reliability.

Therefore, the limit at which compliance/non-compliance determinations will be based is the Minimum Level (ML) which is defined as 3.0 *u*g/l for total recoverable lead and this value may be reduced by permit modification as more sensitive test methods are approved by EPA. Any value below 3.0 *u*g/l shall be reported as zero until written notice is received by certified mail from EPA-New England indicating some value other than zero is to be reported for total recoverable lead's ML of 3.0 *u*g/l (i.e., between zero and 2.99 *u*g/l).

Arsenic

The NH Standards contain arsenic criteria for the protection of human health and for the protection of aquatic organisms. Monitoring of the discharge from outfall 001, and in the receiving water, shows levels of arsenic sufficient to necessitate a review of the reasonable potential for the discharge to cause or contribute to an exceedance of those standards.

The instream dissolved arsenic water quality criteria for the protection of human health include limits based on fish consumption-only (0.14 *u*g/l) and for water and fish ingestion (0.018 *u*g/l). In the NH Standards, the arsenic criteria for human health "refers to the inorganic form only" [See Env-Ws 1703.22, Notes for Table 1703.1, Item (b)]. The aquatic life criteria include a chronic criteria of 150 ug/l and an acute criteria if 340 ug/l. These criteria, converted to their total recoverable form, and a dilution factor based on a ratio of the receiving water flow to the discharge flow, would be used to the calculate permit limits. Arsenic is considered a metal and, therefore, must be regulated in its

total recoverable form (See previous discussion on lead). According to the NH Standards, Table 1703.2, a conversion factor of 1 is used to convert the dissolved form of arsenic to its total form, in the absence of a site-specific translator. (As an aside, federal drinking water standards for total arsenic are 50 ug/l, and will drop to 10 ug/l on January 23, 2006.)

In the mid to late 1990's, sampling at this site was conducted as part of a Groundwater Release Detection Permit (GRDP) issued by the NHDES, and showed two instances of detectable levels of arsenic in Glover Brook just downstream from Outfall 001. These concentrations were 11 *u*g/l on August 12, 1994 and 9.6 *u*g/l on November 5, 1997. However, it is unclear whether these results are as total recoverable or as dissolved arsenic. Since November 23, 1998, sampling at this site has not detected any arsenic in Glover Brook at the detection levels for the three analytical methods employed (5, 10 and 25 *u*g/l). During this period, total recoverable and dissolved arsenic results were reported for November 23, 1998, February 12 and17, 1999, April 24, 1999, and November 7, 1999; whereas, only a total recoverable arsenic result was reported for November 11, 2000.

A sample collected at Outfall 001 on February 12, 1999, by Brownstone Environmental Services (BES) for a study commissioned by Brox Industries, Inc. (See ***Report of Groundwater and Surface Water Quality Study February 1999*** dated May 10, 1999), showed a total recoverable arsenic concentration of 11 *u*g/l and a dissolved arsenic concentration of <5 *u*g/l. However, a sample collected of the same outfall taken on November 11, 2000, showed no detectable arsenic at a detection level of 25 *u*g/l.

Samples from wells on the Brox site showed arsenic levels in ground water that vary from a low of <5 *u*g/l to a high of 210 *u*g/l, which occurred during November 2000. The reports done by Brox's consultant concluded that the arsenic levels in these wells were from natural sources, such as bedrock, and not from the former virgin petroleum contaminated soil stockpile that was removed prior to August 31, 2000, which was the focus of the State's GRDP (The GRDP was terminated by the State on June 27, 2001). This finding is supported by sampling conducted by the United Sates Geological Survey of groundwater from private bedrock wells in the Hillsborough County area, which found that the naturally occurring median concentration of total recoverable arsenic is 2 *u*g/l *(see* ***U.S. Geological Survey Fact Sheet 051-03 dated July 2003***).

Given that recent data do not show arsenic concentrations above the method detection limits and these data were all collected prior to the recent reconfiguration of the treatment process and discharge, EPA-New England has decided not to establish limits for arsenic in the draft permit at this time. However, the draft permit does establish monitoring requirements, and does mandate that the arsenic analyses be performed using specific analytical methods that have ML's that range from 2 to 5 *u*g/l. The draft permit further requires that monitoring for total recoverable arsenic be conducted both in outfall 001 and Glover Brook upstream of the discharge, to document background concentrations in the receiving water.

If future monitoring shows that arsenic concentrations in the discharge have the reasonable potential to cause or contribute to violations of water quality standards, the permit could be reopened, and limit established, using appropriate permit modification procedures.

Storm Water Pollution Prevention Plan (SWPPP)

On June 20, 2002, the facility received coverage under EPA's MSGP, permit number NHR05A722 for all outfalls, including outfall 001 (DSN 001). A SWPPP was prepared as required by the MSGP. Those SWPPP requirements of the MSGP have been incorporated into this draft permit by reference for those areas at this facility contributing storm water runoff and mine dewatering drainage to Outfall 001. Obviously, this should not pose a problem for this facility to meet as that requirement has already been fulfilled for the MSGP.

Under Section 304 of the ACT, which allows for the control of discharges from nonpoint sources of pollution, as implemented through 40 CFR Section 122.44(k), the Agency is allowed to incorporate Best Management Practices (BMPs) (in this case referred to as the SWPPP) into NPDES permits as necessary to control or abate the discharge of pollutants from a variety of activities ancillary to industrial manufacturing or treatment processes such as material storage areas, plant site runoff, mine dewatering, etc. Specifically, discharges authorized for control through BMPs/SWPPP are those under Section 304(e) of the ACT for the control of storm water discharges [See 40 CFR Section 122.44(k)(2)] and those for which numeric limitations are infeasible [See 40 CFR Section 122.44(k)(3)] such as for control of mine dewatering drainage. The Agency has concluded that the best way to control discharges of pollutants in a facilities storm water runoff and/or mine dewatering drainage is through the application of a "pollution prevention plan" approach. The development of a site-specific storm water "pollution prevention plan" allows the permittee to develop specific "best management practices", whether structural or non-structural, that are best suited for controlling these types of discharges taking into consideration the facility's layout and topography. Typical examples of various practices/controls are: good housekeeping; employee training; spill response and prevention procedures; coverage of raw storage piles; minimizing drainage into and out of raw material storage and waste disposal areas; strategic placement of detention ponds around the facility to capture and treat sediment laden runoff; establishing periodic schedules to remove sediments from these ponds to maintain their sediment removal efficiency; dust suppression activities; re-establishing vegetative cover in blasted areas; etc.

C. Antidegradation

New Hampshire's anti-degradation provisions found in Env-Ws 1708 of the NH Standards ensure that provisions in 40 CFR Section 131.12 are met. These provisions ensure that all existing uses in Glover Brook, the receiving water, along with the level of water quality necessary to protect those existing uses are maintained and protected. The State has made a "tentative anti-degradation finding", in the form of a letter to the Agency, in which they reaffirm their belief that, "through regulation with the NPDES permit the existing instream uses and level of water quality necessary to protect the existing uses will be maintained and protected." That tentative finding is an integral part of this permit development process and, therefore, subject to public notice and review before becoming final. Public comments received on the State's "tentative anti-degradation finding" will be responded to by the NHDES-WD and EPA-New England in the Response to Public Comments Document that will accompany the finally issued permit, if any comments are received.

D. Additional Requirements and Conditions

The effluent monitoring requirements have been established to yield data representative of the discharge under the authority of Section 308(a) of the ACT in accordance with 40 CFR §§§ 122.41(j), 122.44(i) and 122.48. In the draft permit, compliance monitoring frequency for the various parameters limited and/or monitored have been set at once per month to determine their effluent variability for this newly reconfigured discharge and the effect of sediment concentration, if any, on the concentrations of arsenic and lead in the effluent and receiving water. Given this site's multiple in-line treatment lagoons with their combined lengthy detention times, a once per month sampling frequency has been chosen to ensure that the data represent independent sampling events. However, flow will be monitored on a daily basis, because at permit development, it is unclear to the Agency what is the likely range in effluent flows and whether or not those flows will be intermittent given the significant changes (elimination of clarifier overflow water and diversion of make-up water from Glover Brook) that have taken placed during the winter of 2003/2004 to the process discharge component of the effluent discharged at Outfall 001.

See Table 1 for a comparison of sampling frequencies and sample types in the current versus new draft permit and, as an aid to the reader, Table 2 has been included to show effluent limitations and/or monitoring requirements in the draft permit. It is the intent of EPA and NHDES-WD to establish minimum monitoring frequencies in all NPDES permits at permit modification and/or reissuances that are appropriate from both environmental and human health perspectives.

The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under the authority of Section 308(a) of the ACT in accordance with 40 CFR §122.41(j), §122.44(i) and §122.48.

The remaining conditions of the permit are based on the NPDES regulations 40 CFR, Parts 122 through 125, and consist primarily of management requirements common to all permits.

Table 1. Sampling Frequencies and Sample Types in the Draft Permit.

PARAMETER	Draft Permit	
	Sampling Frequency	Sample Type
Flow	1/Day	Calculation
pH	1/Month	Grab
TSS	1/Month	Grab
Outfall Turbidity	1/Month	Grab
Glover Brook Turbidity, Upstream Outfall	1/Month	Grab
Glover Brook Turbidity, Downstream Outfall	1/Month	Grab
Glover Brook Turbidity, Difference	1/Month	Calculation
Nitrate plus Nitrite as Nitrogen	1/Month	Grab
Iron (total recoverable)	1/Month	Grab
Arsenic (total recoverable)	1/Month	Grab
Lead (total recoverable)	1/Month	Grab

Table 2. Effluent Limitations and Monitoring Requirements in the Draft Permit.

PARAMETER	Draft Permit	
	Average Monthly	Maximum Daily
Flow	Report gpd	Report gpd
TSS	25 mg/l	45 mg/l
pH	Range: 6.5 to 8.0 S.U.	
Outfall Turbidity	----	Report NTUs
Glover Brook Turbidity, Upstream Outfall	----	Report NTUs
Glover Brook Turbidity, Downstream Outfall	----	Report NTUs
Glover Brook Turbidity, Difference	----	10 NTUs
Nitrate plus Nitrite as Nitrogen	----	Report mg/l
Iron (total recoverable)	----	Report mg/l
Arsenic (total recoverable)	----	Report mg/l
Lead (total recoverable)	0.54 *u*g/l	14 *u*g/l

V. Essential Fish Habitat.

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 the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions 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" (EFH) 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. 50 CFR § 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. Id.

EFH 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.

EFH Species

Glover Brook is a tributary to Ottarnic Pond which then flows into First Brook which, in turn, is a tributary of the Merrimack River, and, as such, all three water bodies are designated EFH for Atlantic salmon (*Salmo salar*). Merrimack River has been designated EFH status for Atlantic salmon ".....including all tributaries to the extent they are currently or were historically accessible for salmon migration". However, NHDES-WD indicates that Ottarnic Pond is a shallow, highly eutrophic, warm water pond which is not suitable habitat for cold water species such as Atlantic Salmon. In addition, the 7Q10 flow in Glover Brook is likely to be essentially zero or close to it, as it is a small headwater stream; therefore, not suitable habitat for Atlantic Salmon. Furthermore, the New Hampshire Fish and Game Department (NHF&GD), indicates there is no stocking of juvenile salmon nor trout in Glover Brook above Ottarnic Pond.

EPA-New England's Opinion of Probable Impacts

The EPA-New England has concluded that formal consultation with NMFS is not required because the EFH species, the Atlantic Salmon, is not present due to the shallow, warm and highly eutrophic conditions in Ottarnic Pond and, potentially, the low flows in Glover Brook. In addition, based on the permit limitations and requirements identified in the draft permit and Fact Sheet that are designed to protect aquatic species, this authorized discharge is not likely to adversely affect the federally managed species, even if present, their forage, or their habitat in Glover Brook itself. If adverse effects do occur as a result of this permit action, or if new information becomes available that changes the basis for this conclusion, then NMFS will be notified and consultation will be promptly initiated.

VI. State Certification Requirements.

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate State's Surface Water Quality Regulations or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the draft permit, EPA-New England is formally requesting that the State's certifying authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The NHDES-WD is the certifying authority. EPA-New England has discussed this draft permit with the staff of the Water Division and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the ACT, Sections 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law. Since certification is provided prior to permit issuance, failure to provide this statement for any condition waives the right to certify or object to any less stringent condition which may be established by EPA-New England during the permit issuance process following public noticing as a result of information received during that noticing. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the ACT or State law, the State should include such conditions and, in each case, cite the ACT or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition.

Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 CFR Part 124.

VII. Comment Period, Hearing Requests, 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: Mr. Roger A. Janson, Director NPDES Permit Program, U.S. Environmental Protection Agency, One Congress Street, Suite 1100 (Mail Code: CPE), Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England 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 (30) 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-New England'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.

VIII. EPA/State Contacts.

Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

Mr. Frederick B. Gay, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
NPDES Permits Unit
One Congress Street
Suite 1100, Mail Code: CPE
Boston, Massachusetts 02114-2023
Telephone No.: (617) 918-1297
FAX No.: (617) 918-0297

_____
Date:

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

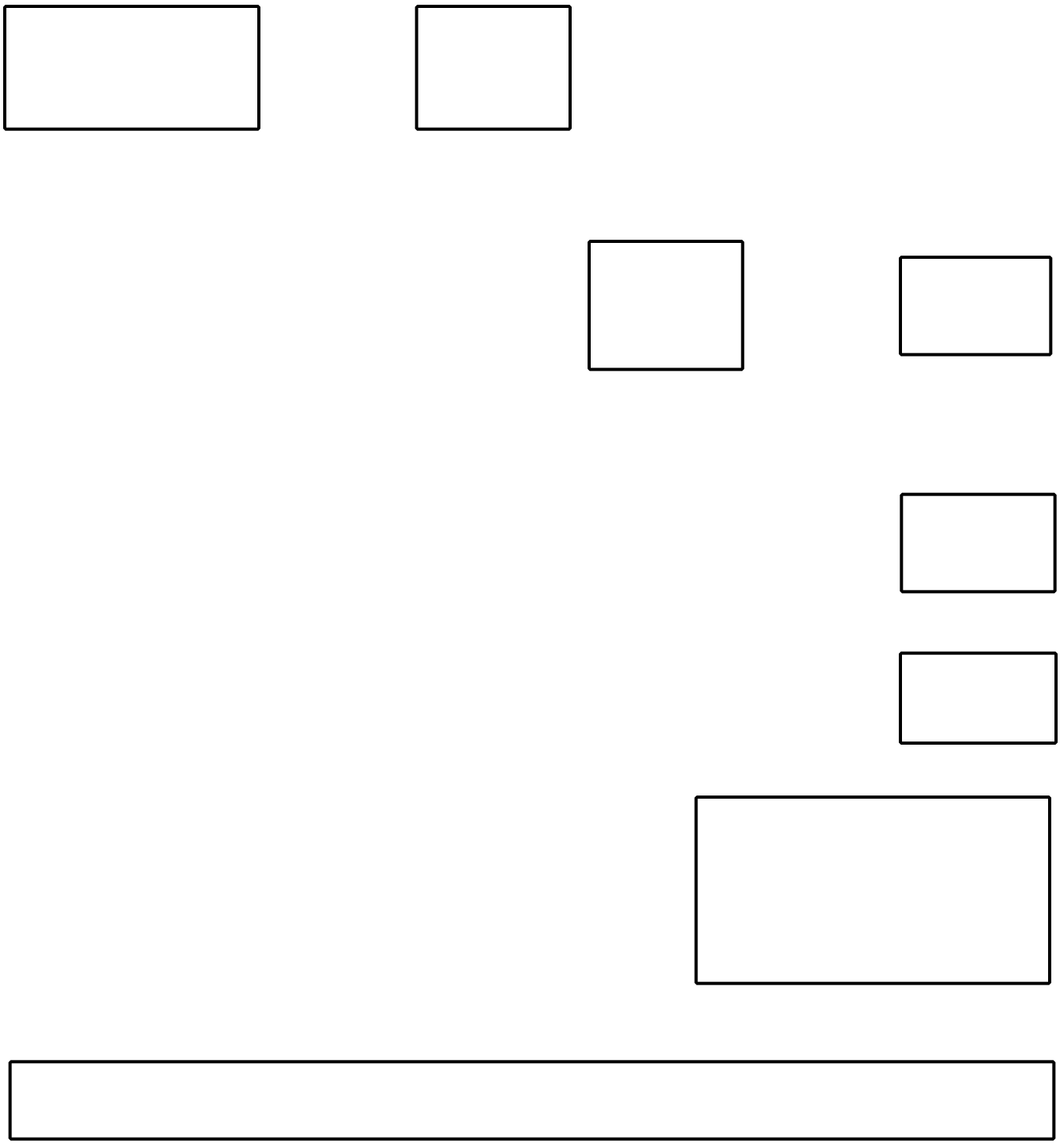
ATTACHMENT A

This attachment is for the overview map of the area–that is the USGS Topographic Map.

OVERVIEW MAP ATTACHED BY STAPLE TO BACK OF THIS PAGE

ATTACHMENT B

Generalized Water-Flow Diagram Showing Process Operations/Flows and Various Treatment Units
(at Permit Development)



ATTACHMENT C

CONCENTRATIONS OF SELECTED EFFLUENT CHARACTERISTICS AT OUTFALL 001

Recent effluent monitoring data for pollutants and other relevant parameters likely present in the discharge from upstream operations are summarized in this attachment. The permittee submitted these data as part of their permit application and in response to information request letters issued by EPA-New England pursuant to Section 308 of the ACT. These data cover the period November 2001 thorough August 6, 2003. They represent an effluent composed of aggregate wash water, treated or otherwise, storm water runoff and mine dewatering drainage from this facility and gives an indication of this facility's ability to meet its current permitted limits. To fully understand the statistics presented in the table below, the reader should be thoroughly familiar with the definitions of average monthly, average weekly and maximum daily in Part II, General Conditions and Definitions, on pages 13, 14 and 18, respectively. In the table, some range values were rounded for ease of presentation.

Effluent Characteristic	Number of Samples	Range of Maximum Daily	Average of Maximum Daily[1]
Flow (gpm)	19	21 - 529	279
pH (S.U.)	34	6.5 - 7.8	7.1
TSS (mg/l)	35	<4.0 - 28	12
Outfall Turbidity (NTUs)	18	3.9 - 25	10.8
Glover Brook Turbidity Upstream (NTUs)	18	<1 - 8.9	2.68
Glover Brook Turbidity Downstream (NTUs)	18	1.3 - 15	5.02
Glover Brook Turbidity Difference (NTUs) from (Downstream minus Upstream)	18	-2.7 to +11.6	N.A.
Iron (mg/l)	3	0.308 - 2.3	1.13
Oil & Grease (mg/l)	19	<5 - <5	<2.5
Ammonia as Nitrogen (mg/l)	4	<1.0 - <1.0	0.5
Nitrate as Nitrogen (mg/l)	2	0.9 - 1.0	0.95

1. Any value qualified with a less than sign was halved prior to computation.

SUMMARY OF WHOLE EFFLUENT TOXICITY RESULTS

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC
Ceriodaphnia dubia	48 Hours	>100 %	100 %
Pimephales promelas	48 Hours	>100 %	100 %

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC
Ceriodaphnia dubia			
Survival	7 Days	100 %	>100 %
Reproduction	7 Days	100 %	>100 %
Pimephales promelas			
Survival	7 Days	100 %	>100 %
Growth	7 Days	100 %	>100 %

ATTACHMENT D

Annual 7Q10 Low Flow on Glover Brook Just Above Outfall 001

"Dingman Equation" to compute the annual 7Q10 low flow at Outfall 001

Equation 12 of "S. Lawrence Dingman & Stephen C. Lawlor, Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, Journal of the American Water Resources Association, Vol. 32, No. 2, April 1995." Equation 12 in the original journal article was corrected by S. Lawrence Dingman in a letter dated June 19, 2000, to Dr. Christopher Lant, Editor, Journal of the American Water Resources Association. The correction changed the minus to a plus sign in the equation just prior to the stratified drift (D) term.

The corrected equation for annual 7Q10 low flow is as follows:

$7Q10 = 10^{x}$ where $x = 1.25\log_{10}A + 0.0004Y + 1.49D - 2.22$

where:

- 7Q10 = Low Flow in cubic feet per second (cfs).
- A = Drainage area, square miles (mi^2); or 0.97 mi^2 just upstream of Outfall 001.
- Y = Mean basin elevation, feet (ft); or 291 ft just upstream of Outfall 001.
- D = Ratio of stratified drift area* to total drainage area, in decimal percent; or 0.124. Stratified drift area is 0.12 mi^2 just upstream of Outfall 001.

*Stratified drift areas taken from Ground-Water Availability Maps published at a scale of 1:125,000 by U.S. Geological Survey in 1975, 1976 and 1977 for New Hampshire.

Harmonic Mean Flow (Q_{hm}) on Glover Brook Just Above Outfall 001

$$Q_{hm} = [1.194 \times (Q_{am})^{0.473}] \times [(7Q10)^{0.552}]$$

where:

- Q_{am} = Arithmetic mean flow in cfs; or 1.41 cfs computed from long-term mean flow equation developed by Dingman (1978).
- 7Q10 = Low flow in cfs; or 0.011 cfs from Dingman's low-flow equation above.

ATTACHMENT D (Continued)

Available Dilution Factor at Outfall 001

$$DF = \frac{(Q_{001}) + (Q_{FDF} \times 1.547)}{Q_{FDF} \times 1.547} \times 0.90$$

where:

DF = Dilution factor
Q_{001} = Annual 7Q10 low flow or Harmonic mean flow at Outfall 001, in cfs.
0.90 = Factor to reserve 10 percent assimilative capacity.
Q_{FDF} = Facility's long-term average daily flow, in million gallons per day (mgd).
1.547 = Factor to convert mgd to cfs.