UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
5 POST OFFICE SQUARE, SUITE 100 (OEP06-4)
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT # MA0005355

PUBLIC NOTICE DATES:

NAME AND ADDRESS OF APPLICANT:

Gehring Acquisition Company, LLC
1225 Franklin Avenue, Suite 300
Garden City, NY 11530

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Tweave LLC
138 Barrows Street
Norton, MA 02766

RECEIVING WATERS: un-named tributary to the Wading River (Taunton River Watershed – MA62-49, formerly part of MA62-17)

CLASSIFICATION: Class B, warm water fishery

SIC CODE: 2221

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I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) for the re-issuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge process water and stormwater into the designated receiving water. The previous permit was issued to Tweave, Inc. on January 19, 2005. The permit was modified to reflect change in ownership to Gehring Acquisition Company, LLC, with the operator remaining Tweave LLC, on August 8, 2008. The current permit (as modified) expired January 19, 2010. EPA received a permit renewal application from Tweave LLC on July 9, 2009. Since the permit renewal application was deemed timely and complete by EPA, the permit has been administratively continued.

II. TYPE OF FACILITY

Tweave is an integrated textile mill specializing in the production of woven stretch materials, located at 138 Barrows Street in Norton, MA (see Attachment A – Site Plan). The facility manufactures, for the sports and intimate apparel trade, highly developed fabric structures capable of extreme dimensional elongation.

III. SUMMARY OF MONITORING DATA

A quantitative description of the discharges in terms of significant effluent parameters based on discharge monitoring reports (DMRs) submitted for Outfall 001 during the time period from February 2005 to September 2009 was reviewed and used in the development of the draft National Pollutant Discharge Elimination System (NPDES) permit (draft permit). A summary of the DMR data is provided in Attachment B to this fact sheet.

IV. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMIT DERIVATIONS

The effluent limitations, monitoring requirements, and any implementation schedule, if required, may be found in Part 1 (Effluent Limitations and Monitoring Requirements) of the draft permit. The permit re-application is part of the administrative file (Permit No. MA0005355).

A. General Requirements

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a NPDES permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. The draft permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and applicable State regulations. During development, EPA considered the most recent technology-based treatment requirements, water quality-based requirements, and all limitations and requirements in the current/existing permit. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136. The general conditions of the draft 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. <u>Technology-Based Requirements</u>

Subpart A of 40 CFR §125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR §125 Subpart A) to meet best practicable control technology currently available (BPT) for conventional pollutants and some metals, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. In general, technology-based effluent guidelines for non-POTW facilities must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989 [See 40 CFR §125.3(a)(2)]. Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit.

EPA has established National Effluent Limitation Guidelines (ELGs) for textile mills point source category (See 40 CFR Part 410.40, Subpart D, *Woven Fabric Finishing Point Source Subcategory*). The ELGs establish applicable limitations for existing dischargers representing; 1) best practicable control technology currently available (BPT) for conventional pollutants, 2) best conventional pollutant technology economically achievable (BCT) for conventional pollutants, and 3) best available technology economically achievable (BAT) for toxic and non-conventional pollutants.

The ELG regulations establish limitations and monitoring requirements on the final outfall to the receiving waterbody. The ELGs also establish limitations based on several methodologies including monthly average and/or daily maximum mass limits based on pounds of product produced based on BPT. The applicable ELGs are summarized in Table 1, below:

Table 1. Effluent Limitation Guidelines (ELGs) applicable to Tweave

40 CFR § 410 Subpart D	Kg/kkg (or pounds per 1,000 lb) of product	
Pollutant or Pollutant Property	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	6.6	3.3
COD	60.0	30.0
TSS	17.8	8.9
Sulfide	0.20	0.10
Phenol	0.10	0.05
Total Chromium	0.10	0.05
pH	Within the range of 6.0-9.0 SU at all times	

Mass-based ELGs are expressed as an allowable mass of pollutant discharge per unit of production and are directly related to a particular facility's production. The current permit is based on a production rate of 1705 pounds per day of finished woven products, taken from the previous 2000 permit, although it was noted in the fact sheet that market conditions had been reduced.

Review of most recent production data provided by the permittee indicates that the average production rate over the past four years (2006-2009) has ranged from 0 - 2640 lbs/day of product, and averaged 1012 lbs/day. Therefore, the ELG limits in the draft permit shall be based on the average production rate over the past four years of 1012 lbs/day. The calculated limits based on the applicable ELGs are summarized in Table 2, below.

Table 2. Summary of Calculated ELG Limits at Tweave

40 CFR § 410 Subpart D	Kg/kkg (or pounds per 1,000 lb) of product		ELG Limits (based on production rate of 1012 lbs/day)	
Pollutant or Pollutant Property	Maximum for any 1 day	Average of daily values for 30 consecutive days	Daily Max Limit (lbs/day)	Monthly Average Limit (lbs/day)
BOD5	6.6	3.3	6.7	3.3
COD	60.0	30.0	60.7	30.4
TSS	17.8	8.9	18.0	9.0
Sulfide	0.20	0.10	0.20	0.10
Phenol	0.10	0.05	0.10	0.05
Total Chromium	0.10	0.05	0.10	0.05
pH	Within the range of 6.0-9.0 SU at all times		6.0-9.0 SU	

According to 40 CFR §122.45(f)(2), pollutants limited in terms of mass may additionally be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations. Therefore, along with the technology-based mass limits, the current permit includes concentration-based equivalent limits. According to the USEPA NPDES Permit Writers' Manual, expressing limitations in terms of concentration as well as mass encourages the proper operation of a treatment system at all times. In the absence of concentration-based limits, a permittee would be able to increase its effluent concentration (i.e., reduce its level of treatment) during low flow periods and still meet its mass-based effluent limits. Concentration limits discourage the reduction in treatment efficiency during low flow periods, and require proper operation of treatment units at all times.[1]

2. Water Quality-Based Requirements

Water quality-based criteria 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 CWA). Water quality-based criteria consist of three (3) parts: 1) beneficial designated uses for a water body or a segment of a water body; 2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s) of the water body; and 3) anti-degradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts State Water Quality Standards, found at 314 CMR 4.00, include these elements. The State Water Quality Regulations limit or prohibit discharges of pollutants to surface waters and thereby assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained. These

1 USEPA NPDES Permit Writers' Manual, p. 67, (EPA-833-B-96-003).

standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless site-specific criteria are established. 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 Commonwealth of Massachusetts (State) has a similar narrative criterion in their water quality regulations that prohibits such discharges [See Massachusetts Title 314 CMR 4.05(5)(e)]. The effluent limits established in the draft permit assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained.

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such require the development of total maximum daily loads (TMDL).

The Final Massachusetts Year 2008 Integrated List of Waters lists Wading River (Segment MA62-49) as requiring a TMDL for pathogens. The Taunton River Watershed 2001 Water Quality Assessment Report indicates that the Aquatic Life and Aesthetics Use was assessed as support in Wading River (Segment MA62-49).

3. Anti-Backsliding

EPA's anti-backsliding provision as identified in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) prohibits the relaxation of permit limits, standards, and conditions unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued. Anti-backsliding provisions apply to effluent limits based on technology, water quality, BPJ and State Certification requirements. Relief from anti-backsliding provisions can only be granted under one of the defined exceptions [See 40 CFR §122.44(l)(i)]. Since none of these exceptions apply to this facility, the effluent limits in the draft permit must be as stringent as those in the current permit.

4. Anti-Degradation

The Massachusetts Anti-Degradation Policy is found at Title 314 CMR 4.04. All existing uses of Wading River must be protected. The Wading River is classified as a Class B water, warm water fishery, by the Commonwealth of Massachusetts (314 CMR 4.06). These waters are designated at habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

B. Description of the Facility

Processes at the facility include spinning of component yarns, weaving of stretchable cloths, dyeing the cloth to the desired color, applying the finishes to the cloth to give the desired qualities such as softness, light fastness, water and oil repellency, durability, and/or soil release properties. The cloth is then shipped offsite to the customer. The average production rate at the facility (from 2006 – 2009) has ranged from 0 - 2640 lbs/day of product, and averaged 1012 lbs/day.

C. Description of Discharge

1. Treatment System

The major dry manufacturing operations include stretch yarn wrapping and weaving processes. There is no wet discharge from this part of the operation. The wet processes include woven fabric scouring, peroxide bleaching, dyeing and application of final functional finishes such as water repellant and permanent press.

The treatment system was originally designed for a 0.5 MGD flow from a cotton grey goods bleachery to treat process water by screening, aeration, clarification, aerobic digestion, pH adjustment, and sand filtration (see Attachment C – Facility Map). The Waste Water Treatment Plant Operation and Maintenance Manual (dated September 25, 2008) submitted by the facility on March 11, 2010, explains the current treatment system, as summarized below and outlined in Attachment D – Current Water Flow Schematic. A review of this manual and further correspondence with the permittee indicates that both the process wastewater and the treatment have substantially changed since originally designed.

Process wastewater is pumped to the screen house (for grit removal), and is gravity fed to a lined aeration basin with a retention time of 2-3 months (depending on the contribution of rainwater falling directly into the basin). The aeration basin contains two floating surface aerators. A large amount of foam was observed in the aeration basin by EPA on a site visit.[2]

From the aeration basin, the water flows by gravity to a cylindrical clarifier which is currently used as a wet well. Sludge is collected in the center of the clarifier/wet well and removed via vacuum truck for offsite disposal. The clarifier/wet well gravity feeds to an aerobic digester which is currently used as a settling tank. The digester/settling tank is a covered cylindrical concrete tank with a diffused aeration system to ensure adequate mixing and oxygen distribution, and a supernatant decant device.

The supernatant decant device in the digester/settling tank allows removal of clear liquid (supernatant) from the digester/settling tank to the sand filter. To remove supernatant from the digester/settling tank, the air supply is turned off and the solids within the tank are allowed to

2 Memorandum to Permit File (MA0005355), Trip Report, February 25, 2010.

settle, leaving a layer of supernatant above the solids. A decant pipe is put in place and the valves to the sand filters are opened, allowing an intermittent batch discharge of the supernatant via gravity flow to the sand filters. Sludge that collects in the digester/settling tank is pumped back to the aeration basin and mixed with the wastewater in the basin.

Aluminum sulfate, which was previously used in the treatment system, is no longer in use at the facility. Sodium carbonate is added to the system at the pump house, to adjust the pH.[3] Additional sodium carbonate is added at the aeration basin if the pH is still low. Final pH adjustment is done prior to discharge to the sand filter, where magnesium hydroxide is automatically added to the discharge as needed. If the pH drops to 6.5 SU, the system automatically pumps magnesium hydroxide into the discharge line. The system automatically shuts off as the pH reaches 7.8 SU.[4]

After final treatment in the sand filter, the treated process water is under-drained by way of two pipes emanating from the bottom of the sand filter currently in use. These two pipes discharge water that is essentially the same after treatment, and therefore are collectively identified as Outfall 001. In order to obtain a representative sample of the discharge through Outfall 001, the permittee shall take flow proportional composite samples of the discharge through each pipe. Three other sand filters are currently out of use; two are in disrepair, and one is temporarily out of use, although there are no current plans to replace the sand filter bed.

2. <u>Stormwater</u>

A second aeration basin, which is currently out of service, is periodically drained of stormwater (runoff from adjacent areas and precipitation which collects in the basin). The stormwater is currently drained from the aeration basin onto the ground for infiltration. A second clarifier, which is also currently out of service, periodically discharges stormwater (precipitation which collects in the clarifier) to the sand filter, for discharge through Outfall 001B. Additionally, an equalization basin is currently used to provide additional process water storage capacity.

Screened process water intermittently flows to the equalization basin, which is out of service, prior to pumping to the aeration basin. Stormwater (runoff from adjacent areas and precipitation which collects in the basin) also collects in the equalization basin. The facility recirculates the water in the equalization basin to the aeration basin, and vice-versa, to aerate the water in the equalization basin to prevent anaerobic conditions and resultant odors. However, dilution of process water by stormwater is not an allowable form of treatment to meet technology-based limits. Therefore, the draft permit requires the permittee to allow at least two weeks after any discharge from Internal Outfalls 001A and/or 001B prior to sampling Outfall 001 to prevent commingling of process water and stormwater (see Permit Part I.A.8).

The stormwater collected in the equalization basin is prohibited from being used to dilute the process water; therefore the equalization basin may no longer be used to provide process water

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3 Letter from Bill DeCouta, of Tweave, to Nicole Kowalski, of EPA, dated March 11, 2010.
4 Email from Bill DeCouta, of Tweave, to Nicole Kowalski, of EPA, dated March 26, 2010.

storage capacity. The permittee may discharge the stormwater collected in the equalization basin through Internal Outfall 001A (an internal sampling point prior to commingling with process water) after the sampling for Outfall 001 has been completed (to avoid dilution of the process water with stormwater).

Thus, water shall be discharged from the equalization basin or the secondary clarifier after sampling at Internal Outfalls 001A and 001B, respectively, prior to commingling with the process water in the treatment system.

D. Discharge Location

Outfall 001 discharges to an un-named tributary of the Wading River (see Attachment C – Facility Map). The Wading River flows just north of the facility. The un-named tributary flows through the facility, just south of the sand filters (where Outfall 001 discharges), and then flows approximately 0.25 miles to connect with the Wading River, east of the facility.

E. Proposed Permit Effluent Limitations and Conditions

1. Outfall 001

a. Flow

The current permit requires effluent flow limitations of 8,000 gpd as a monthly average and 10,000 gpd as a daily maximum. Flow shall be continuously measured and recorded using a flow meter and totalizer. Review of DMR data shows that the flow limitations have not been exceeded on any occasion. The daily maximum flow has ranged from 8,000 gpd to 10,000 gpd and the monthly average flow has ranged from 3 – 7,400 gpd. The draft permit shall continue to require the flow limits contained in the current permit.

b. Dilution Factor

The United States Geological Survey (USGS) maintains a stream flow gage in the Wading River near Norton, MA (01109000). This gage is located about 200 feet downstream from State Route 140; approximately 1.6 miles downstream from where the un-named tributary (which Tweave discharges to) connects to the Wading River. The drainage area at the gage is 43.3 square miles and the 7Q10 is 1.93 cfs (1.25 MGD). The 7Q10, or the 7-day mean stream low flow with 10-year recurrence interval, is the base flow used to calculate the chronic effluent limits in NPDES permits (314 CMR 4.03(3)(a)). The 7Q10 flow in the Wading River at the point of the Tweave discharge is determined by using the 7Q10 value at the Wading River USGS gage (01109000), adjusted for the difference in drainage areas between the discharge and the gage.

The current permit states that the drainage area contributing to the Outfall 001 point of discharge is approximately 36 square miles, and uses a 7Q10 flow of 0.74 MGD (1.1 cfs) for the point of discharge. However, this is assuming Outfall 001 discharges directly to the Wading River.

Outfall 001 actually discharges to an un-named tributary which flows to the Wading River. Therefore, the dilution available from the un-named tributary will be much lower than if Outfall 001 discharged directly to the Wading River. The 7Q10 flow of the un-named tributary is unknown, and is expected to be minimal. Therefore, the dilution available to the effluent is expected to be minimal, and for the purposes of this permit, no dilution shall be granted for the discharge from Outfall 001.

c. Biological Oxygen Demand (BOD_5)

The applicable ELGs for this facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contain production-based limitations of 3.3 lbs BOD_5/1,000 lbs product, as a 30-day average, and 6.6 lbs BOD_5/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate the mass-based effluent limitations. The calculated effluent limitations based on the ELGs in the current permit are 5.6 lbs/day as a 30-day average and 11.25 lbs/day as a maximum. The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:

6.6 lbs BOD_5/1,000 lbs product * 1012 lbs/day product = 6.7 lbs/day

Average of daily values for 30 consecutive days:

3.3 lbs BOD_5/1,000 lbs product * 1012 lbs/day product = 3.3 lbs/day

However, based on the results of the 1988 Study of the Wading River[5], BOD_5 limits of 1.34 lbs/day, as a monthly average, and 2.5 lbs/day, as a daily maximum, were established in the current permit. The concentration-based equivalents are 20 mg/L and 30 mg/L, respectively, and were included in the current permit. These limits shall continue to be required in the draft permit, based on anti-backsliding requirements.

Review of DMRs shows that the BOD_5 mass-based monthly average limit has been exceeded once and daily maximum limit has been exceeded five times. The concentration-based monthly average limit has been exceeded six times and the daily maximum has been exceeded five times. BOD_5 shall continue to be monitored monthly in the draft permit. Although, as previously mentioned, it appears that process water was diluted with stormwater prior to discharge.

d. Total Suspended Solids

The applicable ELGs for this facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contains production-based limitations of 8.9 lbs TSS/1,000 lbs product, as a 30-day average, and 17.8 lbs TSS/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate the mass-based effluent limitations. The

5 *Rumford, Wading, and Threemile Rivers, 1988 Water Quality Survey Data, Wastewater Discharge Data and Water Quality Analysis.* MassDEP, 1990.

calculated effluent limitations based on the ELGs in the current permit are a 30-day average of 15.2 lbs/day TSS and a maximum of 30.35 lbs/day TSS. The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:
17.8 lbs TSS/1,000 lbs product * 1012 lbs/day product = 18.0 lbs/day

Average of daily values for 30 consecutive days:
8.9 lbs TSS/1,000 lbs product * 1012 lbs/day product = 9.0 lbs/day

However, as detailed in the fact sheet for the current permit, MassDEP established TSS limitations equivalent to the BOD limits of 1.34 lbs/day and 2.5 lbs/day based on water quality considerations, for the monthly average limit and daily maximum limits, respectively. These mass-based limits are required in the current permit, in addition to the equivalent concentration-based limits of 20 mg/L average monthly and 30 mg/L daily maximum. These limits shall continue to be required in the draft permit, in accordance with anti-backsliding requirements.

Review of DMR data shows that both the mass-based and concentration-based monthly average limits have been exceeded on one occasion. TSS shall continue to be monitored monthly.

e. Chemical Oxygen Demand (COD)

The applicable ELGs for the facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contain production-based limitations of 30.0 lbs COD/1,000 lbs product, as a 30-day average, and 60.0 lbs COD/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate the mass-based effluent limitations. The calculated effluent limitations based on the ELGs in the current permit are a 30-day average of 51.15 lbs/day COD and a maximum of 102.3 lbs/day COD. The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:
60.0 lbs COD/1,000 lbs product * 1012 lbs/day product = 60.7 lbs/day

Average of daily values for 30 consecutive days:
30.0 lbs COD/1,000 lbs product * 1012 lbs/day product = 30.4 lbs/day

However, the current permit requires an average monthly COD limit of 27 lbs/day and a daily maximum COD limit of 50 lbs/day. The current permit also includes the concentration-based equivalent limits of 400 mg/L and 600 mg/L, respectively. These limits were established based

on water quality considerations in the 1988 Wading River Study,[6] and shall continue to be required in the draft permit, based on anti-backsliding requirements.

Review of DMR data indicates that both the mass-based and concentration-based limits have not been exceeded on any occasion. COD shall continue to be monitored quarterly.

f. pH

The pH limitation range of 6.5-8.3 SU has been retained in the draft permit in accordance with anti-backsliding requirements found in 40 CFR §122.44(l). The pH limits are based on the Massachusetts Surface Water Quality Standards, 314 Code of Massachusetts Regulations ("CMR"), Inland Water, Class B at 4.05 (3)(b)3. These standards require that the pH of the receiving water be in the range of 6.5 to 8.3 standard units and no more than 0.5 units outside the background range. There shall no change from background conditions that would impair any use assigned to this Class. The water quality criteria have been adopted as discharge limitations based on certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55.

The applicable ELGs for the facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), require a pH effluent limitation range of 6.0-9.0 SU. However, since the water quality limit of 6.5-8.3 SU is more stringent, the draft permit shall continue to require a pH effluent limitation range of 6.5-8.3 SU, monitored monthly. Review of the DMR data reveals that the current pH limit range has been exceeded on one occasion, with a pH of 8.7 SU.

g. Oil and Grease (O&G)

The current permit requires a daily maximum O&G limit of 15 mg/L. This limit is consistent with the narrative Massachusetts Surface Water Quality Standard at 314 CMR 4.05 (3)(b)7. The applicable ELGs for the facility do not require an O&G limit.

Therefore, the draft permit shall continue to require an O&G limit of 15 mg/L, consistent with water quality standards. Review of DMR data shows that O&G effluent limitation of 15 mg/L has not been exceeded on any occasion, with a maximum O&G concentration of 13.2 mg/L. The sampling frequency shall continue to be quarterly.

h. Total Sulfides

The applicable ELGs for this facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contain production-based limitations of 0.10 lbs sulfide/1,000 lbs product, as a 30-day average, and 0.20 lbs sulfide/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate the mass-based effluent limitations. The calculated effluent limitations based on the ELGs in the current permit are a 30-day average

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6 *Rumford, Wading, and Threemile Rivers, 1988 Water Quality Survey Data, Wastewater Discharge Data and Water Quality Analysis.* MassDEP, 1990.

of 0.17 lbs/day sulfide and a maximum of 0.34 lbs/day sulfide. The current permit also includes the concentration-based equivalent limits of 2.5 mg/L as a monthly average and 4.1 mg/L as a daily maximum.

The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:
0.20 lbs sulfide/1,000 lbs product * 1012 lbs/day product = 0.20 lbs/day

Average of daily values for 30 consecutive days:
0.10 lbs sulfide/1,000 lbs product * 1012 lbs/day product = 0.10 lbs/day

These ELG based limits for sulfide (0.20 lbs/day daily maximum and 0.10 lbs/day monthly average) shall be included in the draft permit, based on the current production rate of 1012 lbs/day. The permit shall also include concentration-based equivalent limits, as were required in the current permit. The technology-based concentration equivalent limits calculate to (using the long-term average flow of 0.008 MGD to calculate both the monthly average and daily maximum concentrations[7]):

Daily maximum: (0.20 lbs/day) / (0.008 MGD x 8.34) = 3 mg/L
Average monthly: (0.10 lbs/day) / (0.008 MGD x 8.34) = 1.5 mg/L

Sulfide is not listed specifically in the Massachusetts Surface Water Quality Standards (314 CMR 4.00). Therefore, according to the Massachusetts Surface Water Quality Standards [314 CMR 4.05(5)(e)]:

> For pollutants not otherwise listed in 314 CMR 4.00, the *National Recommended Water Quality Criteria: 2002, EPA 822R-02-047, November 2002* published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher.

EPA reviewed the National Recommended Water Quality Criteria, which do not require a sulfide limit, but do contain a 'sulfide-hydrogen sulfide' chronic (CCC) criterion of 2.0 ug/L. Review of EPA's Water Quality Criteria for Water (The Red Book, 1976), shows that the 'sulfide-hydrogen sulfide' limit refers to undissociated hydrogen sulfide. When hydrogen sulfide dissolves in water, it dissociates into hydrosulfide (HS^-) and sulfide ion (S^{-2}); the ratio of the concentrations of these various ions depending on the pH of the solution. At lower pH values, the majority of sulfide is expected to be in the form of undissociated hydrogen sulfide.[8] Therefore, since the pH of the

7 USEPA NPDES Permit Writers' Manual, p. 67.
8 Red Book (EPA 440/9-76-023, July, 1976)

discharge from this facility averages about 7 SU, the concentration of hydrogen sulfide is not expected to be high.

Review of DMRs shows that the sulfide limits in the current permit have not been exceeded on any occasion, with a maximum mass loading reported of 0.008 lbs/day. Total sulfides shall continue to be monitored annually.

i. Total Phosphorus

In freshwater systems including rivers, streams and impoundments, phosphorus is usually the limiting nutrient for primary plant production. Phosphorus promotes the growth of nuisance algae and aquatic plants and when these plants and algae undergo their decay processes, they generate odors and lower the dissolved oxygen levels in the river.

The Massachusetts Surface Water Quality Standards do not contain numerical criteria for total phosphorus (TP). Narrative criteria for nutrients are found at 314 CMR 4.05(5)(c), which states the following:

> *Unless naturally occcuring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses. Human activities that result in the nonpoint source discharge of nutrients to any surface water may be required to be provided with cost effective and reasonable best management practices for nonpoint source control.*

A TMDL study determines the maximum amount of pollutant that a waterbody can receive and still meet WQS, and the allocations of that amount to the pollutant's sources, such as this facility's discharge. Since a TMDL study for nutrients is not currently available for the Wading River, phosphorus limits must meet either water quality-based limits or technology-based limits.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The EPA's Water Quality Criteria for Water 1986 (the Gold Book) recommends, in order to control eutrophication, in-stream phosphorus concentrations should be less than 0.05 mg/L for any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within the lake or reservoir.

More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published ecoregion-specific criteria represent conditions in waters minimally impacted by

human activities, and thus representative of water without cultural eutrophication. Norton, MA is within Ecoregion XIV, Eastern Coastal Plains. The total phosphorus criteria for this ecoregion is found in Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV (EPA 822-B-00-022), published in December 2000, and is 24 ug/L (0.024 mg/L).

The current permit required the facility to conduct a Phosphorus Loading Evaluation and Reduction Plan, with the goal of reducing the phosphorus concentration in the effluent to 1 mg/L. The current permit also required reporting of total phosphorus at a frequency of 1/month, however, the limit in the previous permit of 7.5 mg/L total phosphorus was removed in the current permit, in lieu of the Evaluation and Reduction Plan. The current permit states, if the effluent monitoring results indicate that the total phosphorus concentration exceed criteria and contribute to eutrophication, a limit may be included.

Of the various dyes used at the facility, 12 were found to contain phosphorus concentrations in excess of 1 mg/L, with some as high as 6 mg/L. Review of DMR data shows that the total phosphorus concentration in the discharge has averaged 2.3 mg/L. Based on this average concentration and the average flow limit (0.008 MGD), this calculates to an average phosphorus mass loading of 0.154 lbs/day. The total phosphorus concentration reported in the 2009 permit re-application was 1.73 mg/L. The Phosphorus Loading Evaluation and Reduction Plan in the current permit aimed to reduce phosphorus loading in the effluent to 1.0 mg/L.

Given that the state has not yet adopted numerical water quality based phosphorus criteria, the draft permit will not establish limits based on EPA Ecoregion guidance at this time, but will instead require a monthly average TP limit on the discharge of 0.1 mg/L, based on EPA's Quality Criteria for Water 1986 (the Gold Book), for any stream not discharging directly to lakes or impoundments.

While this limit will not ensure attainment of EPA's recommended Ecoregion guidance criteria, it will significantly reduce phosphorus in the receiving water and ensure that phosphorus discharge concentrations in the receiving waters will not significantly exceed the Gold Book Guidance. If, upon completion of a TMDL for nutrients based on a detailed study of eutrophication in the Wading River and its downstream impoundments, and a detailed analysis of the TP loading from other facilities, it is determined that either a higher or lower limit will result in compliance with WQS, then the EPA and MassDEP may exercise the reopener clause in Part I.C and modify the permit accordingly. Therefore, the limit of 0.1 mg/L for the monthly average TP shall be required in the draft permit. The draft permit shall also re-instate the 7.5 mg/L daily maximum TP limit from the previous permit, based on anti-backsliding requirements. The total phosphorus limits of 0.1 mg/L as monthly average and 7.5 mg/L as a daily maximum are seasonal, from April 1st through October 31st, taken as composites. The permittee shall report the total phosphorus monthly average and daily maximum concentrations (without limits) year-round.

j. Total Kjeldahl Nitrogen (TKN), Nitrite-Nitrate (as N)

Total Kjeldahl Nitrogen (TKN), a component of total nitrogen, is the sum of organic nitrogen and ammonia-N. Total nitrogen is the sum of TKN and nitrite-nitrate (as N). The mouth of the Taunton River, of which the Wading River is a tributary, is on the Massachusetts 303(d) list for organic enrichment/low dissolved oxygen. In marine systems (the lower downstream portions are classified as Class SB) discharges of nitrogen are typically the cause of such conditions.

Review of DMR data shows that the daily maximum concentration of TKN in the discharge has ranged from 0.26-40.5 mg/L. The daily maximum concentration of Nitrite (as N) has ranged from 0-13.9 mg/L and the concentration of Nitrate (as N) has ranged from 0.03-22.4 mg/L. Therefore, the total nitrogen concentration (the sum of TKN and nitrite-nitrate (as N)) has ranged from 0.27-58.8 mg/L. Based on the maximum daily flow limit (0.01 MGD), this calculates to an average nitrogen mass loading range of 0.022-4.9 lbs/day. The current permit shall continue to require reporting of the daily maximum TKN, nitrite, and nitrate concentrations, and also include reporting of the monthly average concentrations of each. TKN, nitrite, and nitrate shall continue to be monitored monthly. The monitoring data collected by the permittee, along with data from other discharges to the Taunton River, are necessary for the future completion of a TMDL.

Additionally, since the Taunton River is impaired for nitrogen, the permittee shall develop appropriate BMPs to evaluate alternative methods of operating the existing treatment system in order to control total nitrogen levels, and to implement optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (for the period of February 2005 – September 2009) is estimated to be 1.44 lbs/day. The permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years.

Additionally, the permittee shall develop BMPs to determine the source(s) of nitrogen in the discharge and eliminate, or reduce to the maximum extent possible, the concentration of nitrogen in the discharge.

k. Total Phenols

The applicable ELGs for this facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contain production-based limitations of 0.05 lbs phenol/1,000 lbs product, as a 30-day average, and 0.10 lbs phenol/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate the mass-based effluent limitations. The calculated effluent limitations based on the ELGs in the current permit are a 30-day average of 0.085 lbs/day phenol and a maximum of 0.17 lbs/day phenol.

The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:
0.10 lbs phenol/1,000 lbs product * 1012 lbs/day product = 0.10 lbs/day

Average of daily values for 30 consecutive days:
0.05 lbs phenol/1,000 lbs product * 1012 lbs/day product = 0.05 lbs/day

The current permit requires technology-based limits for total phenols of 0.040 lbs/day as a monthly average and 0.060 lbs/day as a daily maximum. The current permit also requires the concentration-based equivalents of 0.6 mg/L and 0.72 mg/L, respectively. However, the draft permit shall require the above calculated limits (0.10 lbs/day maximum daily and 0.05 lbs/day monthly average) as an exception to anti-backsliding, based on the change in production rate at the facility. Additionally, the concentration-based equivalents have been recalculated to 1.5 mg/L and 0.75 mg/L, daily maximum and monthly average, respectively.[9]

Review of DMR data shows that the phenol limits have not been exceeded on any occasion. Phenol shall continue to be monitored annually.

l. Total Chromium

The applicable ELGs for this facility, Woven Fabric Finishing Category (40 CFR 410 Subpart D), contain production-based limitations of 0.05 lbs chromium/1,000 lbs product, as a 30-day average, and 0.10 lbs chromium/1,000 lbs product, as a maximum for any 1 day. The current permit used 1705 lbs/day as the production rate at the facility to calculate mass-based effluent limitations. The calculated effluent limitations based on the ELGs in the current permit are a 30-day average of 0.085 lbs/day chromium and a maximum of 0.17 lbs/day chromium. The current permit also requires the concentration-based equivalents of 1.0 mg/L and 1.5 mg/L, respectively.

The draft permit uses 1012 lbs/day, the average long-term production rate at the facility over the past four years, to calculate the revised mass-based effluent limitations, as follows:

Maximum for any 1 day:
0.10 lbs chromium/1,000 lbs product * 1012 lbs/day product = 0.10 lbs/day
Average of daily values for 30 consecutive days:
0.05 lbs chromium/1,000 lbs product * 1012 lbs/day product = 0.05 lbs/day

These limits are more stringent than the current permit total chromium limits of 0.12 lbs/day daily maximum and 0.067 lbs/day average monthly.

Chromium is not listed specifically in the Massachusetts Surface Water Quality Standards (314 CMR 4.00). Therefore, according to the Massachusetts Surface Water Quality Standards [314 CMR 4.05(5)(e)]:

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9 Based on the USEPA NPDES Permit Writers' Manual, p. 67, the calculation of the concentration-based limit from the mass-based limit should be based on the long-term average flow rate; however, the current permit daily maximum concentration-based limit was calculated based on the daily maximum flow rate.

> For pollutants not otherwise listed in 314 CMR 4.00, the *National Recommended Water Quality Criteria: 2002, EPA 822R-02-047, November 2002* published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher.

EPA reviewed the National Recommended Water Quality Criteria, which contain criteria for chromium (III) and chromium (VI) based on dissolved metal concentrations. Converted to total recoverable chromium, the chronic (CCC) criteria is 49.6 ug/L and the acute (CMC) criterion is 815 ug/L, calculated as follows:

Cr (III)

CCC(dissolved) $_{Cr(III)}$ = exp{m_C [ln(hardness)]+ b_C} (CF)
= exp {0.8190 [ln(37)] + 3.7256} (0.316) = 252 ug/L
CCC (total recoverable) $_{Cr(III)}$ = 252 ug/L / CF = 252 ug/L / 0.316 = 799 ug/L

CMC (dissolved) $_{Cr(III)}$ = exp{m_A [ln(hardness)]+ b_A} (CF)
= exp {0.8190 [ln(37)] + 0.6848} (0.860) = 32.8 ug/L
CMC (total recoverable) $_{Cr(III)}$ = 32.8 ug/L / CF = 32.8 ug/L / 0.860 = 38.2 ug/L

Cr (VI)

CCC(dissolved) $_{Cr(VI)}$ = 11 ug/L
CCC (total recoverable) $_{Cr(VI)}$ = 11 ug/L / CF = 11 ug/L / 0.962 = 11.4 ug/L

CMC (dissolved) $_{Cr(VI)}$ = 16 ug/L
CMC (total recoverable) $_{Cr(VI)}$ = 16 ug/L / CF = 11 ug/L / 0.982 = 16.3ug/L

Total Cr $_{Cr(III)+Cr(VI)}$

CCC (total recoverable) $_{Cr(III)+Cr(VI)}$ = 38.2 ug/L + 11.4 ug/L = **49.6 ug/L**
CMC (total recoverable)$_{Cr(III)+Cr(VI)}$ = 799 ug/L + 16.3 ug/L = **815 ug/L**

Assuming no dilution, as described above in Part IV.E.1.b, the mass-based limits are calculated as follows:

Acute limit (lbs/day) = Flow (MGD) * Acute limit (mg/L) * CF [(lb*L)/(MG*mg)]
= 0.01 MGD * 0.815 mg/L * 8.34 (lb*L)/(MG*mg)
= 0.068 lbs/day
Chronic limit (lbs/day) = Flow (MGD) * Chronic limit (mg/L) * CF [(lb*L)/(MG*mg)]
= 0.008 MGD * 0.0496 mg/L * 8.34 (lb*L)/(MG*mg)
= 0.0033 lbs/day

These are the most stringent limits of all of the above described limits. Therefore these limits of 0.0033 lbs/day monthly average and 0.068 lbs/day daily maximum shall be included in the draft

permit, and chromium shall continue to be monitored annually. Additionally, the concentration based limits of 0.05 mg/L and 0.8 mg/L, as calculated above, shall be included in the draft permit.

Review of DMR data shows that the total chromium limits in the current permit have not been exceeded on any occasion. The concentration of chromium in the discharge has ranged from 0.08 mg/L – 0.61 mg/L (both monthly average and daily maximum) and the mass of chromium has ranged from 0.002 lb/day – 0.008 lb/day (both monthly average and daily maximum).

m. Total Copper

The current permit requires water quality-based limits for copper based on an average ambient upstream hardness of 37 mg/L CaCO, based on data submitted as part of the WET testing requirements. The current permit limits for copper are 0.029 lbs/day monthly average and 0.032 lbs/day daily maximum, and concentration-based equivalents of 0.35 mg/L and 0.39 mg/L, respectively.

Based on the most recent data, EPA has recalculated the copper effluent limitations. The hardness of the Wading River collected at the Barrows Street overpass between September 2000 and August 2004 ranged from 21 – 44 mg/L.[10] Taunton River Watershed Water Quality Data (2001) indicates that the hardness upstream of the Tweave discharge ranged from 41 – 47 mg/L, with an average of 44 mg/L.[11] Review of WET tests conducted over the past four years indicates the hardness of the Wading River upstream of the discharge ranged from 28 – 52 mg/L, with an average hardness of 37 mg/L. Therefore, the value of 37 mg/L was used as the receiving water hardness to calculate water quality-based limits. The daily maximum flow limit (0.01 MGD) was used to calculate the acute limit, and the monthly average flow limit (0.008 MGD) was used to calculate the chronic limit. Based on no dilution, as described above in Part IV.E.1.b, the calculations are as follows:

Water Quality based limits:

$m_a = 0.9422$ $b_a = -1.700$ CF = 0.960 h = 37

Acute criteria (dissolved) = exp {0.9422[ln(37)] + (-1.700)} * 0.960 = 5.27 ug/L
Acute limit (dissolved) = 5.27 ug/L
Acute limit (recoverable) = 5.27 / 0.960 = 5.49 ug/L = **0.0055 mg/L**
Acute mass-based limit (recoverable)=0.0055 mg/L*0.01 MGD*8.345 = **0.00046 lbs/day**

$m_c = 0.8545$ $b_c = -1.702$ CF = 0.960 h = 37

Chronic criteria (dissolved) = exp {0.8545[ln(37)] + (-1.702)} * 0.960 = 3.83 ug/L
Chronic limit (dissolved) = 3.83 ug/L
Chronic limit (recoverable) = 3.83 / 0.960 = 3.99 ug/L = **0.0040 mg/L**
Chronic mass-based limit(recoverable)=0.00399mg/L*0.008MGD*8.345=**0.00027lbs/day**

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10 Taunton River Watershed 2001 Water Quality Assessment Report, MassDEP, December 2005.
11 Taunton River Watershed 2001 Water Quality Assessment Report, MassDEP, December 2005, Table 6: Taunton River Watershed Water Quality Data (2001), Wading River, Station WR-03, Mile Point: 5.

These water-quality mass limits of 0.00046 lbs/day daily maximum and 0.00027 lbs/day monthly average are more stringent than the current permit copper limits of 0.029 lbs/day monthly average and 0.032 lbs/day daily maximum; therefore, they shall be included in the draft permit. The draft permit shall require a water-quality based limit of 0.0055 mg/L as a daily maximum and 0.0040 mg/L as a monthly average.

Copper shall continue to be monitored quarterly. Review of DMR data shows that the current copper concentration limit has been exceeded on 7 occasions (both monthly average and daily maximum), with a maximum concentration of 1.3 mg/L, and the current copper mass limit has been exceeded on 2 occasions (both monthly average and daily maximum), with a maximum mass loading of 0.48 lbs/day.

n. Total Zinc

The current permit calculated water quality-based limits for total zinc of 3.6 mg/L as a daily maximum and monthly average. Since the previous permit limits of 1.0 mg/L as a monthly average and 1.5 mg/L as a daily maximum were more stringent, these limits were carried over into the current permit, based on acute toxicity test failures and anti-backsliding requirements.

Based on the most recent data, EPA has recalculated the water quality-based zinc effluent limitations. As explained above, the value of 37 mg/L was used as the receiving water hardness. The daily maximum flow limit (0.01 MGD) was used to calculate the acute limit, and the monthly average flow limit (0.008 MGD) was used to calculate the chronic limit. Based on no dilution, as described above in Part IV.E.1.b, the calculations are as follows:

Water Quality based limits:

$m_a = 0.8473$ $b_a = 0.884$ CF = 0.978 h = 37

Acute criteria (dissolved) = exp {0.8473[ln(37)] + (0.884)} * 0.978 = 50.5 ug/L
Acute limit (dissolved) = 50.5 ug/L
Acute limit (recoverable) = 50.5 / 0.978 = 51.6 ug/L = **0.052 mg/L**
Acute mass-based limit (recoverable)= 0.052 mg/L * 0.01 MGD * 8.345 = **0.0043 lbs/day**

$m_c = 0.8473$ $b_c = 0.884$ CF = 0.986 h = 37

Chronic criteria (dissolved) = exp {0.8473[ln(37)] + (0.884)} * 0.986 = 50.9 ug/L
Chronic limit (dissolved) = 50.9 ug/L
Chronic limit (recoverable) = 50.9 / 0.986 = 51.6 ug/L = **0.052 mg/L**
Chronic mass-based limit (recoverable)= 0.052 mg/L*0.008 MGD*8.345=**0.0034 lbs/day**

These water quality-based limits are more stringent than the current permit limits of 1.0 mg/L (and the mass-based equivalent of 0.067 lbs/day) as a monthly average and 1.5 mg/L (and the mass-based equivalent of 0.12 lbs/day) as a daily maximum; therefore, this limit of 0.052 mg/L (for both daily maximum and monthly average) shall be included in the draft permit. The draft permit shall also include the water-quality based mass equivalent limits, as calculated above, of 0.0043 lbs/day daily maximum and 0.0034 lbs/day monthly average.

Review of DMR data shows that the current permit limits have only been exceeded on one occasion, with a monthly average mass-loading of 0.67 lbs/day. The maximum daily mass of zinc in the discharge has averaged 0.01 lbs/day and the concentration of zinc has averaged 0.14 mg/L. Zinc shall continue to be monitored quarterly.

o. Aluminum

The 1996 Draft Taunton River Watershed Assessment Report notes that instream aluminum concentrations exceed the National Recommended Water Quality Criteria. The current fact sheet states that based on DMR submittals, the concentration of aluminum in the discharge was low, averaging 0.3 mg/L during 2003-2004. The 2004 permit re-application reported an aluminum concentration in the discharge of 0.29 mg/L. However, the fact sheet stated that the permittee shall continue to monitor and report total aluminum as part of the WET testing. However, review of WET tests reveals that the permittee has not been reporting aluminum concentrations as part of the WET tests. The current permit re-application dated November 23, 2009 does not sample for aluminum, as it is marked 'believed absent.'

The acute WET test requires monitoring for aluminum, among other metals, in the chemical analysis. The draft permit shall require reporting of aluminum in the table at Part I.A.1, as required by the WET test, for reporting on the DMRs. Aluminum is a concern based on the past use of aluminum sulfate at the facility as a treatment plant additive.

p. Color

Massachusetts Surface Water Quality Standards, found at 314 CMR 4.05 (3)(b)(6), state that Class B waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this class. The permit re-application dated November 23, 2009 indicates the presence of color in the discharge, measured at 120 APCU. EPA noticed a visibly colored plume discharging from the sand filter through the pipes at Outfall 001 during a site visit.[12] The visible plume continued downstream in the un-named tributary for approximately 15 feet.

Aluminum sulfate is commonly used for color removal in wastewaters containing dyes. Although aluminum sulfate was previously used at the facility, Tweave confirmed (in an email dated 3/26/2010) that it is no longer an additive at the treatment plant.

The draft permit requires monthly sampling for color in platinum cobalt units (PCU). Also, the draft permit requires visual monitoring of the monthly color sample. The permittee shall record the best description of the sample color and submit this information in the comments section of the DMR. Additionally, the draft permit requires that the permittee develop and implement Best

12 Memorandum to Permit File (MA0005355), Trip Report, February 25, 2010.

Management Practices (BMPs) to remove the color from the effluent, and prohibits the discharge from causing objectionable discoloration of the receiving waters.

q. Whole Effluent Toxicity (WET)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria: All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

The Region typically includes toxicity testing requirements where a combination of toxic constituents may be toxic to humans, aquatic life, or wildlife. Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Due to the potential for toxicity resulting from the combination of pollutants in the facility's discharge, in accordance with EPA national and regional policy, and in accordance with MassDEP policy, the previous permit included acute and chronic toxicity monitoring requirements. (See *Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants, 50 Fed. Reg.* 30,784 (July 24, 1985); *EPA's Technical Support Document for Water Quality-Based Toxics Control* (EPA505/2-90-001, March 1991); and MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 23, 1990).

The current permit requires quarterly acute WET tests, with an LC_{50} limit of 100% effluent or greater, for two species (*Ceriodaphnia dubia* and *Pimephales promelas*). The LC_{50} is defined as the concentration of wastewater (effluent) causing mortality to 50 percent of the test organisms. EPA has required acute, rather than chronic (and modified acute), WET testing for the Outfall 001 effluent since it is an intermittent discharge, rather than a continuous discharge.

The 1993 permit required the permitee to test three (3) species, *Ceriodaphnia dubia, Daphnia pulex,* and *Pimephales promelas*. Test results submitted as required by the 1993 permit clearly showed *Ceriodaphnia dubia* as the most sensitive of the three species tested. As a result, the WET testing requirements in the 2000 permit were reduced to a single specie, *Ceriodaphnia dubia.* However, the 2000 permit required the permittee to complete a Toxicity Identification Evaluation (TIE) and Toxicity Reduction Evaluation (TRE). The TIE report was due within 18 months of the effective date of the permit, which was October 9, 2000. The TRE was to be completed within 12 months of the TIE. As of October 2003, neither evaluation had been submitted. Following several odor complaints, MassDEP conducted an inspection in October 2003. In November 2003, DEP issued the facility a notice of non-compliance (NON) for WET testing violations, noncompliance with the TIE/TRE requirements, and operations and maintenance problems. The NON required the permittee to complete the TIE within 180 days of November 26, 2003. The TIE was received by EPA on May 20, 2004. The TIE identifies metals, specifically copper and zinc, as likely causes of toxicity. However, the TIE was not consistent

with EPA Guidance as required. The facility was to investigate options for reducing metals concentrations in the discharge. The facility also identified alcohols and alkoxylated alcohols in the discharge. Tweave was supposed to address these issues in their Toxicity Reduction Evaluation (TRE), due in January 2005. Tweave submitted a TRE dated November 18, 2004 and and updated TRE dated January 13, 2005. These submittals indicate that the historical metal levels have not been sufficiently reduced.

Review of DMR data collected from February 2005 to September 2009 reveals that the acute limit has been exceeded on one occasion for *Ceriodaphnia dubia* and on two occasions for *Pimephales promelas*. Review of WET test reports reveals that the quarterly acute tests have been repeated several times over the past years, based on exceedences of the acute limit.

Given the complexity of this discharge and the toxicity issues at this facility, the draft permit shall continue to require quarterly acute WET tests, with an LC_{50} limit of 100% effluent or greater, for two species (*Ceriodaphnia dubia* and *Pimephales promelas*). Additionally, as outlined above, the draft permit requires more stringent metals limitations, which is expected to reduce the toxicity of the discharge.

EPA has required acute, rather than chronic (and modified acute), WET testing for the Outfall 001 effluent since it is an intermittent discharge, rather than a continuous discharge.

The tests must be performed in accordance with test procedures and protocols specified in Attachment 1 of the permit. The tests shall be performed the second week of the following months: January, April, July, and October and submitted, respectively, by February 28th, May 31st, August 31st, and November 30th. In the event there is no discharge during the second week of the specified months, the permittee shall sample as soon as practicable thereafter, and submit the test results by the last day of the month following completion of the test.

2. <u>Discharges of Collected Stormwater (Outfalls 001A and 001B)</u>

Dilution of process water by stormwater is not an allowable form of treatment to meet technology-based limits. Therefore, the current practice of commingling process water (prior to sampling and treatment) with stormwater collected in the equalization basin or the secondary clarifier, or any other collection unit, shall be prohibited by the draft permit. Stormwater discharges shall be sampled separately, as internal outfalls, prior to commingling with any process water and after all the samples at Outfall 001 for the monitoring period have been collected (to avoid dilution of the Outfall 001 process water sample with stormwater). Additionally, the permittee shall allow at least two weeks after any discharge from Internal Outfalls 001A and/or 001B prior to sampling Outfall 001 to prevent commingling of process water and stormwater.

Specifically, discharge of stormwater which collects in the treatment system components currently out of service [the equalization basin (Outfall 001A), and secondary clarifier (Outfall 001B)] shall be monitored in the draft permit for the parameters described below.

This requirement not to allow commingling of stormwater and process water also applies to use of the equalization basin (which collects stormwater) as excess process water storage. The permittee shall discontinue use of the equalization basin as excess process water storage. The collected stormwater shall remain separate from the process water prior to sampling.

Sampling requirements for the discharge of stormwater from the equalization basin (Outfall 001A), and secondary clarifier (Outfall 001B) to the un-named tributary shall consist of monthly sampling for flow and pH (with a limit of 6.5 – 8.3 SU), and annual sampling for Biological Oxygen Demand (BOD_5), Total Suspended Solids (TSS), Chemical Oxygen Demand (COD), Oil and Grease (O&G), Total Sulfides, Total Phosphorus, Total Kjeldahl Nitrogen (TKN), Nitrite-Nitrate (as N), Total Phenols, Total Chromium, Total Copper, Total Zinc, Aluminum, and Color.

3. Special Conditions and Requirements

The draft permit shall require development of Best Management Practices (BMPs) to be followed in operating the facility, cleaning tanks and other equipment and disposing of any liquid and solid waste. The purpose of the plan is to identify and to describe the practices which minimize the amounts of pollutants discharged to surface waters.

The permittee shall develop and implement appropriate BMPs to re-evaluate the entire treatment system design and optimize the treatment obtained from each unit. Within **one year of the effective date of the permit**, the permittee shall complete an evaluation of alternative methods of operating the existing treatment system to optimize the treatment efficiency, or adding treatment, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational or treatment changes. The methods to be evaluated include, but are not limited to, operational or treatment changes designed to remove color, to eliminate the toxicity of the discharge, to reduce the nitrogen loading, and to reduce the metal loading in the discharge to the un-named tributary. The BMP plan shall include the following requirements, at a minimum:

a. Within **18 months of the effective date of the permit**, the permittee shall implement the recommended operational changes in order to remove the discharge of a visibly colored plume, to eliminate the toxicity of the discharge, to reduce the nitrogen loading, and to reduce the metal loading to the receiving water. The permittee shall submit annual reports to EPA and MassDEP, **on each year following the effective date of the permit,** which summarizes progress and activities related to optimizing the treatment system or adding additional treatment, as described below:

    i. The permittee shall develop appropriate BMPs to evaluate alternative methods of operating the treatment system or adding additional treatment in order to eliminate the discharge of color. The permit requires annual reports be submitted that summarize progress and activities related to optimizing color removal efficiencies, document the monthly color observations throughout the year, and track trends relative to previous

years. The permittee shall develop BMPs to eliminate the discharge of a visibly colored plume.

ii. The permittee shall develop appropriate BMPs to evaluate alternative methods of operating the treatment system or adding additional treatment in order to eliminate (or reduce to the maximum extent possible) the toxicity of the discharge. The permit requires annual reports be submitted that summarize progress and activities related to optimizing toxicity removal efficiencies. The permittee shall develop BMPs to determine the source(s) of toxicity in the discharge and eliminate, or reduce to the maximum extent possible, the toxicity of the discharge.

iii. The permittee shall develop appropriate BMPs to evaluate alternative methods of operating the treatment system or adding additional treatment in order to control total nitrogen levels, and to implement optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (for the period of February 2005 – September 2009) is estimated to be 1.44 lbs/day. The permit requires annual reports be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. Additionally, the permittee shall develop BMPs to determine the source(s) of nitrogen in the discharge and eliminate, or reduce to the maximum extent possible, the concentration of nitrogen in the discharge.

iv. The permittee shall develop appropriate BMPs to evaluate alternative methods of operating the treatment system or adding additional treatment in order to eliminate (or reduce to the maximum extent possible) the metal loading to the discharge. The permit requires annual reports be submitted that summarize progress and activities related to optimizing metal removal efficiencies. The permittee shall develop BMPs to determine the source(s) of metals in the discharge and eliminate, or reduce to the maximum extent possible, the metal loading to the discharge.

b. The permittee shall conduct regular inspections and maintenance of the treatment system to ensure that all treatment units are properly functioning. This inspection and maintenance requirement shall be included in the BMP plan.

c. The permittee shall develop and implement appropriate BMPs to ensure the discharges of process water and collected stormwater are no longer commingled prior to sampling, as was previously done at the facility. The current practice of commingling process water (prior to sampling) with stormwater from the equalization basin and stormwater from the secondary clarifier is prohibited in the permit.

V. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species.

The town of Norton is located in Bristol County. EPA has reviewed the federal endangered or threatened species of fish and wildlife in Bristol County to see if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. Based on the normal distribution of these species, it is highly unlikely that they would be present in the vicinity of this discharge. In addition, the effluent limitations and conditions which are in place in the draft permit should preclude any adverse effects should there be any incidental contact with listed species. EPA is coordinating a review of this finding with NMFS and USFWS through the draft permit and fact sheet.

VI. 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 NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat" (EFH). The Amendments define EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 C.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. Id.

Essential fish habitat is only designated for 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.

A review of available EFH information indicates that the Wading River is not designated EFH for any federally managed species. Therefore, consultation with NMFS is not required. If adverse effects are detected as a result of this permit action, NMFS will be notified and an EFH consultation will promptly be initiated. During the public comment period, EPA has provided a copy of the draft permit and fact sheet to NMFS.

VII. MONITORING AND REPORTING

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 (l), and 122.48.

The Draft Permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. The Draft Permit requires that, no later than one year after the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt out request").

In the interim (until one year from the effective date of the permit), the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To participate in upcoming trainings, visit http://www.epa.gov/netdmr for contact information for Massachusetts.

The Draft Permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

The Draft Permit also includes an "opt-out" requests process. Permittees who believe they can not use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt out request sixty (60) days prior to expiration of its opt out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format.

VIII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the MassDEP 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 Surface Water Quality Standards or unless state certification is waived. The staff of the MassDEP 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 pursuant to 40 CFR §124.53 and expects that the draft permit will be certified.

IX. ADMINISTRATIVE RECORD, PUBLIC COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISION

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, Office of Ecosystem Protection Attn: Nicole Kowalski, 5 Post Office Square, Suite 100 (OEP06-4), Boston, Massachusetts 02109-3912 or via email to kowalski.nicole@epa.gov. The comments should reference the name and permit number of the facility for which they are being provided.

Any person, prior to such date, may submit a request in writing to EPA and the States Agency for a public hearing to consider the draft permit. 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. Within thirty (30) days following the notice of final permit decision, permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

X. EPA & MassDEP CONTACTS

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 the EPA and MassDEP contacts below:

Nicole Kowalski, EPA New England – Region 1

5 Post Office Square, Suite 100 (OEP06-4)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1746 FAX: (617) 918-0746
email: kowalski.nicole@epa.gov

Kathleen Keohane, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608
Telephone: (508) 767-2856 FAX: (508) 791-4131
email: kathleen.keohane@state.ma.us

_____
Date

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

XI. ATTACHMENTS

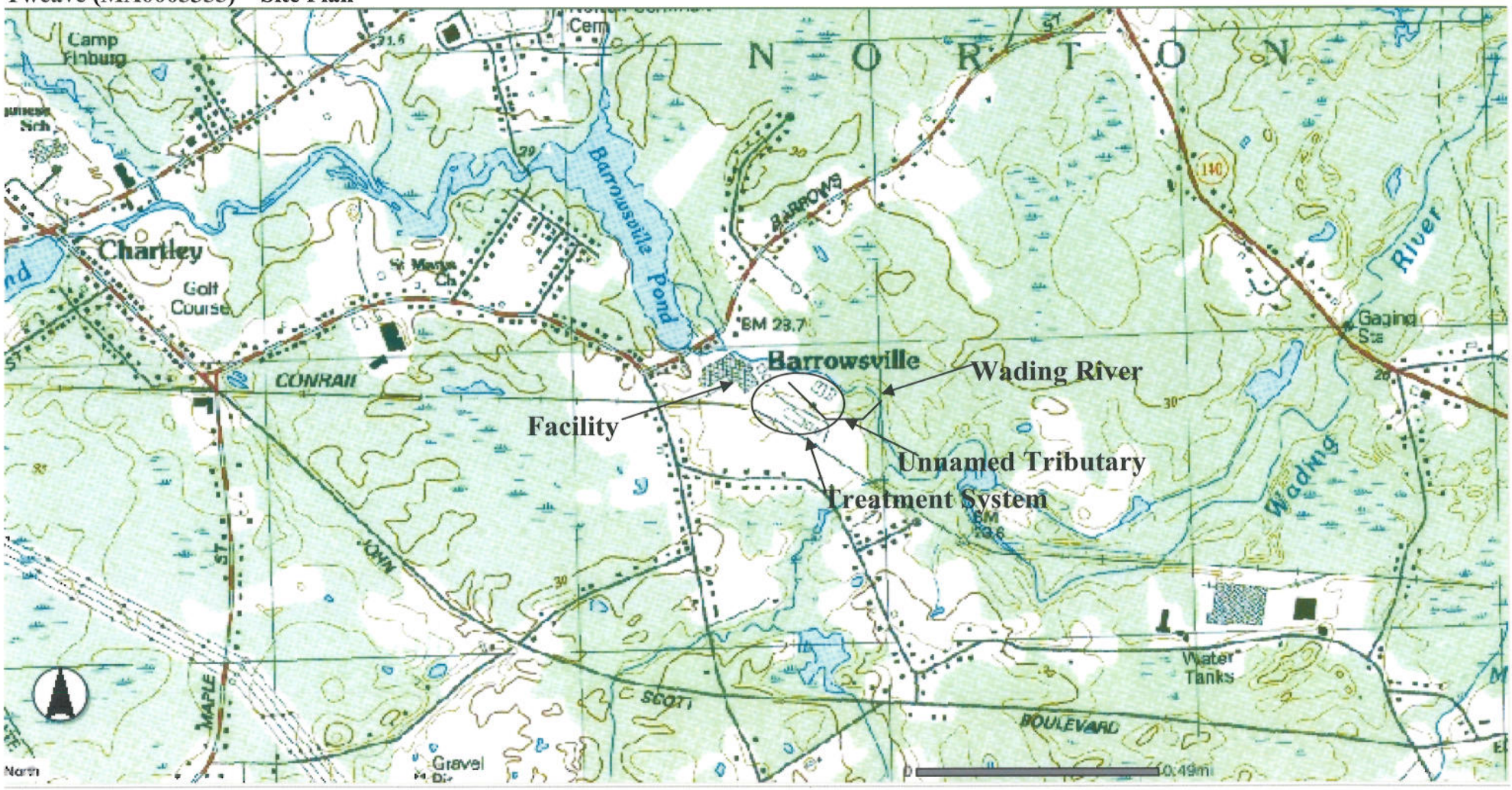
A. Site Plan

B. DMR Data Summary

C. Facility Map

D. Current Water Flow Schematic

ATTACHMENT A
Tweave (MA0005355) – Site Plan



ATTACHMENT B
Tweave (MA0005355) - DMR Data Summary

Outfall 001	BOD5				Flow		TKN	Nitrogen Nitrate, as N	Nitrogen Nitrite, as N	pH		phosphorus
	1.34 lb/d	2.5 lb/d	20 mg/L	30 mg/L	8000 gal/d	10000 gal/d	Req. Mon. mg/L	Req. Mon. mg/L	Req. Mon. mg/L	6.5 SU	8.3 SU	Req. Mon. mg/L
MP Date	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MX	DAILY MX	DAILY MX	MINIMUM	MAXIMUM	DAILY MX
2/28/2005	.516	1.08	16.	16.	3863.	8100.	24.1	8.4	.189	6.5	7.	.8
3/31/2005	.398	.8	12.	12.	3980.	8000.	22.1	6.7	.06	6.5	6.9	.9
4/30/2005	.194	.33	4.	4.	5807.	10000.	11.4	4.3	.04	6.5	6.9	.4
5/31/2005	.386	.67	8.	8.	5886.	10000.	10.2		.206	6.5	6.9	11.
6/30/2005	.099	.17	2.	2.	5957.	10000.	6.5	12.1	.035	6.5	6.8	1.
7/31/2005	.13	.25	3.	3.	5200.	10000.	7.6	7.3	.04	6.5	7.	.7
8/31/2005	.616	1.08	13.	13.	5683.	10000.	9.8	15.	.07	6.5	7.9	1.1
9/30/2005	.12	.25	3.	3.	4.89	10000.	11.	10.5	.2	6.5	6.9	1.5
10/31/2005	.5	1.17	14.	14.	4343.	10000.	9.4		.25	6.5	7.1	1.9
11/30/2005	.71	1.42	17.	17.	5006.	10000.	13.3	3.7	.321	6.5	6.9	1.8
12/31/2005	.27	.83	10.	10.	3240.	10000.	1.08		.04	6.5	7.1	.9
1/31/2006	.39	.83	10.	10.	4700.	10000.	12.8	.48	.05	6.5	6.9	1.1
2/28/2006	.45	1.25	15.	15.	3600.	10000.	.26		.008	6.5	6.9	38.7
3/31/2006	.45	1.25	6.	6.	5250.	10000.	22.6	.29	.026	6.5	7.	.8
4/30/2006	.57	1.42	17.	17.	4030.	10000.	36.1	1.05	.033	6.5	7.	1.
5/31/2006	.43	1.	12.	12.	4343.	10000.	25.7	9.1	.015	6.5	6.9	2.3
6/30/2006	.829	2.09	25.	25.	3976.	10000.	8.	.03	.	6.5	6.9	18.
7/31/2006	.55	3.42	41.	41.	1620.	10000.	40.5	17.1	1.225	6.5	6.9	.7
8/31/2006	.934	3.	36.	36.	3.11	10000.	10.4	8.4	.91	6.5	7.1	.9
9/30/2006	.694	2.92	35.	35.	3303.	10000.	4.7	.64	3.5	6.5	6.9	1.7
10/31/2006	.22	.5	6.	6.	4570.	10000.	7.2	3.5	.307	6.5	7.1	1.8
11/30/2006	.268	.42	5.	5.	6427.	10000.	16.5	10.5	1.42	7.	6.5	1.1
12/31/2006	.195	.33	4.	4.	5843.	10000.	9.4	8.7	.007	6.6	7.1	.7
1/31/2007	.102	.42	5.	5.	2450.	10000.	18.9	9.8	.201	6.5	7.1	1.2
2/28/2007	.965	7.26	87.	87.	1330.	10000.	19.	.98	.022	6.5	7.1	.8
3/31/2007	.24	.56	6.7	6.7	4323.	10000.	21.	1.2	.052	6.5	6.9	1.5
4/30/2007	.109	.33	4.	4.	3260.	10000.	24.	4.9	1.094	6.5	6.9	.4
5/31/2007	.379	1.33	16.	16.	2837.	10000.	16.4	14.1	.029	6.9	6.9	2.6
6/30/2007	.03	.03	4.	4.	913.	10000.	3.2	8.7	.007	6.7	7.2	.6
7/31/2007	.071	.33	4.	4.	2140.	10000.	2.	11.94	.04	6.5	8.7	1.1
8/31/2007	.167	.33	4.	4.	5000.	10000.	3.86	16.3	.26	6.5	6.9	.1
9/30/2007	.018	.23	2.8	2.8	4617.	10000.	3.88	10.	.0338	6.5	6.9	.8
10/31/2007	.105	.36	4.3	4.3	2920.	10000.	2.83	18.9	.022	6.5	7.1	.9
11/30/2007	.035	.3	3.6	3.6	1180.	10000.	1.13	8.29	.0485	6.5	6.9	.3
12/31/2007	.138	.138	4.	4.	4123.	10000.	6.02	7.37	.499	6.5	7.	.5
1/31/2008	2.785	5.09	61.	61.	5473.	10000.	6.51	2.96	3.14	6.5	7.	1.
2/29/2008	.202	.33	4.	4.	6060.	10000.	3.69	7.1	.404	6.5	6.9	.6
3/31/2008	.223	.33	4.	4.	6693.	10000.	2.9	6.83	.634	6.5	7.1	1.
4/30/2008	.18	.31	4.	4.	5500.	9200.	2.22	9.58	.022	6.5	6.8	.9
5/31/2008	.17	.33	4.	4.	5117.	10000.	2.11	11.	.0237	6.5	6.9	1.7
6/30/2008	.51	.51	4.	4.	4533.	10000.	2.52	22.4	.22	6.5	7.1	2.7
7/31/2008	.205	.205	5.	5.	4907.	10000.	2.57	10.2	.2227	6.5	6.8	1.44
8/31/2008	.187	.33	4.	4.	5620.	10000.	1.52	9.64	.022	6.5	6.9	1.3
9/30/2008	.251	.42	5.	5.	6020.	10000.	1.67	10.4	.022	6.5	7.1	1.1
10/31/2008	.174	.33	4.	4.	5210.	10000.	1.63	16.7	.022	6.5	6.8	1.5
11/30/2008	.167	.33	4.	4.	5003.	10000.	2.58	5.8	.007	6.5	6.8	1.3
12/31/2008	.262	.42	5.	5.	6273.	10000.	4.67	5.17	.67	6.5	6.8	.1
1/31/2009	.163	1.18	14.	14.	6040.	10000.	3.65	1.32	13.9	6.8	6.8	1.7
2/28/2009	.124	.12	3.9	3.9	5473.	10000.	1.61	3.49	1.39	6.5	6.5	.462
3/31/2009	.088	1.5	18.	18.	6473.	10000.	4.23	12.1	7.36	7.5	7.5	1.66
4/30/2009	.666	.71	8.5	8.5	7413.	10000.	3.51	1.95	.022	6.72	6.72	1.7
5/31/2009	1.34	2.5	5.	5.	5300.	10000.	3.2	11.	.5	6.74	6.74	1.2
6/30/2009	1.34	2.5	2.	2.	5803.	10000.	2.5	7.6	.09	6.88	6.88	.99
7/31/2009	.478	.51	6.1	6.1	5677.	10000.	2.	12.	.06	6.7	6.7	2.06
8/31/2009	.286	.29	3.5	3.5	5423.	10000.	2.6	7.8	.05	6.7	6.7	1.24
9/30/2009	.26	.4	4.8	4.8	5740.	10000.	2.3	8.3	.06	6.9	6.9	1.93
10/31/2009												
Outfall 001	BOD5				Flow		TKN	Nitrogen Nitrate, as N	Nitrogen Nitrite, as N	pH		phosphorus
Effluent Limit	1.34 lb/d	2.5 lb/d	20 mg/L	30 mg/L	8000 gal/d	10000 gal/d	Req. Mon. mg/L	Req. Mon. mg/L	Req. Mon. mg/L	6.5 SU	8.3 SU	Req. Mon. mg/L
	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MX	DAILY MX	DAILY MX	MINIMUM	MAXIMUM	DAILY MX
maximum	2.79	7.26	87.00	87.00	7413.00	10000.00	40.50	22.40	13.90	7.50	8.70	38.70
minimum	0.02	0.03	2.00	2.00	3.11	8000.00	0.26	0.03	0.00	6.50	6.50	0.10
average	0.40	1.01	11.31	11.31	4490.70	9916.07	8.98	8.15	0.72	6.57	6.98	2.31
exceedences	1	5	6	5	0	0	NA	NA	NA	0	1	NA

TSS				LC50 - Ceriodaphnia	LC50 - Pimephales	Copper				O&G	COD			
1.34 lb/d	2.5 lb/d	20 mg/L	30 mg/L	100 %	100 %	.029 lb/d	.032 lb/d	.35 mg/L	.39 mg/L	15 mg/L	27 lb/d	50 lb/d	400 mg/L	600 mg/L
MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MN	DAILY MN	MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX
.322	.68	10.	10.	100.	100.									
.166	.33	5.	5.											
.242	.42	5.	5.			.001	.001	.017	.017	2.	5.291	5.291	134.	134.
.483	.83	10.	10.	100.	100.									
.59	1.	12.	12.											
.13	.25	3.	3.			.002	.002	.036	.036	2.	9.586	9.586	221.	221.
.19	.33	4.	4.	100.	100.									
.16	.33	4.	4.											
.217	.5	6.	6.			.025	.025	.5	.5	5.	6.46	6.46	138.	138.
.42	.83	10.	10.	100.	100.									
.189	.58	7.	7.											
.19	.42	5.	5.			.017	.017	.4	.4	10.	8.076	8.076	204.	204.
.42	1.17	14.	14.	100.	100.									
.42	1.17	6.	6.											
.57	1.42	17.	17.			.004	.004	.2	.2	4.	4.896	4.896	183.	183.
.5	1.17	14.	14.	6.25	64.									
.232	.58	7.	7.											
.392	2.42	29.	29.			.048	.048	1.3	1.3	6.	12.6	12.6	333.	333.
.104	.33	4.	4.	100.	100.									
.11	.33	4.	4.											
.03	.08	1.	1.			.018	.018	.74	.74	.	3.582	3.582	148.	148.
.107	.17	2.	2.	100.	67.									
.195	.33	4.	4.											
.143	.58	7.	7.			.002	.002	.04	.04	4.	6.758	6.758	170.	170.
.044	.33	4.	4.	100.	100.									
.25	.58	7.	7.											
.15	.46	5.5	5.5			.004	.004	.2	.2	4.	4.8696	4.8696	183.	183.
.072	.96	11.5	11.5	100.	100.									
.015	.015	2.	2.											
.125	.58	7.	7.			.001	.001	.	.	13.2	6.634	6.634	229.	229.
.209	.42	5.	5.	100.	100.									
.	.	.	.											
.097	.33	4.	4.			.003	.003	.1	.1	5.	.837	.837	37.4	37.4
.039	.33	4.	4.	100.	100.									
1.38	1.38	4.	4.											
.502	.92	11.	11.			.001	.001	.04	.04	9.9	2.447	2.447	101.	101.
.202	.33	4.	4.	100.	100.									
.233	.33	4.	4.											
.18	.31	4.	4.			.004	.004	.1	.1	5.4	2.424	2.424	75.6	75.6
.17	.33	4.	4.	100.	100.									
.51	.51	4.	4.											
.164	.164	4.	4.			.013	.013	.3	.3	5.	5.871	5.871	122.	122.
.187	.33	4.	4.	100.	100.									
.201	.33	4.	4.											
.174	.33	4.	4.			.001	.001	.027	.027	11.5	1.922	1.922	45.9	45.9
.167	.33	4.	4.	100.	100.									
.209	.33	4.	4.											
.47	.34	4.	4.			.001	.001	.021	.021	6.9	3.52	3.52	78.	78.
.	.	.	.	100.	100.									
1.34	2.5	4.	4.											
		4.	4.			.028	.028	.896	.896	9.05	2.573	2.573	81.2	81.2
1.34	2.5			100.	100.									
.056	.52	6.2	6.2											
1.34	2.5	5.	5.			.004	.004	.468	.468	4.2	.873	.873	97.	97.
1.34	2.5	5.	5.	100.	100.									
1.34	2.5	5.	5.											
.298	.46	5.5	5.5			.034	.034	.421	.421	4.	7.192	7.192	88.	88.
TSS				LC50 - Ceriodaphnia	LC50 - Pimephales	Copper				O&G	COD			
1.34 lb/d	2.5 lb/d	20 mg/L	30 mg/L	100 %	100 %	.029 lb/d	.032 lb/d	.35 mg/L	.39 mg/L	15 mg/L	27 lb/d	50 lb/d	400 mg/L	600 mg/L
MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MN	DAILY MN	MO AVG	DAILY MX	MO AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX
1.38	2.50	29.00	29.00	100.00	100.00	0.048	0.048	1.300	1.300	13.20	12.60	12.60	333.00	333.00
0.00	0.00	0.00	0.00	6.25	64.00	0.001	0.001	0.000	0.000	0.00	0.84	0.84	37.40	37.40
0.35	0.71	6.03	6.03	95.07	96.37	0.011	0.011	0.306	0.306	5.85	5.07	5.07	140.48	140.48
1	0	1	0	1	2	2	2	7	7	0	0	0	0	0

Zinc				Chromium				Phenols				Sulfide			
.067 lb/d	.12 lb/d	1 mg/L	1.5 mg/L	.067 lb/d	.12 lb/d	1 mg/L	1.5 mg/L	.04 lb/d	.06 lb/d	.6 mg/L	.72 mg/L	.17 lb/d	.34 lb/d	2.5 mg/L	4.1 mg/L
MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX
.0008	.0008	.02	.02												
.009	.0009	.02	.02												
.0041	.0041	.1	.1												
.0016	.0016	.4	.4	.003	.003	.1	.1	.002	.002	.05	.05	.008	.008	.2	.2
.0008	.0008	.03	.03												
.0008	.0008	.02	.02												
.004	.004	.168	.168												
.0007	.0007	.2	.2	.002	.002	.077	.077	.003	.003	.11	.11	.	.	.	.
.008	.008	.03	.03												
.00086	.00086	.	.												
.002239	.002239	.1	.1												
.002423	.002433	.1	.1	.008	.008	.3	.3	.003	.003	.5	.5	.0015	.0015	.2	.2
.003	.003	.1	.1												
.0048	.0048	.1	.1												
.00569	.00569	1.	1.												
.0065	.0065	.146	.146	.007	.007	.61	.61	.001	.001	.05	.05	.002	.002	.184	.184
.	.	.	.												
.05	.05	.05	.05												
.67	.12	.05	.05												
Zinc				Chromium				Phenols				Sulfide			
.067 lb/d	.12 lb/d	1 mg/L	1.5 mg/L	.067 lb/d	.12 lb/d	1 mg/L	1.5 mg/L	.04 lb/d	.06 lb/d	.6 mg/L	.72 mg/L	.17 lb/d	.34 lb/d	2.5 mg/L	4.1 mg/L
MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	DAILY MX
0.670	0.120	1.000	1.000	0.008	0.008	0.61	0.61	0.00	0.00	0.50	0.50	0.01	0.01	0.20	0.20
0.000	0.000	0.000	0.000	0.002	0.002	0.08	0.08	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00
0.041	0.011	0.139	0.139	0.005	0.005	0.27	0.27	0.00	0.00	0.18	0.18	0.00	0.00	0.15	0.15
1.000	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0	0	0

ATTACHMENT C
Tweave LLC (MA0005355) – Facility Map

Legend

Mass. Towns Boundaries

EOT-OTP Roads

Limited Access Highway

Multi-lane Hwy, Not Limited Access

Other Numbered Hwy

Wetland Connections

Wetlands 12k Detailed

Barrier Beach System

Barrier Beach-Deep Marsh

Barrier Beach-Wooded Swamp Mixed Trees

Barrier Beach-Coastal Beach

Barrier Beach-Coastal Dune

Barrier Beach-Marsh

Barrier Beach-Salt Marsh

Barrier Beach-Wooded Swamp Coniferous

Barrier Beach-Wooded Swamp Deciduous

Bog

Coastal Bank Bluff or Sea Cliff

Coastal Beach

Coastal Dune

Cranberry Bog

Deep Marsh

Barrier Beach-Open Water

Open Water

Rocky Intertidal Shore

Salt Marsh

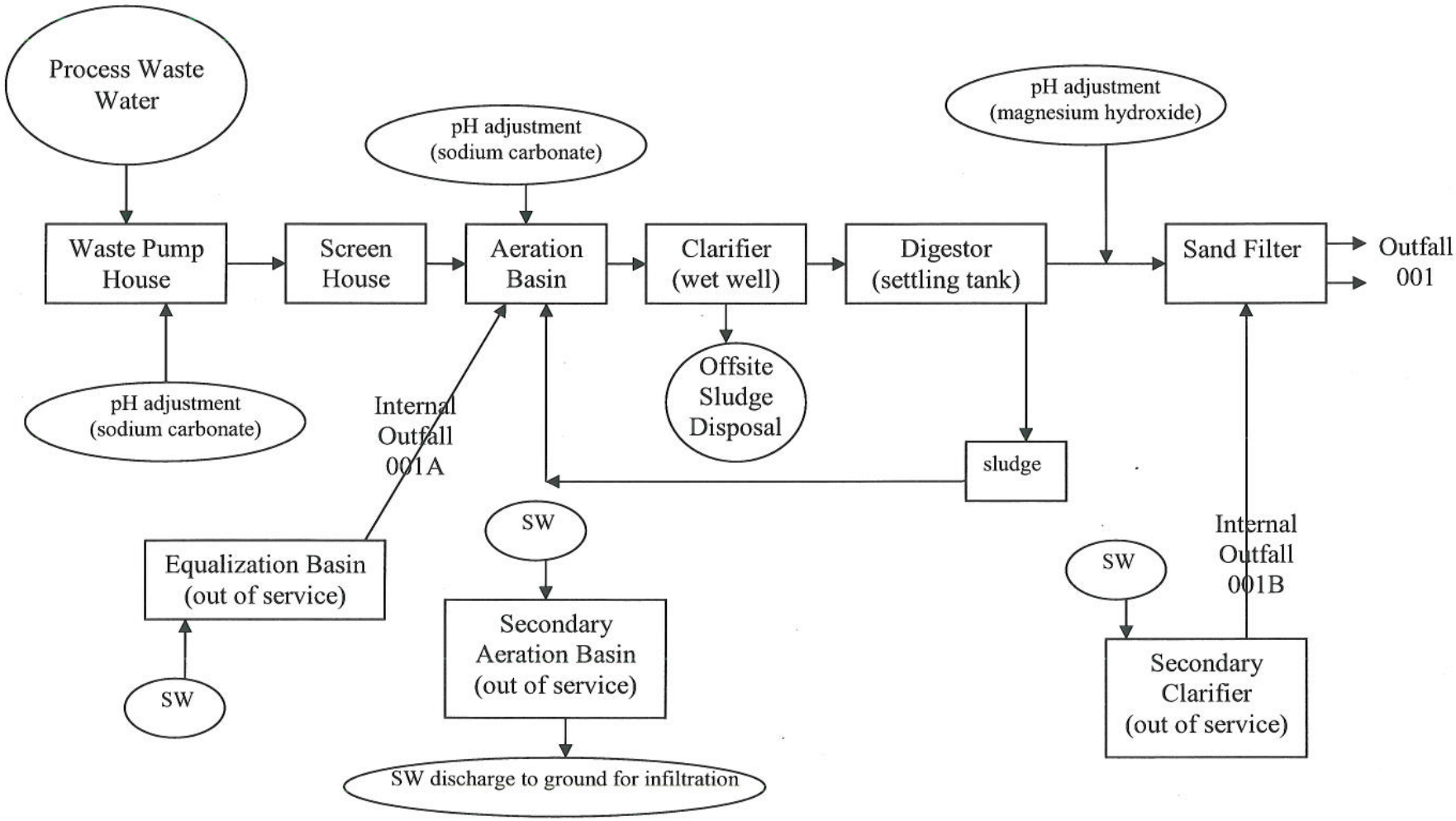
Shallow Marsh Meadow or Fen

Shrub Swamp

Tidal Flat

Wooded Swamp Coniferous

Wooded Swamp Deciduous

Wooded Swamp Mixed Trees

Attachment D
Tweave LLC (MA0005355) –Water Flow Schematic