

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Entegris, Inc.

is authorized to discharge from a facility located at

**129 Concord Road
Billerica, MA 01821**

to the receiving water named the Concord River, a class B water, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

This permit shall become effective on December 1, 2009.

This permit and the authorization to discharge expire at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the general permit for reverse osmosis reject water that was issued on December 17, 2002 and that expired on December 17, 2007.

This permit consists of five (5) pages in Part I including effluent limitations and monitoring requirements and 25 pages in Part II, Standard Conditions.

Signed this 23rd day of September, 2009

/S/ SIGNATURE ON FILE

Ken Moraff, Acting Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

Glenn Haas, Director
Division of Watershed Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I.A. Effluent Limitations and Monitoring Requirements

1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge reverse osmosis (RO) reject water from outfall serial number 001 . Such discharges shall be limited and monitored by the permittee as specified below:				
<u>EFFLUENT CHARACTERISTIC</u>		<u>EFFLUENT LIMITS</u>		<u>MONITORING REQUIREMENTS</u>
<u>PARAMETER</u>	<u>AVERAGE MONTHLY</u>	<u>MAXIMUM DAILY</u>	<u>MEASUREMENT FREQUENCY</u>	<u>SAMPLE¹ TYPE</u>
Flow	80,000 GPD	100,000 GPD	Continuous	Recorder ²
pH Range ³	6.5 – 9.0 s.u.		1/Week	Grab
Dissolved Oxygen ³	Not less than 6.0 mg/l		1/Week	Grab
Total Suspended Solids	30 mg/l	45 mg/l	1/Month	Grab
Total Ammonia Nitrogen	Report ug/l	Report ug/l	1/Month	Grab
Total Residual Chlorine	1.0 mg/l	1.0 mg/l	1/Week	Grab
Copper, Total	Report ug/l	Report ug/l	1/Month	Grab

The discharge of cooling tower blowdown, wastewaters from the cleaning of any RO unit components, or backwash water from any carbon filters, multi-media filters or water softeners to the Concord River is prohibited.

Footnotes:

1. Sampling shall be conducted at a point prior to discharge to Outfall 001 which contains the RO reject water flow, and prior to mixing with any other stream. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.
2. The flow shall be continuously measured and recorded using a flow meter.
3. Requirement for State Certification. For pH, the minimum and maximum values for each month shall be reported.

Part I.A.1. (continued)

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
- b. The effluent pH shall be in the range of 6.5 through 9.0 standard units.
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
- e. The results of sampling for any parameter above its required frequency must also be reported.

3. Toxics Control

- a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.
- b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

4. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

5. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

- (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. §122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f).
- b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- (1) Five hundred micrograms per liter (500 ug/l);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. §122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f).
- c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.
6. This permit may be modified, or revoked and reissued, on the basis of new information in accordance with 40 CFR §122.62.

B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements (Part II) of this permit (Twenty-four hour reporting).

C. MONITORING AND REPORTING

Reporting

Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

Signed and dated Discharge Monitoring Report Forms required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

D. STATE PERMIT CONDITIONS

This discharge permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chapter 21, §43.

Each Agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit shall remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

Response to Public Comments

From July 15, 2009 to August 13, 2009, the United States Environmental Protection Agency (“EPA”) and the Massachusetts Department of Environmental Protection (“MassDEP”) (together, the “Agencies”) solicited public comments on a draft NPDES permit developed pursuant to a permit renewal application from Entegris, Incorporated (“Permittee”) for the reissuance of a National Pollutant Discharge Elimination System (“NPDES”) permit to discharge reverse osmosis reject water from Outfall 001 to the Concord River in Billerica, Massachusetts.

After a review of the comments received, EPA and MassDEP have made a final decision to issue this permit authorizing these discharges. The final permit is identical to the draft permit that was available for public comment.

Copies of the final permit may be obtained by writing or calling EPA’s NPDES Industrial Permits Branch (CIP), Office of Ecosystem Protection, 1 Congress Street, Suite 1100, Boston, MA 02114-2023; Telephone: (617) 918-1579.

Comments submitted by Tracie Sales of the Merrimack River Watershed Council:

Comment A1: pH limits of effluent need to be restricted

MRWC requests that the permit requires the effluent to meet the class B standard of 6.5 – 8.3 s.u.. While we understand that the source water sometimes exceeds 8.3 s.u., effluent exceeding this pH level has been determined by the state to harmful to aquatic life and should be considered “backsliding” in the intent of the regulations. For example, this permit does not address the on-going effort to restore anadromous fish in the area, fish which are extremely sensitive to changes in pH.

Response to Comment A1: As explained in the fact sheet, the upper end of the limited pH range was changed from 8.3 s.u. to 9.0 s.u. The rationale for this change was that the water supplied by the Town of Billerica is at times above 8.3. s.u. and currently necessitates the addition of chemical treatment (sulfuric acid) to assure that the effluent pH meets the 8.3 s.u. limit. As noted in the fact sheet, this change is consistent with the “new information” provision of the antibacksliding regulations.

There is also sufficient dilution available to this discharge to the Concord River (over 200:1) which would assure that the discharge meets the instream standard of 8.3 s.u. quickly upon mixing. As such, since this discharge would not be expected to violate the instream standard, we believe that any effort to restore anadromous fish runs in the area would likewise not be affected.

Comment A2: Reinstate Total Suspended Solids (TSS) reporting requirements

No explanation or rationale was provided for dropping the reporting requirements for TSS mass load. This information is important to have as it appears the flow volume fluctuates making it difficult to estimate the load based on concentration alone. Thus, we believe this should continue to be a requirement.

Response to Comment A2: Due to the low levels of TSS and the intermittent nature of this discharge, it is not believed that reporting a mass amount of TSS discharged would yield useful data not already provided by the reporting of the concentration. The permittee pre-filters its source water which typically removes most detectable levels of TSS. The requirement to report the mass of TSS for a discharge is more appropriate and useful for consistent and larger discharges, such as those from publicly owned treatment works (POTW).

Comment A3: Add ammonia toxicity calculations

The permit does not provide a calculation for the acute and chronic toxicity levels for ammonia for the receiving water. Without this calculation it is hard to assess the potential impacts of the ammonia levels found in the effluent. While it is possible that, given the significant amount of dilution occurring in this situation, the ammonia is not a problem, we are unable to assess that fact without the calculations. This is especially important as this section of the river has had dissolved oxygen problems in the past.

Response to Comment A3: The current ammonia water quality criteria were last published in the “1999 Update of Ambient Water Quality Criteria for Ammonia”. Assuming that salmonid species are present, the acute ammonia criterion is 2.14 milligrams of nitrogen/liter (mg N/l) at a pH of 8.5 s.u. and is higher at lower pH levels. The chronic criterion at a pH of 8.5 s.u. ranges from 0.99 to 1.77 mg N/l, based on the temperature range of 0 – 16 °C. Since January of 2008, the ammonia levels as measured in mg/l of N, have mostly been in the 0.10 – 0.20 mg/l range with the highest detected values being 0.849 and 0.469 mg/l. Over that same period, the effluent pH has typically been in the 7.5 – 8.0 s.u. range. Therefore, it is believed that the current discharge of ammonia does not cause or contribute to a water quality standards violation. Therefore, after reviewing the applicable ammonia criteria, EPA believes that setting an ammonia limit is not necessary at this time because the ammonia levels detected in the permittee’s effluent are well below the criteria values, even without talking dilution into account.

The following three comments are supportive of the draft permit conditions and do not require a response or any change from the draft permit to the final permit:

Comment A4: MRWC supports the Dissolved Oxygen requirement of this permit – especially given that it is higher than class B would normally require.

Comment A5: We are pleased to see the monthly monitoring requirement for Total Residual Chlorine (TRC) in the permit even if the permittee uses no chlorine, therefore, the residual is more a function of the heavy doses at the Billerica Water Treatment Plant.

Comment A6: We are pleased that the boiler blow down is directed to the Waste Water Treatment Plant, and hopefully falls under an IPP from the Waste Water Treatment Plant.

Note: The permittee actually discharges cooling tower blowdown, not boiler blowdown, to the Town of Billerica's treatment plant.

Comments submitted by Mary A. Colligan, the Assistant Regional Administrator for Protected Resources of the Northeast Region of the National Marine Fisheries Service (NMFS):

Comment B1: While several species of listed whales and sea turtles occur seasonally in waters off the Massachusetts coast and populations of the federally endangered shortnose sturgeon occur in the Connecticut and Merrimack Rivers, no listed species are known to occur in the Concord River. As such, no further coordination with NMFS PRD is necessary.

Response to Comment B1: This comment is noted for the record and did not necessitate any changes to the final permit.

September 22, 2009

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

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 NUMBER: MA0040339

NAME AND MAILING ADDRESS OF APPLICANT:

**Entegris, Inc.
129 Concord Road
Billerica, MA 01821**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Entegris, Inc.
129 Concord Road
Billerica, MA 01821**

**RECEIVING WATER(S): Concord River
(USGS Hydrologic Code #01070005 - Merrimack River Basin)**

RECEIVING WATER CLASSIFICATION(S): Class B - Warm water fishery

**SIC CODE: 3089 - Plastic products; 3499 – Fabricated metal products
3569 - General industrial machinery equipment**

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I. Proposed Action, Type of Facility and Discharge Location

Entegris, Incorporated, or “Entegris”(the permittee), formerly the Mykrolis Corporation, operates a facility in Billerica, Massachusetts. This facility is engaged in the manufacture of plastic and stainless steel filtration products, polyvinyl acetate brushes, and industrial machinery equipment. The facility was authorized to discharge reverse osmosis (RO) reject water on September 24, 2004 to the Concord River through Outfall 001, in accordance with the general permit for RO reject water (ROGP) that was issued on December 17, 2002. Entegris initiated this discharge on November 17, 2005 and had previously discharged this reject water to the Town of Billerica’s sanitary sewer system.

The ROGP expired on December 17, 2007 and EPA has decided not to reissue it. Therefore, this RO reject water discharge will be authorized under this individual permit. As such, the previous NPDES ROGP# of MAG450003 has been changed to the individual NPDES permit #MA0040339. The permittee was instructed to file an individual permit application and it did so on March 30, 2009 and this was found to be complete.

The reissued permit will authorize the discharge of RO reject water from Outfall 001 at up to a daily maximum flow of 100,000 gallons per day (GPD) to the Concord River. The effluent is routed underneath the building after connecting with storm water from the roof and ties into a storm drain connection which contains storm water from this site and adjacent property, prior to discharging to Outfall 001. See **Figure 1** for a map of the facility and the outfall location, and **Figure 2** for a water flow schematic.

II. Description of Treatment System and Discharges

Outfall 001 – Reverse Osmosis Reject Water

To achieve the required level of water purity for its manufacturing and research and development (R&D) processes, Entegris employs reverse osmosis (RO) units to treat the incoming water, which is supplied by the Town of Billerica. The outputs of these RO units are a purified water which is used in production/R&D and the RO reject water, which is discharged to Outfall 001. This reject water contains the typical parameters which are found in drinking water, except at higher concentrations.

The Town of Billerica source water contains some residual chlorine and other chlorination byproducts. Since chlorine is detrimental to the operation of RO units, this source water is passed through a carbon pre-treatment bed. This water is also passed through multi-media filtration for solids removal and a water softener prior to entering the RO units. The carbon filters, multi-media filters and water softeners are automatically or manually backwashed typically once or twice per week and this backwash is discharged to the Town of Billerica and is prohibited from being discharged through Outfall 001. If needed, sulfuric acid is added to the RO units incoming water to lower the pH in order to comply with the permit limit. For routine and preventative maintenance, the RO membrane units are taken off line periodically and taken off site for cleaning and replaced with other units.

Flow, pH, and dissolved oxygen (DO) are continuously monitored by meter at the RO reject system. The reject water is first sent to a holding tank inside the facility. Typically, when water in this tank reaches a pre-determined level, it is pumped out to the Concord River through Outfall 001. DO, pH and flow are measured at the outlet of this tank. If the pH or DO does not meet the permit limits, the water is discharged back to the holding tank. If the tank reaches a high level, it overflows to the town sewer. Other parameters are also sampled at the outlet of this holding tank. During the cooling season, the permittee uses this RO reject water for its cooling tower and often discharges very low amounts between June and August since the cooling towers use and evaporate much of this water. The cooling tower blowdown discharge is sent to the Town of Billerica's sewer system and not discharged to the Concord River. The permittee also has the option to discharge the reject water from the holding tank to the Town of Billerica if it is not expected to meet the NPDES permit limits.

III. Receiving Water Description

Under the state water use classification system, MassDEP has designated this stretch of the Concord River (Segment MA82A-07), as a Class B water (314 CMR 4.00). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. These waters are to be suitable for public water supply following appropriate treatment, irrigation and other agricultural uses, and compatible industrial cooling and process uses. The waters shall have consistently good aesthetic value. This segment of the Concord River is on the MassDEP's 2008 303(d) list of impaired waters for metals, nutrients, and pathogens.

IV. Limitations and Conditions

The effluent limitations and all other requirements described in Part VI of this Fact Sheet may be found in the draft permit.

V. Permit Basis: Statutory and Regulatory Authority

General Requirements

The Clean Water Act (CWA) 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 CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. This draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any applicable State regulations. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136.

When developing permit limits, EPA must consider the most recent technology-based treatment and water quality-based requirements. Subpart A of 40 CFR Part 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. EPA is required to consider technology and water quality-based requirements as well as all limitations and requirements in the existing permit when developing permit limits.

Technology-Based Requirements

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. There are no effluent limitations guidelines which are applicable to this facility.

In general, the statutory deadline for non-POTW, technology-based effluent limitations 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 can not be authorized by a NPDES permit.

In the absence of published technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using best professional judgment (BPJ).

The effluent monitoring requirements have been established to yield data representative of the discharges under the authority of Section 308(a) of the Clean Water Act, according to regulations set forth at 40 CFR § 122.41(j), 122.44(i) and 122.48. The monitoring program in the permit specifies routine sampling and analysis which will provide continuous information on the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures are to be found in 40 CFR 136 unless other procedures are explicitly required in the permit.

Water Quality-Based Requirements

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 (WQS). See Section 301(b)(1)(C) of the CWA.

Receiving water requirements are established according to numerical and narrative standards adopted under state law for each water quality 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). The Region has established, pursuant to 40 CFR 122.45(d)(2), a maximum daily limit and average monthly discharge limits for specific chemical pollutants.

A facility's design flow is used when deriving constituent limits for daily and monthly time periods as well as weekly periods where appropriate. Also, the dilution provided by the receiving water is factored into this process where appropriate. Narrative criteria from the state's WQS are often used to limit toxicity in discharges where (a) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (b) toxicity cannot be traced to a specific pollutant.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve state or federal WQS. The permit must address 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 40 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 (a) existing controls on point and non-point sources of pollution; (b) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (c) sensitivity of the species to toxicity testing; (d) known water quality impacts of processes on wastewater; and, where appropriate, (e) dilution of the effluent in the receiving water.

WQS consist of three parts: (a) beneficial designated uses for a water body or a segment of a water body; (b) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s); and (c) antidegradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts Surface Water Quality Standards (MA SWQS), found at 314 CMR 4.00, include these elements. The state will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained or attained. These 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, shall be used unless a site-specific criterion is established. The conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain WQS.

Antibacksliding

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirements of the CWA [see Sections 402(o) and 303(d)(4) of the CWA and 40 CFR §122.44(1)(1 and 2)]. EPA's antibacksliding provisions prohibit the relaxation of permit limits, standards, and conditions except under certain circumstances. Effluent limits based on BPJ, water quality, and state certification requirements must also meet the antibacksliding provisions found at Section 402(o) and 303(d)(4) of the CWA.

The regulations at 40 CFR §122.44(1)(2)(i)(B)(1) offer an exception to the antibacksliding provisions based on information that was not available at the time of permit issuance and which would have justified the application of a less stringent effluent limitation. This exception is referred to as “new information”. The results of the monitoring for copper, or “new information”, indicate that effluent levels based on revised dilution factors are well below the chronic and acute water quality based standards and that effluent levels of total copper would not be expected to cause or contribute to WQS violations. See discussion and calculations in Section VI below. Therefore, the copper limits have been replaced with a monitor only requirement.

Regarding pH, the upper end of the pH range has been changed from 8.3 to 9.0 standard units (s.u.). This change is based on new information that shows that the source water from the Town of Billerica is above 8.3 s.u. at times and that with the dilution available to the discharge, it would not be expected that the discharge would cause or contribute to a violation of the instream state pH range requirement of 6.5 – 8.3 s.u.

Antidegradation

Federal regulations found at 40 CFR Section 131.12 require states to develop and adopt a statewide antidegradation policy which maintains and protects existing instream water uses and the level of water quality necessary to protect the existing uses, and maintains the quality of waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water. The Massachusetts Antidegradation Regulations are found at Title 314 CMR 4.04. This draft permit is being reissued with similar limits that were established in the ROGP. Therefore, EPA and MassDEP have determined that there is no evaluation that needs to be conducted relative to antidegradation since the permittee is not increasing its permitted flow or adding any new or increased levels of any pollutants.

State Certification

Under Section 401 of the CWA, EPA is required to obtain certification from the state in which the discharge is located that all water quality standards or other applicable requirements of state law, in accordance with Section 301(b)(1)(C) of the CWA, are satisfied. EPA permits are to include any conditions required in the state's certification as being necessary to ensure compliance with state water quality standards or other

applicable requirements of state law. (See CWA Section 401(a) and 40 CFR §124.53(e).) Regulations governing state certification are set out at 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).

VI. Explanation of Permit's Effluent Limitations

Outfall 001

The ROGP for Entegris had required flow monitoring with no limit. The permittee has noted that the effluent flows vary with production needs and DMRs have shown effluent flows of RO reject water to be in the range of 956 to 22,144 gallons per day (GPD). In July of 2008, there was no flow as all of the reject water was used in the facility's cooling tower as described earlier. The permittee has requested flow limits based on its potential operational needs of a monthly average of 80,000 GPD and a daily maximum of 100,000 GPD and these have been established as the draft permit limits.

The ROGP had 2 sets of limits, one for discharges with a dilution factor of 10 to 99 and another for a dilution factor of 100 to 1000. In an e-mail from Kathleen Keohane of the MassDEP to Olga Vergara of the USEPA on 8/12/04, a dilution factor of 217 was estimated for this discharge. This was based on an estimated 7Q10 flow of 33.37 cfs in the Concord River previously provided by the permittee and a facility RO reject water flow of 100,000 GPD. The 7Q10 flow is the 7 day mean low flow, measured in cubic feet per second (cfs), at a 10 year recurrence interval and is typically used in permits to establish certain permit limits. Therefore, the ROGP for this permittee was based on the 100 to 1000 dilution range, which included limits Total Suspended Solids (TSS), Total Residual Chlorine (TRC), pH, Total Copper and Dissolved Oxygen. There were also monitoring requirements for flow and ammonia. For this individual draft permit, EPA has evaluated whether these previous limits and monitoring requirements are still appropriate based on past discharge monitoring results and also considered whether any other requirements need to be included, based on the recently submitted individual permit application.

Copper

Copper may be toxic to aquatic life at low concentrations, so the ROGP contained numerical limits for total recoverable copper and specified an appropriate method of analysis. Total copper limits in the ROGP were established at a monthly average of 516 ug/l and a daily maximum of 730 ug/l for those discharges in the 100 – 1000 dilution range. The permittee has reported total copper values of between non-detect and 16 ug/l since obtaining coverage under the ROGP. The copper limits that would apply for this discharge are hardness dependent and have been calculated below to reflect the water quality criteria published in the Federal Register on December 10, 1998 (National Recommended Water Quality Criteria, December 10, 1998, FR Vol. 63, No.237) and dilution factors based on revised plant flows.

Water Quality-Based Total Copper limits that would apply to this discharge

$$e (X [\ln(h)] + Y)$$

Where X is the chronic coefficient for dissolved fractions of a particular metal;
 Y is the acute coefficient for dissolved fractions of a particular metal; and
 h is the hardness of the receiving water; ln is the natural logarithm

Calculation of the applicable water quality based copper limits for this discharge:

Chronic: X = 0.8545 Y = -1.702 Acute X = 0.9422 Y = - 1.70

Estimated hardness = 50 mg/l as CaCO₃¹

Thus;

$$e(.8545 [(\ln 50)] -1.702) = 5.2 \text{ ug/l}$$

$$e(.9422 [(\ln 50)] -1.70) = 7.3 \text{ ug/l}$$

To achieve the applicable effluent limits, the following dilution factors were used:

Concord River 7Q10 flow at gaging station 01099500: **33.37 cfs = 21.6 MGD**

Average Flow = 80,000 GPD or **0.08 MGD**; Maximum Flow = **0.10 MGD**

average flow dilution: $\frac{21.6 + 0.08}{0.08} = 271$ maximum flow dilution: $\frac{21.6 + 0.1}{0.1} = 217$

Monthly Average (chronic)	Daily Maximum (acute)
271 (5.2) = 1410 mg/l = 1.41 mg/l	217 (7.3) = 1580 ug/l = 1.58 mg/l

These values must be divided by a conversion factor to attain the applicable total recoverable metal limits. The chronic value corresponds to a monthly average limit and the acute to a daily maximum limit.

Monthly average: 1.41 mg/l / 0.96 = **1.47 mg/l**
 Daily Maximum: 1.58 ug/l / 0.96 = **1.65 mg/l**

Since the ROGP copper limits are more stringent than those based on the actual dilution, the ROGP's total recoverable copper limits of 516 and 730 ug/l would apply for this discharge. However, since the DMRs have shown effluent total copper levels in the range of non-detect to 16 ug/l, there is not a reasonable potential that this discharge will

1. Estimated value based on Concord River water analyses from Whole Effluent Toxicity test reports conducted by the Town of Billerica's Publicly Owned Treatment Works (POTW) facility.

violate either one of these values. Therefore, a monitor only requirement has been established for total copper to verify that the actual effluent levels remain well below these values. In addition, the sample type has been changed from a 24 hour composite to a grab sample, because there is not expected to be significant variability in the discharge of effluent copper over a 24 hour period.

pH

The pH range in the ROGP was previously limited to the Class B range of 6.5 to 8.3 s. u. which is the range required by state WQS and which can be found at 314 CMR 4.05. The permittee has found that its source water sometimes exceeds 8.3 s.u. and there was an automatic sulfuric acid feed system installed at the permit's outset to insure that the pH that enters the RO system is below the permitted maximum of 8.3 s.u. The DMRs have reported effluent pH in the range of 7.5 to 8.3 s.u. since January of 2008.

EPA has determined that the upper range of the pH shall be limited at 9.0 s.u. This is the highest level that is typically allowed in EPA's technology guidelines. EPA expects that the instream state WQS of 8.3 s.u. would still be met at a discharge level of 9.0 s.u., due to the amount of dilution available to this discharge. This would also decrease the amount of sulfuric acid that would be required to reduce pH levels that are between 8.3 and 9.0 s.u. The draft permit continues to require weekly grab samples for pH and a reporting of the monthly pH range in the DMRs.

Total Suspended Solids (TSS)

Since RO systems concentrate solids in the intake water, the previous ROGP had established permit limits of 30 mg/l (monthly average) and 45 mg/l (daily maximum) for TSS as well as a monitoring requirement for the mass of TSS discharged. Since January 2008, the permittee has detected TSS in its effluent only once at a value of 22 mg/l. In order to assure that the filtering steps employed prior to the RO system are working properly and that suspended solids do not pass through to the effluent, the limits and monthly monitoring requirement have been retained in the draft permit. The sample type has been changed from a 24 hour composite to a grab sample, because there is not expected to be significant variability in the discharge of TSS through a 24 hour period. In addition, the permittee no longer needs to report the mass of TSS associated with the detected concentration.

Dissolved Oxygen (DO)

Consistent with the ROGP, there is also a minimum dissolved oxygen (DO) level of 6.0 mg/l required, to be monitored once per week. This limit also complies with the State WQS minimum of 5.0 mg/l for warm water fisheries. DMR data since January of 2008 have shown the DO to be within the range of 6.3 to 8.95 mg/l. During the month of April 2006, an equipment malfunction resulted in DO levels of between 4.5 and 5.8. This

malfunction was corrected. Therefore, this parameter will continue to be monitored on a weekly basis with the minimum of 6.0 mg/l.

Total Residual Chlorine (TRC)

The ROGP established a limit for Total Residual Chlorine (TRC). The permittee will not be using any chlorine based chemical for cleaning purposes and all discharges associated with the cleaning of the RO units will be discharged to the Town of Billerica sewer. However, the Town of Billerica's water supply, the source of the water used at this facility, is chlorinated and TRC has been detected in the effluent in the range of 0.02 to 0.23 mg/l, with no violations of the limit of 1.0 mg/l. This was the limit determined in the ROGP for discharges which had a dilution factor of greater than 100. The following calculation shows what the TRC limit would be based on the actual dilution:

Water Quality Criteria: Freshwater – Chronic: 0.011 mg/l ; Acute: 0.019 mg/l

Effluent Limitations: Monthly Average: 271 (0.011 mg/l) = **3.0 mg/l**
 Daily Maximum: 217 (0.019 mg/l) = **4.1 mg/l**

Since the ROGP's TRC limits are more stringent than those based on the actual dilution, the ROGP's limits of 1.0 mg/l as a monthly average and a daily maximum will remain in this permit due to anti-backsliding and since the permittee has demonstrated that it can comply with these limits. The monthly monitoring requirement for TRC has been retained in this draft permit to assure that TRC levels are not present in the discharge and that the carbon units are working as intended and removing residual chlorine in the source water prior to being sent through the RO units and eventually discharged to Outfall 001.

Total Ammonia Nitrogen (TAN)

When RO units are bleached or cleaned with hypochlorite or other chlorine based compounds, chloramines are created, resulting in the reject water containing ammonia. Therefore, Total Ammonia Nitrogen (TAN) monitoring was required in the ROGP.

Although the permittee contracts to have its RO units taken off-site for cleaning, chlorine-based cleaning compounds are not believed to be used with any portion of its RO system. A review of past DMRs has found that TAN has been detected at levels up to 849 ug/l, with some non-detect samples. However, since TAN has been detected occasionally at elevated levels, this monthly monitoring requirement has been maintained in this draft permit.

VII. Essential Fish Habitat Determination (EFH)

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 actions or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish

habitat, such 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 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.

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. The Concord River is not covered by the EFH designation for riverine systems and thus EPA has determined that EFH consultation with NMFS is not required.

VIII. Endangered Species Act (ESA)

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 NMFS typically administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, and plants to see if any such listed species might potentially be impacted by the reissuance of this NPDES permit and has not found any such listed species. EPA has determined that there are no species of concern present in the vicinity of the outfall from this Facility. Therefore, EPA does not need to formally consult with NMFS or USFWS in regard to the provisions of the ESA.

EPA has structured the proposed limits to be sufficiently stringent to assure that Water Quality Standards will be met. The effluent limits established in this permit ensure the protection of aquatic life and maintenance of the receiving water as an aquatic habitat. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to both NMFS and USFWS.

Other Conditions

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.

IX. State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State WQS. The staff of 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.

X. Public Comment Period, Public Hearing, 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, Massachusetts Office of Ecosystem Protection (CIP), 1 Congress Street, Suite 1100, 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 and MassDEP. 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 30 days following the notice of the final permit decision, any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of 40 CFR 124.74, 48 Fed. Reg. 14279-14280 (April 1, 1983).

XI. EPA and 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:

George Papadopoulos, Massachusetts Office of Ecosystem Protection
One Congress Street Suite 1100 - Mailcode CIP
Boston, MA 02114-2023
Telephone: (617) 918-1579 FAX: (617) 918-1505

Paul Hogan, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor, Worcester, Massachusetts 01608
Telephone: (508) 767-2796 FAX: (508) 791-4131

July 6, 2009
Date

Ken Moraff, Acting Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

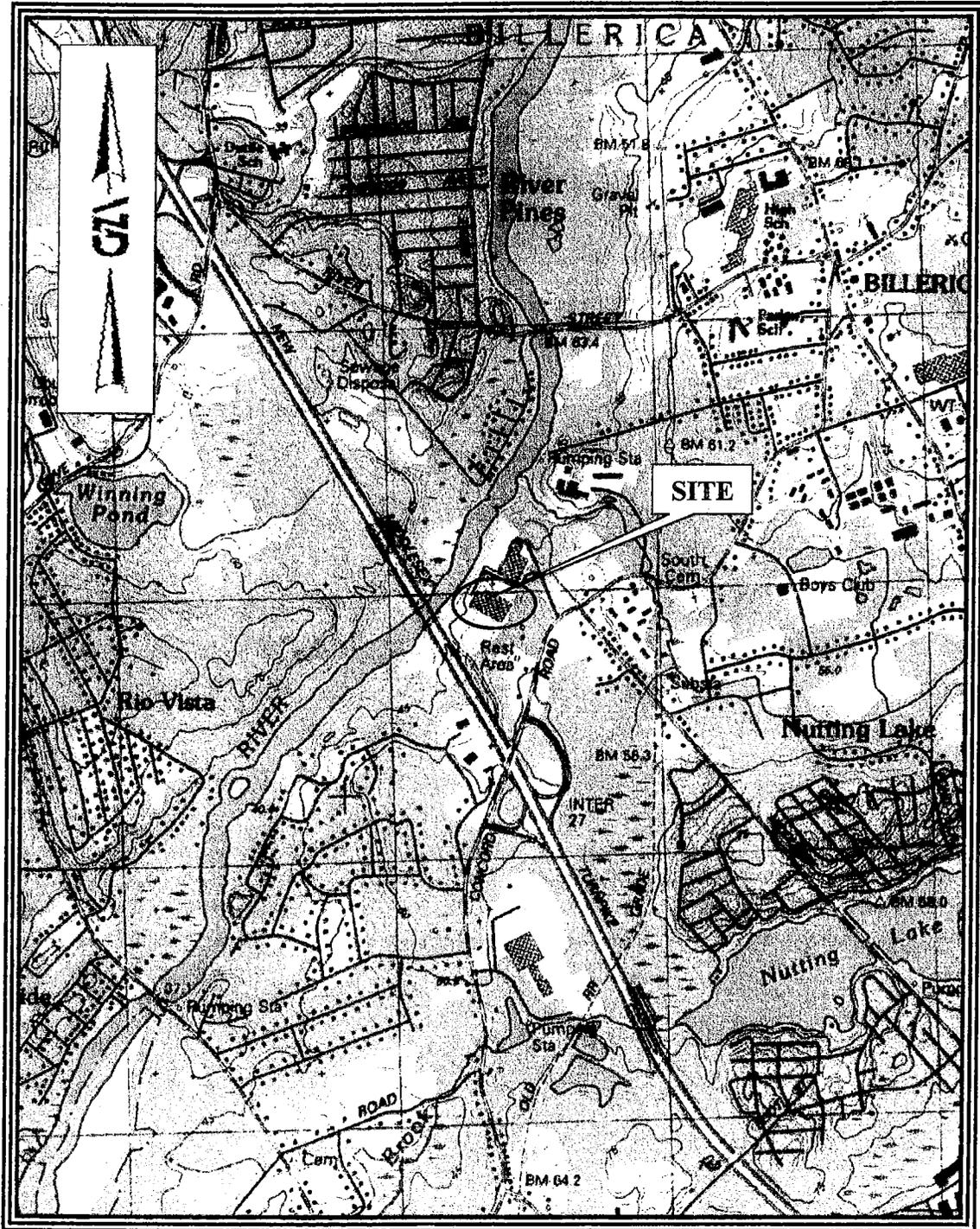
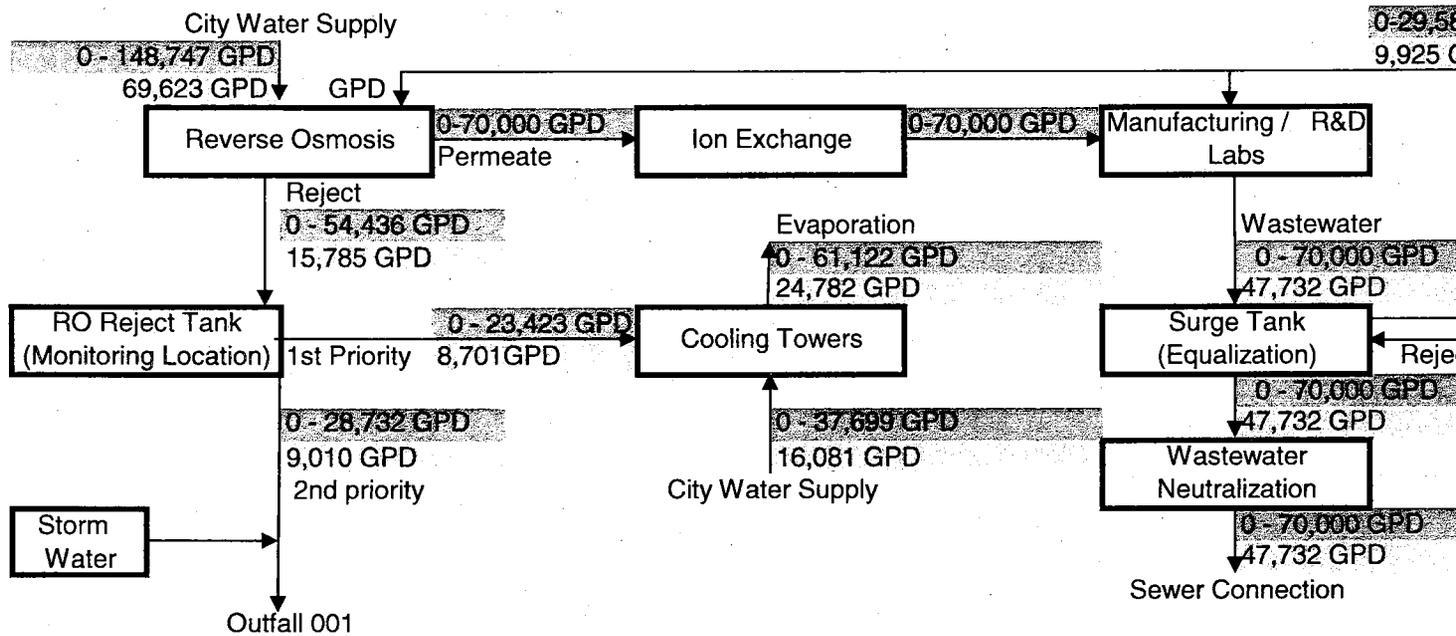


FIGURE 1
LOCUS PLAN



129 Concord Road: Billerica, Massachusetts
REF: Billerica, Massachusetts (1987) USGS Quad 1:25,000

FIGURE 2
Schematic of Water Flow
Entegris Inc.
Billerica, Middlesex County, MA



Note: Monitoring location is RO Reject Tank as previously approved by EPA/MassDEP
 12 month range
 Average annual