UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET
SUITE 1100
BOSTON, MASSACHUSETTS 02203
FACT SHEET

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

NPDES PERMIT NO.: MA0031955

PUBLIC NOTICE DATE:

NAME AND ADDRESS OF APPLICANT:

Brookfield Engineering Laboratories
11 Commerce Boulvard
Middleboro, Massachusetts 02346
ATTN: Charles R. Heshion
Environmental & Facilities Manager

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Brookfield Engineering Laboratories
369 Canton Street
Stoughton, Massachusetts 02072

RECEIVING WATERS: **Unnamed Tributary to Town Pond to Neponset River (Neponset River Watershed)**

CLASSIFICATION: **Class B**

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

The above named applicant has requested that the U.S. Environmental Protection Agency issue an NPDES permit to discharge into the designated receiving water. The facility operates two groundwater remediation systems. A treatment system was installed in May 1999 to treat a bedrock aquifer impacted by chlorinated volatile organic compounds (VOCs) at the former facility. In May 2002, a second treatment system was installed to treat an unconsolidated aquifer impacted by VOCs at the leading edge of the disposal area. See Figure 1 for site locations.

II. Description of Discharge

Effluent from the two outfalls eventually leads into the east branch of the Neponset River. The effluent from outfall 001 discharges into an unnamed tributary leading to Town Pond which leads to the Neponset River and the effluent from outfall 002 discharges into an unnamed tributary south of Canton Street via the existing Town of Stoughton storm sewer system on Canton Street. The wetland drains to Town Pond and Town Pond eventually merges with the east Branch of the Neponset River

III. Limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Derivation

Brookfield designed and manufactured viscometers and rheometers at 240 Cushing Street in Stoughton MA. from the early 1960's until the facility ceased operations as of January 1999. Current operations at the facility involve groundwater remediation activities related to solvent releases from the former manufacturing operations. Solvents were historically used on the site for degreasing activities to clean machined parts. The solvent 1,1,1- trichloroethane (TCA) was used from the early 1960s, when Brookfield began plating parts, until 1993. In 1993, the degreasing solvent was changed from TCA to trichloroethylene (TCE). Use of TCE continued at this location until Brookfield vacated the building at the end of 1998.

Chlorinated volatile organic solvents (VOC'S) were detected in the monitoring wells at the Brookfield facility during groundwater monitoring investigations conducted in May through October 1998. In response to a verbal communication with MA DEP regarding the groundwater analytical results, a Notice of Responsibility/Notice of Response Action (NOR/NORA) was issued to Brookfield Engineering in June 1998. See Draft Release Abatement Measure (RAM) Plan, Fuss and O'Neil, March 2000. The source of contamination is the disposal of spent TCA into a drywell located at the rear of the former Brookfield facility at 240 Cushing Street. Assessment activities, conducted to date, indicate that the subject disposal area appears to extend from the source area near the rear of the 240 Cushing Street property to the southwest toward the intersection of Canton Street and Gerry Circle. The disposal site includes portions of a mixed residential and commercial area.

The permittee currently has a separate NPDES permit exclusions for each outfall. Pursuant to 40 CFR 122.3(d), an NPDES permit exclusion was issued to the permittee so that the installation and operation of the groundwater treatment system could begin in a timely fashion. A requirement of an NPDES permit exclusion is that the permittee file a completed NPDES permit application to the US EPA requesting an individual permit A completed permit application was received from the permittee on November 14, 2002.

The MA DEP issued the permittee a TierIB permit in September 1999 for outfall 1 and a TierIB permit in October 2002 for outfall 2 under the Massachusetts Contingency Plan (MCP).

Treatment Systems

A bedrock groundwater remediation system began operation in August 1999 at 240 Cushing Street, Stougton, MA. Groundwater from bedrock is extracted from wells at a combined flow of 45 gallons per minute. The treatment system consists of a low profile air stripper before effluent is discharged to a storm drain leading to the receiving water. Equalization tanks and bag filters were installed before the air strippper and the carbon vessel to remove entrained particulate matter.

A second groundwater remediation system for the unconsolidated aquifer was installed at 369 Canton Street, Stoughton, MA in the spring of 2002. Groundwater is extracted from twenty-four (24) extraction wells (RW-01 through RW-24) at a maximum combined flow of 160 gallons per minute (gpm). Groundwater from each of the 24 recovery wells is conveyed to the treatment system via buried PVC pipes. The pipes are manifolded and connected to an air/water separator tank. Water from the air/water separator tank is pumped through iron/sediment removal filters and discharged to an equalization tank. Water from the equalization tank is then pumped to an air stripper for VOC removal. Treated groundwater from the air stripper sump goes to an existing storm drain leading to the receiving water.

General Requirements

Under Section 301(b)(1)(c) of the Clean Water Act (CWA), discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards, 314 CMR 4.00, include the requirements for the regulation and control of toxic constituents and also require that EPA criteria established pursuant to Section 304 (a) of the CWA shall be used unless site specific criteria are established. The State will limit or prohibit discharges of pollutants to surface water to assure that surface water quality standards of the receiving water are protected and maintained or attained.

Waterbody Classification and Usage

The receiving water at both discharge points are classified as Class B waterbodies by the Massachusetts Department of Environmental Protection (MA DEP). Class B waters are designated as habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. These waters shall have consistently good aesthetic value.

Where designated, Class B waters 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.

Flow

Data included in the NPDES permit application on the average flow contributed by outfall 001 is 45 gallons per minute and 100 gallons per minute for outfall 002. However, due to the variability of flows from groundwater pump and treat systems and the ability of the systems to treat variable flows without impacting the effluent quality, the draft permit will not contain a flow limit in the NPDES permit. There is a requirement that the flow for both outfalls shall not exceed the design requirements or bypass the treatment system.

pH

The draft permit includes proposed pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 CFR 133.102(c). Class B waters shall be in a range of 6.5 through 8.3 standard units and not more than 0.5 standard units outside of the background range. There shall be no change from background conditions that would impair any use assigned to this class.

TSS

The TSS, limits in the draft permit are based on water quality considerations and state certification requirements. These limits are designed to achieve the water quality standards for a Class B receiving water.

Non-conventional pollutants

Monthly analytical reports for influent and effluent wastewater and monitoring data submitted with the NPDES permit application for both treatment systems were reviewed for parameters of consistently high concentrations to determine limitations in the draft permit. The three volatile organic constituents (VOCs) of concern in the effluent are 1,1,1 Trichloroethane, 1,1-Dichloroethene, and Tetrachloroethene

There is currently no final EPA published water quality criteria for 1,1,1 Trichloroethane, although it is listed as a priority pollutant. EPA has therefore determined that an appropriate effluent limitation can be established from the State's cleanup standards. Since this site is being remediated under the MCP and the objective is treatment of groundwater, the limitation for 1,1,1 Trichloroethane in the draft

permit is based on the State's published standards for groundwater under the MCP, see 310 CMR 40.0974.

All groundwaters in the Commonwealth are assigned to one of three classes based upon the most sensitive uses for which the groundwater is to be maintained and protected. The discharge from this site is upgradient of the Town of Stoughton Public Drinking Water wells therefore the limits in the draft permit are based on Class 1 Groundwater Standards. It should be noted that the treatment technologies used at this site (air stripping and carbon) will routinely produce an effluent quality well below these standards.

Class 1 Groundwater Standards are fresh groundwaters found in the saturated zone of unconsolidated deposits or consolidated rock and bed rock and are designated as a source of potable water supply. Recent monitoring reports submitted by the permittee indicate that the treated effluent will meet the established limits. The Class 1 Groundwater Standards for 1,1,1 Trichloroethane is the Massachusetts Maximum Contaminant Level (MCL). MCL is defined in 310 CMR 22.00 as the maximum permissible level of a contaminant in water which is delivered to any uses of a public water system.

Parameter	MCP - Groundwater Standard	Draft Permit Limitation
1,1,1 Trichloroethane	200 ppb	200 ppb

The monthly average and maximum daily limitations for1,1-Dichloroethene and the monthly average limitation for Tetrachloroethene are water quality based effluent limitations. These limits are based on the available dilution in the receiving stream and the human health criteria in the National Recommended Water Quality Standards published in the Federal Register on December 10, 1998. See Attachment A of the fact sheet for the dilution factor.

Monthly average effluent limit for 1,1-Dichloroethene
Dilution Factor x Chronic Human Health Criteria
4.4 x 0.057 = 0.25

Maximum daily effluent limit for 1,1-Dichloroethene
Dilution Factor x Acute Human Health Criteria
4.4 x 3.2 = 14.08

Monthly average effluent limit for Tetrachloroethene
Dilution Factor x Chronic Human Health Criteria
4.4 x 0.8 = 3.52

The maximum daily effluent limitation in the draft permit for Tetrachloroethene is based on the MCP State Cleanup Standard (5.0 ug/L). Compared to the water quality based effluent limitation calculated at 39 ug/L, the MCP Cleanup Standard is more stringent, and therefore more protective of the environment.

Parameter	Human Health Criteria		Water Quality Based Limits		Effluent Limits in the Draft Permit	
	Water and Organism (Chronic), ug/l	Organism only (Acute), ug/l	Chronic, ug/l	Acute, ug/l	Chronic, ug/l	Acute, ug/l
1,1-Dichloroethene	0.057	3.2	0.25	14.08	0.3	14
Tetrachloroethene	0.8	8.85	3.52	38.94	4	5

Although historic monitoring data have indicated that these three parameters are the most prevalent in groundwater being treated, it is common to find other volatile organic compounds in groundwater at remediation sites. However, due to similar chemical characteristics and treatment removal efficiencies of Air Stripping and Carbon treatment systems each VOC compound does not require individual limitations. EPA has extensive experience with these treatment systems and the collected data demonstrate that it is appropriate to establish effluent limits for a selected group of significant site specific parameters. Other VOC compounds at lower concentrations will be removed as well by the treatment system.

Best Management Practices Plan

Pursuant to 40 CFR 122.44(k)(4), Best Management Practices (BMP) may be expressly incorporated into a permit where reasonably necessary to achieve effluent limitations and standards or to carry out the purpose and intent of the CWA. These circumstances apply to the groundwater remediation. There are no EPA Effluent Guidelines for the cleanup of contaminated groundwater.

In essence, the BMP requirements direct the permittee to mitigate potential impacts to the receiving water. The objective of BMP is to protect the local waterway by minimizing the potential of pollutants being discharged, through human error, or through equipment malfunction. In issuing such a condition to Brookfield Laboratories, consideration of the potential for the adverse impact on the Towns drinking water wells, water quality and aquatic wildlife were the dominant factors.

The BMP's become an enforceable element of the permit one month after the effective date of the permit. The BMP's, therefore, become supporting elements to the numerical effluent limitations by minimizing the discharge of any pollutants through the proper operation of the treatment system. BMP's are considered to be equally enforceable as the numerical limits in the permit.

V. State Certification Requirements

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

VI. Public Comment Period, Public Hearing, and Procedures for Final Decision

All person, including applicants, who believe any condition of the 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, 1 Congress Street, Suite 1100 (CMA), Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the permit to EPA. 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 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 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 C.F.R. §124.74, 48 Fed. Reg. 14279-14280 (April 1, 1983).

VII. EPA Contact

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

Betsy Davis
US Environmental Protection Agency
1 Congress Street
Suite 1100 (CPE)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1576

DATED copy on file

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

Attachment A: Dilution Factor Calculations

Attachment A

Brookfield Engineering Laboratories, Inc.

MA0031955

Low Flow Dilution Calculation (7Q10)

Estimated 7Q10 Calculation for outfall 001

The low flow for Old Swamp River gaging station, in Weymouth , Massachusetts, was computed using daily stream flow for the period 1962 to 2001.

Drainage area for Old Swamp River at the gaging station is 4.50 square miles and the low flow is 0.17 cfs.

Drainage area at the point of discharge for the bedrock groundwater remediation system is estimated to be 9.0 square miles.

$$7Q10_{@\ Brookfield} = \frac{7Q10_{@\ old\ swamp\ river\ gage}}{\text{Drainage area of Old Swamp River at the gaging station}} \times \text{Estimated drainage area at Brookfield Engineering}$$

$$7Q10_{@\ Brookfield} = \frac{0.17\ cfs}{4.50\ sq\ mi} \times 9.0\ sq\ mi$$

$7Q10_{@Brookfield} = 0.34$ cfs

Treatment system design slow = 45 gpm = 64800 gpd = 0.0648 MGD

0.0648 mgd x 1.547 cfs = 0.100

Dilution Factor

($7Q10_{@Brookfield}$ + Design Flow)/Design Flow = $Dilution\ Factor_{@\ Brookfield}$

(0.34 cfs + 0.1 cfs)/0.1 cfs = 4.4

Dilution Factor $_{@Brookfield}$ = 4.4