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September 4, 2015

Ms. Erika Durr
Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
1200 Pennsylvania Avenue, N.W.
Mail Code 1103M
Washington, D.C. 20460-0001

Re: **Invensys Systems Inc. – NPDES Appeal 15-10**
Petition for Review of NPDES Permit No. MA0004120

Dear Ms. Durr:

Enclosed please find for filing Invensys System Inc.'s Petition for Review of NPDES Permit No. MA0004120 and related exhibits. The Environmental Protection Agency Region 1 issued this permit on July 17, 2015. The Environmental Appeals Board granted Invensys' Motion for Extension of Time to File Petition for Review on August 6, 2015, and ordered the Petition for Review be filed on or before September 4, 2015 (*See* Docket Entry #5). Therefore, this Petition for Review is timely filed.

The Petition for Review has been prepared in compliance with the formatting and length requirements contained in the Environmental Appeals Board's Practice Manual.

Please do not hesitate to contact me with any questions.

Sincerely,

Jesse Harlan Alderman

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)	
Invensys Systems, Inc.	)	NPDES Appeal No. 15-10
NPDES Permit No. MA0004120	)	

PETITION FOR REVIEW OF THE INVENSYS SYSTEMS NPDES PERMIT ISSUED BY EPA REGION 1

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September 4, 2015

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INTRODUCTION

Petitioner Invensys Systems, Inc. ("Invensys")[1] through its undersigned counsel respectfully submits this petition for review of the issuance of National Pollution Discharge Elimination System ("NPDES") Permit No. MA0004120 (the "Permit" attached as Exhibit 1) on July 17, 2015 by the U.S. Environmental Protection Agency ("EPA"), Region 1 (the "Region"). The Permit is fatally flawed and must be remanded to EPA. The flaws include reliance on numerous factual determinations that are clearly erroneous, including several that have literally no support in the Region's administrative record for the Permit. The flaws also include changes of position that are unjustified and contrary to law and the taking of positions that are inconsistent with positions that EPA has taken elsewhere. Finally, the Region relied on EPA's new rule defining waters of the United States without actually applying the rule to the relevant facts in the record.

The Permit covers two different outfalls, known as Outfall 001 and Outfall 002. Among the Region's errors are jurisdictional problems with respect to the alleged receiving water for each outfall that go to the very foundation of the Permit, thus requiring remand in its entirety. These flaws include the following: First, Outfall 002 has not discharged industrial process wastewater for more than a half-century. Instead, it discharges stormwater and groundwater to a highly intermittent man-made ditch that is very often dry and is not identified on any relevant federal or state hydrography maps at the point of discharge. Now, for the first time in the Facility's long permitting history, the Region purports to assert Clean Water Act jurisdiction based on a solitary observation of aquatic organisms in what is known as Robinson Brook some

[1] Invensys was purchased by Schneider Electric after comments on the draft permit were filed and now operates under that name. For convenience, given the many documents in the record referring to Invensys, we will continue to refer to Invensys throughout.

450 yards downstream from the Outfall 002 discharge, without attempting to meet its burden of recording physical indicators of a flow and volume at the point of discharge as is required by 33 C.F.R. § 328.3. Second, with respect to Outfall 001, the Region – for the first time in the 41-year history of the Petitioner's permit – identified in the Permit a different receiving water, Gudgeon Brook, without meeting its burden of demonstrating that Gudgeon Brook is a "water of the United States" and without a reasoned explanation for concluding that the receiving water is no longer, as it has been for the entire life of the Permit, the Neponset Reservoir. Both of these jurisdictional determinations were clearly erroneous and require remand of the entire Permit.

The Region bases its jurisdiction claims over Gudgeon Brook and Robinson Brook on EPA's newly promulgated "Clean Water Rule: Definition of 'Waters of the United States,'" 80 Fed. Reg. 37053, 37053-37127 (June 29, 2015); *see* 33 C.F.R. § 328.3 (effective August 28, 2015) ("Clean Water Rule"). However, the record does not support the Region's conclusion that either Gudgeon Brook or Robinson Brook is a water of the United States at the point of discharge. In addition, the Region relied on flawed methodology and on facts or conclusions unsupported by any evidentiary foundation in setting numeric water-quality-based effluent limitations in the Permit. These and other key findings of fact or conclusions of law are clearly erroneous, lack rational evidentiary support, involve an abuse of discretion or implicate important policy considerations that warrant review by the Environmental Appeals Board ("EAB"). 40 C.F.R. § 124.19(a)(4)(A) & (B). Finally, many of the Region's responses to comments fail to meaningfully acknowledge or address important issues raised by Invensys related to disputed conditions, as required by 40 C.F.R. § 124(17)(a)(2). Thus, Invensys respectfully requests that the EAB grant review of this petition.

Specifically, Invensys contests and challenges the following conclusions, conditions, and limitations of the Permit:

1. The assertion of Clean Water Act jurisdiction over Gudgeon Brook and Robinson Brook at the point of discharge for Outfalls 001 and 002, respectively, as "tributaries" under the Clean Water Rule (Section II);

2. The designation of "Gudgeon Brook/Neponset Reservoir" as a receiving water of Outfall 001 without a reasonable explanation for its change from prior precedent of denominating the receiving water as "Neponset Reservoir" (Section III);

3. The establishment of numeric effluent limits that are dependent on alternate analyses of different "receiving waters" to suit different purposes, such as the Region's use of "Gudgeon Brook" to conclude that effluent limits should not be calculated with a dilution allowance, but the use of "Neponset Reservoir" for analysis of the Outfall 001 discharge's alleged effects on water-quality-dependent uses (e.g., fishing, recreation, habitat) (Section IV);

4. The decision to impose numerical water quality criteria rather than Best Management Practices ("BMPs") based on the facts of Invensys's discharges and the Region's use of BMPs in similarly situated permits (Section V);

5. The application of a "worst case" hardness factor of 50 mg/l for calculation of the numeric effluent limitations for metals without justification in the record (Section VI);

6. The imposition of weekly monitoring requirements for the Outfall 002 discharge point where the data in the record demonstrate that the point of discharge has little to no observable flow for multiple consecutive weeks, thus rendering such frequent monitoring impossible (Section VII);

7. The imposition of a similar frequency of monitoring in Gudgeon Brook at the Outfall 001 discharge is unjustified for the opposite reason, i.e., there is so much existing data for the Outfall 001 discharge that EPA's argument that variability in the discharge requires frequent monitoring is clearly erroneous (Section VII); and

8. The failure to include a compliance schedule in the Permit where Invensys demonstrated the substantial time and expense that installation of the necessary treatment systems would require and raised substantial question whether it is even feasible to implement a treatment system to attain the numerical effluent limits. (Section VIII).

THRESHOLD PROCEDURAL REQUIREMENTS

For the following reasons, Invensys satisfies the threshold requirements for filing a petition for review under 40 C.F.R. Part 124:

1. Invensys has standing to petition for review of the Permit because it timely submitted extensive comments on the draft Permit in 2011. A copy of Invensys' Comments ("Comments"), the draft Permit Fact Sheet ("Fact Sheet"), and EPA's Response to Comments ("Response") are attached as Exhibits 2, 3, and 4 respectively; and

2. All issues discussed in this petition either (a) were raised with specificity during the public comment period, to the extent reasonably ascertainable at the time, or (b) concern changes from the draft Permit to the final Permit decision. 40 C.F.R. § 124.19(a); *see also In re RockGen Energy Ctr.*, 8 E.A.D. 536, 540 (EAB Aug. 25, 1999).

FACTUAL AND STATUTORY BACKGROUND

Prior to the issuance of the Permit, Invensys' facility on Neponset Avenue (the "Facility") in the Town of Foxborough operated under an NPDES discharge permit issued in

1991 (the "1991 Permit").[2] 1991 Permit (Sept. 30, 1991), Exhibit 5. Invensys submitted a timely renewal application on October 31, 1996. The Region publicly noticed a draft Permit reissuance on March 3, 2003. Invensys timely submitted comments on April 4, 2003. Fact Sheet, Exhibit 3, at p. 1. A final permit was not issued. *Id.* On August 3, 2011, the Region noticed a revised draft Permit. Invensys again submitted comments, on October 31, 2011. *See generally*, Comments, Exhibit 2, Fact Sheet, Exhibit 3. The Region filed a Response to Comments this year, and issued the final Permit on July 17, 2015. *See generally*, Permit, Exhibit 1; Response, Exhibit 4.

Changes of Designation of the Outfall 001 Receiving Waters

The 1991 Permit (and all prior permits) authorized a discharge to a single receiving water denominated the "Neponset Reservoir" from the Facility's Outfall 001. 1991 Permit, Exhibit 5, p. 1/7. Outfall 001 has been the subject of an NPDES permit since 1974. While the volume, character and toxicity of its discharge have changed markedly since 1974 (the outfall now discharges only stormwater and groundwater), the location has not: Outfall 001 has discharged to the same location throughout the entire period. Comments, Exhibit 2, pp. 4-5, 22-23.

In all prior permits between 1974 and 1991, Outfall 001 is described as discharging to "***the receiving waters named Neponset Reservoir***." 1991 Permit, Exhibit 5, p. 1/7 (emphasis supplied). *See* 1987 Permit (Nov. 16, 1987), Exhibit 6, p. 1/7; 1984 Permit (June 29, 1984), Exhibit 7, p. 1/7; 1974 Permit, Exhibit 8, p. 1/1 (Oct. 8, 1974). None of the four prior permits, or accompanying fact sheets, made a single reference to "Gudgeon Brook." In the Fact Sheet, written in 2011, the Region stated: "The current permit for the Neponset Facility, issued in 1991,

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[2] The Region has not included the 1991 Permit and 1991 Permit Fact Sheet in the draft uncertified Administrative Record. Invensys assumes that this was an oversight. In any case, as these documents are properly part of the Record, Invensys includes both as exhibits hereto at Exhibit 5 and Exhibit 13 respectively.

authorizes the discharge of noncontact cooling water (since eliminated) and storm water ***to the Neponset Reservoir***." Fact Sheet, Exhibit 3, p. 3 (emphasis supplied).

In the text of the draft and final Permit, however, EPA identified the receiving water of the Outfall 001 discharge as "Gudgeon Brook/Neponset Reservoir." Permit, Exhibit 1, p. 1, Fact Sheet Exhibit 3, p. 1. Gudgeon Brook is an approximately 200-foot-long man-made channel with a flow that is highly variable and directly proportional with precipitation events. *Id.* According to the Massachusetts Geographical Information System ("MassGIS"), Gudgeon Brook is intermittent in its nature.[3] Given its limited reach, variable water levels and intermittent nature, Gudgeon Brook is not suitable habitat for fish, and therefore does not support many of the species used to develop federal numerical water quality criteria. *Id.* In addition, the Region has not conducted any analysis of the relevant biotic community that may actually be present in Gudgeon Brook. Comments, Exhibit 2, pp. 31-32; Response, Exhibit 4, pp. 36-40. Nor has it identified any water-quality-dependent uses. *Id.*

Operational Upgrades and Elimination of Discharges at the Facility to Outfall 001

From an operational standpoint, the Outfall 001 discharge, and the Facility in general, are largely unrecognizable from the time Invensys filed its application for what became the 1991 Permit. First, Invensys has long since eliminated ***all*** discharges of industrial wastewater and non-contact cooling water at Outfall 001.[4] While prior permits had allowed industrial discharges at Outfall 001, Invensys, beginning in 1988, constructed significant operational upgrades to reduce the discharge of pollutants into the Neponset Reservoir. Chief among these was the

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[3] *See* Comments, Exhibit 2, pp. 22-23, *citing* MassGIS, MassDEP Hydrography Layer (1:25,000), available at http://www.mass.gov/mgis/hd.htm (last visited August 23, 2015).

[4] Outfall 002 has not discharged industrial wastewater or non-contact cooling at any time since the 1940s or 1950s. *See* Fact Sheet, Exhibit 3, p. 3. Moreover, as noted below, Outfall 002 discharges to the Narragansett Bay drainage system, rather than to Boston Harbor. *Id.*; *See* Comments, Exhibit 2, pp. 33-34.

diversion of industrial process wastewater and sanitary wastewater to the Town of Mansfield municipal treatment works. Comments, Exhibit 2, 4-5; Fact Sheet, Exhibit 3, pp. 3-4. In addition, in 1994, Invensys installed a closed-loop cooling system, which both significantly reduced its water usage and eliminated the discharge of non-contact cooling water to the Neponset Reservoir. *Id.* As a result, there are currently no industrial process discharges through Outfall 001. Rather, the outfall functions only as a discharge point for storm water, groundwater infiltration, and sump pumps dewatering the basements of the Facility. *Id.*

Second, the stormwater discharged from the Facility is not exposed to any industrial activities due to Invensys' adoption of BMPs. Comments, Exhibit 2, 4-5; Fact Sheet, Exhibit 3, p. 3-5. Chemical usage has been minimized and all raw materials used at the Facility are stored indoors. *Id.* Storage of bulk containers for scrap metals occurs in an outdoor roofed secondary containment outfitted with sump pumps. Fact Sheet, Exhibit 3, p. 5. Hazardous wastes are stored in containers in designated indoor areas. *Id.* Third, in 1995, as part of efforts by Invensys to address conditions in the Neponset Reservoir under Mass. Gen. Laws c. 21E (the Commonwealth's "Superfund" law) and the Massachusetts Contingency Plan, 310 CMR 40.0000 (the "MCP"), Invensys installed a dry weather flow treatment system to remove VOCs from groundwater collected by the Facility's storm drain system prior to discharge to Outfall 001. Similarly, in 1997, Invensys completed an extensive cleanout of the Outfall 001 drain line system to remove accumulations of sediments and waste materials that had built up during the period when the Facility had been discharging industrial wastewater. Comments, Exhibit 2, p. 5; Fact Sheet, Exhibit 3, pp. 3-4. Invensys removed loose sediment from the drain lines through high pressure evacuation to an adjacent manhole. Fact Sheet, Exhibit 3, p. 4. Drain segments were inspected by closed-circuit television monitors. *Id.* Invensys abandoned the use of any drain segments that could not be fully cleaned by filling the lines with concrete and/or blocking them off with brick and masonry seals. *Id.* Over time, the drain line cleanout resulted in a substantial reduction in the concentration of metals in the discharge (e.g., 92% reduction for cadmium and 91% for chromium). *Id.*; Comments, Exhibit 2, p. 5 & Attachment 1.

Summary of MCP Comprehensive Site Assessment Data Demonstrating a Healthy Ecosystem in Neponset Reservoir

Since 1995, Invensys has been engaged in the comprehensive site assessment process under Chapter 21E and the MCP related to the Neponset Reservoir. Comments, Exhibit 2, pp. 5-6; Fact Sheet, Exhibit 3, pp. 3-4. Under the supervision of the Massachusetts Department of Environmental Protection ("MassDEP"), Invensys has undertaken substantial remedial efforts at the Facility pursuant to a Release Abatement Measure ("RAM") Plan and gathered extensive data on environmental conditions in the Neponset Reservoir in a Phase II Environmental Site Assessment ("Phase II"). Comments, Exhibit 2, pp. 5-7. Invensys, in its comments on the draft permit, provided the Phase II to the Region and requested that it be included in the Administrative Record and its findings be considered in setting the Outfall 001 effluent limitations. Comments, Exhibit 2, p. 1 & n.1. The Region did not accept this request, and has not included the Phase II in the record.[5] Nevertheless, because the focus of the Neponset Reservoir Phase II was the same as the purpose behind the NPDES permit – to ensure the ecological health of the Neponset Reservoir – it is important to summarize the findings and

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[5] If the Region reviewed the Phase II, its failure to consider the findings and explain the necessity of such stringent effluent limitations would be arbitrary and contrary to the evidence in the record. It appears that the Region is simply waving a magic wand to make evidence that does not support its position that this Permit is necessary to save the environment disappear. The failure of the Region to include the Phase II in the Administrative Record is improper. *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402 (1971) ("[R]eview is to be based on the full administrative record that was before the [agency] at the time [it] made [its] decision.").

conclusions of the Phase II because they stand in stark contrast to the unsupported stringency of Outfall 001 numeric effluent limitations.

The extensive data that Invensys gathered pursuant to the MCP process – a process in which EPA participated – regarding the environmental conditions in the Neponset Reservoir demonstrate that the levels of constituents do not pose a significant risk to human health or the environment. Comments, Exhibit 2, p. 5. The data analyzed in the Phase II conducted as part of the MCP process supported the following conclusions:

- There is no Significant Risk of harm to Human Health in the Reservoir
- Based on an MCP Method 3 Human Health Risk Characterization, exposure to Contaminants of Concern ("COCs") present in sediment, surface water, fish tissue, and groundwater at the Reservoir does not pose a significant risk of harm to human health;
- The Reservoir reflects an active, diverse and abundant ecological setting;
- Reservoir conditions do not result in any Critical Exposure Pathways; do not pose an Imminent Hazard; do not pose a Substantial Hazard to Human Health; do not present a Significant Risk of Harm to Human Health, Safety or Public Welfare; and do not pose a Substantial Hazard to the Environment as those terms are defined under the MCP;
- There is no evidence of stressed biota, including without limitation fish and wildlife kills or abiotic conditions; and
- There is no evidence of significant biological harm to invertebrates, plankton, fish, birds or other wildlife. While some individual measures of effect evaluated in the Phase II showed slight impairment, the effects were small and not correlated to constituent concentrations in surface water;
- A risk characterization based on a "weight of the evidence approach" and 23 lines of evidence, concluded that there is no evidence of significant risk of harm to the environment in the Neponset Reservoir.[6]

Id. at pp. 5-6.

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[6] Based on these findings, MassDEP accepted a Response Action Outcome statement from Invensys on January 25, 2013, under which Invensys continues to monitor and assess site conditions.

In short, this site-specific NPDES permit would apply to a facility that has neither a process water discharge nor a non-contact cooling water discharge. Best management practices, drain line cleaning and other structural improvements have resulted in a significant decrease in contaminant concentrations in the discharge from Outfall 001. Moreover, Invensys has demonstrated, through its comprehensive assessment of conditions in the Neponset Reservoir, that the *de minimis* levels of contamination being discharged are not adversely impacting the ecological conditions in the Reservoir. *Id.* at pp. 5-6.

New Regulation of Outfall 002 Discharge

The Permit is the first NPDES permit for the Facility to regulate a second outfall, Outfall 002, for stormwater and groundwater to Robinson Brook. Permit, Exhibit 1, p. 1; Fact Sheet Exhibit 3, p. 1. Outfall 002 previously was covered by a stormwater multisector general permit ("MSGP"). Comments, Exhibit 2, p. 36. Outfall 002 is at a different area of the Facility than Outfall 001. Unlike Outfall 001, Outfall 002 does not drain to the Neponset Reservoir. Outfall 002 is part of the Narragansett Bay drainage basin; Outfall 001 drains to Boston Harbor. Unlike Outfall 001, Outfall 002 has not discharged industrial process water in more than fifty years, and has had significantly less exposure to any industrial processes. Comments, Exhibit 2, pp. 4, 36-37; Fact Sheet, Exhibit 3, p. 4. Outfall 002 discharges to a man-made ditch, which often has negligible or no flow. Comments, Exhibit 2, pp. 4, 33-34. At Outfall 002, no federal or MassGIS topographical or hydrographic maps reflect the presence of "Robinson Brook".[7] Only beginning at Mechanic Street, approximately 450 yards (1,350 feet) from the outfall – and after intermingling with municipal stormwater discharges – is a water body identified as "Robinson

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[7] USGS Topographical Map (Mansfield Quadrangle), *available at* http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/imquad.html (last visited August 23, 2015).

Brook" shown by MassGIS (and, even here, Robinson Brook" is shown by MassGIS as an intermittent stream). The total watershed of "Robinson Brook" is 0.18 of a square mile, none of which is on Invensys property.[8] *Id.* at Attachment 13. Due to its low flow and variable nature, the receiving water for Outfall 002, up to the point below Mechanic Street where MassGIS first identifies the existence of "Robinson Brook", has no potential for recreational, industrial or agricultural uses. *Id.*

Invensys monitored Outfall 002 from August 2001 to March 2002, making frequent notation of the character and contents of the ditch below the point source. *Id.* at p. 33 & Attachment 14. Here, at the point of discharge, Invensys observed little or no flow, including in several periods of four or more consecutive days with no-flow.[9] *Id.* In one stretch, from August-September 2001, the ditch below Outfall 002 was observed to be dry or with no observable flow for 33 consecutive days. *Id.* at p. 34 & Attachment 14. Similar sequential dry "periods" were observed in September-October 2001 (21 consecutive days); October 2001 (14 consecutive days); November 2001 (13 consecutive days); November-December 2001 (11 consecutive days); and February 2002 (20 consecutive days). *Id.* Given its highly intermittent nature, the ditch below Outfall 002 is not suitable habitat for fish, and therefore does not support many of the species used to develop the federal numerical water quality criteria. *Id.*

ARGUMENT

Despite Invensys' elimination of sources of wastewater discharges, substantial technological upgrades at the Facility, and the continued environmental and ecological health of

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[8] Comments, Exhibit 2, p. 33, *citing* Comments, Exhibit 2, pp. 22-23, *citing* MassGIS, MassDEP Hydrography Layer (1:25,000), available at http://www.mass.gov/mgis/hd.htm (last visited August 23, 2015).

[9] Although not part of the record, Invensys' consultants have observed that as of July and August, 2015, the portion of Robinson Brook below Outfall 002 has similarly experienced numerous consecutive dry days.

the Neponset Reservoir, the Region has imposed stringent numeric effluent limitations in the Permit on Outfall 001 even though the prior permit did not contain numerical effluent limitations. EPA also imposed nearly identical numeric limits on Outfall 002, despite the markedly different industrial history of the outfalls and hydrologic character of these points of discharge. *Compare* Permit, Exhibit 1, 1991 Permit, Exhibit 5. The Region has imposed such limits, instead of relying on BMPs, without any adequate response to Invensys's comments that use of numeric criteria is inappropriate for these largely stormwater-related discharges and that their use is inconsistent with the Region's reliance on BMPs in other recent NPDES permits. Overall, to impose such stringent numeric limits, the Region had to make determinations that were clearly erroneous, arbitrary and not rationally supported by the evidentiary record. Lastly, the Region also imposed such limits on a new outfall (002) without a case-specific analysis of the connectivity, flow or volume at the outfall's point of discharge to downstream segments, and without any evidence in the record that the existing MSGP for the Invensys discharge at Outfall 002 is not sufficiently protective of the receiving water. Response, Exhibit 4, pp. 42-47.

I. Standard of Review

A petition for review will be granted by the EAB where the NPDES permit decision was based on a clearly erroneous finding of fact or conclusion of law or if the decision involves an important matter of policy or exercise of discretion that warrants review. 40 C.F.R. § 124.19(a). The EAB is the final decision maker for EPA. Its "determination is based on independent review and analysis of the issue." *In re Mobil Oil Corp.* 5 E.A.D. 490, 508, 509 n.30 (EAB Sept. 29, 1994). Although the EAB may defer to a regional office on technical issues, it will do so only if the "approach ultimately selected by the Region is rational in light of all of the information in the record," *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 568 (EAB 1998), and will not defer "[w]here the agency has failed to exercise its expertise." *Tex Tin Corp. v. EPA*, 935 F.2d 1321, 1324 (D.C. Cir. 1991).

II. The Region has not established that the receiving waters for either Outfall 001 or Outfall 002 are "waters of the United States" at the point of discharge, such that Clean Water Act jurisdiction is permissible

The Clean Water Act prohibits any discharge of pollutants into "navigable waters" without a permit. 33 U.S.C. §§ 1311(a), 1362(12)(a). "Navigable waters" is defined by the Act as "waters of the United States . . . ." *Id.* at § 1362(7). The Supreme Court has grappled with how to interpret the term "waters of the United States," most recently proffering different definitions in separate plurality opinions in *Rapanos v. United States*, 547 U.S. 715 (2006). In response, EPA adopted the Clean Water Rule on June 29, 2015. 80 Fed. Reg. 37053, 37053-37127 (June 29, 2015); *see* 33 C.F.R. § 328.3 (effective August 28, 2015).[10] The Clean Water Rule defines "waters of the United States" to include, among other things, "tributaries." 33 C.F.R. §§ 328.3(a)(1)-(5). "Tributary" is defined as:

> a water that contributes flow, either directly or through another water [to a water of the United States] ***that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark.***

Id. at § 328.3(c)(3) (emphasis supplied).

The EPA's comments on the Clean Water Rule further explain the fundamental characteristics of tributaries:

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[10] There have already been multiple court decisions in cases challenging the validity of the Rule. Two federal district courts have ruled that such challenges may only be brought in a court of appeals. One district court found that it had jurisdiction and preliminary enjoined enforcement of the Rule. *Georgia v. McCarthy,* 2015 U.S. Dist. LEXIS 114040 (S.D. Ga. 2015); *North Dakota v. EPA*, 2015 U.S. Dist. LEXIS 113831 (D. N.D. Aug. 27, 2015); *Murray Energy Corp. v. EPA*, 2015 U.S. Dist. LEXIS 112944 (D. W.Va. Aug. 26, 2015). The EPA has stated that the Rule will not be in effect in the 13 states subject to the court order invalidating the rule. Massachusetts is not one of those states, and the Rule is effective in Region 1. *See* EPA, Clean Water Rule Litigation Statement, *available at* http://www2.epa.gov/cleanwaterrule/clean-water-rule-litigation-statement.

> tributaries as defined by the rule are headwater streams that play an important role in the transport of water, sediments, organic matter, nutrients, and organisms to downstream waters. The physical indicators of bed and banks and ordinary high water mark demonstrate that there is sufficient volume, frequency, and flow in such tributaries to a traditional navigable water, interstate water, or the territorial seas to establish a significant nexus.

80 Fed. Reg. 37053, 37068.

EPA may determine "on a case-specific basis" that certain bodies of water demonstrate a "significant nexus" to waters of the United States. 33 C.F.R. § 328.3(a)(8). As a predicate, EPA must establish that such waters are "located within the 100-year floodplain" of certain jurisdictional waters or "within 4,000 feet of the high tide line or ordinary high water mark" of a larger group of jurisdictional waters. *Id.* at §§ 328(a)(1)-(5). The term "significant nexus" is further defined to mean "that a water, including wetlands, either alone or in combination with other similarly situated waters in the region, significantly affects the chemical, physical, or biological integrity of "[waters used in interstate commerce, interstate waters, or territorial seas]." *Id.* at 328.3(c)(5). "For an effect to be significant, it must be more than speculative or insubstantial." *Id.* The functions of a water body that are relevant to the "significant nexus" evaluation are:

> (i) Sediment trapping, (ii) Nutrient recycling, (iii) Pollutant trapping, transformation, filtering, and transport, (iv) Retention and attenuation of flood waters, (v) Runoff storage, (vi) Contribution of flow, (vii) Export of organic matter, (viii) Export of food resources, and (ix) Provision of life cycle dependent aquatic habitat (such as foraging, feeding, nesting, breeding, spawning, or use as a nursery area) for species located in [waters of the United States].

Id.

For Outfall 001, the Region now seeks to regulate a different body of water, Gudgeon Brook, a purported "tributary" of the Neponset Reservoir. For Outfall 002, the Region seeks to regulate Robinson Brook, which is in a different watershed than Outfall 001 and would be subject to a NPDES permit for the first time. Permit, Exhibit 1, p. 1. Both assertions of jurisdiction are in error.

A. Gudgeon Brook

Because the Region has newly identified the receiving waters of Outfall 001 as "Gudgeon Brook/Neponset Reservoir" in this Permit, it bears the burden of providing an evidentiary basis in the record that Gudgeon Brook qualifies as jurisdictional under 33 C.F.R. § 328.3. *Rapanos,* 547 U.S. 715, 745 (2006); *Bricks, Inc. v. EPA*, 426 F.3d 918, 923 (7th Cir. 2005); *Hoffman Homes, Inc. v. EPA*, 999 F.2d 256, 259 (7th Cir. 1993). The Region has not met its burden.

The Region stated that "Gudgeon Brook is a tributary of the Neponset Reservoir" and that "[t]he Brook flows into the Neponset Reservoir." Fact Sheet, Exhibit 3, p. 2. The Region cited no record evidence or analysis in its Response to comments to justifying its conclusion that Gudgeon Brook meets the Clean Water Rule's definition of tributary.[11] 33 C.F.R. § 328.3(c)(3). The Region did not provide any field observations of Gudgeon Brook to demonstrate either the requisite physical indicators of a "tributary" under 33 C.F.R. § 328.3(c)(3), or data establishing a significant nexus to a jurisdictional water body. *See* 80 Fed. Reg. at 37068.

Moreover, the Region provided no analysis to demonstrate the hydrologic and ecologic connectivity between Gudgeon Brook and the Neponset Reservoir to establish a significant nexus. *See* 33 C.F.R. §§ 328.3(a)(8); 328.3(c)(5). The Region provided no evidence related to any of the functions that must be assessed, such as sediment trapping, flow, or provision of life cycle dependent aquatic habitat. *Id.* It may not argue now that there is a significant nexus. Second, the Region has not provided an explanation, required by the Clean Water Rule, why

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[11] The Region also did not provide reference to any figure that shows Gudgeon Brook is a tributary. *See In re: Scituate Wastewater Treatment Plant*, 12 E.A.D. 708, 724 (EAB April 19, 2006). The Region acknowledged that "Gudgeon Brook is not an identified segment in the MassDEP list of integrated waters." Fact Sheet, Exhibit 3, p. 2.

Gudgeon Brook, is not a "ditch," which would be excluded from jurisdiction. The Clean Water Rule expressly exempts "[d]itches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands." 33 C.F.R. § 328(b)(3)(ii). Gudgeon Brook is a man-made and intermittent ditch. Comments, Exhibit 2, p. 22-23, Fact Sheet, p. 2. The record is bare of any evidence pertinent to a determination whether Gudgeon Brook is a water of the United States, other than it is man-made and intermittent. The Region was required to demonstrate with record evidence that Gudgeon Brook is not excluded from the definition of waters of the United States under 33 C.F.R. § 328(b)(3), but has not done so.

In its Comments, Invensys provided reference to empirical field observations that "Gudgeon Brook is an approximately 200 foot long man-made channel with a flow that is highly variable and directly proportional with precipitation events and, according to [MassGIS], is intermittent in nature." Comments, Exhibit 2, pp. 22-23. Given this description – and in the absence of any other showing by the Region of the requisite indicia of a tributary – the Region has not carried its burden to demonstrate that Gudgeon Brook meets the Clean Water Rule's definition. 33 C.F.R. §§ 328(b)(3), 328.3(c)(3). *Precon Dev. Corp. v. United States Army Corp. of Eng'rs*, 633 F.3d 278, 293-995 (4th Cir. 2011) (agency's narrative observation of flow in ditch insufficient to carry its burden of demonstrating ditch was a water of the United States); In re: ConocoPhillips, 13 E.A.D. 768, 793 (EAB, June 2, 2008) (remanding where no discussion of the basis of the decision or proof of the agency's analysis, but only "conclusory statements").

B. Robinson Brook

The Region asserts jurisdiction over "Robinson Brook" in the Permit. *See* Fact Sheet, Exhibit 3, p. 1. The Region's description of Robinson Brook in the Fact Sheet is scant and conclusory, and thus insufficient to support its jurisdictional determination. Comments, Exhibit 2, pp. 34-35, *quoting Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision* *in* Rapanos v. United States and Carabell v. United States ("*EPA Guidance*") (Dec. 2, 2008) p. 12. (Region must "ensure that the information in the record adequately supports any jurisdictional determination [and that the Region must] explain the rationale for the determination [and] disclose the data and information relied upon."). Notwithstanding its burden, the Region baldly states "Robinson Brook is located at the headwaters of the Taunton River Basin, and is a tributary to the Rumford River." Fact Sheet, Exhibit 3, p. 2. There is, in fact, no evidence in the record that the receiving water for the discharge is a "tributary" to the Rumford River; this is mere assertion.

The Region appears to have made this statement based on the characteristics of Robinson Brook at a point approximately 450 yards (1,350 feet) downstream of Outfall 002, which is not representative of conditions in the receiving waters of the Outfall itself. What the Region also neglects to mention is that "Robinson Brook" only appears for the first time on any relevant hydrologic maps at this point of observation, 450 yards from the Outfall.[12] Fact Sheet, Exhibit 3, p. 2. Whether or not the Brook is a "tributary" of the Rumford River at that point, the Region's assertion of jurisdiction is unsupportable at the Outfall 002 point of discharge. Outfall 002 discharges to a man-made ditch on the Invensys property. Comments, Exhibit 2, Attachment 5 at App. C. At Outfall 002, the discharge includes both stormwater and groundwater from the Facility, as well as intermingled stormwater from Town of Foxborough municipal discharges. Response, Exhibit 4, at 47. This municipal stormwater has collected in drainage ditches adjacent to the Invensys property and upstream of Outfall 002. Comments, Exhibit 2, Attachment 5 at App. C. The discharge is carried through the ditch, which is culverted below-ground further

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[12] Robinson Brook itself is not even "identified in the tables or maps in the Massachusetts Water Quality Standards [and] the segment receiving the Invensys discharge is also not identified in the [MassDEP] 2008 [List of Integrated Waters]." Fact Sheet, Exhibit 3, p. 2.

downstream on the Invensys property, and then daylights at Mechanic Street in the Town of Foxborough outside the Invensys Property boundary. *Id.* Between Outfall 002 and where Robinson Brook daylights at Mechanic Street, there are additional municipal stormwater discharges from two street drains. Response, Exhibit 4, at p. 47. To be crystal-clear, neither the ditch section nor the culvert section above Mechanic Street are identified as part of "Robinson Brook on any hydrogeological maps. Nor is any part of the Invensys Property shown as part of the watershed for Robinson Brook. Fact Sheet, Exhibit 3, p. 2.

For past convenience, the parties have referred to both Outfall 002 and the segment on the Invensys property (both the ditch and culvert) carrying the Outfall 002 discharge as "Robinson Brook." However, neither the receiving water of Outfall 002 nor the segment between the Outfall and Mechanic Street bear the required attributes of a water of the United States. The Region has not included any evidence in the Record that examines the actual receiving water of Outfall 002. The Region instead appears to have selectively analyzed a downstream segment that would better illustrate its chosen result – perhaps because the location the Region examined ***is*** shown as part of Robinson Brook on the relevant GIS maps.

Invensys extensively commented on this absence of any jurisdictional basis of the Outfall 002 receiving water. Comments, Exhibit 2, at pp. 33-35 & Attachment 14. Invensys specifically noted that data collected from field observations of the receiving water below Outfall 002, including the lengthy periods of no observable flow, militated against jurisdiction. *Id.* Invensys also commented that then-current EPA Guidance instructed EPA not to exercise Clean Water Act jurisdiction over "intermittent streams which do not typically flow year-round or have continuous flow at least seasonally." Comments, Exhibit 2, pp. 34-35, *quoting EPA Guidance p. 12*. That precisely describes the Outfall 002 receiving water at the point of the discharge. In its

Response, the Region attempted to define "Robinson Brook" as a tributary of the Rumford River based on analyses under the two plurality opinion tests set forth in *Rapanos* (the Plurality Standard and the Scalia Standard). Response, Exhibit 4, pp. 42-47; *Memo to file from Hilary Snook (6/1/15): Robinson Brook*; Exhibit 9, pp. 1-3 ("*Snook Memo*"). The Region provided no analysis of Robinson Brook under the Clean Water Rule, even though the Region acknowledged the Rule's applicability. Response, Exhibit 4, p. 47; *see* 80 Fed. Reg. at 37079. However, the Region, despite issuing the Final Permit after promulgation of the final Clean Water Rule, simply promised to evaluate – at some later date – Robinson Brook in light of the rule's definition of tributary. Response, Exhibit 4, p. 47. The analysis is inconsistent the Clean Water Rule.

Even aside from the Region's inconsistency with the Clean Water Rule, ***the Region simply provided no analysis at all regarding whether the actual Outfall 002 receiving water is a water of the United States***. This failure makes the Region's analysis clearly erroneous under any definitional standard. As noted, the Region's ***only*** field observations of flow were made at a point ***450 yards*** from the Facility's point of discharge at Outfall 002. Memorandum of Woodard and Curran (July 29, 2015), Exhibit 11.[13] *See Snook Memo*, Exhibit 9, p. 1. The Snook Memo notes that "visual observations were made from the Mechanic Street road crossing and ***downstream*** to the Cocasset Street road crossing, and then from the Route 140 road crossings and from the outlet of Hersey Pond at Walnut Street." *Id.* (emphasis supplied). The Region, in turn, used Snook's negligible observation of certain macroinvertebrates and stream substrates harboring larval aquatic life and amphibian egg masses to conclude that "Robinson Brook specifically performs many of the important functions of headwater streams" . . . "and its

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[13] Invensys relies on this non-record Memorandum in response to the *Snook Memo*, because the *Snook Memo* was prepared after the draft permit, and its methodology and conclusions were not reasonably ascertainable during the comment period. 40 C.F.R. § 124.19(a); *In re RockGen Energy Ctr.*, 8 E.A.D. 536, 540 (EAB Aug. 25, 1999).

importance to the integrity of downstream navigable waters is clear." Response, Exhibit 4, p. 45. However, Snook's observations 450 yards from Outfall 002 do not establish that the receiving water at the point of discharge performs any of these functions, either at the Outfall 002 point of discharge, or between Outfall 002 and Mechanic Street. This significant distance from the Outfall 002 receiving water to the Region's point of analysis of "Robinson Brook" is shown on the same United States Geological Survey Topographical Maps relied on by the Region to identify Robinson Brook – maps which do not show the discharge point at Outfall 002 as being part of "Robinson Brook". Memorandum of Woodard and Curran, Exhibit 11; *See* Response, Exhibit 4, p. 10.[14] By studying a downstream segment of "Robinson Brook" with a different flow and ecological character than the Outfall 002 receiving water, the Region's "data and information relied upon" are irrelevant. *See EPA Guidance p. 12.* While the data attempts to demonstrate a nexus from Robinson Brook to the Rumford River, it does not even attempt to demonstrate such a nexus between the Outfall 002 receiving water and the Rumford River. Memorandum of Woodard and Curran, Exhibit 11.

While this failure alone should invalidate the Permit with regard to Outfall 002, the Region's analysis is even less supportable when viewed under the lens of the Clean Water Rule. First, the Region has not shown that Robinson Brook, even at its chosen point of observation, carries sufficient flow to be designated a "tributary." *Id.* EPA made clear in its comments to the final Clean Water Rule that an evidentiary showing of these "the presence of the physical indicators of a bed and banks and an ordinary high water mark" is a necessary precondition to meeting the definition of a "tributary." *Id. See* 80 Fed. Reg. at 37068, 37079.

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[14] The Region's reliance on an e-mail from a citizen observer of a similarly distant downstream segment of Robinson Brook (at the YMCA on Mechanic Street after the Brook daylights off-site from Invensys' property) is equally flawed. *See E-mail from Jane Sears Pierce* (Dec. 18, 2013), Exhibit 10.

> The rule definition of ''tributary'' requires that flow must be of sufficient volume, frequency, and duration to create the physical characteristics of bed and banks and an ordinary high water mark. If a water lacks sufficient flow to create such characteristics, it is not considered a ''tributary'' under this rule. While some commenters expressed concern that a feature that flowed very rarely could meet the proposed definition of ''tributary,'' it is the agencies' judgment that ***such a feature is not a tributary under the rule because it would not form the physical indicators required under the definitions of ''ordinary high water mark'' and ''tributary.''***

80 Fed. Reg. at 37079. *See also id.* at 37068.

The Region has not documented any physical indicators at the site of observation 450 yards downstream from Outfall 002, yet alone at Outfall 002 or the segment between the outfall and Mechanic Street. *See* Response, Exhibit 4, pp. 42-47; *Snook Memo*, Exhibit 9, pp. 1-3. The observation of minimal evidence of fauna in stream substrates is irrelevant where the Region made no observations of the ability of the receiving water ***at the point of discharge*** to export organic matter or provide a sustainable aquatic habitat. *See* 33 C.F.R. § 328.3(c)(3); 80 Fed. Reg. at 37079.

Second, the downstream segment of Robinson Brook observed for the *Snook Memo* is not representative of the volume, frequency, and flow of the Outfall 002 receiving water at the point of discharge. Memorandum of Woodard and Curran, Exhibit 11. *See* Comments, Exhibit 2, p. 12; Response, Exhibit 4, pp. 46-47. The hydrological characteristics of the two "segments" are substantially different. Memorandum of Woodard and Curran, Exhibit 11. While Robinson Brook at the Region's point of observation (Mechanic Street) may often hold water, at Outfall 002, the receiving water is a narrow manmade ditch that largely conveys stormwater runoff from nearby roadways and parking lots and seldom contains flowing water. Memorandum of Woodard and Curran, Exhibit 11. *See* 33 C.F.R. § 328(b)(3)(ii) ("[d]itches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands" are excluded from Clean Water Act jurisdiction). In fact, Invensys submitted data demonstrating that the receiving water below Outfall 002 is characterized by successive days of no observable flow. Comments, Exhibit 2, p. 34 & Attachment 14; Response, Exhibit 4, pp. 46-47. The Region critiqued this data for not presenting flow observations in non-drought conditions, but provided no contrary record evidence, as is its burden. *EPA Guidance p. 12.*

The Region's finding that "Robinson Brook", 450 yards ***below*** Outfall 002, is a water of the United States, is not sufficient to support a jurisdictional finding for the receiving water ***at*** the point of discharge. 33 C.F.R. § 328.3(c)(3); *See Rapanos*, 547 U.S. at 722. Indeed, the Region admitted reservations with its own jurisdictional analysis because of the distance from its chosen point of observation to Outfall 002. It stated equivocally that "under the Scalia or Plurality Standard, Robinson Brook is a water of the United States ***at least*** from the point where it has been observed to carry perennial flow at Mechanic Street" [the point of field observation for the *Snook Memo*].[15] Response, Exhibit 4, at 46 (emphasis in original). The Region ignored its failure to provide any physical indicators of flow (or any observations at all) at the point of discharge, because it contended that "during low-flow conditions the discharge from outfall 002 will reach the perennial portion[16] of Robinson Brook in an essentially undiluted state." *Id.* at 47. The Region provided no scientific basis to support this conclusory dilution analysis. *Id.* Indeed, the conclusion is implausible. Discharges from two municipal storm drains enter Robinson

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[15] Any water of the United States has to be jurisdictional somewhere, by definition. Simply because a water body is jurisdictional somewhere does not mean that every feature anywhere that ever contributes any water to that water of the United States is itself a water of the United States. That is not what *Rapanos* holds and that is not what the Clean Water Rule says. The source of the Mississippi River, Bower's Spring in the Centennial Mountains of Montana, is not jurisdictional just because the Mississippi River itself is a "water of the United States." The Region's assertion of jurisdiction over a water body without the requisite characteristics of a "tributary" because a downstream segment of that body becomes perennial cannot be the standard under which to apply the Clean Water Rule. Application of that standard would create an exception that would swallow the Clean Water Rule.

[16] It is worth reemphasizing that, while the Snook Memorandum reflects one observation at one time, MassGIS has concluded that Robinson Brook is intermittent, not perennial. In light of the MassGIS conclusion, a single observation by EPA cannot be sufficient to establish that Robinson Brook is perennial.

Brook downstream of Outfall 002 but upstream of the Mechanic Street location that Snook observed. *Id.* The Region provided no data to demonstrate that this contribution of stormwater does not dilute the concentration of pollutants in the discharge where it reaches Snook's downstream observation point. It also ignored that the flow at the downstream observation point is greater as a result of these contributory municipal stormwater discharges.

Similarly, the Region also failed to demonstrate any "significant nexus" between Robinson Brook and the Rumford River – at any point of observation. 33 C.F.R. §§ 328.3(a)(8); 328.3(c)(5). *See* Fact Sheet, Exhibit 3, p. 1. First, the Region's comments that purported to provide a significant nexus analysis under the Plurality Standard contained no site-specific analysis of Robinson Brook. Rather the Region merely recited the basic connectivity features of headwater streams generally. Response, Exhibit 4, pp. 42-45. Such generic observations cannot sustain the Region's assertion of jurisdiction. *Edison Electric Institute v. EPA*, 2 F.3d 438, 446 (D.C. Cir. 1993) (application of rule to specific wastes based on the view that the wastes "can plausibly be disposed in municipal landfills" was no more than speculation where EPA provided no information that this actually occurred). Nor did the Region provide the analytical predicates to establish relation to the jurisdictional water's 100-year flood plain or spatial relationship to the ordinary high water mark as required for a significant nexus analysis under 33 C.F.R. § 328.3(c)(5), or a case-specific, non-speculative recitation of the brook's chemical, physical, or biological functions. *Id.* Finally, the Region argued "that the permittee has previously applied for, and received coverage for discharges to Robinson Brook under EPAs Multi-Sector General Permit" (MSGP). Response, Exhibit 4, p. 42. That the Region would infer a waiver of the jurisdictional argument on this basis is borderline frivolous. The obligations under the MSGP are substantially different than those under the Permit. That Invensys protectively sought coverage under the MSGP says literally nothing about the jurisdictional issue. In sum, given the Region's barebones analysis, the assertion of jurisdiction over the receiving water for Outfall 002 is clear error and not rationally supported by the evidentiary record under both the *Rapanos* standards and the Clean Water Rule.

III. The Region has not provided a reasoned analysis for changing designation of the Outfall 001 receiving water to Gudgeon Brook from Neponset Reservoir

The Region supplied no analysis in the record for its decision to designate the Outfall 001 receiving water as "Gudgeon Brook/Neponset Reservoir." Comments, Exhibit 2, pp. 29-32; Response, Exhibit 4, pp. 39-40. In the Fact Sheet for the 1987 Permit, the Region made clear that Outfall 001 discharges to the Neponset Reservoir, describing the substantial analyses of the Reservoir's aquatic health that had been undertaken in order to set effluent limitations. *See* Comments, Exhibit 2, p. 30, *citing* 1987 Fact Sheet (June 30, 1987), Exhibit 12 p. 2 ("In June of 1986, the Massachusetts DEQE performed a water quality survey to assess the quality of the Neponset Reservoir and its assimilative capacity for the discharge"). The Region stated that the purpose of the permit was to "minimize the discharge of pollutants to the reservoir." *Id.* Likewise, in the Fact Sheet for the 1991 Permit, the Region described the water-quality-based uses of the Reservoir that the limitations were intended to preserve. Comments, Exhibit 2, p. 30, *citing* 1991 Fact Sheet (Sept. 30, 1991), Exhibit 13 p. 2. Moreover, the Town of Foxborough has a municipal storm water outfall that discharges into the same location as Invensys' Outfall 001. Comments, Exhibit 2, p. 30 & n.117. Like Outfall 001, Foxborough's discharge point is covered under a NPDES permit. Foxborough's permit – like prior Invensys permits – lists the Neponset Reservoir, not Gudgeon Brook, as the receiving water. Id.

In the Final Permit, the Region listed "Gudgeon Brook/Neponset Reservoir" as the Outfall 001 receiving water with no explanation. Response, Exhibit 4, pp. 39-40. The Region baldly stated in its Response that "[p]revious permits were incorrect to the extent that they identified the Neponset Reservoir as the immediate receiving water." *Id.* at 39. The only basis provided by the Region to justify the change was that certain Invensys documents describe the point at which analytical tests were conducted as "Gudgeon Brook" and because "Invensys has not provided any photographs, maps, or other evidence that could lead to the conclusion that Outfall 001 discharges directly to the Neponset Reservoir." *Id.* at 39-40.

The Region's terse justification for the change of its prior precedent violates settled principles of administrative law. The Supreme Court has held that a federal agency may not change direction from a prior position without a "reasoned analysis." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42 (1983); *Atchison, Topeka & Santa Fe Ry. Co. v. Wichita Bd. of Trade*, 412 U.S. 800, 808 (1973) (an agency has a duty to "explain its departure from prior norm"); *City of Anaheim v. FERC*, 723 F.2d 656, 659 (9th Cir. 1984) ("agencies may not impose undue hardship by suddenly changing direction, to the detriment of those who have relied on past policy"). This requirement applies with equal rigor when an agency changes fundamental permit conditions that regulated parties and the public have relied on for consistency and planning. *See, e.g., N.Y. Pub. Interest Research Group v. Johnson*, 427 F.3d 172, 182-183 (2d Cir. 2005). The reason for this rule is clear: "The law demands a certain orderliness. Therefore, an agency that decides to depart significantly from its own precedent . . . must confront the issue squarely and explain why the departure is reasonable." *Davila-Bardales v. INS*, 27 F.3d 1, 5 (1st Cir. 1994).

The Region did not "explain its departure from prior norm." *Atchison*, 412 U.S. at 808. That prior permits "were erroneous" is not analysis or an explanation; it is mere conclusion. Response, Exhibit 4, p. 40. At minimum, the Region was required to provide a fact-specific analysis of the effect of the Outfall 001 discharge on the distinct biology of Gudgeon Brook, as opposed to the Reservoir; an explanation for how the biotic community and water-quality-dependent uses that differ in the Brook compared to the overall Reservoir; and the hydrologic relationship between the Brook and the Reservoir. This is precisely the analysis supplied in prior permits when establishing effluent limitations to the entire Reservoir. *See* 1987 Fact Sheet Exhibit p. 2; 1991; Fact Sheet, Exhibit 13 p. 2. A similarly rigorous analysis was required when the Region decided to switch the receiving water to a purported tributary of the Reservoir.

It is immaterial that Invensys has labeled of the point of discharge as Gudgeon Brook in informal documents, such as laboratory tests. This does not excuse the Region from its burden of supplying a reasoned explanation for the fundamental permit change. *See Johnson*, 427 F.3d at 182-83. It is neither reasonable, nor even an analysis at all, to justify the change in denomination of the receiving waters by attempting to reverse the burden of providing reasonable factual support for the permit conditions and require Invensys to supply the necessary documentary evidence. Response, Exhibit 4, p. 39. Similarly, the differential treatment of the classification of the receiving water in the Town of Foxborough permit also requires a more reasoned analytical response. *Baltimore Gas & Electric Co. v. Heintz*, 760 F.2d 862, 871-72 (D.C. Cir. 1978) ("when an agency treats two similarly situated transactions differently, an explanation for the agency's actions must be forthcoming."). The Region did not respond at all to this comment from Invensys. Response, Exhibit 4, p. 39-40.

IV. The Region's alternating designation of Gudgeon Brook for dilution analysis and Neponset Reservoir for analysis of the Outfall 001's effects on water-quality-dependent uses is arbitrary and led to unduly stringent numeric effluent limitations

The Region not only failed to provide an explanation for its change; it also selectively referred to the two identities of the receiving water of the Outfall 001 discharge (i.e., Gudgeon Brook or Neponset Reservoir) in its supporting documents to suit its convenience. This alternating designation of receiving waters biased the permit towards extremely stringent limits by maximizing the uses and species in Reservoir while at the same time eliminating any dilution allowance by narrowly focusing on Gudgeon Brook. For instance, the Fact Sheet discusses the Reservoir and its characteristics and classification in the "Receiving Waters" section. Fact Sheet, Exhibit 3, p. 2. There, it focuses entirely on the effect that the Outfall 001 discharge may have on the ability of the Neponset Reservoir to support various water-quality-dependent uses, offering no discussion whatsoever of the effect of the discharge on the biology of Gudgeon Brook or the uses specifically attributed to Gudgeon Brook as a Class B water. *Id.* However, for purposes of dilution, the Region assumes that Gudgeon Brook alone is the receiving water into which Outfall 001 discharges. *Id.* at p. 9. With regard to dilution, the Region wrote:

> The available dilution for the facility's discharges to Gudgeon Brook ("Outfall 1") and Robinson Brook ("Outfall 2") was determined to be zero. These determinations are based on the fact that both discharge locations are at the headwaters of small streams and so have little or no flow upstream of the discharge locations. Therefore, given that the available dilution is zero, the water quality criteria must be met at the point of discharge, with no allowance for dilution. *Id.*

The Region's disingenuous ambiguity regarding the identity of the receiving water demonstrates that the Region has not properly derived the numeric water quality-based effluent limitations it seeks to impose for Outfall 001. *See* Comments, Exhibit 2, pp. 31-32, *citing Interim Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (EPA, September 1, 1996) ("*Interim Approach*") p. 4. The proper derivation of such limits requires "an adequate receiving water exposure assessment." *Id.* The *Interim Approach* cautions against implementing numeric criteria without such an assessment, because doing so "may result in the imposition of inappropriate numeric limitations on a discharge" and "the imposition of numeric water quality criteria as end-of-pipe limitations without properly accounting for receiving water assimilation of the pollutant" which "could lead to overly stringent permit requirements, and excessive and expensive controls on storm water discharges, not necessary to provide for attainment of WQS."[17] *Id.*

The Region wants to have its cake and eat it, too. It wants to use Neponset Reservoir as the benchmark for analyzing the discharge's effect on the water-quality-dependent uses (such as fishing, recreation, habitat, etc.). *See* Fact Sheet, Exhibit 3, *citing* 314 Code Mass. Regs. 4.05(3)(b). However, it wants to use Gudgeon Brook to justify its provision of no dilution allowance in the calculation of numeric effluent limits. Given that Gudgeon Brook is essentially comprised entirely of stormwater and groundwater discharge from the Facility, and supports few if any water-quality dependent uses, a dilution allowance reflecting conditions in a geographically appropriate section of the larger Reservoir was required under the *Interim Approach*. Comments, Exhibit 2, p. 32. *See* 314 Code Mass. Regs. 4.05(3)(b). Because the Region has failed to establish the receiving water, let alone conduct a receiving water exposure assessment in either the Reservoir or the Brook, it may not impose the effluent limitations for Outfall 001 included in the Final Permit.[18]

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[17] The Region acknowledged that it relied on the *Interim Approach* to establish the numeric effluent limitations in the Draft Permit.

[18] The Region's argument that concentrations measured where Gudgeon Brook reaches the rest of the Neponset Reservoir are elevated and that dilution is thus still unwarranted misses the mark. First, the record is replete with evidence that the Reservoir is thriving, so something must be preventing the Invensys discharge from causing harm. Comments, Exhibit 2, pp. 5-6. More directly, as the Phase II report demonstrates, the chemistry of the Reservoir is complex and it would not be appropriate simply to look at water column concentrations and Invensys effluent discharge concentrations. *Id.* at p. 11. Concentrations in the Reservoir reflect the relationship between the water column and the underlying sediments. The impact of the Invensys effluent on concentrations in the Reservoir, and thus the determination of what dilution factor would be appropriate, can only be made after a careful assessment of all of the factors affecting concentrations in the Reservoir. *Id.* This the Region failed to do.

V. The Region's decision to impose numerical water quality criteria rather than BMPs was inappropriate on the facts of Invensys's discharges and was inconsistent with the Region's approach to this issue in other permits.

As Invensys demonstrated in its comments on the draft permit, Comments, Exhibit 2, pp. 9-18, the Region's use of numeric effluent limits rather than BMPs is not justified on the facts of this case, contradicts EPA's own guidance, and is inconsistent with the Region's approach to other permits in similar contexts. Given that the discharges from both Outfall 001 and 002 contain only stormwater and groundwater, and include no industrial discharges, *id.*, p. 9, the use of BMPs is appropriate and the imposition of numeric effluent limitations would be unreasonable. This is even more the case because the discharge is not a "process water discharge" that occurs "at predictable rates with predictable pollutant loadings under low flow conditions." *Id.*, 11; *Interim Approach*, pp. 2-3. The Region has acknowledged that the Invensys discharge reflects "significant variability in almost all parameters." Fact Sheet, Exhibit 3, p. 12, n.4. EPA's own *Interim Approach* notes that such variability is a fundamental reason for utilizing BMPs rather than numeric effluent criteria. *Interim Approach*, pp. 2-3. In light of this variability, and given the language of EPA's own guidance, EPA's explanation that BMPs are appropriate because there are periodic exceedances of the water quality criteria does not begin to justify EPA's refusal to consider BMPs.

This is particularly the case where the Region's argument is based on its conclusion that "there is no significant dilution in the receiving water…" Response, Exhibit 2, p. 17. However, as demonstrated above, EPA was only able to reach that conclusion by reliance on its unsupported decision to alter the receiving water from the Neponset Reservoir to Gudgeon Brook. The Region acknowledged that "[v]ariability, particularly in cases where the discharge is diluted with the receiving water, can make it more difficult to determine reasonable potential and to establish protective limits." *Id.* Since the receiving water should be Neponset Reservoir, the Region's own Response supports use of BMPs rather than numeric effluent limits.

The Region has further acknowledged that "BMPs can be imposed in lieu of numeric limits including when numeric limits are infeasible," but here, the Region "believes that numeric limits are appropriate and feasible in this case." *Id.* However, while the Region may "believe" that numeric limits are feasible, the record does not contain substantial evidence to support the Region's belief. Belief is not sufficient to sustain EPA's permit.

The Region's treatment of BMPs in this Permit is also inconsistent with EPA's willingness to rely on BMPs, rather than numeric effluent limits, in other recent permits issued by this Region. The Region fails to justify this inconsistent treatment. It principally argues that it has no obligation to justify disparate treatment of different permittees. Response, Exhibit 2, p. 20. However, while that may be true in some hypothetical circumstances, where the permittee has placed evidence in the record that the two permits are based on fact patterns that are the same in relevant respects, an agency must justify such disparate treatment, as pointed out above.[19] *State Farm.*, 463 U.S. at 42; *Atchison,* , 412 U.S. at 808 (an agency has a duty to "explain its departure from prior norm"); *Baltimore Gas*, 760 F.2d at 871-72 ("when an agency treats two similarly situated transactions differently, an explanation for the agency's actions must be forthcoming.").

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[19] Indeed, the Supreme Court has held that, where an agency treats similarly situated permit applicants differently, the agency may be found to have violated the disadvantaged applicant's constitutional right to equal protection and may be liable for damages. *Village of Willowbrook v. Olech*, 528 U.S. 562 (2000).

VI. The Region's selection of a hardness value for metals is unreasonably conservative and not supported by the evidence in the record

The Region uses a water hardness value of 50 mg/l as the basis for deriving the numeric criteria for the hardness-dependent metals in the Final Permit (i.e., copper, lead, zinc, and cadmium). Fact Sheet, Exhibit 3, p. 10; Response, Exhibit 4, pp. 35-36. The Region asserts that a 50 mg/l hardness factor is "a reasonably conservative value" because Invensys submitted quarterly data reflecting hardness values of 52.4 – 83.2 mg/l from Q4 2006 through Q3 2010. Response, Exhibit 4, pp. 35-36. The Region further responded that (i) a full data set of hardness data showed one recorded value below 50 mg/l (Q2 2005); and (ii) a review of data from January 2012 through July 2013 showed a hardness range of 43 – 73 mg/l. *Id.*

The Region's approach arbitrarily biased the numeric water-quality-based effluent limitations. Comments, Exhibit 2, 27-29. As a matter of law, an agency's decision must be based, not on "mere fears for the future but facts and findings, a statement of the reasons that is supported by concrete inferences from substantial evidence, and is not to be snatched from the air on a purely hypothetical 'worst case' analysis." *Memphis Light Gas & Water Div. v. FPC*, 504 F.2d 225, 234 (D.C. Cir. 1974). Here, the Region stated that "the use of conservative, or worst case, assumptions is an appropriate means" to ensure attainment with water quality standards." Response, Exhibit 4, p. 35. However, it has impermissibly selected a hypothetical worst case value rather than one supported by the data in the record.

First, that the effluent periodically reflected a hardness value in the low 50 mg/l range does not mean that such values represent the norm or average. The average annual hardness of the effluent ranged in the 2006-2011 period studied in the record from 61 to 86 mg/l, producing an overall average of 70 mg/l. When the data is limited to the last three years in the range studied by the Region, the overall average is 78 mg/l. Thus, the Region's hardness value of 50 mg/l does not reflect the typical hardness levels in the Outfall 001 discharge and is therefore excessively conservative. Second, it is entirely unreasonable for the Region to point to one test result from more than 10 years ago that showed a hardness value below 50 mg/l. *See Sierra Club v. EPA*, 671 F.3d 955, 957-58 (2012) (holding EPA was arbitrary in relying on old 2004 emissions data when current 2010 data was in the record). Third, the Region failed to acknowledge that its standard practice is to use an average (i.e., not "worst case") hardness values in establishing effluent limitations for Region 1 NPDES permits. Comments, Exhibit 2, p. 28 & n.103, *citing* EPA 2006 Responses to Comments on Wyman Gordon Permit p. 7; Pine Brook Country Club, NPDES Permit No. MA0032212, Fact Sheet p. 8. For the Region to use the worst-case to determine hardness in the Invensys permit when it has used the average in other permits is the very definition of arbitrary agency behavior. *Baltimore Gas & Electric*, 760 F.2d at 871-72 ("when an agency treats two similarly situated transactions differently, an explanation for the agency's actions must be forthcoming.").

Even more arbitrarily, the Region applied the same 50 mg/l hardness factor to Outfall 002, tersely writing: "[G]iven the lack of hardness data for Robinson Brook and the proximity of the two water bodies, it is a reasonable assumption that the hardness levels will be similar." Response, Exhibit 4, p. 36. This is absurd. Outfall 001 and Outfall 002 are 1,900 feet apart and drain into different basins. This assumption is – literally – baseless. It is unreasonable and unsupportable for the Region to impose numeric water quality-based effluent limits on either discharge based on a hardness value that is inconsistent with, and far lower than, the entire body of data collected from that discharge.

VII. The Final Permit's weekly monitoring conditions for the Outfall 001 and 002 are irrational in light of the information in the record

The Permit's weekly monitoring requirements similarly demonstrate that the Region acted irrationally "in light of all of the information in the record." *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 568 (EAB 1998). First, the Final Permit requires sampling of metals in Robinson Brook below Outfall 002 "once per week." Final Permit, Exhibit 1, pp. 5-6. This weekly monitoring condition ignores the fact that Invensys presented substantial and unrebutted evidence that Robinson Brook is dry, if not seasonally, then at least for multiple consecutive weeks at a time. It is impossible for Invensys to comply with this condition. Comments, Exhibit 2, p. 33 & Attachment 14. Second, the record contains voluminous monitoring records for Outfall 001. This discharge has been subject to NPDES permits for 41 years, and has been exhaustively sampled under this Permit since then. The Neponset Reservoir was also exhaustively sampled as part of the state Superfund cleanup of the Neponset Reservoir. The Region is well aware of this, yet imposed weekly monitoring without justification.

VIII. The Region's failure to include a compliance schedule was not rational in light of the information in the record

EPA regulations allow for the establishment of compliance schedules for new, more stringent water quality-based limits. 40 C.F.R. § 122.47(a)(1). Invensys requested such a schedule. In support, Invensys submitted a Technical Memorandum demonstrating that attempting to comply with the Final Permit's numeric limits would require expensive installation of a sophisticated treatment system – and even then, compliance with the numeric limits may be still an impossibility.[20] Comments, Exhibit 2, Attachment 5. The Region failed to provide a

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[20] Invensys estimates that to even attempt to comply with the numeric limits imposed by the Final Permit, it will be required to install a water treatment system with a 2 million gallon storage capacity and ion exchange capability with capital costs in the range of $6-to-$17 million and $300,000-to-$900,000 in annual operation and maintenance

cogent reason for denying Invensys' request for a compliance schedule. Response, Exhibit 4, pp. 59-60. That failure is all the more arbitrary where the Region did not even address Invensys' demonstration in the record that no technology may be able to attain the Permit's effluent limitations.

IX. Request for Stay of Entire Permit

The limits and conditions contested by this Petition must be stayed, along with any uncontested conditions that are not severable from those contested. 40 C.F.R. §§ 124.16(a), 124.60(b). Because Invensys has challenged the Region's jurisdiction over the receiving waters named in the Final Permit and numerous other major aspects of that permit, and given the interdependent relationship of these provisions to all remaining non-contested provisions, the proper result is to stay the Final Permit in its entirety. *See Friends of Pinto Creek v. United States EPA*, 504 F.3d 1007, 1010 (9th Cir. 2007).

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costs. Comments, Exhibit 2, pp. 23-25 & Attachment 5. Even then, there is no guarantee that the treatment system will be able to meet the permit limits. Comments, Exhibit 2, pp. 23-24 & Attachment 5.

CONCLUSION

The Region's handling of this Permit has been unreasonable throughout the entirety of the 19-year long permit renewal process. The Region changed the receiving water for Outfall 001 from Neponset Reservoir to Gudgeon Brook, without any explanation, other than the previous designation was somehow wrong. It imposed a site-specific permit on Outfall 002, without putting any evidence in the record to demonstrate that the receiving water of the discharge of Outfall 002 is a water of the United States. It rejected the use of BMPs and insisted on numeric effluent standards – for both Outfalls – even though it relied on BMPs for other, similarly situated permittees. It utilized a worst-case approach to determining a hardness value, notwithstanding that it utilized mean hardness data in other Region 1 permits. It refused to include a compliance schedule, notwithstanding the significant evidence in the record that it simply may not be feasible to attain the numeric effluent limits in the permit – and the absence of any record evidence this it ***is*** feasible to attain the limit. And the Region did all this, notwithstanding the massive body of evidence that the Neponset Reservoir is a healthy, thriving, ecosystem (and the complete absence of any evidence of harm to Robinson Brook as well). At bottom, the Region simply seems bound and determined to regulate an "industrial discharge" that no longer exists by imposing the most stringent possible permit on Invensys, regardless of need, feasibility, or record support.

Invensys therefore respectfully requests that the EAB grant review of the terms and conditions of the Final Permit challenged by this Petition. After such review, Invensys respectfully requests:

A. The opportunity to present oral argument in this proceeding and a briefing schedule for this appeal to assist the EAB in resolving the issues in dispute;

B. A remand of the Final Permit to the Region with an order to issue an amended NPDES Permit consistent with the EAB's findings; and

C. All other relief that the EAB deems appropriate under the circumstances.

Respectfully Submitted,

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September 4, 2015

Table of Attachments

<u>Ex. 1</u>. 2015 NPDES Permit No. MA0004120 (July 17, 2015)

<u>Ex. 2</u>. Invensys Comments on Draft Permit (Oct. 31, 2011)

<u>Ex. 3</u>. 2011 Draft NPDES Permit No. MA0004120 Fact Sheet

<u>Ex. 4</u>. EPA Region Response to Comments on Draft Permit

<u>Ex. 5</u>. 1991 NPDES Permit No. MA0004120 (Sept. 30, 1991)

<u>Ex. 6</u>. 1987 NPDES Permit No. MA0004120 (Nov. 16, 1987)

<u>Ex. 7</u>. 1984 NPDES Permit No. MA0004120 (June 29, 1984)

<u>Ex. 8</u>. 1974 NPDES Permit No. MA0004120 (Oct. 8, 1974)

<u>Ex. 9</u>. Memo to file from Hilary Snook (6/1/15)

<u>Ex. 10</u>. E-mail from Jane Sears Pierce (Dec. 18, 2013)

<u>Ex. 11</u>. Memorandum of Woodard & Curran (Aug. 17, 2015)

<u>Ex. 12</u>. 1987 Draft NPDES Permit No. MA0004120 Fact Sheet

<u>Ex. 13</u>. 1991 Draft NPDES Permit No. MA0004120 Fact Sheet

Statement of Compliance with Word Limitation

I hereby certify that this Petition for Review, including all relevant portions, contains fewer than 14,000 words.

Jesse Harlan Alderman

CERTIFICATE OF SERVICE

I, Jesse Harlan Alderman, hereby certify that on September 4, 2015, I caused to be served a true and correct copy of the foregoing Motion for Extension of Time to File Petition for Review, via U.S. Mail, to the following:

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Jesse Harlan Alderman

Exhibit 1

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, (MGL Chap. 21, §§26-53),

Invensys Systems, Inc.
(formerly named "The Foxboro Company - Neponset Plant")

is authorized to discharge from a facility located at

38 Neponset Avenue
Foxboro, MA 02035

to receiving waters named the **Gudgeon Brook/Neponset Reservoir (001), and Robinson Brook (002)**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit will become effective on the first day of the calendar month immediately following sixty days after signature.

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on September 30, 1991.

This permit consists of 13 pages in Part I including effluent limitations, monitoring requirements, and Attachment A (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol (May, 2007)), and 25 pages in Part II including Standard Conditions and Definitions.

Signed this 17th day of July, 2015

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

David R. Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.a. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge effluent from outfall serial number 001 (i.e., untreated ground water infiltration, untreated ground water from sump pumps in facility basements, treated ground water from a dry weather treatment system (treated for VOCs) and storm water) to Gudgeon Brook. Such discharges will be limited and monitored by the permittee as specified below.*1

Effluent Characteristic	Units	Discharge Limitation		Monitoring Requirement	
		Average Monthly	Maximum Daily	Measurement Frequency	Sample Type
Rainfall / Precipitation*2	inches	Report	Report	Per Discharge Event	Total
Flow	MGD	Report	Report	Daily	See Footnote *3
pH	st. units	(See Footnote *4)		4/Week	Grab
E. coli Bacteria (April 1 – Oct. 31)*5	cfu/100 ml	Report	Report	1/Month	Grab
Copper, Total*7	ug/l	6.1	8.8	See Footnote *6	24-Hour Composite
Lead, Total*8	ug/l	1.7	Report	See Footnote *6	24-Hour Composite
Zinc, Total	ug/l	78.8	78.8	See Footnote *6	24-Hour Composite
Cadmium, Total*9	ug/l	0.2	1.3	See Footnote *6	24-Hour Composite
Aluminum, Total	ug/l	87	Report	See Footnote *6	24-Hour Composite
Tetrachloroethylene	ug/l	Report	Report	See Footnote *6	Grab
Whole Effluent Toxicity, C-NOEC *10,*11,*12	%	—	100	1/Quarter	24-Hour Composite

Footnotes:

*1. Samples taken in compliance with the monitoring requirements stated above will be taken at a point prior to mixing with other streams, will be representative of the discharge, and will be taken at the point of discharge into Gudgeon Brook (unless otherwise specified). All sampling, preservation, and analysis of samples will be in accordance with EPA approved methods found at 40 CFR Part 136 and all sampling shall be taken at the same time of day and the same day(s) of the week for each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

The permittee shall measure sump pump discharges from sumps H, I, O, and Z on a continuous basis. The time and duration of each sump pump activation, as well as an estimate of the discharge volume resulting from each sump pump activation, shall be reported in an attachment with each monthly Discharge Monitoring Report (see Footnote #6).

The sampling frequency during the term of the permit may be modified if the permittee provides sufficient justification that less frequent monitoring will adequately characterize the discharge(s) and ensure attainment of water quality standards. The permittee is required to continue sampling as specified in the permit until EPA informs the permittee in writing that the requirements have been modified.

*2. Report the National Weather Service data from the closest location to the facility for which National Weather Service data is available for each sampling event. The permittee will also report the intensity, duration, and volume of each precipitation event during, and for the three (3) days prior to, each sampling event. The precipitation data shall be reported in an attachment with each monthly Discharge Monitoring Report (see Footnote #6).

*3. The permittee will estimate the flow on a daily basis at the discharge point located in manhole #45 (or after manhole #45), and prior to discharge into Gudgeon Brook. Documentation of the method utilized to estimate flows, including information on the accuracy of the method, shall be submitted within 90 days of the effective date of the permit.

*4. The pH of the effluent will not be less than 6.5 nor greater than 8.3 standard units at any time.

*5. *Escherichia coli (E. coli)* bacteria monitoring requirements are effective from April 1st through October 31st. The monthly average values shall be expressed as geometric means.

*6. The permittee will conduct sampling once per week. In addition to being reported on the monthly Discharge Monitoring Report, the individual sampling results, along with the sampling date, the sump pump activation data, and the precipitation data, shall be reported in a table format as an attachment with each monthly Discharge Monitoring Report.

*7. The minimum quantification level (ML) for copper is defined as 3.0 ug/l. This value is the minimum quantification level for copper using the Furnace Atomic Absorption analytical method. Sample results of 3.0 ug/l or less will be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*8. The minimum quantification level (ML) for lead is defined as 3.0 ug/l. This value is the minimum quantification level for lead using the Furnace Atomic Absorption analytical method. Sample results of 3.0 ug/l or less shall be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*9 The minimum quantification level (ML) for cadmium is defined as 0.5 ug/l. This value is the minimum quantification level for lead using the Furnace Atomic Absorption analytical method. Sample results of 0.5 ug/l or less shall be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*10. The permittee will conduct chronic toxicity tests four times per year. The permittee will conduct the chronic tests using the daphnid, Ceriodaphnia dubia and the fathead minnow, Pimephales promelas. Toxicity test samples will be collected during the first full week of the months of March, June, September, and December. The test results will be submitted by the last day of the month following the completion of the test. The results are due April 30th, July 31th, October 31th, and January 31th, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment** A of this permit. Chemical specific monitoring results from quarterly whole effluent toxicity testing can be used to satisfy the weekly monitoring requirement for the same chemical.

Test Dates during first full week of:	**Submit Results By:**	**Test Species**	**Chronic Limit C-NOEC**
March June September December	April 30th July 31th October 31th January 31th	Ceriodaphnia dubia (Daphnid) Pimephales promelas (Fathead minnow) See Attachment A	≥ 100 %

After submitting four consecutive sets of whole effluent toxicity (WET) test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction of the WET testing requirements. The permittee is required to continue testing as specified in the permit until EPA informs the permittee in writing that the requirements have been modified.

*11. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation. The "100%" limit is defined as a sample which is composed of 100% effluent (no dilution). This is a maximum daily limit.

*12. The permittee is authorized to use an alternate dilution water in accordance with Attachment A and is not required to run a receiving water control.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.b. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge effluent from outfall serial number 002 (untreated ground water infiltration, untreated ground water from sump pumps in facility basements, and storm water) to Robinson Brook. Such discharges will be limited and monitored by the permittee as specified below *1

Effluent Characteristic	Units	Discharge Limitation		Monitoring Requirement	
		Average Monthly	Maximum Daily	Measurement Frequency	Sample Type
Rainfall / Precipitation *2	inches	Report	Report	Per Discharge Event	Total
Flow	MGD	Report	Report	Daily *3	See Footnote *3
pH	st. units	(See Footnote *4)		4 /Week	Grab
Copper, Total *5	ug/l	6.1	8.8	See Footnote *6	24-Hour Composite
Lead, Total *7	ug/l	1.7	Report	See Footnote *6	24-Hour Composite
Zinc, Total	ug/l	78.8	78.8	See Footnote *6	24-Hour Composite
Cadmium, Total *8	ug/l	0.2	1.3	See Footnote *6	24-Hour Composite
Aluminum, Total	ug/l	87	Report	See Footnote *6	24-Hour Composite
Iron, Total	ug/l	1000	Report	See Footnote *6	24-Hour Composite
Mercury, Total *9	ug/l	Report	Report	See Footnote *6	24-Hour Composite
Trichloroethylene	ug/l	30	Report	See Footnote *6	Grab
Tetrachloroethylene	ug/l	3.3	Report	See Footnote *6	Grab
Whole Effluent Toxicity, LC_{50} *10,*11,*13	%	—	100	1 /Quarter	24-Hour Composite
Whole Effluent Toxicity, C-NOEC *10,*12,*13	%	—	100	1 /Quarter	24-Hour Composite

Footnotes:

*1. Samples taken in compliance with the monitoring requirements stated above shall consist of a flow weighted composite from manhole #26 and manhole #39. All sampling, preservation, and analysis of samples will be in accordance with EPA approved methods found at 40 CFR Part 136 and all sampling shall be taken at the same time of day and the same day(s) of the week for each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

The permittee shall monitor sump pump discharges from sumps A, B, C, D, E, J, and L on a continuous basis. The time and duration of each sump pump activation, as well as an estimate of the discharge volume resulting from each sump pump activation, shall be reported in an attachment with each monthly Discharge Monitoring Report (see Footnote #6).

The sampling frequency during the term of the permit may be modified if the permittee provides sufficient justification that less frequent monitoring will adequately characterize the discharge(s) and ensure attainment of water quality standards. The permittee is required to continue sampling as specified in the permit until EPA informs the permittee in writing that the requirements have been modified.

*2. Report the National Weather Service data from the closest location to the facility for which National Weather Service data is available for each sampling event. The permittee will also report the intensity, duration, and volume of each precipitation event during, and for the three (3) days prior to, each sampling event. The precipitation data shall be reported in an attachment with each monthly Discharge Monitoring Report (see Footnote #6).

*3. The permittee will estimate the flow on a daily basis from manhole #26 and manhole #39. Documentation of the method utilized to estimate flows, including information on the accuracy of the method, shall be submitted within 90 days of the effective date of the permit.

*4. The pH of the effluent will not be less than 6.5 nor greater than 8.3 standard units at any time.

*5. The minimum quantification level (ML) for copper is defined as 3.0 ug/l. This value is the minimum quantification level for copper using the Furnace Atomic Absorption analytical method. Sample results of 3.0 ug/l or less will be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*6. The permittee will conduct sampling once per week. In addition to being reported on the monthly Discharge Monitoring Report, the individual sampling results, along with the sampling date, the sump pump activation data, and the precipitation data, shall be reported in a table format as an attachment with each monthly Discharge Monitoring Report.

*7. The minimum quantification level (ML) for lead is defined as 3.0 ug/l. This value is the minimum quantification level for lead using the Furnace Atomic Absorption analytical method. Sample results of 3.0 ug/l or less shall be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*8. The minimum quantification level (ML) for cadmium is defined as 0.5 ug/l. This value is the minimum quantification level for lead using the Furnace Atomic Absorption analytical method. Sample results of 0.5 ug/l or less shall be reported as zero on the discharge monitoring report. All sample results that are below the ML but above the method detection limit shall be reported on a separate attached document to be submitted with the monthly discharge monitoring reports.

*9. The minimum quantification level (ML) for mercury shall be 0.2 ug/l. If any future sampling indicates that there are detectable levels of mercury in outfall 002, the permittee shall notify EPA and MassDEP in an attachment to the DMR for that month and within three months of obtaining the sampling result shall, develop and submit a plan to EPA and MassDEP for eliminating the source of the mercury contamination, and within one year of obtaining the sampling result shall complete implementation of the plan and submit a report to EPA and MassDEP documenting the results.

*10. The permittee will conduct chronic (and modified acute) toxicity tests four times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee will conduct the chronic tests using the daphnid, Ceriodaphnia dubia and the fathead minnow, Pimephales promelas. Toxicity test samples will be collected during the first full week of the months of March, June, September, and December. The test results will be submitted by the last day of the month following the completion of the test. The results are due April 30th, July 31th, October 31th, and January 31th, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit. Chemical specific monitoring results from quarterly whole effluent toxicity testing can be used to satisfy the weekly monitoring requirement for the same chemical.

Test Dates during first full week of:	Submit Results By:	Test Species	Acute Limit LC_{50}	Chronic Limit C-NOEC
March June September December	April 30th July 31th October 31th January 31th	Ceriodaphnia dubia (Daphnid) Pimephales promelas (Fathead minnow) See Attachment A	≥ 100 %	≥ 100 %

After submitting four consecutive sets of whole effluent toxicity (WET) test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction of the WET testing requirements. The permittee is required to continue testing as specified in the permit until EPA informs the permittee in writing that the requirements have been modified.

*11. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) will cause no more than a 50% mortality rate.

*12. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation. The "100%" limit is defined as a sample which is composed of 100% effluent (no dilution). This is a maximum daily limit.

*13. The permittee is authorized to use an alternate dilution water in accordance with Attachment A and is not required to run a receiving water control.

Part I.A.1. (continued)

c. In addition to the effluent and monitoring requirements listed in Part I.A.1.a. and b. of this permit, the discharge will not cause or contribute to an exceedance of state water quality standards.

d. There will be no discharge of floating, suspended and settleable solids in concentrations and combinations that would impair any use assigned to Class B waters or would cause aesthetically objectionable conditions or impair the benthic biota or degrade the chemical composition of the bottom.

e. The effluent will be free from oil and grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

2. All existing manufacturing, commercial, mining, and silvaculture 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 CFR Part 122.21(g)(7); or

(4) The level established by the Director in accordance with 40 C.F.R. Part 122.44(f).

b. That activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a 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 (mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR Part 122.21(g)(7).

(4) The level established by the Director in accordance with 40 CFR Part 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.

3. This permit may be modified, or revoked and reissued, on the basis of new information in accordance with 40 CFR §122.62.

4. Toxics Control

a. The permittee will not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent will 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.

5. Numerical Effluent Limitations for Toxicants

EPA or the MassDEP may use the results of the toxicity tests and chemical analysis 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.

B. UNAUTHORIZED DISCHARGES

This permit only authorizes discharge from two outfalls in accordance with the terms and conditions contained herein. Discharges of wastewater from any other point sources not authorized by this permit or other NPDES permit authorizing discharges from this facility, will be reported in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

C. STORM WATER POLLUTION PREVENTION PLAN

1. The permittee shall develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) designed to reduce, or prevent, the discharge of pollutants in storm water to the receiving waters identified in this permit. The SWPPP shall be a written document that is consistent with the terms of this permit. Additionally, the SWPPP shall serve as a tool to document the permittee's compliance with the terms of this permit. Development guidance and a recommended format for the SWPPP are available on the EPA website for the Multi-Sector General Permit (MSGP) for Storm water Discharges Associated with Industrial Activities (http://cfpub.epa.gov/npdes/stormwater/msgp.cfm).

2. The SWPPP shall be completed or updated and certified by the permittee **within 90 days after the effective date of this permit**. The permittee shall certify that its SWPPP has been completed or updated and shall be signed in accordance with the requirements identified in 40 CFR §122.22. A copy of this initial certification shall be sent to EPA and MassDEP **within one hundred and twenty (120) days of the effective date of this permit.**

3. The SWPPP shall be prepared in accordance with good engineering practices and shall be consistent with the general provisions for SWPPPs included in the most current version of the MSGP. In the current MSGP (effective September 29, 2008, modified May 27, 2009), the general SWPPP provisions are included in Part 5.

Specifically, the SWPPP shall document the selection, design, and installation of control measures and contain the elements listed below:

a. A pollution prevention team with collective and individual responsibilities for developing, implementing, maintaining, revising and ensuring compliance with the SWPPP.

b. A site description which includes the activities at the facility; a general location map showing the facility, receiving waters, and outfall locations; and a site map showing the extent of significant structures and impervious surfaces, directions of storm water flows, and locations of all existing structural control measures, storm water conveyances, pollutant sources (identified in Part 3.c. below), storm water monitoring points, storm water inlets and outlets, and industrial activities exposed to precipitation such as, storage, disposal, material handling.

c. A summary of all pollutant sources which includes a list of activities exposed to storm water, the pollutants associated with these activities, a description of where spills have occurred or could occur, a description of non-storm water discharges, and a summary of any existing storm water discharge sampling data.

d. A description of all storm water controls, both structural and non-structural.

e. A schedule and procedure for implementation and maintenance of the control measures described above and for the quarterly inspections and best management practices (BMPs) described below.

4. The SWPPP shall document the appropriate best management practices (BMPs) implemented or to be implemented at the facility to minimize the discharge of pollutants in storm water to waters of the United States and to satisfy the non-numeric technology-based effluent limitations included in this permit. At a minimum, these BMPs shall be consistent with the control measures described in the most current version of the MSGP. In the current MSGP (effective September 29, 2008, modified May 27, 2009), these control measures are described in Part 2.1.2. Specifically, BMPs must be selected and implemented to satisfy the following non-numeric technology-based effluent limitations:

a. Minimizing exposure of manufacturing, processing, and material storage areas to storm water discharges.

b. Good housekeeping measures designed to maintain areas that are potential sources of pollutants.

c. Preventative maintenance programs to avoid leaks, spills, and other releases of pollutants in storm water discharged to receiving waters.

d. Spill prevention and response procedures to ensure effective response to spills and leaks if or when they occur.

e. Erosion and sediment controls designed to stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants.

f. Runoff management practices to divert, infiltrate, reuse, contain, or otherwise reduce storm water runoff.

g. Proper handling procedures for salt or materials containing chlorides that are used for snow and ice control.

5. All areas with industrial materials or activities exposed to storm water and all structural control used to comply with effluent limits in this permit shall be inspected, at least once per quarter, by qualified personnel with one or more members of the storm water pollution prevention team. Inspections shall begin during the 1st full quarter after the effective date of this permit. EPA considers quarters as follows: January to March; April to June; July to September; and October to December. Each inspection must include a visual assessment of storm water samples from each outfall. The permittee shall document the following information for each inspection and maintain the records along with the SWPPP:

a. The date and time of the inspection and at which any samples were collected;

b. The name(s) and signature(s) of the inspector(s)/sample collector(s);

c. Weather information and a description of any discharges occurring at the time of the inspection;

d. Results of observations of storm water discharges, including any observed discharges of pollutants and the probable sources of those pollutants;

e. Any control measures needing maintenance, repairs or replacement; and,

f. Any additional control measures needed to comply with the permit requirements.

6. The permittee shall amend and update the SWPPP within 14 days of any changes at the facility that result in a significant effect on the potential for the discharge of pollutants to the waters of the United States. Such changes may include, but are not limited to: a change in design, construction, operation, or maintenance, materials storage, or activities at the facility; a release of a reportable quantity of pollutants as described in 40 CFR §302; or a determination by the permittee or EPA that the BMPs included in the SWPPP appear to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity.

7. Any amended, modified, or new versions of the SWPPP shall be re-certified and signed by the permittee in accordance with the requirements identified in 40 CFR §122.22. The permittee shall also certify, at least annually, that the previous year's inspections and maintenance activities were conducted, results recorded, records maintained, and that the facility is in compliance with this permit. If the facility is not in compliance with any aspect of this permit, the annual certification shall state the non-compliance and the remedies which are being undertaken. Such annual certifications also shall be signed in accordance with the requirements identified in 40 CFR §122.22. The permittee shall maintain at the facility a copy of its current SWPPP and all SWPPP certifications (the initial certification, re-certifications, and annual certifications) signed during the effective period of this permit, and shall make these available for inspection by EPA and MassDEP. In addition, the permittee shall document in the SWPPP any violation of numerical or non-numerical storm water effluent limits with a date and description of the corrective actions taken.

D. MONITORING AND REPORTING

1. **For a period of 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, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit**, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of

data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: http://www.epa.gov/netdmr. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility 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").

DMRs shall be submitted electronically to EPA 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 shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

b. Submittal of NetDMR Opt-Out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-1)
Boston, MA 02109-3912

And

Massachusetts Department of Environmental Protection
Wastewater Management Program
One Winter Street, 5th Floor
Boston, Massachusetts 02108

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy Discharge Monitoring Report Form(s) (DMRs) postmarked no later than the 15th day of the month following the completed reporting period. All reports required under this permit shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports or notifications required herein or in Part II shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (OES04-SMR)
5 Post Office Square - Suite 100
Boston, MA 02109-3912

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

MassDEP – Southeast Region
Bureau of Air and Waste
20 Riverside Drive
Lakeville, MA 02347

Copies of toxicity tests only shall be sent to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

Any verbal reports, if required in Parts I and/or II of this permit, shall be made to both EPA-New England and to MassDEP.

E. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. 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 a 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.

Exhibit 2

invensys.

Delivered by Hand

October 31, 2011

Stephen Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code ORA18-1
Boston MA 02109-3912

David Pincumbe
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Municipal Permits Branch
5 Post Office Square, Suite 200
Mail Code OEP06-4
Boston, MA 02109-3912

Re: NPDES Permit MA0004120
Invensys Systems, Inc, 38 Neponset Avenue Foxboro, Massachusetts
Comments on the 2011 Draft NPDES Renewal Permit

Dear Mr. Perkins and Mr. Pincumbe:

This letter, along with the attached detailed comments (collectively, the "Comments") prepared by our legal counsel Foley Hoag LLP, is submitted by Invensys Systems, Inc. ("Invensys" or the "Company"), the applicant, in connection with the above-referenced draft NPDES permit issued for public comment by U.S. Environmental Protection Agency ("EPA" or "the Agency") on August 3, 2011 (the "2011 Draft Permit").

The Comments document the many significant flaws in the scientific and legal basis for the permit. Unfortunately, the 2011 Draft Permit fails to make any significant changes in response to comments raised by Invensys in connection with the 2003 Draft Permit (and its predecessor drafts in 2002 and 2001), and our 2005 follow-up comments. The Agency also appears (again) to have ignored or dismissed our comments in summary fashion without proper and adequate consideration and response. One such example is our long-standing request to derive site-specific water quality criteria on which to base numeric effluent limitations, if indeed, such limits are even lawful or necessary.

For the reasons discussed in the Comments, EPA should withdraw the 2011 Draft Permit, so that EPA and Invensys may begin good faith negotiations on a new draft permit – one that accurately reflects the truly *de minimis* environmental impacts of current operations of the Invensys facility and the compelling scientific evidence that the historical discharges from the facility to the Neponset Reservoir have not adversely impacted the Reservoir. Given that the higher historical discharges have not adversely affected the Reservoir, requiring Invensys to spend over ten million dollars to try to further reduce the current discharges cannot be justified on any environmental or human health basis. The 2011 Draft Permit, like its predecessor drafts, ignores facts as it seeks to regulate an "industrial discharge" that no longer exists.

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The current NPDES discharge permit for the Neponset Avenue was issued in 1991 and a timely renewal application was submitted by the Company in November 1996; thus, the facility's NPDES-authorized discharge continues to operate under the terms of the 1991 Permit until EPA issues a renewal permit. The 1991 Permit authorizes a discharge to the Neponset Reservoir (i.e. "Outfall 001"). Outfall 001 has been the subject of an NPDES permit since the original NPDES permit was issued in 1974 and it has discharged to the same place throughout the entire period. In all previous iterations of the permit, Outfall 001 is described as discharging *"to receiving waters named Neponset Reservoir."* Yet, in the 2011 Draft Permit, EPA changes, without ***any*** explanation, the identification of the receiving waters to "Gudgeon Brook/Neponset Reservoir" and then inconsistently shifts between the Brook and the Reservoir in its Fact Sheet and Draft Permit, seemingly for the purpose of crafting the most-stringent numeric discharge limits possible and/or to validate its dismissal of the vast body of site-specific ecotoxicological information which demonstrates that the historical Outfall 001 discharge has ***not*** adversely impacted the Neponset Reservoir.

The 2011 Draft Permit also for the first time seeks to regulate a second outfall (i.e. Outfall 002) for stormwater and groundwater that discharges to Robinson Brook. Robinson Brook is an intermittent stream and, as demonstrated in the Comments, the Agency has failed to provide a jurisdictional determination that the discharge from Outfall 002 is subject to EPA jurisdiction under the Clean Water Act. Even if EPA were to establish jurisdiction over the discharge from Outfall 002, EPA has also failed to provide a sufficient basis for termination of coverage under the existing Multi-Sector General Permit (MSGP) requirements that Outfall 002 has operated under since 2000.

From an operational standpoint, much has changed in the past twenty (20) years since the 1991 Permit was issued. Despite these changes, EPA's 2011 Draft seeks to impose onerous and over-reaching conditions on Outfall 001[1] to control sources or operations that no longer exist or that are already more than adequately controlled. Manufacturing operations have been significantly scaled-back and the facility's chemical use / environmental footprint has been minimized to a small fraction of what it once was. All hazardous material storage and handling have been moved indoors or are conducted inside roofed secondary containment structures outfitted with blind sumps. Best management practices (BMPs) are in place and have been adhered to as part of the facility's stormwater management pollution prevention plan (SWPPP). Yet, the 2011 Draft Permit seemingly ignores these improvements and proceeds under the false premise that the Neponset Avenue facility of 2011 exists in a pre-1991 industrial operations mode.

The nature and composition of the discharge has dramatically changed since the issuance of the 1991 Permit as well. Today, the effluent consists only of stormwater and groundwater. The industrial component (i.e. effluent from the pretreatment of electroplating rinse waters containing cadmium and other heavy metals) of the NPDES discharge was eliminated in 1988 by a tie-in to the Mansfield municipal treatment works. The non-contact cooling water component of the NPDES discharge was eliminated in 1994 by the installation of a closed-loop water recycling system which eliminated the introduction of anti-scaling treatment chemicals from the discharge and reduced effluent flow into the Neponset Reservoir by 90+ million gallons of water on an annual basis. A dry weather treatment system (for volatile organic compounds, or "VOCs") was installed in 1995 to remove trace VOCs from the effluent during non-storm

[1] Similarly onerous and over-reaching conditions are also proposed to apply for new Outfall 002 (Robinson Brook). Notwithstanding our position that Outfall 002 has no place in this individual NPDES permit and is either exempt from CWA requirements or should be subject to MSGP, the basic arguments against the numeric standards and monitoring measures proposed in the 2011 Draft Permit for Outfall 001 extend to Outfall 002 as well.

periods; the VOC concentrations were later determined to pose no significant risk to human health or the environment, but the Company opted to continue to operate the dry weather treatment system as a sign of good faith and environmental stewardship. A 1997-98 comprehensive drainline cleanout program for the Outfall 001 pipeline segment removed tons of accumulated sediment and debris, flushed clean thousands of linear feet of drainline, and achieved significant reductions in metals and VOC mass loading as a result. In the case of cadmium, the average effluent concentration in 2011 is 92% lower than it was in the pre-1997 pre-cleanout period. Years of monthly Discharge Monitoring Report (DMR) monitoring confirm this reduction in contaminant mass over time. Moreover, Whole Effluent Toxicity (WET) testing conducted at Outfall 001 on a quarterly basis for two (2) aquatic species (i.e. *C. dubia* and *P. promelas*) unequivocally demonstrates that the effluent is not toxic:

A. For the period 1994-Q1 through 2011-Q2 (i.e., the post-NCCW period to now)

- Number of quarterly WET sampling events = 70 quarters (17.5 years)
- Number of test results with less than 100% survival = 2
  - 1994-Q1; *C. dubia* = 42.36%
  - 2002-Q1; *C. dubia* = 83.00%
- Percent Pass = [(70 events x 2 species/event) – 2 fails] / 140 = 138/140 * 100% = 98.57%

B. For the period 2001-Q1 through 2011-Q2 (i.e., since the last test failure)

- Last test failure = 2001-Q1 (*C. dubia*; 83.00%)
- Number of quarterly WET sampling events = 37 quarters
- Number of years since last failure = 37 quarters / 4 quarters/year = 9.25 years
- Number Pass = (37 events x 2 species/event)] = 74 tests (100%)

Invensys has invested millions of dollars to minimize chemical/water usage; upgrade or replace infrastructure; develop and implement pollution prevention planning and training programs; and remove decades-in-the-making legacy impacts of sediment accumulation in the drainage system. Long-term testing confirms the success of those efforts in reducing mass loading over time and confirming the non-toxic nature of the discharge. And yet, with little to no explanation or justification, and with seeming indifference to the actual current data, EPA proposes to establish numeric effluent discharge limits that are so extraordinarily low that, in the case of cadmium, the proposed limit is actually lower than the laboratory detection limit.

As described in the detailed Comments, the scale and cost of engineering alternatives required to even ***try*** to meet the numeric criteria are enormous. Water treatment systems would require a massive storage/collection system to hold upwards of 2 million gallons of water and a state-of-art treatment (e.g., ion exchange) technology with capital costs in the range of $6-17 million dollars and annual operating/energy costs are in the range of $80-892 thousand dollars. And yet, even with these enormous expenditures, there is no guarantee that any advanced treatment system would be capable of consistently achieving compliance with the extraordinarily low proposed limits. At the same time, Invensys would be required to implement an overly burdensome and unnecessary weekly compliance monitoring program that will cost nearly $200 thousand dollars in new equipment and expense and add tens of thousands of dollars in additional annual compliance administration costs.

Finally, to add insult to injury, this immense engineering and data collection effort would have to be instituted without the benefit of a compliance schedule. The lack of a compliance schedule is particularly frustrating, given that the 2003 Draft Permit acknowledged the need for a compliance schedule. Nothing has changed since that time that would warrant elimination of a compliance schedule.

Onerous permit conditions such as those proposed by the Agency in this case ***might*** have had some degree of merit in the 1990s, prior to the operational changes at the facility and, particularly, prior to the accumulation of the overwhelming body of evidence demonstrating the health of Neponset Reservoir. At this point in time, however, there is an enormous and compelling body of site-specific scientific data gathered as part of the MCP Phase II Comprehensive Site Assessment (CSA) approved by MassDEP in 2006. The Phase II CSA demonstrated that the Reservoir is an active and abundant ecological system in which Constituents of Concern (COCs) are present, but at concentrations that present No Significant Risk of harm to human health, public welfare or safety, and no indication of any potential for biologically significant harm.

Specific individual Phase II findings have demonstrated that:

- There is No Significant Risk of harm to Human Health
  - Based on an MCP Method 3 Human Health Risk Characterization, exposure to COCs present in sediment, surface water, fish tissue, and groundwater at the Reservoir does not pose a significant risk of harm to human health.
- The Reservoir reflects an active, diverse and abundant ecological setting
  - The Reservoir contains a variety of upland, wetland, and aquatic habitats that support a diverse assemblage of wildlife species. The convoluted shoreline, shallow bays (some with extensive aquatic vegetation and dead wood), and many islands provide a unique interspersion of habitats which seem to be favored by numerous species. The Reservoir and its surrounding habitats provide extensive cover, foraging, and breeding resources for a diverse variety of birds, mammals, reptiles, and amphibians. Aquatic and semi-aquatic mammals, including river otter and raccoon, likely forage in and around the Reservoir year-round.
  - The Reservoir supports a number of fish species and is a popular fishing area. The fish community structure is typical of New England lakes and ponds and includes species such as largemouth bass, sunfish, shiners, perch, pickerel, and bullheads. Fish meristics are within the normative range and the species composition in the Reservoir is essentially the same as it was in the 1950's and comparable to those in unimpacted waterbodies of a similar setting.
  - There is a high use of the Reservoir by waterfowl, cormorants, kingfisher, great blue heron, and osprey which feed on the fish and aquatic organisms.
- Reservoir conditions do not result in any Critical Exposure Pathways; do not pose an Imminent Hazard; do not pose a Substantial Hazard to Human Health; do not present a Cumulative Receptor Cancer / Non-Cancer Risk; do not present a Significant Risk of Harm to Human Health, Public Welfare or Safety; and do not pose a Substantial Hazard to the Environment as those terms are defined under 310 CRM 40.0000.

- There is no evidence of stressed biota attributable to the release at the Reservoir, including without limitation, fish and wildlife kills or abiotic conditions.

- There is no evidence of significant biological harm to invertebrates (e.g., worms), plankton, fish, birds or other wildlife. While some individual measures of effect evaluated in the Phase II CSA showed slight impairment, the effects were small and were not correlated with contaminant concentrations in the surface water.

- The Phase II risk characterization used a weight-of evidence approach to assess the environmental risk in the Reservoir. The approach, which was described in detail in the approved Phase II Scope of Work takes into account the strengths and weaknesses of different measurement methods when determining whether the results show that a stressor (e.g., heavy metals) has caused, or could cause, a harmful ecological effect. The Phase II risk evaluation program resulted in a conclusion that, based on 23 lines of evidence, adverse effects of COCs in the Neponset Reservoir – to the extent that there are any effects – are minimal/negligible and collectively provide no evidence of a significant risk of harm to the environment.

The Phase II findings were the result of years of work by highly qualified environmental professionals, including risk assessment and ecological experts, and were subject to searching public review before ultimately being approved by MassDEP in 2006. Yet, the 2011 Draft Permit raises theoretical possibilities for risk while ignoring actual site-specific data which demonstrate that cadmium and the other constituents in the Reservoir system—the very same constituents present in the permitted discharge—do not pose a significant risk of harm.

As the Comments demonstrate, we have researched dozens of stormwater permits in Region 1 (some of which address stormwater combined with contaminated groundwater). Almost none of them impose numeric effluents limitations; they instead rely on BMPs rather than multi-million dollar engineered treatment options. Moreover, none of those permits contained monitoring requirements anywhere near as onerous as those which the 2011 Draft Permit would impose. These differences are so extreme that they raise troubling questions of fundamental fairness. Indeed, given the extensive site-specific knowledge about the negligible impacts that historic discharges have had on the Reservoir, such disparate treatment is, at face value, arbitrary and capricious. Without justifying this disparate treatment, and the record contains no hint of any such justification, the Agency cannot treat Invensys differently than similarly situated parties.

Invensys has always taken, and will continue to take, its environmental obligations seriously. We remain committed to working with the Agency to implement reasonable, cost-effective, and environmentally necessary measures that will result in actual benefits to the watershed and the environment. However, the excessively stringent limitations and other overly burdensome requirements in the 2011 Draft Permit will not produce any such benefits. EPA should:

- Withdraw the 2011 Draft Permit;

- Acknowledge that Outfall 002 (Robinson Brook) is not subject to CWA jurisdiction or, in the alternative, keep it under the MSGP program;

- Engage in good faith negotiations on a renewal permit for Outfall 001 (Neponset Reservoir) that is based on BMPs and reasonable compliance monitoring rather than numeric limits and weekly monitoring;

- If, following such negotiations, the parties agree that numeric limits are necessary, support and approve Invensys's request to develop alternative site-specific water quality criteria as we proposed to do 2003 and propose again as part of these Comments.

There is overwhelming evidence that the Neponset Reservoir is healthy. EPA does not even begin to address this evidence in the 2011 Draft Permit. There is a total disconnect between the onerous terms in the Draft Permit and the healthy ecosystem. It is as though EPA were trying to solve a problem that does not, in fact, exist. It is not just arbitrary and capricious, as our attorneys' legal arguments have demonstrated. It is grossly unfair and unnecessary, because the cost to solve this non-existent problem will be borne by Invensys, which has already incurred substantial costs in both eliminating the historical industrial discharge from the facility and in demonstrating that the historical discharge has not adversely impacted the Reservoir. The agency simply cannot justify the stringent limits it would impose on the remnant discharge when the industrial discharge is long-gone and the Reservoir is currently healthy

As explained in detail in these Comments, any decision by EPA to finalize the 2011 Draft Permit would be arbitrary and capricious and would not survive judicial review. Invensys will promptly appeal any decision by EPA to finalize the 2011 Draft Permit.

Sincerely,

Paul A. Ahearn
Director of Special Projects – Environmental

Enclosure

cc: Ann Lowery, MassDEP
Kimberly Groff, MassDEP
Seth D. Jaffe, Esq. – Foley Hoag

COMMENTS OF INVENSYS SYSTEMS, INC. ON
DRAFT NPDES PERMIT MA 0004120
38 Neponset Avenue, Foxboro, MA

INTRODUCTION 1

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INTRODUCTION

The following comments on the above referenced draft National Pollutant Discharge Elimination System ("NPDES") permit (the "2011 Draft Permit") are submitted on behalf of the applicant, Invensys Systems, Inc. ("Invensys").

In preparing its comments, Invensys and its consultant have reviewed the 2011 Draft Permit and related Fact Sheet, as well as information contained in the administrative record for the 2011 Draft Permit and other relevant information.[1] As a result of this review, Invensys has identified significant flaws in the scientific and legal basis underlying the 2011 Draft Permit. Many of these flaws were previously identified by Invensys in comments it submitted on a draft permit for the Invensys Systems Facility (the "Facility") that was publicly noticed on February 4, 2003 (the "2003 Draft Permit").[2] Those comments[3] detailed the United States Environmental Protection Agency's ("EPA" or the "Agency") failure to provide scientific support or a reasoned explanation for the extremely stringent permit conditions proposed in the 2003 Draft Permit. The 2003 Comments also noted that EPA had ignored its own regulations and guidance, regulations and guidance issued by the Massachusetts Department of Environmental Protection ("MassDEP") and extensive scientific analysis and data regarding the environmental impacts of the subject discharges.

Unfortunately, the 2011 Draft Permit fails to incorporate significant changes in response to the arguments raised by Invensys in the 2003 Comments. In fact, in many respects the 2011 Draft Permit is even more stringent, unreasonable and burdensome than the 2003 Draft Permit. As a result, these comments address many of the same serious flaws that Invensys identified in the 2003 Comments.[4] Like the 2003 Draft Permit, the 2011 Draft Permit contains serious conceptual and analytical errors, including:

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[1] Invensys has identified a number of documents that are relevant to the permit proceeding but which are not currently included in the record. These materials are referred to and their relevance described herein. Invensys respectfully requests that the record be supplemented to include such documents, copies of which are being provided. Further, Invensys notes that on October 15, 2010, via a letter from Paul Ahearn (Invensys) to Brian Pitt (EPA), Invensys provided the Agency with a copy of various technical documents related to the assessment of the Neponset Reservoir (the "Reservoir"), including the January 2003 Phase II Comprehensive Site Assessment (the "Phase II) and related documents. Further, Mr. David Pincumbe has received copies of all submittals related to the Reservoir as a designated recipient on the Site mailing list under the Public Information Plan for the Site. However, copies of the Phase II and related documents were not included in the 2011 Draft Permit record made available for Invensys' review. Because the findings of the Phase II are highly relevant to the permit proceeding, Invensys requests that the Agency ensure that the entirety of the Phase II and related documents are included in the record. As these documents were previously provided to the Agency, and in light of their substantial length, Invensys has not included an additional copy of the documents with this submittal. However, should the Agency require additional copies of the Phase II and related documents to include in the record, Invensys will provide them at the Agency's request.

[2] A final permit was not issued following publication of the 2003 Draft Permit.

[3] Invensys submitted comments on the 2003 Draft Permit on April 4, 2003 (the "2003 Comments").

[4] Because many of the flaws identified in the 2003 Comments are also relevant to the 2011 Draft Permit, Invensys incorporates by reference its 2003 Comments.

- The Agency failed to provide scientific support or a reasoned explanation for the extremely stringent permit conditions proposed in the 2011 Draft Permit.

- EPA ignored extensive scientific analysis and data regarding the environmental impacts of the subject discharges.

- EPA acted inconsistently with its own regulations and guidance, as well as regulations and guidance issued by the MassDEP.

- Finally, EPA acted inconsistently with recent permitting determinations in Region 1 governing discharges of comingled storm water and groundwater by developing permit requirements that appear to be virtually unprecedented in their stringency for a discharge that contains no industrial process water whatsoever.

As a result of these conceptual and analytic errors, Invensys has identified, among others,[5] the following specific problems with the 2011 Draft Permit, which are addressed in more detail herein:

1. Rather than relying on Best Management Practices ("BMPs"), the 2011 Draft Permit contains stringent numeric effluent limits for toxics. The Agency's imposition of numeric effluent limits is inappropriate in this case. Pursuant to long-standing Agency policy, the use of BMPs in lieu of numeric limits is permissible and appropriate for regulating storm water discharges in circumstances such as those present here. EPA's purported justifications for not acting consistently with such policy are unconvincing. The Agency's assertion that it has sufficient data on which to base numeric limits is belied by its own claim that weekly sampling is necessary to adequately characterize the discharge. In addition, the Agency has provided no support for its assertion that the use of additional BMPs would be insufficient to attain water quality criteria. Further, the incorporation of numeric limits is inconsistent with the Agency's permitting determinations in other recent cases involving similarly situated parties, which rely on BMPs for the regulation of both storm water and groundwater discharges.

2. The numeric effluent limits proposed in the 2011 Draft Permit are based on EPA's flawed application of the National Recommended Water Quality Criteria ("NRWQC").[6] Moreover, even if numeric limits were to be imposed, the facts of this case strongly support the development of permit limits based on site-specific water quality criteria ("SSWQC"). Specifically, the permitted discharges are not causing toxicity in the receiving waters, the receiving waters do not contain many of the species on which the NRWQC are based, and the costs of complying with the NRWQC far outweigh any

[5] In addition to these Comments, Invensys is submitting Table 1, attached hereto, which contains additional comments on specific aspects of the 2011 Draft Permit and Fact Sheet.

[6] While Invensys recognizes that the NRWQC have, for certain constituents, been incorporated into the 2011 Draft Permit by the Agency through the Massachusetts Surface Water Quality Standards, Invensys refers to the NRWQC, rather than the Massachusetts standards, throughout these Comments in an attempt to be consistent with the language used in the Fact Sheet.

environmental benefits that could come from compliance. Invensys has previously requested development of SSWQC, but neither EPA nor MassDEP ever responded to Invensys' proposal to gather the information necessary to develop those criteria.

3. Even if the use of numeric effluent limits based on NRWQC were appropriate, EPA's calculations of such limits are fundamentally flawed. First, EPA failed to conduct an adequate analysis of the Facility's reasonable potential to exceed water quality standards prior to developing the numeric effluent limits contained in the 2011 Draft Permit. In addition, the Agency arbitrarily based its calculations on an unreasonably conservative water hardness value of 50 mg/l – a value lower than any hardness value observed in the effluent – resulting in unreasonably conservative effluent limits.

4. Prior permits identified the Neponset Reservoir as the receiving water for the Outfall 001 discharge. The 2011 Draft Permit identifies the receiving water as "Gudgeon Brook/Neponset Reservoir", and focuses on Gudgeon Brook as the receiving water for purposes of dilution. The Agency has failed to provide any explanation for its departure from its prior practice of focusing on the Reservoir as the receiving water.

5. The Agency identifies Robinson Brook as the receiving water for discharges from Outfall 002. However, Robinson Brook is an intermittent stream, and the Agency has failed to document in the administrative record a determination that it has jurisdiction over Robinson Brook. Absent such a determination, the Agency has no authority to require a permit for the discharge.

6. The 2011 Draft Permit contains a number of monitoring requirements that are unnecessary, unreasonably burdensome, and clearly excessive. Despite Agency guidance that indicates that the "potential cost to the permittee" should be a consideration in establishing monitoring requirements, the 2011 Draft Permit imposes extremely costly monitoring requirements, the need for which EPA has not even begun to justify. Invensys has been unable to identify other permits issued by Region 1 that contain monitoring requirements nearly as onerous as those the Agency has sought to impose here.

7. The Agency failed to include a compliance schedule despite the fact that inclusion of such a schedule is authorized under applicable laws and regulations, and immediate compliance with the limits imposed in the 2011 Draft Permit is not possible. In fact, Invensys' consultants estimate that it would take approximately two (2) to three (3) years to implement costly treatment technologies necessary to achieve compliance with the stringent limits contained in the 2011 Draft Permit. Moreover, it is not even known at this time whether such technologies would even be able to attain compliance with such limits. The failure to include a schedule of compliance in the 2011 Draft Permit is patently unreasonable.

While Invensys is willing to work with the Agency to implement cost-effective solutions that will result in actual benefits to the relevant watersheds and environment, Invensys does not believe that the excessively stringent limitations and overly burdensome monitoring requirements proposed in the 2011 Draft Permit will produce such benefits.

This is true for two primary reasons. First, EPA appears to be approaching this facility with a set of assumptions that are no longer true. EPA has issued a permit that regulates the discharge as though it were industrial wastewater. As discussed below, however, all industrial process water was eliminated from the discharge many years ago. Therefore, the stringent conditions proposed in the 2011 Draft Permit are no longer necessary. The current discharge, comprised solely of storm water and groundwater, should be regulated consistent with other such sites, where no process water is present. Second, EPA's approach does not fit the needs of the receiving waters here. The constituents present in the storm water and groundwater being discharged have been demonstrated not to pose a substantial human health or ecological risk to the Neponset Reservoir, and should not pose such risks to Gudgeon Brook or Robinson Brook. In addition, as Invensys has commented in the past, permit limits based on EPA's NRWQC are not necessary for protection of those waters. Instead, an appropriate permit should be based on scientifically supported SSWQC, properly tailored to the characteristics of, and aquatic life present in, the receiving waters.

As a result of the serious flaws contained in the 2011 Draft Permit and Fact Sheet, the 2011 Draft Permit should be withdrawn. A replacement draft permit incorporating the use of BMPs for the control of pollutants, rather than overly stringent numeric limitations, should be issued in its place. Alternatively, issuance of a replacement draft permit should be deferred until information necessary for the derivation of SSWQC, on which more appropriate effluent limitations can be based, is developed.

I. <u>Overview of Historical and Current Conditions at the Facility</u>

The Facility has been subject to NPDES permits for Outfall 001 since the 1970s. The discharge was originally permitted in 1974 and has since been authorized under a series of renewals. The current NPDES permit was issued in 1991, and a timely renewal application was submitted by Invensys in 1996. The Facility has been subject to a multi-sector general storm water permit for Outfall 002 since the 1990s.

Since the initial issuance of those permits, Invensys has made significant operational and process changes and improvements at the Facility in order to reduce its potential impact on the environment. Manufacturing operations have been significantly scaled back, and the Facility's chemical use has been minimized. Currently all raw materials used at the Facility are stored indoors. Bulk containers for scrap metal are stored in an outdoor roofed secondary containment area outfitted with blind sumps. Hazardous wastes are stored in containers in designated indoor storage areas. As a result, the storm water discharged from the site is no longer exposed to industrial activities. BMPs are in place and have been adhered to as part of the Facility's storm water pollution prevention plan ("SWPPP").

Further, while prior permits authorized the discharge of treated industrial wastewater, non-contact cooling water and storm water to the Neponset Reservoir, the discharges of industrial wastewater and non-contact cooling water were eliminated many years ago. Beginning in 1988, Invensys made significant changes to its operations in order to reduce the discharge of pollutants to receiving waters. In June 1988, Invensys eliminated its discharge of industrial wastewater to the Reservoir by diverting such wastewater to the Town of

Mansfield sewer system. In 1994, Invensys installed a closed-loop cooling system, significantly reducing its water usage and eliminating the discharge of non-contact cooling water to the Reservoir. As a result, there are currently *no industrial process discharges* through either of Outfall 001 or Outfall 002. Rather, Outfalls 001 and 002 function as discharge points only for storm water, groundwater infiltration, and discharges of groundwater from sump pumps dewatering the basements of the facility.

In addition to eliminating industrial discharges to the receiving waters, Invensys has expended significant resources on improvements intended to minimize discharges of pollutants to the environment. In 1995, Invensys began treating dry weather flows prior to discharge to Outfall 001 in order to remove VOCs from groundwater collected by the storm drain system. The treatment system is designed to treat dry weather flows of up to 60 gallons per minute, and consists of a stripper and two vapor phase carbon drums. While the VOC concentrations were subsequently determined to pose no significant risk to human health or the environment, Invensys nonetheless opted to continue the dry weather treatment operation. In 1997, Invensys undertook a cleanout of the Outfall 001 drain line system to remove accumulations of sediment and waste materials believed to be a potential source of constituents, which had built up during the period when the facility had been discharging industrial wastewater. The drain line cleanout resulted in a substantial reduction in the concentrations of metals in the discharge.[7] In fact, in the case of cadmium, the average effluent concentration today is approximately 92 percent lower than it was during the period prior to the drain line cleanout.[8] A comparable cleanout of the Robinson Brook drain line system was completed in 2003.

Invensys has also, since 1995, been engaged in a comprehensive site assessment process under Mass. Gen. Laws c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan ("MCP") related to the Neponset Reservoir. As a result of those efforts, extensive data have been gathered on environmental conditions in the Reservoir. Specifically, the Phase II was completed in 2000. The results of the Phase II demonstrate that the levels of constituents present in the Reservoir do not pose a significant risk to human health or the environment.[9] Specifically, the Phase II findings have demonstrated that:

- There is No Significant Risk of harm to Human Health

[7] Release Abatement Measure Completion Report prepared for Invensys by Environmental Science & Engineering, Inc., Neponset Reservoir, DEP Release Tracking No. 4-11387, Tier 1A Permit No. 138020 (October 25, 1999), Table 10; see also Fact Sheet, p. 4.

[8] See Attachment 1 hereto, summarizing historical Outfall 001 cadmium data.

[9] The exceedances of the NRWQC, which fail to consider site-specific conditions and species, currently preclude attainment of a formal condition of "No Significant Risk" under the MCP. However, all of the site-specific data gathered concerning environmental conditions in the Reservoir did not indicate the existence of significant risk. Unfortunately, the Agency appears to have ignored these results in developing the limitations proposed in the 2011 Draft Permit.

- Based on an MCP Method 3 Human Health Risk Characterization, exposure to Contaminants of Concern ("COCs") present in sediment, surface water, fish tissue, and groundwater at the Reservoir does not pose a significant risk of harm to human health.

- The Reservoir reflects an active, diverse and abundant ecological setting

  - The Reservoir contains a variety of upland, wetland, and aquatic habitats that support a diverse assemblage of wildlife species. The convoluted shoreline, shallow bays (some with extensive aquatic vegetation and dead wood), and many islands provide a unique interspersion of habitats which seem to be favored by numerous species. The Reservoir and its surrounding habitats provide extensive cover, foraging, and breeding resources for a diverse variety of birds, mammals, reptiles, and amphibians. Aquatic and semi-aquatic mammals, including river otter and raccoon, likely forage in and around the Reservoir year-round.

  - The Reservoir supports a number of fish species and is a popular fishing area. The fish community structure is typical of New England lakes and ponds and includes species such as largemouth bass, sunfish, shiners, perch, pickerel, and bullheads. Fish meristics are within the normative range and the species composition is essentially the same as it was in the 1950s and comparable to those in unimpacted waterbodies of a similar setting.

  - There is a high use of the Reservoir by waterfowl, cormorants, kingfisher, great blue heron, and osprey which feed on the fish and aquatic organisms.

- Reservoir conditions do not result in any Critical Exposure Pathways; do not pose an Imminent Hazard; do not pose a Substantial Hazard to Human Health; do not present a Significant Risk of Harm to Human Health, Safety or Public Welfare; and do not pose a Substantial Hazard to the Environment as those terms are defined under 310 CMR 40.0000.

- There is no evidence of stressed biota attributable to the release at the Reservoir, including without limitation, fish and wildlife kills or abiotic conditions.

- There is no evidence of significant biological harm to invertebrates (e.g., worms), plankton, fish, birds or other wildlife. While some individual measures of effect evaluated in the Phase II CSA showed slight impairment, the effects were small and were not correlated with constituent concentrations in the surface water.

- The Phase II risk characterization used a weight-of evidence approach to assess the environmental risk in the Reservoir. The approach, which was described in detail in the approved Phase II Scope of Work ("SOW"), takes into account the strengths and weaknesses of different measurement methods when determining whether the results show that a stressor (e.g., heavy metals) has caused, or could cause, a harmful ecological effect. The Phase II risk evaluation program resulted in a conclusion that, based on the 23 lines of evidence, adverse effects of COCs in the Neponset Reservoir – to the extent that there are any effects – are minimal/negligible and collectively provide no evidence of a significant risk of harm to the environment.

The Phase II findings were the result of years of work by highly qualified environmental professionals, including risk assessment and ecological experts, and were subject to searching public review before ultimately being approved by MassDEP in 2006.

The body of site-specific information developed in the Phase II assessment provides a critical and directly applicable understanding of the potential impact that the permitted effluent has on the Neponset Reservoir ecosystem. The conclusions of the Phase II, coupled with the fact that concentrations of metals in the discharge today are significantly lower than the historic concentrations that led to the conditions studied in the Reservoir in the first place, provide a strong argument that no further reductions are necessary to protect the Reservoir.

Unfortunately, in developing the 2011 Draft Permit, the Agency appears to have completely ignored relevant facts concerning the current operations at the Facility as well as the wealth of available information demonstrating that the constituents present in the discharge do not pose a significant risk to human health or the environment.

II. The Agency has Failed to Justify the Extremely Stringent Permit Conditions Proposed

In developing permit conditions for a NPDES permit, the Agency is obligated to establish a record basis for the draft permit and to provide an adequate explanation of why individual permit conditions are reasonable in light of that record and applicable law.

More specifically, the Agency is required to comply with the following requirements:

- The Agency's determination of permit requirements must be based on factual information in the administrative record for the draft permit.[10] Mere speculation cannot be used in place of record evidence.[11]

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[10] See 40 CFR § 124.9 (stating that the provisions of a draft permit "shall be based on the administrative record").

[11] See Edison Electric Institute v. U.S. EPA, 2 F.3d 438, 446 (D.C. Cir. 1993) (application of toxicity characteristic rule to certain mineral processing wastes based on the view that the wastes "can plausibly be disposed in municipal landfills" was no more than speculation where EPA provided no factual information suggesting this actually occurred); see also Corrosion Proof Fittings v. EPA, 947 F.2d 1201, 1227 (5th Cir. 1991) ("Musings and conjecture are 'not the stuff of which substantial evidence is made.'"); Memphis Light, Gas & Water Div. v. FPC, 504 F.2d 225, 234 (D.C. Cir. 1974) (an agency's decision cannot be based on "mere fears for the future but facts and findings, a statement of the reasons that is supported by concrete inferences from substantial evidence, and is not to be snatched from the air on a purely hypothetical 'worst case' analysis").

- EPA must adequately explain its reasoning in the record and fact sheet in order to provide adequate notice of the grounds for selecting the requirements at issue.[12] Evidence not made available in the draft permit, and therefore not subject to public comment, cannot be relied upon in the final permit.[13]

- The Agency must ensure that the data and analysis relied upon are accurate and have a sound scientific basis.[14] The Agency may not ignore contradictory information placed before it by the permittee.[15]

In this case, the record compiled by the Agency contains no factual information or analysis that could justify or explain the limits and conditions proposed in the 2011 Draft Permit. The only explanation proffered by the Agency is the Fact Sheet itself.

As the following sections explain, the Agency has not adequately justified the imposition of the excessively stringent permit conditions it has proposed. In particular, the Agency has failed to provide an adequate explanation for its imposition of excessively stringent effluent limits based on the NRWQC or for its imposition of unnecessary, costly and unprecedented monitoring requirements for a discharge comprised solely of storm water and groundwater. In addition, numerous provisions of the 2011 Draft Permit are erroneous or ambiguous. Finally, the Agency's failure to include a schedule for coming into compliance with the permit limits in order to allow Invensys to implement extremely complicated and costly technologies required to achieve the permit limits, if such limits can in fact be achieved, is arbitrary, capricious, and contrary to federal and state regulations. Each of these errors must be corrected in the final permit.

[12] See 40 CFR § 124.56 (identifying requirements for fact sheets); In re: Vulcan Construction Materials, LP, (EAB, March 2, 2011), p. 18 (remanding when EPA provided only "a cursory explanation of how the analysis was conducted" and noting that, on remand, EPA must make its analysis available to the public for comment); In re: ConocoPhillips, 13 E.A.D. 768, 793 (EAB, June 2, 2008) (remanding where the record did not contain a discussion of the basis of the decision or proof of the agency's analysis, but only "conclusory statements" about what is appropriate "with little to no analysis to support that determination"); see also In re: Knauf Fiber Glass, 1999 WL 64235, *43 (EAB, February 4, 1999) (where the record contained only the conclusory statement of a staff member on the potential environmental justice impacts of a proposed permit action, agency was instructed to make full analysis of issue available for public comment on remand); In re: Hawaii Electric Light Co., Inc., 1998 WL 830633, *30 (EAB, November 25, 1998) (where data offered by EPA in support of its permit determination were not in record and therefore were "not . . . subject to public scrutiny and comment" permit would be remanded to agency for a new notice and comment period on that data).

[13] Id.

[14] See Appalachian Power Co. v. EPA, 251 F.3d 1026 (D.C. Cir. 2001) (remanding regulation where agency relied on models producing seemingly implausible results despite the availability of better evidence in the record).

[15] See Chemical Manufacturers Assoc. v. EPA, 28 F.3d 1259, 1265-66 (D.C. Cir. 1994) (rule set aside where agency failed to respond to detailed criticisms of the model on which the rule was based with anything but conclusory statements and speculative assertions); see also Natural Res. Def. Council, Inc. v. EPA, 822 F.2d 104, 111 (D.C. Cir. 1987) ("an agency rule is arbitrary and capricious if the agency . . . ignores important arguments or evidence"); Lorion v. United States Nuclear Regulatory Comm'n, 785 F.2d 1038, 1042 (D.C. Cir. 1986) ("an agency has a duty to consider all the evidence").

III. The Imposition of Effluent Limits for Toxics Is Unreasonable and Arbitrary

The application of the NRWQC to establish stringent numeric effluent limits for Outfalls 001 and 002 is unnecessary and inconsistent with applicable regulations and policy regarding the use of BMPs in lieu of numeric effluent limits to regulate storm water discharges in circumstances such as those present in this case, as well as the Agency practice with respect to other, similarly situated permittees. Further, to the extent that numeric effluent limits are to be established for these discharges, the appropriate approach would be to establish limits for the discharges based on SSWQC. If the Agency persists in its approach of arbitrarily and capriciously applying effluent limits based on the NRWQC, however, the Agency's calculations must be corrected.

In sum, EPA should eliminate the proposed numeric limits in favor of the use of BMPs. Alternatively, the Agency should delay issuance of the 2011 Draft Permit or withdraw the proposed effluent limits for toxics from the 2011 Draft Permit and allow Invensys an opportunity to develop appropriate SSWQC on which to base limits for the discharges.

A. The Use of BMPs Is Appropriate in this Case

The Agency's imposition of numeric limits is inappropriate in the present circumstances. Here, where the discharges at issue contain only storm water and groundwater (i.e., *no industrial discharges* such as process wastewater or non-contact cooling water), the discharges are variable in terms of flow and pollutant concentrations, additional monitoring data are needed to properly characterize the effluent, and numeric limits are not necessary to provide adequate water quality protection, the use of BMPs is both permissible and appropriate under the Agency's long-established policies. The use of BMPs in lieu of numeric criteria is also consistent with the Agency's recent permitting decisions in Region 1 in similar scenarios.

That the Agency may use BMPs in lieu of numeric limitations in appropriate circumstances is clear.[16] Further, as Invensys explained at length in 2003, the Agency's policy regarding the development of water quality-based standards for storm water discharges, the Interim Approach for Water Quality-Based Effluent Limitations in Storm Water Permits (the "Interim Approach")[17], supports BMPs to control storm water flows:

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[16] See 40 C.F.R. 122.44(k).

[17] Interim Approach for Water Quality-Based Effluent Limitations in Storm Water Permits (EPA, September 1, 1996). The Fact Sheet essentially concedes that the Interim Approach is relevant and applicable to this case, and this is one point on which Invensys and the Agency agree. See p. 9, n.3. It is true that EPA may reconsider the application of numeric limits to certain storm water discharges, as reflected in its November 12, 2010, Memorandum entitled "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs'" (the "Revised TMDL Memo"). The Revised TMDL Memo recommends that permitting authorities issue permits containing numeric effluent limitations for storm water discharges *where feasible*. For a number of reasons, however, the Revised TMDL Memo does not dictate the application of numeric limits in this case.

> Under the Clean Water Act (CWA) and NPDES regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water quality-based limitations, where numeric water quality-based effluent limitations are determined to be unnecessary or infeasible.[18]

The Interim Approach states that "numeric limitations for storm water permits can be very difficult to develop" because not enough is known "about the intermittent and variable nature of these types of discharges and their effects on receiving waters."[19] Specifically, "[s]torm water discharges are highly variable both in terms of flow and pollutant concentrations, and the relationship between discharges and water quality can be complex."[20] As such, the Interim Approach stresses that the Agency has only provided guidance on a methodology for deriving numerical water quality-based effluent limitations

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First, EPA is considering the withdrawal or modification of the Revised TMDL Memo, so it does not constitute final Agency policy at this time. In March 2011, EPA reopened the Revised TMDL Memo and announced that it would accept public comments in order to determine whether it should be withdrawn, reissued with revisions, or retained without change. Although EPA had announced its intention to make such determination by August 15, Invensys is not aware of such determination having been made. Second, as can be inferred from its title, the Revised TMDL Memo focuses on waters for which TMDLs with WLAs have been developed. TMDLs for the constituents of concern have not been developed in the Neponset River watershed. As a result, it is appropriate that the Fact Sheet refers to the Interim Approach but not to the Revised TMDL Memo. Third, the Revised TMDL Memo only allows for numeric limits when the permitting authority has conducted a reasonable potential analysis pursuant to 40 C.F.R. 122.44(d)(1)(iii) (see Revised TMDL Memo, p. 3), which EPA has failed to do here, as discussed in Section III.C.1, infra.

Finally, and most importantly, even if it were applicable, the Revised TMDL Memo, like the Interim Approach, would *not* require numeric limits in the present circumstances. The Revised TMDL Memo acknowledges that the use of BMPs in lieu of numeric effluent limitations is appropriate in cases where the development of numeric limits is not feasible. Indeed, the Revised TMDL Memo makes clear that a permitting authority may rely on BMPs rather than numeric limits by *recommending* (not requiring) the use of numeric limits only "where feasible" and stating that, "[t]he permitting authority's decision as to how to express the WQBEL(s), either as numeric effluent limitations or BMPs . . . should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying WLA, including the nature of the storm water discharge, available data, modeling results or other relevant information." Revised TMDL Memo, p. 3. The Interim Approach, which also makes clear that the use of BMPs is appropriate in cases where the development of numeric limits is not feasible, remains the appropriate guidance to use in determining whether the facts and circumstances of a particular case make development of a numeric limit infeasible. A review of the facts and circumstances of the present case, in light of the guidance provided in the Interim Approach, makes clear that the use of BMPs is the appropriate approach here.

[18] Interim Approach, p. 1.

[19] Id. at p. 2.

[20] Id.

"for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters," not "intermittent wet weather discharges during high flow conditions."[21] For such variable discharges, the Agency's established policy has been to use BMPs where insufficient information exists to develop numeric effluent limits, rather than risking the implementation of inappropriate numeric water quality-based effluent limitations.[22]

The Interim Approach supports the application of BMPs here. The discharge from the Facility cannot be considered a "process wastewater discharge" that occurs "at predictable rates with predictable pollutant loadings under low flow conditions." On the contrary, the Facility discharges no process wastewater whatsoever, and has no control over pollutant loadings in the storm water or groundwater discharged, with the exception of VOCs that are voluntarily removed from dry weather flows. Discharge flows and loadings are a function of the volume and intensity of any wet weather event, as well as groundwater elevation and characteristics, all of which can vary, and all of which are unrelated to current production at the Facility. In addition, discharge volumes can increase substantially during wet weather, high flow conditions. Finally, the relationship between Facility discharges and water quality does not support a simple, straightforward application of the NRWQC through numeric limits, which might be appropriate for an industrial wastewater discharge. Evidence from the Phase II that the Reservoir is healthy and that constituents present in the discharge pose no risk to human health or the environment, despite occasional exceedances of the NRWQC, suggests that the relationship between the variable storm water and groundwater flows currently discharged by the Facility and the water quality in the Reservoir is highly complex. Under these circumstances, numeric limits are neither necessary nor feasible, and EPA policy supports control through BMPs rather than numeric limits.

In the Fact Sheet, the Agency purports to respond to Invensys' prior comments regarding the use of BMPs in storm water permits, arguing: (1) that the use of BMPs is not appropriate here, where substantial data already exist "showing that pollutant concentrations in storm water discharges exceed applicable water quality criteria" and will not be diluted; and (2) that the remediation conducted at the Facility has already involved the implementation of BMPs such that it "is not reasonable to expect that the imposition of routine BMPs will be sufficient to attain water quality criteria."[23] These arguments are unconvincing for a variety of reasons.

First, the Agency's use of numeric water quality-based effluent limitations is inconsistent with its position that Invensys' discharges have demonstrated "significant variability in almost all parameters."[24] As noted, the variability of storm water discharges is

[21] Id. at pp. 2-3.

[22] Id. at pp. i & 4 ("Potential problems of incorporating inappropriate numeric water quality-based effluent limitations rather than BMPs in storm water permits at this time are significant in some cases.").

[23] Fact Sheet, p. 9, n.3.

[24] E.g., id. at p. 12, n.4.

one of the fundamental reasons that BMPs are appropriate in lieu of numeric criteria for storm water NPDES permits.[25] The Agency cannot rationally claim that Invensys' storm water and groundwater discharges are highly variable – so variable, in fact, that *weekly monitoring* is purportedly "necessary to characterize the discharge"[26] – while simultaneously imposing strict numeric water quality-based effluent limitations on those discharges. As the Agency has noted, "[d]eriving numeric water quality-based effluent limitations for any NPDES permit *without an adequate effluent characterization* . . . may result in the imposition of inappropriate numeric limitations on a discharge."[27] It is clear, based on the Agency's own statements in the Fact Sheet regarding the variability of the discharge and the purported necessity of weekly monitoring, that the discharges have not been characterized adequately to allow for development of numeric effluent limitations.

The inadequacy of the Agency's justifications for imposing numeric water quality-based effluent limits is particularly clear in relation to the Robinson Brook discharge. The entire universe of data cited by the Agency as the basis for imposing stringent numeric limits for Outfall 002 is comprised of sampling data collected on *only five days*: June 15, 2001; July 17, 2001; September 25, 2001; July 2, 2002; and July 23, 2002.[28] Data collected on five days nearly ten years ago cannot possibly constitute "adequate sampling data" to justify the imposition of exceedingly stringent numeric effluent limits in lieu of BMPs.[29] This is especially true here, where two of the five sets of samples relied upon by EPA were actually collected at a point where Invensys' discharge had already left the Facility property and mingled with discharges from two municipal street drains located on Neponset Avenue,[30] and are therefore *not* representative of discharges coming solely from the Invensys Facility.[31] The Agency also mentions, without relying upon, data collected on three additional dates, including two in 2003 following the Robinson Brook drain line cleanout.[32] The Agency indicates that these later data demonstrate that, "while some metals levels did in fact

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[25] Interim Approach, pp. i & 2-4.

[26] Fact Sheet, pp. 12 & 16. While Invensys concedes that the discharges are variable, such variability does not justify the onerous monitoring requirements contained in the 2011 Draft Permit. See Section V.A, infra.

[27] Interim Approach, p. 4 (emphasis added).

[28] See Fact Sheet, p. 13 (citing Attachments C.1, C.2, C.4 & C.5).

[29] Id. at pp. 13-.15.

[30] See id. at Attachments C.1, C.2, C.4 & C.5, Facility Drainage Map (Attachment 2 hereto). The June 15, 2001 and September 25, 2001 samples were collected on the east side of Neponset Avenue, across the street from the Facility.

[31] Invensys respectfully submits that the only data that can reasonably be interpreted as measuring Invensys' contribution to Robinson Brook are the data from samples collected at manhole 26, before the discharge has mingled with storm drain discharges unrelated to the Facility, not data from samples collected at Outfall 002 or in Robinson Brook. As noted in Table 1, Invensys requests that the Agency clarify that sampling should be conducted at Manhole 26.

[32] Fact Sheet, p. 13, n.5 (citing Attachment C.7).

decrease after the drain cleaning, metals levels are in many cases still well above criteria."[33] This means that, in addition to basing its imposition of effluent limits for Outfall 002 on an extremely limited set of data, some of which are not actually data reflective of the Facility's discharge, the Agency has also relied on data that are likely not representative of the current, post-cleanout discharge. Further, a review of the data collected after the cleanout of the Outfall 001 drain lines indicates that levels of various constituents did not decrease immediately following the cleanout, but rather took several years to stabilize at the lower levels acknowledged by the Agency.[34] A similar trend is probable for Robinson Brook. Thus, it is likely that even the data collected in 2003 – which EPA attaches to its Fact Sheet but ignores for purposes of calculating limits – are not representative of the current discharge to Robinson Brook. For all of these reasons, the Agency's imposition of numeric effluent limits for the Robinson Brook discharge is inappropriate.

As to the Agency's contention that the use of additional BMPs is not appropriate for the Facility because some have already been implemented by Invensys in its remediation efforts, that argument also fails. Indeed, it directly contradicts the Interim Approach, which allows for the use of BMPs in first-round storm water permits, "*and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards*."[35] The Agency completely ignores the second half of its own stated approach in skipping over the "second-round" step of additional BMPs in favor of a far more conservative option, strict numeric water quality-based effluent limitations, despite the variability of the discharges.[36]

Further, it is unreasonable for the Agency to conclude that the existence of exceedances of the NRWQC (which fail to consider site-specific conditions and species) justify the imposition of numeric effluent limits here. This is particularly true where there is evidence indicating that the criteria being used as the basis for EPA's determination are not appropriate for the Neponset Reservoir. Specifically, the Phase II conclusions, which were based on 23 lines of evidence, including toxicological studies, fish and wildlife surveys and fish meristics, demonstrate that the constituents discharged from the Invensys site have not resulted in a significant risk of harm to human health or the environment in the Reservoir. As a result, it would be reasonable for the Agency to conclude that numeric limits are not necessary because the pollutant reduction efforts at the facility have been successful, and continued implementation of BMPs will be sufficient to control the discharges. Moreover,

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[33] Id.

[34] See id. at p. 4.

[35] Interim Approach, p. I (emphasis added).

[36] The Agency may in fact be skipping the proper first step as well. Given the many improvements made by Invensys at the Facility since the issuance of the 1991 Permit, the industrial discharges as they currently exist (i.e., as only storm water and groundwater discharges involving no process wastewaters) have never been covered by a NPDES permit tailored to their characteristics. As such, Invensys has never yet been issued a "first-round storm water permit" focused on the use of BMPs.

the levels of constituents in the discharges have only decreased over time. The Agency must consider these positive indicators when assessing the likely effectiveness of BMPs.

The Agency's justifications for ignoring its own established policy are also unconvincing because they are contradicted by the Agency's recent practice in comparable cases, in which similarly situated permittees have been issued permits requiring the use of BMPs rather than applying numeric water quality-based effluent limitations, *even where data demonstrating water quality exceedances exists and/or other BMPs had been previously undertaken at the site* but were unsuccessful in eliminating water quality exceedances. It is a fundamental tenet of administrative law that an agency may not single out a particular applicant for stringent treatment, but must treat similarly situated dischargers consistently.[37]

The final modified version of the permit issued to the General Electric ("GE") facility in Pittsfield in 2009, NPDES Permit No. MA0003891 (the "GE Permit"), is one such example. Invensys submitted comments on a prior iteration of the GE permit in 2005 (the "2005 Comments"), which described in detail the Agency's unjustified differential and more stringent treatment of Invensys in the 2003 Draft Permit.[38] Specifically, Invensys noted that the Agency had relied almost entirely on BMPs rather than numeric water quality-based effluent limitations in issuing the GE permit.[39] This was true even with respect to GE's discharge of PCBs, a contaminant which EPA acknowledged continued to be discharged at levels exceeding water quality standards and was "found at elevated levels in fish tissues in the receiving waterbodies, resulting in the issuance of advisories limiting the consumption of certain species"[40] – something that is not true in the Invensys context.[41] EPA has provided *no* response whatsoever to Invensys' 2005 Comments regarding the GE Permit, let alone any explanation for the Agency's disparate treatment of Invensys.

Notably, the GE Permit was modified after Invensys submitted its 2005 Comments, with the Agency issuing a revised permit in September 2008 and the actual final permit in August 2009, after an appeal by GE. The 2008 version of the GE Permit was based (like

[37] See, e.g., Shaws Supermarkets Inc. v. NLRB, 884 F.2d 34, 36 (1989) ("An [agency's] inadequately explained departure solely for the purposes of a particular case . . . is not to be tolerated."), quoting NLRB v. International Union of Operating Engineers, Local 925, 460 F.2d 589, 604 (5th Cir. 1972).

[38] Invensys submitted its 2005 Comments to the Agency on June 23, 2005. As many of the flaws identified in the 2005 Comments remain relevant to the 2011 Draft Permit, and as EPA has entirely failed to respond to those comments, Invensys incorporates by reference its 2005 Comments.

[39] 2005 Comments, p. 1 ("Where the Invensys permit would impose unjustified and in many cases unachievable numeric effluent limits, the GE permit, consistent with EPA policy, relies almost entirely on Best Management Practices ('BMPs') to reduce environmental impacts from storm water and groundwater.").

[40] Id. at pp. 2-3.

[41] See id. at p. 3.

Invensys' permit) on recent monitoring data,[42] which demonstrated that the effluent was variable and exceeded the water quality criteria for PCBs.[43] However, in the final GE Permit, the Agency declined to include numerical effluent limitations for PCBs in the untreated discharges, opting instead to require new BMPs,[44] which were deemed sufficient despite the fact that "site remediation activities . . . and other improvements" had already been undertaken at the site and "generally reduced PCB concentrations,"[45] though not enough to eliminate PCB water quality criteria exceedances.[46] In other words, the Agency imposed *only* BMP requirements in conditions strikingly similar to those the Agency now claims mandate numeric limits. The August 2009 GE Permit was even more lenient and flexible (e.g., requiring less frequent sampling for PCBs and other constituents at seven outfalls[47]), despite the facts that: (a) the GE site is a federal Superfund site[48]; (b) there are periodic exceedances of instream PCB water quality criteria downstream of GE's discharges[49]; (c) there are high concentrations of PCBs in fish tissue[50]; and (d) the GE site discharges to a waterbody that is on the MassDEP "303d list" as impaired by PCBs in Fish Tissue[51] and is undergoing significant stream restoration as part of the PCB clean-up effort.[52]

Another Region 1 permit which demonstrates that the Agency's treatment of Invensys is inconsistent and overly stringent is NPDES Permit No. MA0004341, issued to

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[42] GE Permit 2008 Fact Sheet, available at http://www.epa.gov/region1/npdes/permits/attachments/ma0003891fs.pdf (last visited October 31, 2011), p. 1 & Attachments D-Q.

[43] Id. at pp. 9-16.

[44] Id. at p. 9.

[45] Id. at p. 9.

[46] Id. at pp. 9-16.

[47] EPA agreed to reduce the required wet weather sampling for PCBs, oil and grease, total dissolved solids, and pH at outfalls 005, 05A, 05B, 006, 06A, 009, 09B and SR05. Compare 2008 GE Permit, available at http://www.epa.gov/region1/npdes/permits/2008/finalma0003891permit.pdf (last visited October 31, 2010), pp. 5-7, 9-11 & 13 and 2009 Final GE Permit, available at http://www.epa.gov/region1/npdes/permits/2009/finalma0003891permitmod.pdf (last visited October 31, 2011), pp. 5, 7-8, 10-12 & 14.

[48] GE 2008 Fact Sheet, supra, at p. 48.

[49] Id. at pp. 6-8.

[50] See 2005 Comments, pp. 2-3.

[51] GE 2008 Fact Sheet, supra, at pp. 6-8; see also Final 2008 Integrated List of Waters, available at http://www.mass.gov/dep/water/resources/08list2.pdf (last visited October 31, 2011), p. 119; Proposed 2010 Integrated List of Waters, available at http://www.mass.gov/dep/water/resources/10list3.pdf (last visited October 31, 2011), p. 123

[52] GE 2008 Fact Sheet, supra, at p. 21.

the Wyman Gordon Company in North Grafton in 2008 (the "Wyman Gordon Permit"). The Agency's response to comments developed in conjunction with the 2006 version of the permit notes that there were exceedances of water quality criteria, yet the permit modification in 2008 removed numeric limits in favor of the use of BMPs, despite the fact that BMPs had already been implemented at the facility. In language very similar to the purported justification the Agency now provides to explain the present permit, the EPA stated as follows in its responses to comments received regarding the 2006 version of the Wyman Gordon Permit:

> [M]onitoring data reported by the permittee to EPA as required under the existing permit, clearly show "excursions" over water quality criteria...In these cases where the detected concentrations exceed the applicable numeric water quality criteria for these specific pollutants and receiving stream dilution is so small, EPA concludes that there is reasonable potential that the discharge may cause or contribute to an excursion about the applicable water quality standards, and therefore EPA must develop effluent limitations.[53]

However, the permit was modified in February 2008 after negotiations with the Agency and significant changes were made, including the recognition of BMPs as a legitimate approach to addressing the presence of constituents. As the Agency wrote, "the Region agrees to modify the Final Permit to impose [BMPs for certain outfalls] in lieu of specified numeric effluent limits and [WET] reporting requirements."[54] Specifically, the Agency removed numeric effluent limitations for metals and reporting requirements for WET testing for multiple outfalls[55] and instead required the permittee to implement new BMPs and comply with BMP deadlines.[56]

The Agency has also issued a NPDES permit for the Wyman Gordon facility situated adjacent to the North Grafton property on Route 122. That permit, NPDES Permit No. MA0001121 (the "Wyman Gordon Route 122 Permit"), provides another compelling

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[53] EPA's 2006 Responses to Comments on the Wyman Gordon Permit, available at http://www.epa.gov/region1/npdes/permits/attachments/finalma0004341rtc.pdf (last visited October 31, 2011), p. 8.

[54] EPA's Statement of Basis regarding the Wyman Gordon Permit, available at http://www.epa.gov/region1/npdes/permits/draft/attachments/draftma0004341sob.pdf (last visited October 31, 2011), p. 2.

[55] The relevant outfalls were 007, 008 and 009, which discharge storm water only. As to Outfalls 001 and 010 which, unlike Invensys' discharges, contain not only storm water but also mixed process wastewater and noncontact cooling water, EPA retained numeric effluent limits. Id.

[56] These included the structural repair of catch basins, the cleaning of storm sewer lines, the installation and maintenance of silt sacks, monthly vacuum sweeping of all paved or impervious areas from spring through fall, the mitigation of winter deicing impacts, and good housekeeping of the site. Id. at pp. 3-5; see also 2008 Final Wyman Gordon Permit, available at http://www.epa.gov/region1/npdes/permits/2008/finalma0004341permitmod.pdf (last visited October 31, 2011), pp. 11-13.

example of EPA's use of BMPs instead of numerical limits. Aluminum levels were 3-6 mg/l after one round of BMPs was implemented. The permit allows and requires a second, more comprehensive, BMP approach rather than numeric limits, even though the data clearly show violations of water quality criteria.[57]

As a final example, EPA issued NPDES Permit No. MA0000787 for Logan International Airport (the "Logan Airport Permit") in 2007, in which BMPs are utilized in lieu of numeric limits for known problem pollutants at the site. Specifically, the permit only requires monitoring and the development of a BMP plan,[58] despite the facts that: (a) substantial data collected by MassPort for fecal coliform at outfall 002 has shown median values of 400 cfu/100 ml,[59] which is above the Massachusetts Water Quality Standard; and (b) the discharges are to the Boston Harbor, which is listed on the Commonwealth's 303(d) list as impaired by pathogens.[60] Similarly, it has been demonstrated that the site suffers from extremely high levels of BOD from the glycol that is used in deicing,[61] but only BMPs are required to address the problem.[62]

It would be arbitrary and capricious for EPA to apply a different standard to Invensys than it has applied to other similarly situated permittees, particularly where EPA's established policies counsel against the use of numeric water quality-based effluent limits in the circumstances present here. The Agency has failed to provide an adequate justification for its disparate treatment of Invensys.

Pursuant to Agency policy and consistent with EPA's past practice in other similar cases, the new permit for the Facility should require "expanded or better-tailored BMPs" or "an integrated suite of BMPs" in order "to provide for the attainment of water quality standards."[63] Should the Agency agree that the use of BMPs in lieu of numeric limitations is appropriate, Invensys is willing to retain a third-party consultant to undertake an assessment of BMPs that could be implemented at the Facility and their likely effectiveness. Invensys

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[57] See EPA's Response to Comments on the Draft Wyman Gordon Route 122 Permit (i.e., NPDES Permit No. MA0004341), available at http://www.epa.gov/region1/npdes/permits/attachments/finalma0004341rtc.pdf (last visited October 31, 2011), pp. 8 & 18.

[58] 2007 Final Logan Airport Permit, available at http://www.epa.gov/region1/npdes/logan/pdfs/finalma0000787permit.pdf (last visited October 31, 2011), pp. 37-41.

[59] Logan Airport Permit Fact Sheet, available at http://www.epa.gov/region1/npdes/logan/pdfs/finalma0000787fs.pdf (last visited October 31, 2011), p. 21.

[60] Final 2008 Integrated List of Waters, supra, at pp. 90-91; Proposed 2010 Integrated List of Waters, supra, at pp. 97-98.

[61] Logan Airport Permit Fact Sheet, supra, at pp. 24-25 & 31-32.

[62] 2007 Final Logan Airport Permit, supra, at pp. 35-36.

[63] Interim Approach, pp. i & 6.

would agree to provide EPA and MassDEP with a report within six months of completion of the assessment which summarizes the results of such assessment and identifies a list of BMPs Invensys proposes to undertake at the Facility.[64]

In sum, the use of BMPs is not only permissible under the Agency's established policies, but also the appropriate approach in the present circumstances. It is also consistent with the Agency's recent permitting decisions in similar scenarios. Accordingly, Invensys requests that in the final permit the Agency require the Facility to undertake BMPs in lieu of incorporating the numeric limitations proposed in the 2011 Draft Permit.

B. Any Numeric Limitations for Toxics Should Be Based on SSWQC

In the 2011 Draft Permit, the Agency has once again established numeric effluent limits for metals based on the application of the National Recommended Water Quality Criteria, which do not consider the site-specific characteristics and species of the receiving waters. The application of the NRWQC in this case results in effluent limits which are far more stringent than necessary for the protection of human health and the environment and will be exceedingly costly to achieve, if they can indeed be achieved. As Invensys stated in its 2003 Comments and has argued on numerous occasions in the past with respect to proposed permit limits for the discharges, in light of the strong available evidence demonstrating that the regulated discharges do not present a risk to human health or the environment, as demonstrated by the ecological risk assessment conducted as part of the Phase II, the use of the NRWQC to derive permit limits is inappropriate. Rather, effluent limits for the subject discharges should be based on SSWQC reflective of the unique physical, chemical and biological characteristics of the receiving waters. As a result, Invensys is, contemporaneously with the submittal of these Comments, submitting a formal request to MassDEP for the development of SSWQC for the Outfall 001 and Outfall 002 receiving waters. If EPA continues to believe that numeric effluent limits are necessary, it should delay finalization of the 2011 Draft Permit until appropriate SSWQC, on which to base such limits, can be adopted.[65]

1. The Development of SSWQC is Authorized by Relevant Regulations

The NRWQC are developed based on the laboratory protocols and species ranking procedures set forth in EPA's 1985 Guidelines for Deriving Numerical National Aquatic Life Criteria for Protection of Aquatic Organisms and Their Uses,[66] and they do not take into

[64] Invensys' proposal in this regard is dependent on the Agency agreeing to the use of BMPs in lieu of numeric effluent limits.

[65] As noted above, Invensys continues to believe that the use of BMPs in lieu of numeric limits is appropriate in this case. Should SSWQC be developed for the receiving waters, Invensys does not concede that any effluent limitations based on such criteria must be numeric effluent limitations. Rather, the use of BMPs may be determined to be an appropriate means of achieving compliance with SSWQC.

[66] Guidelines for Deriving Numerical National Aquatic Life Criteria for Protection of Aquatic Organisms and Their Uses (EPA, 1985), updated in 2010 on-line version, available at

account local and regional water quality conditions or biota. As a result, in certain cases, effluent limitations based on such criteria do not accurately reflect the potential toxicity represented by a specific concentration of the pollutant in the receiving water. In such cases, the development of SSWQC is necessary.

Pursuant to both federal and state regulations and guidelines, the development of permit limits based on site-specific criteria is permissible and would be appropriate in the present case. Specifically, federal regulations expressly allow states to develop permit limits based on numeric criteria that have been "modified to reflect site-specific conditions."[67] Massachusetts water quality standards, in turn, provide that the development of site specific criteria for toxic pollutants is permissible where EPA recommended criteria are "invalid due to site specific physical, chemical or biological considerations."[68] The federal Water Quality Standards Handbook acknowledges that site-specific limits are appropriate when "the species at the site are more or less sensitive than those included in the national criteria data set" or "physical and/or chemical characteristics of the site alter the biological availability and/or toxicity of the chemical".[69] Similarly, MassDEP policy provides that site-specific limits are appropriate when local conditions differ from those used to develop the recommended limit or to reflect the presence or absence of particular water uses.[70]

The MassDEP has acknowledged the appropriateness of the use of SSWQC to develop permit limits by revising its water quality standards to incorporate site-specific criteria for certain waters. Specifically, in January 2007, revisions to the state water quality standards to incorporate site-specific criteria for certain waters became effective. The revised regulation included site-specific criteria for copper in 23 specified streams and stream segments, resulting in the replacement of the NRWQC in determining NPDES permit limits for approximately 30 facilities. In 2009, an additional seven river segments were added to the site-specific copper list. The adoption of site-specific criteria was necessitated by the fact that many NPDES permits had "very stringent compliance limits for copper based on EPA national criteria that are difficult for most facilities to achieve, in many cases lower than is necessary to protect water quality."[71] Therefore, site-specific criteria were developed to "continue to protect water quality without requiring unwarranted levels of

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http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/upload/85guidelines.pdf (last visited October 31, 2011).

67 40 C.F.R. 131.11(b)(1)(ii).

68 See 314 C.M.R. 4.05(5)(e)(1).

69 Water Quality Standards Handbook: Second Edition (EPA, August 15, 1994), p. 3-39.

70 See Implementation Policy for the Control of Toxic Pollutants in Surface Waters (MassDEP, February 23, 1990), available from http://www.mass.gov/dep/water/laws/policies.htm#npdes (last visited October 31, 2011), pp. 2-3.

71 See Clean Water: Control Pollution from Point Sources – Surface Water Discharge Compliance (MassDEP, October 2005), available at www.mass.gov/dep/water/priorities/ppa06sum.doc (last visited October 31, 2011), p. 35.

investment by regulated entities in an attempt to achieve the limits."[72] In fact, EPA recently revised the NRWQC for copper such that they no longer provide default numeric criteria but instead recommend that site specific water quality information be used in conjunction with the Biotic Ligand Model ("BLM") to derive SSWQC.[73] Further, Invensys understands that the MassDEP is in the process of adopting site-specific criteria for additional waters, including site-specific criteria for zinc in the lower Squannacook River near the Hollingsworth & Vose Company's West Groton facility.

2. The Facts of this Case Strongly Support the Development of SSWQC

a. The Concentrations of Toxic Constituents Currently Present Do Not Cause Aquatic Toxicity

Invensys has time and again provided Region 1 with extensive evidence indicating that further reductions in the levels of constituents cannot be justified on the basis of risk to human health or the environment. The available evidence points to the fact that the discharges are not acutely toxic and do not appear to have an adverse impact on the ecological receptors of concern in Gudgeon Brook or the Reservoir, based on the results of acute toxicity bioassays conducted pursuant to the current NPDES Permit and subchronic and chronic toxicity bioassays conducted under the Phase II.

Specifically, as part of the current NPDES Permit requirements, Invensys has routinely collected effluent water samples for the purposes of whole effluent toxicity (WET) testing on two species: *Ceriodaphnia dubia* and *Pimephales* promelas. Such tests have been performed quarterly for over 17 years, resulting in a data set of 140 separate tests. The results of these WET tests overwhelmingly demonstrate that the effluent is not toxic – in the 13 years since the drain line cleanout, all WET tests for both species have showed 100% survival, except for a single test conducted in the 1st quarter of 2002, where *C. dubia* showed 83% survival.

In the Fact Sheet, EPA acknowledges that the "testing has shown that the discharge routinely meets its LC50 limit of 100 percent effluent".[74] However, while acknowledging that WET testing has demonstrated that the effluent does not cause acute toxicity, the Region indicates that it "believes there is a reasonable potential for the discharge to cause chronic

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[72] Id.

[73] See EPA's National Recommended Water Quality Criteria ("NRWQC")(EPA Office of Water and the Office of Science and Technology, 2009), available at, http://water.epa.gov/scitech/swguidance/standards/current/upload/nrwqc-2009.pdf (last visited October 31, 2011), p. 2 ("Freshwater criteria calculated using the BLM", and referencing Aquatic Life Ambient Freshwater Quality Criteria - Copper: 2007 Revision (EPA, February 2007), available at http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/pollutants/copper/upload/2009_04_27_criteria_copper_2007_criteria-full.pdf (last visited October 31, 2011)). The 2011 Draft Permit cites the outdated version of the NRWQC, rather than the current version adopted by the Agency in 2009.

[74] Fact Sheet, p. 12.

toxicity in the receiving water."[75] Region 1 cites to no evidence to support this assertion. The Agency must rely on factual information contained in the administrative record rather than mere speculation.[76]

Although the currently required effluent WET testing is limited to evaluating acute toxicity, site-specific data from the Phase II indicate that the levels of constituents are also not causing chronic toxicity. Had the Region considered the available evidence, it would have determined that, contrary to its unsupported assertions, the discharge has not been demonstrated to cause chronic toxicity in the receiving waters. Specifically, data collected during the ongoing assessment activities in the Neponset Reservoir demonstrate that the historical discharge of higher concentrations of metals has not had an adverse impact on the ecological receptors of concern within the Reservoir. As discussed in Section I, supra, the Phase II findings demonstrate, among other things, that:

- The Reservoir reflects an active, diverse and abundant ecological setting.
- There is no evidence of stressed biota attributable to the release at the Reservoir.
- There is no evidence of significant biological harm to invertebrates (e.g., worms), plankton, fish, birds or other wildlife. While some individual measures of effect evaluated in the Phase II showed slight impairment, the effects were small and were not correlated with constituent concentrations in the surface water.
- Based on the 23 lines of evidence used to assess the environmental risk in the Reservoir, adverse effects of COCs in the Reservoir – to the extent that there are any effects – are minimal/negligible and collectively provide no evidence of a significant risk of harm to the environment.

The Massachusetts Department of Fish and Wildlife agreed with the Phase II's conclusion that the Reservoir supports a diverse and productive fauna, concluding that, "[the Phase II] study does show that fish meristics are within normative ranges, and that the Neponset Reservoir species composition is essentially the same as it was in 1958."[77] Indeed, the findings of the Phase II are consistent with an earlier MassDEP investigation of the Reservoir. Specifically, in 1986 the Massachusetts Department of Environmental Quality Engineering undertook a study of conditions in the Reservoir. Based on the study findings it was concluded that "the reservoir contains a healthy population of fish. None of the fish

[75] Id. at pp. 12 & 15.

[76] See 40 CFR § 124.9 (the provisions of a draft permit "shall be based on the administrative record"); Edison Electric Institute, 2 F.3d at 446; Corrosion Proof Fittings, 947 F.2d at 1227 ("Musings and conjecture are 'not the stuff of which substantial evidence is made.'").

[77] See Response to Comments on Phase II, Sept. 15, 2003, citing to August 28, 2001 written correspondence from Richard Kellar, Massachusetts Department of Fish and Wildlife, to Jonathan Hobill, MassDEP Bureau of Waste Site Cleanup. See also 2003 Comments, p. 10.

captured appeared to be stressed by conditions in the reservoir. Analysis of the fish tissue indicated levels which are safe and common for fish from this type of environment."[78]

The results of the Phase II environmental risk characterization suggest that the low levels of constituents occurring in the current discharges will not negatively impact the ecological communities of species present in the receiving waters. Further, specifically with respect to subchronic and chronic toxicity bioassays conducted under the Phase II, as part of the ecological risk characterization, sediment and surface water bioassays were conducted on several aquatic species. Results of the tests, which represented subchronic to chronic exposures, indicated that while toxicity was observed at certain individual sample stations, toxicity was neither consistently observed nor strongly correlated with concentrations of heavy metals in aquatic media, suggesting that the limited observed toxicity was related to factors other than the presence of metals in the surface water or sediment. Indeed, it is important to note that the concentrations of cadmium in samples used to conduct Phase II toxicity tests, in which no statistically significant chronic toxicity was observed, were <u>*higher*</u> than those characteristic of recent effluent samples from Outfall 001.[79] Overall, bioassay results did not show strong evidence of chronic or subchronic toxicity to fish or macroinvertebrates.

Given the available data, and the fact that the discharges do not appear to be causing toxicity in the receiving waters, if the Agency continues to believe that numeric limits are necessary, it should allow for the development of SSWQC in order to provide a more accurate measure of the levels of metals that would be protective of the relevant species present in the receiving waters.

b. The Receiving Waters Do Not Support the Species Used to Develop the NRWQC

It is also clear that the use of site-specific criteria is appropriate based on the species present in the receiving waters and the "uses" that are being achieved in those waters. Both Gudgeon Brook and Robinson Brook are classified as "Class B" waters, and, as such, "are designated as habitat for fish, other aquatic life, and wildlife . . . and for primary and secondary contact recreation."[80] However, as the result of extremely low flows, neither Gudgeon Brook nor Robinson Brook support these uses. Gudgeon Brook is an approximately 200 foot long man-made channel with a flow that is highly variable and directly proportional with precipitation events[81] and, according to the Massachusetts

[78] 1987 Permit Fact Sheet (June 30, 1987), p. 3 (Attachment 3 hereto).

[79] <u>See</u> Attachment 4 hereto, showing detected dissolved cadmium concentrations measured at five locations in the Reservoir on two dates (March 1999 and January 2000) and corresponding toxicity results, and compare to Attachment 1 hereto, summarizing historical Outfall 001 cadmium data.

[80] 314 C.M.R. 4.05(3)(b).

[81] MACTEC, Final Phase II Comprehensive Site Assessment Report, Release Tracking No. 4-11387, Neponset Reservoir (September 2003).

Geographical Information System ("MassGIS"), is intermittent in its nature.[82] Given its limited reach, variable water levels and intermittent nature, Gudgeon Brook is not likely to be a suitable habitat for fish. Similarly, and as discussed in further detail in Section IV.B, infra, Robinson Brook is an intermittent stream, with no flow present during certain time periods during the year. As such, it has limited habitat value and no potential for recreational uses. The fact that the characteristics of Gudgeon Brook and Robinson Brook do not support a use of fish habitat, and therefore do not support many of the species used to develop the federal numerical criteria, demonstrates that site-specific criteria are appropriate.[83]

Even if the Neponset Reservoir, which does serve as a habitat for certain species of warm-water fish, is considered as the receiving water, the development of SSWQC is appropriate in order to take into account the fish communities that actually inhabit the Reservoir.[84] For example, as Invensys noted in its 2003 Comments, the basis of the derivation of the NRWQC for cadmium includes data on salmonids (trout-type species that inhabit cold-water systems). However, salmonids are not native to, or present in, the Neponset Reservoir or, if there were any doubt, either Gudgeon Brook or Robinson Brook. The inclusion of data from certain sensitive species not present in the Reservoir or the brooks in the derivation of the NRWQC has likely resulted in numerical criteria that are overly conservative for those waters.

c. Costs of Compliance with the Numerical Limits Far Outweigh Any Environmental Benefits

Another factor favoring the development of site-specific limits is the extraordinarily high cost of complying with limits derived from the NRWQC. In adopting SSWQC for copper in certain waters in the Commonwealth, MassDEP acknowledged that such criteria would protect water quality "without requiring unwarranted levels of investment by regulated entities" in order to comply with limits based on the federal criteria.[85] In this case, the estimated costs of achieving compliance with the proposed limits are wholly out of proportion to any environmental benefits that would result from compliance. Further, even if costly treatment technologies are implemented, it is not known whether such treatment technologies will be able to achieve compliance with the stringent limits proposed in the 2011 Draft Permit.

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[82] MassGIS, MassDEP Hydrography Layer (1:25,000), available at http://www.mass.gov/mgis/hd.htm (last visited October 31, 2011).

[83] As noted in the 2003 Comments, Invensys would be eligible for a variance from water quality standards based on the facts of this case. See 2003 Comments, pp. 11-12.

[84] As discussed in further detail in Section IV.A, infra., EPA has failed to explain why it has focused Gudgeon Brook, rather than the Neponset Reservoir, as the receiving water. If Gudgeon Brook is the receiving water, the relevant biotic community would be that present in Gudgeon Brook.

[85] See MassDEP's "Clean Water: Control Pollution from Point Sources – Surface Water Discharge Compliance" (October 2005), supra, at p. 35.

Invensys' consultant, Woodard & Curran, has evaluated a number of options that could be used to achieve compliance with the proposed limits.[86] These options include treatment of the discharge and/or rehabilitation or replacement of the drain lines to eliminate groundwater infiltration. All of the engineering options are costly – ranging from $6 million to $17 million in capital costs, plus $300,000 to $900,000 in annual operation and maintenance costs – *and none have even been proven to achieve the discharge limits* proposed in the 2011 Draft Permit.

Due to the extremely stringent permit limits and the potential high volumes of storm water flow that would be treated, treatment of wet weather discharge would be complex and costly. Due to the high flow rate, two million gallons of equalization capacity, provided by three aboveground cylindrical storage tanks, each with a diameter of 55 feet and height of 40 feet, would be required. The treatment would require multiple processes to treat the water for metals, pH, E. coli and VOCs, with costly treatment technologies including a combination of ultrafiltration, reverse osmosis and ion exchange being used to meet the low limits for metals. The wet weather treatment option is expected to cost approximately $17 million in capital costs and have annual operation and maintenance costs of approximately $900,000. While the treatment technologies are theoretically expected to achieve the discharge limits proposed in the 2011 Draft Permit, Woodard & Curran and vendors with whom they have consulted have been unable to identify any treatment systems which have been constructed and are operating that achieve the discharge limits proposed in the 2011 Draft Permit. Therefore additional assessment of the technologies is necessary to determine whether achieving compliance with the proposed limits is even technologically feasible.

Even options involving rehabilitation or replacement of the drain lines, which assume only treatment of dry weather or sump discharge, would still be exceedingly costly. Such options include replacement of the storm water drainage systems or sliplining or pipe bursting the existing drainage systems. Such options would require the same non-conventional treatment technologies required for a wet weather treatment system to treat groundwater infiltration and groundwater inflow to the building sumps, and therefore are subject to the same concerns related to feasibility. Further, some sections of the drain line are likely inaccessible and therefore not candidates for rehabilitation. The estimated costs of such options range from $6 million to $13 million in capital costs and would require annual operation and maintenance costs ranging from approximately $280,000 to $500,000.

The extremely high costs of achieving compliance with the proposed numeric effluent limits – if compliance with such limits is even technologically feasible – far outweigh any environmental benefits that could be obtained. Indeed, the abundance of overwhelming scientific evidence indicating that the discharges do not appear to be causing toxicity in the receiving waters calls into question whether compliance with the proposed limits would result in any material benefits whatsoever. Especially in light of the extreme imbalance in the costs and benefits, to the extent that numeric limits are to be included in the permit, such limits should be based on site-specific criteria.

[86] A copy of Woodard & Curran's report, Engineering Analysis of Options to Achieve Compliance with Draft 2011 NPDES Permit, is attached hereto as Attachment 5.

3. Invensys Is Willing to Undertake Development of SSWQC

The possibility of establishing SSWQC for the subject receiving waters has been discussed with the Agency and MassDEP previously. At least as early as October 2001, Invensys proposed in written comments on a pre-draft version of the renewal permit that it and the Agency work cooperatively to develop appropriate site-specific discharge limits. Invensys also submitted detailed comments objecting to the Agency's interpretation and application of the NRWQC in the pre-draft permit.[87] Subsequently, in January 2002, the Agency met with Invensys and discussed additional data that could be collected to support the development of effluent limits that would take into account site-specific conditions. In that meeting, the Agency agreed to review a scope of work ("SOW") for additional data collection. Dr. Charles Menzie, one of Invensys' former consultants, later met with an Agency representative to discuss the most effective means for responding to the Agency's questions. A scope of work was submitted to Region 1 in April 2003, along with Invensys' comments on the 2003 Draft Permit. The SOW noted that the estimated schedule for completing the work outlined in the scope of work was contingent upon the Agency's and MassDEP's review and approval of the SOW. Unfortunately, the agencies never responded to the proposal.

Contemporaneously with the submittal of these Comments, Invensys is submitting a written request to MassDEP requesting the development of SSWQC for the Outfall 001 and Outfall 002 receiving waters and seeking an opportunity to meet with MassDEP to present a work plan containing a detailed technical approach for a SSWQC determination.[88] In light of the demonstrated need for the development of SSWQC in this case and the absence of environmental harm caused by the discharges, a decision by the Agency to proceed with the proposed limits would be arbitrary and capricious. Accordingly, Invensys requests that the proposed permit limits be set aside and that the Agency defer issuance of a revised draft until site-specific criteria can be developed and approved for the receiving waters.

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[87] See October 30, 2001 Letter from Paul Ahearn to Janet Labonte, pp. 1-5.

[88] See Attachment 6 hereto.

C. EPA's Calculations are Flawed

Invensys strenuously objects to the inclusion in the 2011 Draft Permit of numeric limits based on the NRWQC. Without waiving those arguments, Invensys must nonetheless note that, for the reasons set forth below, the Agency's calculations of such limits are fundamentally flawed.

1. <u>EPA Failed to Conduct an Adequate RPE Analysis</u>

The Agency asserts in the Fact Sheet that the limits it has established are necessary because the effluent has "the reasonable potential" to cause or contribute to exceedances of the NRWQC, based on the Agency's review of certain data.[89] The Agency is correct that 40 CFR §122.44, which it cites throughout the relevant pages of the Fact Sheet in support of the numeric limits in the 2011 Draft Permit, requires the imposition of effluent limitations when a "reasonable potential" for exceedances has been found.[90] However, the regulations require EPA to perform a "reasonable potential analysis" in making such a determination. Indeed, 40 CFR §122.44(d)(1)(ii) <u>*requires*</u> the permitting authority to "use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water."

EPA's recently revised <u>NPDES Permit Writer's Manual</u> (the "<u>Manual</u>") establishes that a proper reasonable potential analysis involves "us[ing] any available effluent and receiving water data as well as other information pertaining to the discharge and receiving water (<u>e.g.</u>, type of history, industry, existing TBELs, compliance history, stream surveys), as the basis for a decision" of whether a water quality-based effluent limit is necessary.[91] Moreover, when the reasonable potential analysis is being conducted with data, which EPA clearly purports to have done here,[92] the <u>Manual</u> lays out at page 6-23 four steps that must be followed:

1. Determine the appropriate water quality model;
2. Determine the expected receiving water concentration under critical conditions;
3. Determine whether there is reasonable potential; and
4. Document the reasonable potential determination in the fact sheet.

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[89] <u>See</u> Fact Sheet, pp. 10-15.

[90] As discussed in further detail in Section III.A, <u>supra</u>, such effluent limitations need not be numeric effluent limitations.

[91] <u>NPDES Permit Writer's Manual</u> (EPA, September 2010), p. 6-23.

[92] <u>See</u> Fact Sheet, pp. 10-15, all referencing data as bases for the numeric limits included in the 2011 Draft Permit.

Nothing in the Fact Sheet or record indicates that the Agency ever engaged in such an analysis. This lack of documentation is itself a failure to properly conduct the analysis, given the final required step. As the Manual mandates at page 6-30:

> As a final step, permit writers need to document the *details* of the reasonable potential analysis in the NPDES permit fact sheet. The permit writer should clearly identify the information and procedures used to determine the need for the WQBELs. The goal of that documentation is to provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how each pollutant was evaluated, including the basis (i.e., reasonable potential analysis) for including or not including a WQBEL for any pollutant of concern.

(Emphasis added.) The Agency has plainly not satisfied this requirement in preparing the 2011 Draft Permit. As the Environmental Board has made clear, the lack of a documented reasonable potential analysis is "clear error and grounds for a remand."[93] The Agency's failure to properly conduct a reasonable potential analysis fails to follow procedures required by law and is unlawful, arbitrary and capricious.[94]

2. EPA's Choice of Hardness Values Is Unsupported by the Record

Similarly, if EPA continues to insist upon the inclusion in the permit of numeric limits based on the NRWQC, it must revise those limits based on a hardness calculation that is reasonable given the actual data available and the Agency's past practice regarding hardness values.

In the 2011 Draft Permit, EPA uses a water hardness value of 50 mg $CaCO_3$/l as the basis for deriving the numeric criteria for the metals for which the NRWQC are hardness-dependent (i.e., copper, lead, zinc, and cadmium). EPA asserts that, for Gudgeon Brook, "[t]he hardness value of 50 mg/l was chosen as a reasonably protective value based on a review of the past three years of data submitted by the permittee."[95] For Robinson Brook, "the hardness was assumed to be similar to Gudgeon Brook" due to a lack of hardness data.[96]

[93] In re Wash. Aqueduct Water Supply Sys., 11 E.A.D. 565, 585 n.22 (EAB 2004).

[94] The Agency's failure is particularly striking with respect to Outfall 001. As discussed in further detail in Section IV.A, infra., the Agency has failed to clearly identify, let alone characterize, the appropriate receiving water for Outfall 001. To the extent the Agency purports to have considered the reasonable potential of the Outfall 001 discharge to cause or contribute to a violation of water quality standards, such consideration appears to be based on Gudgeon Brook as the receiving water. However, as explained in Section IV.A , prior permits covering Outfall 001 listed Neponset Reservoir as the receiving water. The Agency has failed to provide any explanation for focusing on Gudgeon Brook in the 2011 Draft Permit. Until it provides an adequate explanation for this change, any analysis of potential to exceed water quality standards should be based on the Neponset Reservoir as the receiving water.

[95] Fact Sheet, p. 10.

[96] Id. at p. 13.

In actuality, EPA's chosen hardness value is unreasonably conservative, and it artificially lowers the numeric water quality-based limits contained in the permit. The value the Agency has chosen to use, 50 mg/l, is *lower* than the lowest observed hardness recorded in the relevant Outfall 001 effluent samples. This is clear even from the Fact Sheet itself, in which EPA states: "The range of hardness values over the past three years (fourth quarter 2006 through third quarter 2010[)] is from *52.4* mg/l to 83.2 mg/l".[97] When effluent samples collected through the second quarter of 2011 are also considered, that range is actually 52.4 mg/l to *86* mg/l.[98] Moreover, the fact that the effluent periodically reflected a hardness value in the low 50 mg/l range does not mean that such values represent the norm or average. Indeed, the average annual hardness of the effluent ranged in 2006-2011 from 61 to 86 mg/l, producing an overall average of 70 mg/l.[99] When the data is limited to the last three years – which EPA's current version of the Fact Sheet indicates is the appropriate method[100] – the overall average is 78 mg/l.[101] Thus, EPA's hardness value of 50 mg/l does not reflect typical hardness levels in the Outfall 001 discharge and is therefore extremely – and excessively – conservative.[102] This fact is supported by other Region 1 permits, in which EPA has used a hardness value equaling the *average* recorded hardness of the effluent[103] – not a value lower than the lowest value – in deriving effluent limitations.

This argument is important because the use of hardness levels more representative of the levels actually observed in the Outfall 001 effluent would result in less stringent (i.e., higher) numeric water quality-based limitations for copper, lead, zinc and cadmium. Specifically, if the average effluent hardness data from the last three years of sampling is used,[104] the average effluent hardness is 78 mg/l, the application of which would alter the numeric limits as follows:

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[97] Id. at p. 10 (emphasis added), citing Attachment A.2 (providing hardness data collected for Outfall 001 for WET tests).

[98] See Attachment 7 hereto, providing more recent hardness data for Outfall 001.

[99] See id.

[100] See Fact Sheet, p. 10.

[101] See Attachment 7 hereto.

[102] The historical hardness concentrations may have been lower (e.g., for 1992 and 1993), but those levels – from before the drain line cleanout – are not representative of the current reality. EPA apparently concedes this, focusing its own analysis only on data from 2006 and after.

[103] E.g., EPA's 2006 Responses to Comments on the Wyman Gordon Permit, supra, at p. 7 ("EPA determined that the hardness factor to be used in setting an effluent limit for hardness-dependent metals would be the average hardness of the effluent . . . reported in the WET reports," even where the receiving water "tends to be dominated by the facility's effluent."); see also NPDES Permit No. MA0032212 issued to Pine Brook Country Club in Weston, available at http://www.epa.gov/region1/npdes/permits/2010/finalma0032212permit.pdf (last visited October 31, 2011), Fact Sheet, p. 8 (using the average effluent and ambient hardness data from WET tests from June 2007 to September 2008).

[104] See Fact Sheet, p. 10 (indicating that past three years of sampling data are relevant.

Metal	Average Monthly	Maximum Daily
Copper	5.2 → 7.5 ug/l	7.3 → 11.1 ug/l
Lead	1.3 → 2.3 ug/l	33.8 → 59.5 ug/l
Zinc	66.5 → 97.1 ug/l	66.5 → 97.1 ug/l
Cadmium	0.16 → 0.23 ug/l	1.05 → 1.66 ug/l

It is unreasonable and scientifically unsupportable for EPA to impose numeric water quality-based effluent limits on the Outfall 001 discharge based on a hardness value that is inconsistent with, and far lower than, recent data collected from that discharge;[105] and it is unjustifiable for EPA to assume for Outfall 002 the same excessively conservative hardness it has unreasonably applied to Outfall 001. Accordingly, Invensys requests that, to the extent the final permit contains numeric limits based on the NRWQC, such limits be calculated based on a hardness value of 78 mg/l.

IV. The Agency Has Incorrectly Identified and/or Evidenced Jurisdiction Over the Receiving Waters

A. The Agency Has Not Provided a Justification for Identifying Gudgeon Brook as the Outfall 001 Receiving Water

Outfall 001 has been subject to a NPDES permit since 1974, and it has discharged to the same place throughout that entire period. In all prior iterations of the permit[106] Outfall 001 is described as discharging "to receiving waters named Neponset Reservoir."[107] None of the five prior versions mentioned "Gudgeon Brook" in the description of the receiving waters into which Outfall 001 discharges. Indeed, even the current Fact Sheet illustrates that the prior iterations of this permit covered a discharge to the Reservoir: "The current permit for the Neponset Facility, issued in 1991, authorizes the discharge of noncontact cooling water (since eliminated) and storm water to the *Neponset Reservoir*."[108]

In the Fact Sheet for the 1987 Permit, the Agency made clear that it understood Outfall 001 to be discharging to the Neponset Reservoir by not only expressly naming the receiving water "Neponset Reservoir"[109] and noting that the prior permit was "to discharge

[105] It is also unreasonable for EPA to use a hardness value that is lower than the equivalent values applied by EPA in other permits.

[106] Many of these prior versions are not included in the administrative record.

[107] 1974 Permit (October 8, 1974), p. 1/1 (Attachment 8 hereto); 1984 Permit (June 29, 1984), p. 1/7 (Attachment 9 hereto); 1987 Permit (November 16, 1987) (Attachment 10 hereto); 1991 Permit (September 30, 1991), p. 1/7.

[108] Fact Sheet, p. 3 (emphasis added).

[109] 1987 Permit Fact Sheet, supra, at p. 1 (Attachment 3 hereto).

treated process wastewater and noncontact cooling water in to the Neponset Reservoir"[110] but also describing the substantial analyses of *the Reservoir* it had undertaken to determine what needed to be included in the NPDES permit for Outfall 001.[111] In finalizing the permit in November 1987, the Agency again noted that NPDES permit MA0004120 was "developed for the Foxboro Corporation for the discharge of noncontact cooling water and treated process wastewater to the *Neponset Reservoir*"[112] and reiterated that the purpose of the permit was to "protect the water quality standards in the *reservoir*" by "minimiz[ing] the discharge of pollutants to the *reservoir*."[113] Likewise, in the Fact Sheet for the 1991 Permit – which the present draft is to replace – the Agency listed the receiving water as "Neponset Reservoir"[114] and described the uses of the reservoir ("The reservoir is used for primary and secondary recreation, as well as warm water fishery, and is in close proximity to public and private drinking water supply wells"[115]). In additional documents contained in the record, EPA and MassDEP have periodically reiterated that they understand the permit being renewed to relates to the Reservoir.[116,117]

Despite its extensive history of treating Outfall 001 as discharging to the Neponset Reservoir, EPA has in the 2011 Draft Permit shifted its focus to "Gudgeon Brook/Neponset Reservoir" with no explanation for why it is doing so. This is a violation of the basic tenant of administrative law that, because "[t]he law demands a certain orderliness," an administrative agency that decides "to depart significantly from its own precedent . . . must

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[110] Id. at p. 2.

[111] Id. at p. 2 ("In June of 1986, the Massachusetts DEQE performed a water quality survey to assess the quality of the *Neponset Reservoir* and *its* assimilative capacity for the discharge from the Foxboro Company.").

[112] EPA's Response to Comments Received During Public Notice on the June 30, 1987 Draft Permit (November 17, 1987), p. 1 (emphasis added) (Attachment 11 hereto).

[113] Id. at pp. 1-2 (emphasis added).

[114] 1991 Permit Fact Sheet (September 30, 1991), p. 1.

[115] Id. at p. 3.

[116] E.g., July 29, 1997 Letter from EPA to I. Cook of the Neponset River Watershed Association (treating this permit as relating to the Neponset Watershed); Public Notice on 1997 Draft Permit and additional draft permits (June 22, 1997) ("Receiving Water: All to Neponset River [sic]"); NPDES Permit Rating Work Sheet (August 15, 2000) ("Receiving Water: Neponset Reservoir"). See also MassDEP approval of plan to continue operation of dry-weather treatment system to "remove volatile organic compounds (VOC's) from groundwater and storm water prior to its discharge to the Neponset Reservoir" (April 8, 1997) (Attachment 12 hereto); EPA/MassDEP approval of RAM Plan to cleanout the Outfall 001 drain lines (June 18, 1997) ("The RAM Plan proposes to eliminate or minimize any discharge of contaminants...to the Neponset Reservoir.").

[117] It is worth noting that the Town of Foxborough has a municipal storm water outfall that discharges into the same location. The company noted this fact in its first application for a NPDES permit to cover Outfall 001 and reiterated it in 2003, and EPA concedes it in the current Fact Sheet. Like Outfall 001, Foxborough's discharge point is covered under a NPDES permit and, like all the prior iterations of the present permit, that NPDES permit that also lists the Neponset Reservoir – *not* Gudgeon Brook – as the receiving water.

confront the issue squarely and explain why the departure is reasonable."[118] It is impermissible for EPA to "depart *sub silentio* from its usual rules of decision to reach a different, unexplained result in a single case . . . . An inadequately explained departure solely for the purposes of a particular case, or the creation of conflicting lines of precedent governing the identical situation, is not to be tolerated."[119]

EPA not only fails to provide an explanation for its change; it also seems unclear itself about the identity of the receiving water. In a number of respects the Fact Sheet suggests that Outfall 001 should be considered as discharging to the Reservoir. For instance, the Fact Sheet discusses the Reservoir and its characteristics and classification in the "Receiving Waters" section,[120] and it focuses entirely on the effect that the Outfall 001 discharge allegedly has on the ability of the Neponset Reservoir to support various uses,

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[118] Davila-Bardales v. INS, 27 F.3d 1, 5 (1st Cir. 1994) (also holding that remand is appropriate where an agency has "blazed a new trail that veers significantly from its own prior precedent" but "has failed to explain why it is changing directions (or even to acknowledge in the later decision that it is detouring from a beaten path)"); see also, e.g., Atchison, Topeka & Santa Fe Ry. Co. v. Wichita Bd. of Trade, 412 U.S. 800, 808 (1973) (an agency has a "duty to explain its departure from prior norms. . . . Whatever the ground for the departure . . . it must be clearly set forth so that the reviewing court may understand the basis of the agency's action and so may judge the consistency of that action with the agency's mandate."); Secretary of Agriculture v. United States, 347 U.S. 645, 653-54 (1954) (an agency must "adequately explaine[] its departure from prior norms . . . with the simplicity and clearness through which a halting impression ripens into reasonable certitude"; it cannot leave others to "spell out, to argue, to choose between conflicting inferences. Something more precise is requisite in the quasi-jurisdictional findings of an administrative agency.") (citations omitted); Shaws Supermarkets Inc. v. NLRB, 884 F.2d 34, 36 (1st Cir. 1989) ("The problem in this case for the Board, however, is that (a) it is not writing on a blank slate, but has written on the subject often in the past; (b) the Board has not said that it wishes to depart from its several prior cases on the subject; yet (c) . . . the prior cases dictate a result [contrary to the Board's decision in the instant case]. The law that governs an agency's significant departure from its own prior precedent is clear. The agency cannot do so without explicitly recognizing that it is doing so and explaining why."); Massachusetts Dep't of Ed. v. United States Dep't of Ed., 837 F.2d 536, 544-45 (1st Cir. 1988) (once an agency "builds a body of precedent . . . it cannot thereafter lightly disregard" that precedent, but must "follow, distinguish, or overrule" it); National Black Media Coalition v. FCC, 775 F.2d 342, 355 (D.C. Cir. 1985) ("it is also a clear tenant of administrative law that if the agency wishes to depart from its consistent precedent it must provide a principled explanation for its change of direction. . . . We have steadfastly held that an agency changing its course must apply a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored.") (citations omitted); Baltimore Gas & Electric Co. v. Heintz, 760 F.2d 1408, 1418 (4th Cir. 1985) ("It is a well-settled proposition of administrative law that when an agency deviates from established precedent, it must provide a reasoned explanation for its failure to follow its own precedents . . . when an agency treats two similar transactions differently, an explanation for the agency's actions must be forthcoming.") (citations omitted); Democratic Union Organizing Committee v. NLRB, 603 F.2d 862, 871-72 (D.C. Cir. 1978) (when an agency "fails to distinguish contradictory decisions rendered in similar cases," it forfeits "the deference we would otherwise show to its very considerable expertise" in the matters of its competence); Greyhound Corp. v. ICC, 551 F.2d 414, 416 (D.C. Cir. 1977) (per curium) ("This court emphatically requires that administrative agencies adhere to their own precedents or explain any deviations from them."); K. Davis, Administrative Law Treatise § 11.5 at 206 (1994) ("The dominant law clearly is that an agency must either follow its own precedents or explain why it departs from them.").

[119] NLRB v. International Union of Operating Engineers, Local 925, 460 F.2d 589, 604 (5th Cir. 1972) (citations omitted).

[120] Fact Sheet, p. 2.

offering no discussion whatsoever of the effect of the discharge on the biology of Gudgeon Brook or the uses attributed to Gudgeon Brook as a Class B water.[121] However, for purposes of dilution, EPA assumes that Gudgeon Brook alone is the receiving water into which Outfall 001 discharges.[122] The Agency's shift between focusing on Gudgeon Brook and on the Reservoir is inconsistent and biases the permit towards extremely stringent limits by maximizing the uses and species at issue while at the same time minimizing dilution. The Agency must focus on the Reservoir or Gudgeon Brook, but cannot have it both ways. The shift is also confusing, and EPA has ignored Invensys' requests for clarification on this point.[123]

Furthermore, EPA's lack of clarity regarding what the receiving water actually is demonstrates yet again that EPA has not properly derived the numeric water quality-based effluent limitations it seeks to impose for Outfall 001. As the Agency's own guidance establishes, the proper derivation of such limits requires, among other things, "an adequate receiving water exposure assessment".[124] The Agency cautions against implementing numeric criteria when such an assessment has not been conducted because doing so "may result in the imposition of inappropriate numeric limitations on a discharge" including "the imposition of numeric water quality criteria as end-of-pipe limitations without properly accounting for receiving water assimilation of the pollutant" which "could lead to overly stringent permit requirements, and excessive and expensive controls on storm water discharges, not necessary to provide for attainment of WQS."[125] Because EPA has failed to clearly establish the receiving water at issue, let alone conduct a receiving water exposure assessment, it cannot properly impose the numeric water quality-based effluent limitations for Outfall 001 that are included in the 2011 Draft Permit.

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[121] See Fact Sheet, p. 2.

[122] See Fact Sheet, p. 9 ("The available dilution for the facility's discharge[] to Gudgeon Brook (Outfall 001)...was determined to be zero. [This] determination[was] based on the fact that [the] discharge location[is] at the headwaters of [a] small stream[] and so ha[s] little or no flow upstream of the discharge location.").

[123] 2003 Comments, Table 1, p. 1, No. 2 ("No justification or explanation as to exactly which water body (Gudgeon Brook or Neponset Reservoir) is the designated 'receiving water' for the Outfall 001 discharge."); see also 2003 Comments, p. 11 ("EPA nonetheless calculates the draft permit limits as if Gudgeon Brook is the receiving water, making no allowance for any dilution potential that exists in the Reservoir.").

[124] Interim Approach, p. 4.

[125] Id. at p. 4.

B. The Agency Has Not Documented a Jurisdictional Determination for Robinson Brook

As Invensys noted in 2003, Robinson Brook is "is an intermittent stream, with limited habitat value and no potential for recreational, agricultural or industrial uses."[126] This characterization is confirmed by Massachusetts law,[127] under which the portion of Robinson Brook presently at issue[128] is understood to be an intermittent stream because it is listed as intermittent by MassGIS[129] and has a watershed of only 0.18 square mile.[130] Moreover, during the period August 2001 to March 2002 Invensys monitored the flow in Robinson Brook, making frequent observations regarding its contents.[131] On most days – including many stretches of four or more consecutive days[132] – little to no flow was observed

[126] 2003 Comments, p. 11. The comment continued: "The first actual water body that might support any type of biotic community is located a significant distance away and EPA has identified no evidence suggesting that this community is actually affected by Invensys' discharge."

[127] 310 CMR 10.58(2)(a)(1)(c) ("A stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size of less than one square mile, is intermittent").

[128] The appropriate discussion for present purposes is whether the segment of Robinson Brook located in the vicinity of the plant is intermittent, not whether the Brook is intermittent along its entire length. 310 CMR 10.58(2)(a)(1):

> Intermittent streams are not rivers . . . because surface water does not flow within them throughout the year. When surface water is not flowing within an intermittent stream, it may remain in isolated pools or it may be absent. When surface water is present in contiguous and connected pool/riffle systems, it shall be determined to be flowing. Rivers begin at the point an intermittent stream becomes perennial or at the point a perennial stream flows from a spring, pond, or lake . . . Upstream of the first point of perennial flow, a stream is normally intermittent.

[129] MassGIS, MassDEP Hydrography Layer (1:25,000), available at http://www.mass.gov/mgis/hd.htm (last visited October 31, 2011). This information, compiled in March 2010, is the "more recent map provided by the Department" than the current United States Geological Service ("USGS") map (available at http://viewer.nationalmap.gov/viewer/), which is from 1987. See also MassDEP Priority Resource (21E) Map in the MassGIS (2011), available at http://maps.massgis.state.ma.us/21E/viewer.htm (last visited October 31, 2011).

[130] See Attachment 13 hereto, providing USGS StreamStats Output on the Drainage Basin Characteristics for the Subject Portion of Robinson Brook.

[131] A table summarizing those observations is attached hereto as Attachment 14.

[132] See 310 CMR 10.58(2)(a)(1)(d) (establishing that, even where the requirements of 310 CMR 10.58(2)(a)(1)(c) are not satisfied – which they are in this case – "the issuing authority shall find that any stream is intermittent based upon a documented field observation that the stream is not flowing...at least once per day, over four days in any consecutive 12 month period").

in the Brook at the monitoring point, buttressing the conclusion that the relevant portion of the stream is intermittent.[133]

Notably, the Agency has neither acknowledged nor responded to Invensys' arguments that Robinson Brook is intermittent. The current Fact Sheet characterizes Robinson Brook by stating that it "is located at the headwaters of the Taunton River Basin, and it is a tributary to the Rumford River . . . is not specifically identified in the tables or maps in the Massachusetts Water Quality Standards . . . [and in the segment receiving the Invensys discharge] is also not identified in the 2008 Integrated List."[134] These observations are consistent with Robinson Brook being intermittent, as established under 310 CMR 10.58(2)(a)(1)(c), which makes EPA's failure to address this issue even more glaring.

EPA's own guidance (both current and pending) establishes that it may not exercise Clean Water Act jurisdiction over tributaries "whose flow is 'coming and going at intervals . . . broken, fitful,"[135] "ephemeral tributaries which flow only in response to precipitation,"[136] or "intermittent streams which do not typically flow year-round or have continuous flow at least seasonally,"[137] without first conducting a "fact-specific analysis"[138] well documented in the record[139] demonstrating that there is a "significant nexus with a traditional navigable

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[133] As is apparent from Attachment 14, Robinson Brook was observed to be dry or with no observable flow for 33 consecutive days in August-September 2001, 21 consecutive days in September-October 2001, 14 additional consecutive days in October 2001, 13 consecutive days in November 2001, 11 additional consecutive days in November-December 2001, 20 consecutive days in February 2002, and at least 5 consecutive days in March 2002. It is true that these observations were made during a declared drought. However, these data are only used to confirm data that already establish that Robinson Brook is intermittent. Moreover, the data are overwhelming – thirty-three consecutive days with no flow is fairly conclusive.

[134] Fact Sheet, p. 2.

[135] EPA Guidance "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States" (December 2, 2008) ("2008 CWA Jurisdiction Guidance"), p. 7, quoting Scalia decision in Rapanos, 547 U.S. 715, 732-33, n.5 (2006); see also EPA's "Draft Guidance on Identifying Waters Protected by the Clean Water Act" (May 2, 2011), p. 27.

[136] Id.

[137] Id.

[138] 2008 CWA Jurisdiction Guidance, p. 1 ("The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water: Non-navigable tributaries that are not relatively permanent . . . . The agencies will apply the significant nexus standard as follows: A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters[;] Significant nexus includes consideration of hydrologic and ecologic factors"); see also pp. 8 (listing hydrologic and ecologic factors to be considered in significant nexus analysis) & 10-11 (describing what a significant nexus analysis should include).

[139] Id. at p. 11 ("EPA regions shall document in the administrative record the available information regarding whether a tributary and its adjacent wetlands have a significant nexus with a traditional navigable water, including the physical indicators of flow in a particular case and available information regarding the functions

water."[140] The Agency has failed to provide *any* documentation of its jurisdictional determination for Robinson Brook. There is nothing in the record to indicate that EPA has so much as considered – let alone conducted a fact-specific analysis to determine – whether Robinson Brook has the capacity to "significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable'"[141] or whether jurisdiction under the Clean Water Act is appropriate at all. This dearth of record support is contrary to EPA's own guidance that it must "ensure that the information in the record adequately supports any jurisdictional determination…explain the rationale for the determination [and] disclose the data and information relied upon."[142]

Thus, EPA has failed to properly document its jurisdictional determination for Robinson Brook, as required by Agency policy. Absent such a determination, it has no authority under the CWA to require a permit for the discharge to Robinson Brook.

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of the tributary and any adjacent wetlands. The agencies will explain their basis for concluding whether or not the tributary and its adjacent wetlands, when considered together, have a more than speculative or insubstantial effect on the chemical, physical, and biological integrity of a traditional navigable water."); see also pp. 12-13:

> EPA regions will ensure that the information in the record adequately supports any jurisdictional determination. The record shall, to the maximum extent practicable, explain the rationale for the determination, disclose the data and information relied upon, and, if applicable, explain what data or information received greater or lesser weight, and what professional judgment or assumptions were used in reaching the determination . . . EPA regions will also demonstrate and document in the record that a particular water either fits within a class . . . not requiring a significant nexus determination, or that the water has a significant nexus with a traditional navigable water. As a matter of policy . . . EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.
>
> All pertinent documentation and analysis for a given jurisdictional determination . . . shall be adequately reflected in the record and clearly demonstrate the basis for asserting or declining CWA jurisdiction. Maps, aerial photography, soil surveys, watershed studies, local development plans, literature citations, and references from studies pertinent to the parameters being reviewed are examples of the information that will assist staff in completing accurate jurisdictional determinations.

[140] Id. at pp. 7 ("'[R]elatively permanent' waters do not include ephemeral tributaries which flow only in response to precipitation and intermittent streams which do not typically flow year-round or have continuous flow at least seasonally. However, CWA jurisdiction over these waters will be evaluated under the significant nexus standard . . .") & 12 ("The agencies will also decide CWA jurisdiction over other non-navigable tributaries . . . based on a fact-specific analysis to determine whether they have a significant nexus with traditional navigable waters.")

[141] Rapanos, 547 U.S. at 780; see also 2008 CWA Jurisdiction Guidance, p. 3.

[142] 2008 CWA Jurisdiction Guidance,, p. 12.

C. EPA Has Not Provided a Sufficient Basis for Termination of Coverage under the Multi-Sector General Permit

Even if there were a basis for concluding that EPA has jurisdiction to regulate Robinson Brook under the CWA, the Agency has failed to provide a sufficient justification for removing Outfall 002 from coverage under the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP). In a June 2002 letter to Invensys, the Agency set forth two purported bases for removing Outfall 002 from coverage under the MSGP: (1) the nature of the discharges, which include groundwater and sump pump discharges "not authorized by the MSGP"; and (2) EPA and MassDEP's "belie[f] that the storm water discharges alone are a significant contributor of pollutants" based on "effluent sampling data collected by the company from [Outfall 002] during dry and wet weather on July 15, 2001[143] and July 17, 2001". EPA's conclusion that coverage under the MSGP is inappropriate is flawed.

First, the sump discharges should be considered authorized non-storm water discharges in that they constitute "foundation or footing drains where flows are not contaminated with process materials." The sumps dewater groundwater from building basements, which does not come in contact with Facility processes. Second, with respect to groundwater discharges, while the limited dry weather sampling data available do identify exceedances of NRWQC for certain constituents[144], such data were collected prior to the 2002-2003 drain line cleanout, and are therefore not likely to be representative of the current groundwater. Further, it is not clear that the fact of such exceedances necessarily results in the water being considered "contaminated", especially here where, as described in Section III.B.2, <u>supra</u>, the exceedances are of NRWQC which fail to consider site-specific conditions and species.

In addition, Invensys strongly disagrees with the Agency's contention that the storm water discharges are a "significant contributor of pollutants." As an initial matter, Invensys is unaware of <u>*any*</u> existing data which would allow the Agency to determine the concentrations of constituents in storm water alone. Rather, the available data is representative of the combined flow of storm water, sump discharge and groundwater.[145] Therefore, the Agency lacks a scientific basis for its conclusion. Further, the Agency does not have a sufficient basis on which to determine that the Outfall 002 discharges, even as a combined stream, are a significant contributor of pollutants to Robinson Brook. The entire basis for the Agency's conclusion is monitoring data collected on <u>*two*</u> dates in 2001. As noted in Section III.A, <u>supra</u>, this monitoring data is likely not representative of the current discharge, and the Agency has not provided any analysis of whether the discharges are likely

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[143] While the June 2002 letter refers to sampling data collected on July 15, 2001, Invensys is not aware of any sampling having been conducted on that date. Rather, Invensys believes that the Agency is likely referring to sampling conducted on June 15, 2001.

[144] <u>See</u> Fact Sheet, Attachment C.2.

[145] Certain of the data also likely reflect the discharges of two non-Invensys municipal storm drains from Neponset Avenue located between the Facility and Outfall 002, as discussed in Section III.A, <u>supra.</u>

to significantly contribute pollutants using all available data. Finally, as described in Section III.B, supra, any exceedances are of NRWQC, which fail to consider site-specific conditions and species. Given the circumstances of this case, the use of such criteria is inappropriate.

Accordingly, Invensys requests that the Agency reconsider its determination to terminate coverage of the Robinson Brook discharge under the MSGP.

V. The 2011 Draft Permit's Monitoring Requirements are Unreasonable and Unnecessary

EPA's Interim Approach requires that monitoring regimes established in NPDES permits be "coordinated and cost-effective".[146] The purpose of a monitoring program is to "gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits."[147] Unfortunately, rather than heeding the requirements set forth in the relevant guidance documents, the 2011 Draft Permit imposes a number of monitoring requirements that are unnecessary, unreasonably burdensome and, to Invensys' knowledge, unprecedented in their excess.

A. Weekly Sampling Requirement for Toxics Is Unnecessary

The 2011 Draft Permit requires Invensys to sample for toxics on a weekly basis. The Agency has failed to provide an adequate justification for the imposition of such an excessive requirement. Further, such requirement cannot be squared with the Agency's well-established policy that needless and burdensome monitoring is to be avoided. Nor can it be squared with the Agency's treatment of other permittees in Region 1.

Faced with a draft permit in 2003 that increased sampling for toxics in the Outfall 001 discharge *twelve-fold*, from once per quarter to once per week, Invensys argued that such a change was excessive and requested a justification from EPA for the striking departure from its established policy and prior requirements.[148] Citing EPA's then-current NPDES Permit Writers' Manual, Invensys explained that the Agency's own guidance prohibits the imposition of unnecessary or burdensome monitoring.[149] Invensys reiterated the same argument in its 2005 Comments on the GE Permit.[150] Since the submission of those comments, the Manual has changed, but EPA's stated policy has not. Monitoring frequencies must still be "sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, *the potential cost to the*

[146] Interim Approach, p. i.

[147] Id.; see also Manual, p. 8-5.

[148] E.g., 2003 Comments, Table 1, p. 3, No. 10 & Table 2, p. 1., No. 1.1

[149] 2003 Comments, p. 13 (quoting EPA's 1996 NPDES Permit Writers' Manual, p. 119) & Table 1, p. 3, No. 10.

[150] 2005 Comments, p. 3.

permittee," and they "should not be excessive" or unnecessary "to provide sufficient information about the discharge."[151]

Despite the fact that the new Manual expressly states that "decisions for setting monitoring frequency should be described in the fact sheet,"[152] the Agency has provided no explanation for why it is has completely ignored the cost to Invensys of weekly monitoring. Weekly monitoring will involve significant additional expense compared to the monitoring that is required under the current permit. Indeed, Invensys anticipates that compliance with the monitoring requirements proposed in the 2011 Draft Permit will require Invensys to expend $200,000 in initial outlay for sampling equipment, plus annual monitoring costs ranging from approximately $40,000 to $100,000. On the facts of this case, such costs are shockingly excessive on their face. The imposition of such burdensome and costly monitoring requirements is contrary to Agency policy, and is inconsistent with virtually all other permits within Region 1 that Invensys has reviewed.

Indeed, rather than responding to Invensys' comments by providing a meaningful explanation for why it believes weekly monitoring to be appropriate for Outfall 001,[153] EPA has moved to an even more extreme position, ***doubling*** the monitoring frequency for toxics in the Outfall 002 discharge from twice per month[154] to once per week without mentioning the fact that it is doing so or providing any justification for its action. This is, again, a blatant violation of the EPA's own guidance, which requires the Agency to describe its "decisions for setting monitoring frequency" in the fact sheet.[155]

As to Outfall 001, EPA attempts to justify the onerous monitoring requirements on the grounds that the discharge is variable, stating that "[t]he data indicate that there is significant variability in almost all parameters and this, in part, reflects differences in weather conditions as well as the activation frequency of numerous sump pumps." It is undisputed that a key factor in establishing what monitoring frequency is truly necessary is

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[151] Manual, p. 8-5 (emphasis added).

[152] Id.

[153] Invensys previously noted that EPA said "nothing whatsoever regarding the frequency of monitoring." 2003 Comments, p. 13. EPA's new assertion at page 12 of the Fact Sheet that it "believes that these frequencies are necessary to characterize the discharge, and to ensure that adequate numbers of both dry and wet weather events are sampled" is a statement of EPA's conclusion, not a substantive justification, and it does no more than the prior lack of explanation to justify such frequent, costly monitoring. EPA may not rely on *ipse dixit* to justify permit requirements. E.g., American Petroleum Institute v. EPA, 661 F.2d 340, 349 (5th Cir. 1981) ("Courts require that administrative agencies articulate the criteria employed in reaching their result and are no longer content with mere administrative ipse dixits based on supposed administrative expertise.") citing Appalachian Power Co. v. EPA, 477 F.2d 495, 507 (4th Cir. 1973).

[154] As Invensys noted in 2003, twice-monthly monitoring of Outfall 002 toxics in 2003 Draft Permit was itself an unexplained, unjustified increase in monitoring frequency from prior drafts of the permit, as EPA had increased VOC sampling six-fold from once per quarter to twice per month and created a brand new requirement for metals testing twice per month. See 2003 Comments, Table 1, p. 3, No. 13.

[155] Manual, p. 8-5.

the expected variability of the discharge. However, there is no evidence to support that Invensys' discharges are so variable as to merit the extremely costly requirement of *weekly* monitoring. As noted in Section III.A, supra, storm water discharges are variable, which is the very reason EPA's established policy is to employ BMPs rather that numeric effluent limitations in storm water permits. However, such variability simply does not necessitate weekly monitoring. Indeed, as discussed in further detail below, Invensys has reviewed numerous NPDES permits for storm water or comingled storm water and groundwater discharges issued by Region 1 and has not located another permit that requires such frequent monitoring for toxics.

As noted, EPA does not so much as mention the increased frequency of toxics monitoring required for Outfall 002 under the 2011 Draft Permit, so it is not clear whether data variability is the EPA's purported justification for imposing such frequent monitoring. What is clear is that EPA has based this increase on data that was not only insufficient to justify such a frequency in 2003, but is also outdated. As Invensys noted in 2003, the "proposed sampling frequencies for Outfall 002 are based on effluent sampling conducted in 2001 and 2002."[156] At that time, EPA interpreted such data as requiring twice-monthly sampling of metals and VOCs. The Robinson Brook sampling frequencies in the current draft are ***still*** based on data from 2001 and 2002,[157] but now EPA is inexplicably requiring twice as much sampling (i.e., once per week). EPA has provided no explanation for this change of position because, as noted, it has not mentioned changes to the Robinson Brook sampling at all, anywhere in the Fact Sheet or record. Furthermore, and as noted in Sections III.A and IV.C, supra, the 2001 and 2002 data is outdated. In 2003, Invensys argued that it was unreasonable for the Outfall 002 sampling frequency to be based on data from 2001 and 2002 because more recent and representative sampling data was available. Specifically, Invensys noted that February 2003 data was available from sampling that had been conducted "at the conclusion of a major drain line cleanout program to remove accumulated sediment from within the drain lines leading to Robinson Brook indicat[ing] that post-cleanout contaminant levels are generally lower than pre-cleanout levels."[158] This is only more true today, as *additional* post-cleanout data (e.g., from November 2003) was made available to EPA after the 2003 Comments were submitted. Indeed, EPA not only received this more recent data from Invensys; it actually attached it to the Fact Sheet and referenced it.[159] Nevertheless, EPA persists in ignoring it for purposes of establishing the toxics sampling frequency for Outfall 002.

The frequency of the monitoring EPA is now requiring in the Outfall 001 discharge for tetrachloroethylene (PCE) also merits particular attention, as it highlights the manifest unreasonableness of the 2011 Draft Permit. EPA has removed all numeric VOC limits for

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[156] 2003 Comments, Table 1, p. 3, No. 14 & p. 4, No. 17.

[157] Fact Sheet, p. 13.

[158] 2003 Comments, Table 1, p. 3, No. 14 & p. 4, No. 17.

[159] Fact Sheet, p. 13, n.5 & Attachment C.7.

Outfall 001,[160] but it has nevertheless increased the report-only sampling frequency for PCE *twelve-fold* from the once per quarter that was required under the 1991 Permit to once per week under the present draft. Thus, the sampling requirements have increased from four sampling events per year to 52 sampling events per year. As Invensys noted in 2003, this increased monitoring frequency is entirely unjustified. Since the 1991 permit was issued (with once per quarter VOC sampling), the Outfall 001 drain line has been cleaned. EPA admits that this effort by Invensys "resulted in a substantial reduction in the concentration of...VOC" in the Outfall 001 discharge[161] – "up to 70% lower."[162] Moreover, as Invensys informed EPA earlier this year, "VOC levels detected in the [Outfall 001] discharge were all below applicable MCP standards and were determined by an LSP to pose no significant risk."[163] Even EPA itself has "not found that [there is] reasonable potential to exceed the criteria . . . [because PCE] has not been detected in the effluent monitoring."[164] While these circumstances are more than sufficient to cast doubt on EPA's drastic increase in the frequency of required PCE monitoring in the Outfall 001 discharge, additional information demonstrates that EPA's PCE requirements for Outfall 001 are unreasonable. Specifically, EPA bases its PCE monitoring requirement determination on data from a single sump[165] that contributes minimal flow to the Outfall 001 discharge, and considers that sump data in light of the human health criterion for the ingestion of fish (i.e., 3.3 ug/l),[166] which Invensys has repeatedly explained is an irrelevant concern for Gudgeon Brook.[167]

EPA has not even attempted to justify the increased costs associated with this twelve-fold increase in sampling events or explained what environmental benefits might result from it. Nor could it, as the costs of such increased monitoring far outweigh any environmental benefit that could come from increased monitoring for a constituent that has not been detected in the effluent monitoring.

The weekly toxics monitoring requirements EPA proposes to impose are not only inconsistent with the Agency's stated policies and guidance; they are also unprecedented in their stringency and excess. *All* the other industrial storm water permits issued by Region 1 that Invensys has been able to locate require much less frequent monitoring for toxics.

[160] This is not true for Outfall 002, where EPA has added or increased numeric standards for both TCE and PCE, which Invensys also believes to be unjustified, as discussed above.

[161] Fact Sheet, p. 4.

[162] 2003 Comments, Table 1, p. 3, No. 14 & p. 4, No. 17; see also Table 1, p. 3, No. 10.

[163] February 16, 2011 E-mail of Paul Ahearn to David Pincumbe.

[164] Fact Sheet, pp. 11-12.

[165] Id. at p. 11 & Attachment A.7.

[166] See id. at p. 11.

[167] E.g., October 30, 2001 Letter from Paul Ahearn to Janet Labonte, pp. 3-4; 2003 Comments, p. 7, n.13.

As Invensys noted in 2005, before the aforementioned GE Permit was modified in 2009, it required monitoring no more than monthly and frequently quarterly. Weekly sampling was not even required for PCBs, which EPA specifically acknowledged have shown significant variability in the GE discharges.[168] EPA has never acknowledged Invensys' comments regarding the GE Permit, let alone explained why increased monitoring requirements are warranted here. The frequency required under the GE Permit has since increased somewhat, but at most to twice-monthly during dry weather.[169] This is still *half* the monitoring required under the 2011 Draft Permit, despite greater evidence of variability in the GE discharges.[170] Moreover, the GE Permit only requires wet weather sampling one to three times per quarter – not weekly as for Invensys. This constitutes inconsistent implementation of the Manual criteria and unequal treatment of similarly situated parties, and it is therefore impermissible.

Similarly, the Wyman Gordon Permit requires quarterly (report-only) monitoring for metals.[171] The Logan Airport Permit requires monthly (report-only) monitoring for bacteria – a problem pollutant at the site – and only quarterly (report-only) sampling for PAHs (report only).[172] And a multitude of other Region 1 permits reflect that quarterly or at most monthly monitoring – and *not* EPA's attempted imposition of weekly monitoring requirements on Invensys – is the established norm.[173]

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[168] 2005 Comments, pp. 1 & 3-4.

[169] 2009 Final GE Permit, supra, at pp. 2-14.

[170] See 2005 Comments, pp. 3-4.

[171] 2008 Final Wyman Gordon Permit, supra, at pp. 5-7.

[172] 2007 Final Logan Airport Permit, supra, at pp. 3, 5-6 (nn.3-4), 7, 9-10 (nn.8-9), 20, 22 & 23 (n.17).

[173] See, e.g., the NPDES permits by EPA Region 1 for: CSX Transportation in Allston (Permit No. MA0025704), available at http://www.epa.gov/region1/npdes/permits/finalma0025704permit.pdf, pp. 2 & 5 (monthly samples at most and only twice yearly monitoring for priority pollutants); Massachusetts Bay Transportation Authority ("MBTA") in Somerville (Permit No. MA0003590), available at http://www.epa.gov/region1/npdes/permits/2007/finalma0003590permit.pdf, p. 2 (monthly samples at most and only quarterly monitoring for priority pollutants); Texas Instruments in Attleboro (Permit No. MA0001791), available at http://www.epa.gov/region1/npdes/permits/2010/finalma0001791permit.pdf, pp. 2-3 & 5-6 (monthly samples at most, quarterly samples for some VOCs, and only yearly monitoring for priority pollutants); Clean Harbors in Braintree (Permit No. MA0031551), available at http://www.epa.gov/region1/npdes/permits/2011/finalma0031551permit.pdf, p. 2 (monthly samples at most, and annual report-only monitoring of metals); Cornell-Dubilier in New Bedford (Permit No. MA0003930), available at http://www.epa.gov/region1/npdes/permits/2008/finalma0003930permit.pdf, p. 2 (quarterly samples at most, including for problem pollutant PCBs); Eastman Gelatine in Peabody (Permit No. MA0003956), available at http://www.epa.gov/region1/npdes/permits/finalma0003956permit.pdf, pp. 2 & 4 (quarterly monitoring for most pollutants, but metals monitoring only twice per year); Solutia in Chicopee (Permit No. MA0001147), available at http://www.epa.gov/region1/npdes/permits/2008/finalma0001147permit.pdf, pp. 2-31 (at most monthly; report-only metals at most once per quarter and often less, i.e., once or twice per year; and report-only bacteria monitoring once per year); Saint-Gobain Abrasives, Inc. and Saint-Gobain Ceramics & Plastics, Inc. in Worcester (Permit No. MA0000817), available at

Finally, EPA has ignored Invensys' repeated requests that, if the unprecedented weekly sampling requirements are retained over Invensys' objection, a mechanism for relief be provided in the permit. Such a mechanism was first suggested by EPA.[174] In 2003, Invensys expressly asked that the permit "provide for the frequency of the monitoring to be reduced to once per quarter after twelve months of consistent results."[175] As the 2003 Comments noted, this would have been consistent with the provisions in the 2003 Draft Permit for adjusting the frequency of WET testing – provisions which also exist in the 2011 Draft Permit.[176] EPA has failed to respond to Invensys' comment in this regard. Invensys therefore reiterates its request that, if the excessive weekly monitoring requirements are retained in the permit over Invensys' objection, the final permit contain a provision which automatically scales back the frequency at either or both outfalls after a period of twelve months of consistent results.

B. 24-Hour Composites for Metals Is Excessive

The requirement for 24-hour composite samples for the monitoring of certain parameters remains unclear, despite the fact that Invensys has twice expressed confusion and requested clarification. Specifically, in October 2001, Invensys asked how monthly averages and daily maximum values were supposed to be reported using 24-hour composites.[177] In 2003, Invensys reiterated the comment: "The sampling for metals is proposed as using 24-hour composites, but the discharge limits are expressed as monthly averages or daily maximum values. How are the 24-hour composite samples to be used in such comparisons?"[178] EPA has still provided no response.

Moreover, Invensys has repeatedly objected that 24-hour composite sampling is excessive and unnecessary, requesting that EPA justify the requirement.[179] EPA has completely neglected to *mention* the requirement or Invensys' related comments anywhere in the Fact Sheet.

As Invensys explained in 2003, composite sampling is used to account for variability over 24 hours.[180] Invensys repeated this argument in its 2005 Comments, stating that 24-

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http://www.epa.gov/region1/npdes/permits/2009/finalma0000817permit.pdf, pp. 2-3 & 7 (metals monitoring quarterly at most, sometimes only twice yearly). All websites last visited October 31, 2011.

[174] See 2003 Comments, Table 2, p. 1, No. 1.1.

[175] Id. at p. 14.

[176] Id. at Table 1, p. 3, No. 12.

[177] October 30, 2001 Letter from Paul Ahearn to Janet Labonte, Exhibit 2.

[178] 2003 Comments, Table 1, p. 2, No. 7.

[179] E.g., id. at Table 2, p. 1, No. 1.2 & p. 3, No. 2.

[180] Id. at p. 14.

hour composite sampling "is a far more burdensome and expensive sampling method than the more typical grab sampling. Like frequent monitoring, composite sampling is appropriate only where variability within the sampling period is expected to be significant."[181] EPA has provided no argument or data demonstrating that such 24-hour variability exists in this case. Indeed, the available data demonstrate that EPA has no basis for assuming that such variability will exist in Invensys' discharges.

Almost all of the other Region 1 NPDES permits listed in the foregoing section require grab sampling, not 24-hour composites, and certainly not 24-hour composites every week. In fact, the only such permits to require any 24-hour composite sampling of similar discharges are the GE Permit, which includes some *twice-monthly* or *quarterly* 24-hour composite sampling of its *report-only* parameters, and the Texas Instruments permit, which does require 24-hour composite sampling for priority pollutants, but only *once per year*.[182] EPA has provided no justification for requiring such frequent 24-hour composites here or for its differential treatment of Invensys.

Invensys strenuously objects to this requirement and requests that the sampling requirement be altered to require only grab sampling.

C. Quarterly WET Testing for Outfall 001 Is Unnecessary

The 2011 Draft Permit allows with respect to Outfall 001 that "[a]fter submitting four consecutive sets of whole effluent toxicity (WET) tests results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction of the WET testing requirements."[183] EPA therefore concedes that quarterly WET testing is not necessary after one year of such testing has demonstrated compliance.[184]

In 2003 Invensys noted that "[t]here already exists an overwhelming data base which: (i) clearly demonstrates that the Outfall 001 discharge to Gudgeon Brook is not toxic, and (ii) provides the basis for an immediate reduction of WET testing levels from the quarterly frequency proposed by EPA to annual testing."[185] EPA has not responded to this

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[181] 2005 Comments, p. 3.

[182] 2009 Final GE Permit, supra, at pp. 2-4, 6, 9 & 12-13; Texas Instruments Permit No. MA0001791, supra, at pp. 2 & 5. The Saint-Gobain Permit requires 24-hour composite sampling of its non-contact cooling water, but only once per quarter.

[183] 2011 Draft Permit, p. 4, n.10.

[184] EPA is not the only agency to espouse this interpretation. In 1991, in reviewing the permit which the present draft is intended to replace, multiple persons at MassDEP indicated that the frequency of toxicity testing should be reduced from once per quarter to once per year after one year of testing. September 26, 1991 Memorandum from Laurie Kennedy to Richard Cretien (Attachment 15 hereto) ("If acute toxicity is not detected in the discharge after one year of testing, the monitoring frequency could be reduced from quarterly to annually."); September 30, 1991 Memorandum from Paul Hogan to Richard Cretien (Attachment 16 hereto) ("the permittee could request, after one year of 'passable' data, a lessening of the toxicity monitoring requirement to once per year").

[185] 2003 Comments, Table 1, p. 5, No. 5; see also pp. 3 & 7.

argument. Now there are over eight *additional* years of quarterly WET testing. Indeed, whereas Invensys was able to reference nine years' worth of data in 2003, its position is now supported by additional years of WET test results. As noted above, in the 13 years since the 1997-1998 drain line cleanout, all WET tests for both species have showed 100% survival, except for the test conducted in the 1st quarter of 2002, where *C. dubia* showed 83% survival. Thus, the available information *still* indicates that Invensys' discharges are not acutely toxic to humans, aquatic life, or wildlife, and the frequency of WET testing should be reduced now to once per year,[186] if not eliminated entirely.[187]

D. The 2011 Draft Permit Contains Additional Unnecessary Monitoring Restrictions

EPA has added new details since the 2003 Draft Permit, which render the already excessive monitoring requirements more onerous still. Specifically, the current draft requires all sampling to take place "at the same time of day and the same day(s) of the week for each month,"[188] and toxicity samples are now mandated to be collected "in the first full week" of the listed months.[189] EPA has provided no basis for these restrictions. Invensys requests that these arbitrary restrictions be removed the final permit.

VI. The Agency Unreasonably Failed to Include a Compliance Schedule

The 2011 Draft Permit does not include a schedule for compliance with the extremely stringent limitations established therein. While Invensys strenuously objects to the need for the numeric permit limits proposed in the 2011 Draft Permit, rather than BMPs, the Agency's failure to include a reasonable compliance schedule also warrants a response.

The 2003 Draft Permit included a one-year schedule of compliance. In its 2003 Comments, Invensys noted that the proposed one-year compliance schedule was unreasonable and that construction of any of the available methods of achieving compliance with the permit limits could not be completed within the one year time frame. Accordingly, Invensys requested that a three-year compliance schedule be incorporated in the final permit.[190]

Rather than responding to Invensys' request for a more reasonable schedule of compliance, Region 1 has eliminated *any* schedule of compliance from the 2011 Draft Permit. Region 1 has provided no justification for the failure to include a compliance

[186] Various NPDES permits require annual WET testing, including the aforementioned permits issued to the MBTA in Somerville and Clean Harbors in Braintree.

[187] See the aforementioned final NPDES permits issued to Wyman Gordon, Logan International Airport, and Cornell-Dubilier, none of which require WET testing.

[188] 2011 Draft Permit, pp. 3 & 6, n.1.

[189] Id. at p. 4, n.10 & p. 7, n.10.

[190] 2003 Comments, p. 15.

schedule in the 2011 Draft Permit,[191] nor is there anything in the record provided to Invensys to suggest that Region 1 even considered the impact of such removal.[192] A compliance schedule should be included in the final Permit.

EPA's own guidance calls for the inclusion of schedules of compliance in the circumstances of this case. First, EPA guidance documents make clear that compliance schedules are allowed for effluent limitations based on standards adopted after July 1, 1977 if a state has indicated in its water quality standards that it intends to allow them.[193] The relevant state regulations squarely allow for schedules of compliance as a matter of Massachusetts law, providing that "[a] permit may, when appropriate, specify a schedule leading to compliance with the Massachusetts and Federal Clean Water Acts and regulations."[194] The regulations make clear that incorporation of a schedule of compliance is appropriate to afford a permittee additional time to comply with new permit limitations.[195]

Second, factors to be considered in determining whether a compliance schedule is appropriate weigh heavily in favor of including such a schedule here. The applicable Massachusetts regulations allow for inclusion of a schedule of compliance where "the permittee either cannot comply with such permit requirements or limitations, or there is insufficient information available to determine whether the permittee can comply".[196] Further, relevant Agency guidance notes a number of factors that are relevant to whether inclusion of a compliance schedule is appropriate in a specific permit, including: whether the discharger has already had to meet the WQBELs under prior permits; and, the need for "modifications to treatment facilities, operations or measures to meet the WQBELs" and the time those steps would take.[197] Consideration of these factors points in strongly in favor of including a compliance schedule in the present case.

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[191] Region 1 states in the Fact Sheet that "[c]ompliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit." Fact Sheet, p. 6. However, this statement relates to the use of schedules for compliance with technology based standards, and is not applicable to the water quality-based limits imposed in the 2011 Draft Permit.

[192] In re Wash. Aqueduct Water Supply Sys., 11 E.A.D. 565, 566 ("the administrative record must reflect the permit issuer's 'considered judgment,' meaning that the permit issuer must articulate with reasonable clarity the reasons for its conclusions and the crucial facts it relied upon in reaching those conclusions").

[193] See May 10, 2007 Memorandum from James A. Hanlon to Alexis Strauss regarding Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits (the "Hanlon Memo"). See also Manual at pp. 9-8 - 9-9.

[194] 314 CMR 4.03(1)(b).

[195] Id. Specifically, the relevant regulations make clear that the purpose of a compliance schedule is to allow the "permittee adequate time to comply with one or more permit requirements or limitations that are based on new, newly interpreted or revised water quality standards that became effective after both issuance of the initial permit for a discharge and July 1, 1977."

[196] Id.

[197] Hanlon Memo, pp. 2-3.

As noted in the attached report by Woodard & Curran, Invensys will be unable to immediately comply with the water quality-based effluent limitations proposed in the 2011 Draft Permit upon the effective date of the permit, if compliance with such limits is even technologically feasible. As discussed in Section III.B.2.c, supra, in order to comply with the proposed limitations Invensys would be required to install complex, non-conventional controls, including complicated, multi-phase treatment systems, accompanied by the construction of equalization tanks, the rehabilitation of existing drain lines or replacement of storm water drainage system. Estimates of the costs of the technologies that would be required to be implement range from $6 million to $17 million in capital costs, plus $300,000 to $900,000 in annual operation and maintenance costs. Invensys anticipates that the performance of necessary characterization and treatability studies, preparation and permitting of designs, and completion of construction will take approximately 2 to 3 years. More importantly, it is not even known at this time whether any of the potential approaches would even be able to attain compliance. To require immediate compliance with strict numeric effluent limits when it is not even known if compliance is possible is not just unreasonable and unfair; it borders on the absurd.

Accordingly, Invensys requests that, if Region 1 were to issue a final permit in a form similar to the 2011 Draft Permit, such permit include a compliance schedule providing for three (3) years to come into compliance with the effluent limits.

VII. The Permit Contains a Number of Additional Flaws

A. EPA Has Not Established a Basis for Imposing a Limit for Lead for Outfall 002

Even if it were acceptable for EPA to rely on 2001-2002 pre-cleanout data in establishing permit conditions for Outfall 002 (which it is not), the 2001-2002 data do not support EPA's imposition of an acute criterion for lead. The 2011 Draft Permit imposes an acute criterion of 33.8 ug/l. However, as the Fact Sheet explains, "[a] review of the effluent data submitted by the facility show concentrations ranging from 6.0 ug/l to 23.4 ug/l during wet weather, and 32 ug/l during dry weather"[198] – that is, *never* over the 33.8 ug/l limit.[199] Thus, inconsistent with all its other explanations demonstrating that numeric water quality-based effluent limits are being imposed because at least one exceedance has taken place,[200] EPA has imposed a numeric acute criterion for lead where there are no data demonstrating even one exceedance. Notably, EPA has taken the affirmative step of eliminating from the present permit a numeric acute criterion for lead in the Outfall 001 discharge. The data mandates that it must do the same for Outfall 002.

[198] Fact Sheet, p. 14.

[199] This is also true for the more current data which EPA attaches to the Fact Sheet but neglects to consider in establishing limits on the Outfall 002 discharge. Id. at Attachment C.7-B.

[200] As discussed in Section III.C.1, supra, Invensys submits that this method is itself inappropriate, as it does not constitute the required reasonable potential analysis.

B. The Bacteria Limit for Outfall 001 Should Be Eliminated

Between 2003 and 2010, EPA eliminated bacteria monitoring from the permit requirements for Outfall 001, stating that "a review of the discharge data indicate[d] that there is no reasonable potential to exceed criteria."[201] However, EPA has now added a bacteria limit and monitoring requirement for Outfall 001,[202] with requirements more onerous than pre-existing versions. Specifically, EPA has reduced the average monthly limit to 126 cfu/100 ml and drastically increased the frequency of required sampling, from once per month in wet weather from April through October, to once per week during the same period, regardless of weather conditions.[203]

EPA's stated basis for adding these stringent requirements into the permit for Outfall 001 is unspecified "discharge data submitted by the facility," which allegedly indicate recent exceedances, "although the majority of the data is still within the permit limits."[204] In reality, a few exceedances of a given limit do not necessarily correspond to a reasonable potential to exceed. As discussed in Section III.C.1, supra, EPA may not impose numerical WQBELs without demonstrating a reasonable potential to exceed the WQC. Moreover, to the extent that any high bacteria levels do exist in the Outfall 001 discharge, such levels are likely to stem from upstream, off-site drainage conditions out of Invensys' control (e.g., wild animal or pet waste affecting storm water, septic systems affecting groundwater, etc.). Finally, EPA's new bacteria requirements for Outfall 001 are inconsistent with the bacteria requirements EPA has included in other permits, most of which are report-only (i.e., do not include numeric criteria) and do not include onerous weekly sampling, if any bacteria limits exist at all.[205] For instance, the 2007 Logan Airport Permit imposes no numeric bacteria limit and requires its report-only monitoring once per month,[206] despite the fact that – unlike

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[201] 2010 Fact Sheet, p. 7.

[202] As to the Outfall 002 discharge, EPA has done the opposite for bacteria, eliminating all bacteria sampling since the 2010 draft, with no explanation for why it is doing so or why the two outfalls are being treated differently.

[203] 2011 Draft Permit, p. 2 & p. 3, nn.5-6.

[204] Fact Sheet, p. 10.

[205] Many permits include *no* bacteria limit. E.g., 2009 Final GE Permit, supra; 2008 Final Wyman Gordon Permit, supra; CSX Transportation Permit No. MA0025704, supra; Texas Instruments Permit No. MA0001791, supra; Clean Harbors Permit No. MA0031551, supra; Cornell-Dubilier, Permit No. MA0003930, supra; Eastman Gelatine Permit No. MA0003956, supra; Saint-Gobain Abrasives, Inc. and Saint-Gobain Ceramics & Plastics, Inc. Permit No. MA0000817, supra.

[206] 2007 Final Logan Airport Permit, supra, at pp. 3, 7, 20 & 22. See also MBTA Permit No. MA0003590, supra, at pp. 2 & 3, n.4 (requiring report-only monitoring once per month); Solutia Permit No. MA0001147, supra, at pp. 6, 14, 18, 22 & 26 (requiring report-only monitoring once per year).

in the present case – bacteria was one of the central pollutants of concern for the site given "the bacteria problem identified in the Logan area."[207]

For the foregoing reasons, Invensys respectfully requests that the bacteria limit and monitoring requirement for Outfall 001 be removed, consistent with the Outfall 002 portion of the permit. If EPA concludes that bacteria must be monitored in the Outfall 001 discharge, Invensys respectfully submits, in the alternative, that the permit requirements should conform to other Region 1 permits by requiring, at most, report-only monitoring once a month during the April-October period identified by EPA as relevant.

C. The pH Limit Is Inappropriate

In another example of unnecessary stringency in the present Draft, EPA has unreasonably removed from the pH limits the words "unless exceeded due to natural causes" – a phrase that appears in many other Region 1 NPDES permits imposing pH limits.[208]

The lower pH levels observed in the Outfall 001 effluent (5.5-6.4) are not atypical for eastern Massachusetts and conform to common, regionally-occurring surface water conditions resulting from acid rain. Indeed, the Massachusetts Acid Rain Monitoring (ARM) Program, which has been monitoring pH and alkalinity of Massachusetts ponds, lakes and streams since 1983, reported in June 2011 that pH levels in Massachusetts streams range from 3-7.8, with many reported values well below the lower limit imposed in the 2011 Draft Permit (i.e., 6.5).[209] The permit should specify a range of pH levels that, at a minimum, reflects regional water quality, rather than imposing a national recommended WQC default range that does not reflect the regional conditions.

EPA has previously recognized the propriety of such an approach, not only in the context of other recent NPDES individual storm water permits,[210] but even in prior iterations of this very same permit. Specifically, the 1991 Permit included a provision that allowed for

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[207] EPA's Responses to Comments on the Logan Airport Permit, available at http://www.epa.gov/region1/npdes/logan/pdfs/finalma0000787rtc.pdf, p. 148.

[208] E.g., 2009 Final GE Permit, supra, at p. 17, n.21; MBTA Permit No. MA0003590, supra, at p. 4, n.b; Eastman Gelatine Permit No. MA0003956, supra, at p. 5, n.4; Solutia Permit No. MA0001147, supra, at p. 34, n.b.

[209] Acid Rain Monitoring Report, FY2011 End of Fiscal Year Report (June 30, 2011), available at http://www.umass.edu/tei/wrrc/arm/ARM_FY11_Annual_Report.pdf (last visited October 31, 2011), pp. 9-12, Table 5.

[210] See, e.g., 2007 Final Logan Airport Permit, supra, at pp. 3, 7 & 24, n.11 (*6.0* to 8.5); Texas Instruments Permit No. MA0001791, supra, at pp. 2 & 3, n.b ("not more than 0.5 units outside of the natural background range"); Saint-Gobain Abrasives, Inc. and Saint-Gobain Ceramics & Plastics, Inc. Permit No. MA0000817, supra, at pp. 2-3, n.b (same); Clean Harbors Permit No. MA0031551, supra, at p. 5, n.10 ("If the pH results of the discharge are outside the range of 6.5 – 8.5 s.u. due to background conditions, the pH must be within 0.2 s.u. of the rainfall's pH level.").

pH to be "not more than 0.5 units outside of the naturally occurring background range."[211] Therefore, the current text of footnote 4 on pages 3 and 6 should be revised as follows:

> The pH of the effluent shall not be less than 6.5 standard units (SU), nor greater than 8.3 SU at any time, unless these values are exceeded due to natural causes. The pH shall be no more than 0.5 units outside the natural background range. To demonstrate that the pH values of the effluent are outside the permitted pH range due to natural causes, the permittee must show that pH measurements of the source water and the effluent are the same. When the values are exceeded due to natural causes, documentation of such conditions must be submitted by the permittee with the monthly DMR and recorded in the SWPPP.

Such an approach is consistent with EPA's comment in the current Fact Sheet that Invensys should "submit data along with the discharge monitoring reports documenting the extent to which rainwater pH [a]ffects the pH of the final discharges,"[212] but it also avoids the unnecessary stringency EPA has introduced into the 2011 Draft Permit by removing the common natural exceedances clause.

D. Mercury Reporting Requirement Has No Basis

The Agency has not provided a reasonable basis for requiring monitoring for mercury at Outfall 002. The Agency acknowledges that most data collected from the Outfall 002 drainage area indicated non-detectable levels for mercury. The Agency then cites to two sampling results – one from 2002 collected *prior* to the drain cleaning and one from 2003 – which indicated detectable levels for mercury, as the basis for imposing the monitoring requirement.[213] However, the samples to which the Agency refers were collected at catch basin number 24, an internal outfall. As such, the sampling results are not representative of the overall Facility discharges and form an insufficient basis for imposing a monitoring requirement for mercury at Outfall 002.

E. Requirement To Submit Weather Data Is Unreasonable

It is unreasonable for EPA to require Invensys to submit data from the National Weather Service, which is equally available to EPA. Invensys highlighted this point in both 2001[214] and 2003,[215] but EPA has still failed to respond in any way to the argument.

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[211] 1991 Permit, pp. 2 & 3, n.a.

[212] Fact Sheet, p. 10.

[213] Id. at p. 14.

[214] October 30, 2001 Letter from Paul Ahearn to Janet Labonte, Exhibit 2, Comment 6.d ["The requirement to submit National Weather Service data seems to be excessive in view of the fact that such data are readily available to the Agency via the internet (i.e., the same data source that the Company would access to compile the information.)"] Please explain rationale/need for this requirement.

Invensys respectfully requests that records of the National Oceanic and Atmospheric Administrative (NOAA) for Taunton be used instead.

VIII. Conclusion

In light of the serious errors identified above, Invensys requests that EPA withdraw the 2011 Draft Permit. As described above, the 2011 Draft Permit is dramatically more stringent than is necessary to protect human health and the environment, is extremely burdensome and is unlikely to result in any environmental benefit. A revised draft permit incorporating the use of BMPs for the control of pollutants, rather than overly stringent numeric limitations, should be issued in its place. Alternatively, issuance of a replacement draft permit should be deferred until information necessary for the derivation of SSWQC on which to base effluent limitations can be developed. Failure to revise the 2011 Draft Permit as described would be arbitrary and capricious and thus would not withstand judicial review.

[215] 2003 Comments, Table 1, p. 1, No. 4 ["No justification given by EPA. Compilation and submittal of weather data for 3 days prior to, and the day of, each sampling event is excessive and unnecessary since NWS data is readily available to EPA via the internet (i.e., the same data source that the Company would access to compile the information)."]

TABLE 1: Additional Comments on 2011 Draft Permit and Fact Sheet[1]

NO.	ISSUE, LOCATION, SPECIFIC REQUIREMENT	INVENSYS COMMENT
A. Receiving Waters		
1.	Fact Sheet, p. 2: The Neponset Reservoir is identified in the Massachusetts 2008 Integrated List of Waters as a Category 5 water, requiring TMDL for noxious aquatic plants, turbidity, and exotic species.	The Reservoir is *not* identified as impaired for metals and VOCs, only for noxious aquatic plants, turbidity and exotic species. As such, EPA's imposition of strict numeric water-quality based limitations for metals and VOCs in the Outfall 001 discharge is unnecessary and unreasonable.
B. Proposed Effluent Limitations for Metals		
2.	Draft Permit, p. 2 (Outfall 001) and p. 5 (Outfall 002): Metals limitations expressed as total or dissolved concentrations.	For purposes of evaluating risks to aquatic biota, dissolved concentrations (rather than totals) should be used for all of the monitored metals (i.e., copper, lead, zinc, cadmium, aluminum and iron). This is well-recognized by the Agency.
3.	Draft Permit, p. 6, nn.1 & 3: Sampling location for Outfall 002.	The only data that can reasonably be interpreted as measuring Invensys' contribution to Robinson Brook are the data from samples collected at manhole 26, before the discharge has mingled with storm drain discharges unrelated to the Facility. Data from samples collected at Outfall 002 (i.e., in Robinson Brook) reflect commingling with street drains located on Neponset Avenue. The final permit should specify that the applicable sampling location is at Manhole 26, prior to the commingling with the Neponset Avenue street drains.

[1] The comments provided in this table do not represent the totality of Invensys Systems, Inc.'s comments on the NPDES Draft Permit MA 0004120 and related Fact Sheet issued by EPA on August 3, 2011. Additional comments are contained in the October 31, 2011 letter of Paul Ahearn and attached Comments submitted on behalf of Invensys Systems, Inc.

NO.	ISSUE, LOCATION, SPECIFIC REQUIREMENT	INVENSYS COMMENT
B. Proposed Effluent Limitations for Metals (cont.)		
4.	Draft Permit, p. 3, n.6 (Outfall 001) and p. 6, n.6 (Outfall 002): Periodic testing for metals.	Confirm that metals back-up data contained in the quarterly Whole Effluent Toxicity (WET) testing required under the revised permit can be used to satisfy a metals monitoring event.
5.	Draft Permit, p. 2 & p. 3, n.8 (Outfall 001) and p. 5 & p. 6, n.7 (Outfall 002): The ML for lead is 3.0 ug/l, but the average monthly limit for both outfalls is 1.3 ug/l.	A numeric average monthly limit for lead that is lower than the ML is unreasonable.
6.	Draft Permit, p. 2 & p. 3, n.9 (Outfall 001) and p. 5 & p. 6, n.8 (Outfall 002): The ML for cadmium is 0.5 ug/l, but the average monthly limit for both outfalls is 0.16 ug/l.	A numeric average monthly limit for cadmium that is lower than the ML is unreasonable.
7.	Fact Sheet, pp. 13-15: Reasonable potential to exceed determinations for Outfall 002	EPA's determinations as to reasonable potential to exceed, in addition to lacking the required RPE analysis, appear to be based only on data from 2001 and 2002, not the more recent 2003 data.
8.	Draft Permit, p. 2 (Outfall 001) and p. 5 (Outfall 002): Cadmium limitation	While Invensys strenuously objects to EPA's imposition of numeric limits based on the NRWQC and has identified errors with the Agency's calculation of the same, Invensys notes that the Remediation General Permit (MAG910000) contains a monthly average effluent limitation for cadmium of 0.2 ug/l. This limit appears to have been calculated based on the federal numeric water quality criteria, and is based on a hardness of 50 mg/l. The monthly average effluent limitation for cadmium in the Draft Permit is calculated based on the same assumptions; however the limitation contained in the Draft Permit is 0.16 ug/l.

NO.	ISSUE, LOCATION, SPECIFIC REQUIREMENT	INVENSYS COMMENT
C. Sump Flow Data		
9.	Draft Permit, p. 3, n.1 and Fact Sheet, p. 11 (Outfall 001) and Draft Permit, p. 6, n.1 and Fact Sheet, p. 14 (Outfall 002): Requirement to measure sump pump discharges on a continuous basis and report time/duration of each sump pump activation and estimate of discharge volume resulting from each activation.	These requirements are unnecessary and overly burdensome, and they are inconsistent with the other monitoring requirements present in the Draft Permit, which are already excessive. If the purpose of the sump flow data is to quantify the volume and rate of sump contributions to the discharges exiting the outfalls, which are to be sampled once a week under the Draft Permit, continuous monitoring is unnecessary to achieve that purpose.
D. pH Range		
10.	Draft Permit, p. 3, n.4 (Outfall 001) and p. 6, n.4 (Outfall 002): The pH of the discharge must be within the specified range.	No explanation provided as to how (and where) the naturally occurring background range for the pH of the receiving water body is determined.
E. Bacteria		
11.	Draft Permit, p. 2 and Fact Sheet, p. 10: Bacteria sampling required for Outfall 001 on the basis that "recent data show a reasonable potential for the discharge to cause or contribute to exceedances of water quality standards."	EPA has changed the criterion from fecal coliform to E. coli. All the existing data reflect fecal coliform levels which cannot properly be used as a basis for a determination that there is a reasonable potential to exceed the new E. coli WQC, for which there is no data. Further, even if the use of fecal coliform data was appropriate, it does not appear that EPA can properly conduct an RPE analysis on the data attached to the Fact Sheet, which contains only maximum and average values for each quarter.

NO.	ISSUE, LOCATION, SPECIFIC REQUIREMENT	INVENSYS COMMENT
F. Nature of the Discharge		
12.	Fact Sheet, p. 4, last paragraph, last three sentences	All of the discharges from the Cocasset Facility discharge to Robinson Brook downstream of the Outfall 002 headwall. The Cocasset Facility is covered by a No Exposure Certification for Exclusion from NPDES Storm Water Permitting. The discharges to Outfall 002 are from the southern portion of the Neponset Facility. Only discharges which discharge at the Outfall 002 headwall will be covered by this site-specific NPDES permit.
G. Mixing Zone		
13.	Fact Sheet, p. 9: Dilution for the Outfall 001 discharge is set to zero, with the focus being exclusively on Gudgeon Brook, not the Reservoir.	As Invensys has argued previously, EPA should look to MassDEP regulations concerning the use of a mixing zone, at 314 CMR 4.03(2). All the criteria for the establishment of a mixing zone are satisfied here.
14.	Fact Sheet, p. 9 & p. 9, n.2: Dilution for the Outfall 001 discharge is set to zero, and Foxborough municipal discharge will not be considered.	As noted in 2003, the Gudgeon Brook headwall contains two separate discharges: Outfall 001 and a second outfall pipe which is owned by the Town of Foxborough and discharges stormwater from Chestnut Street and nearby (non-Invensys) neighborhoods. EPA's explanation for why the municipal stormwater outfall was not taken into account in the development of limits for Outfall 001 is unconvincing because it is not Invensys' fault that there is insufficient information about the quantity, timing or water quality of the additional flow, and – under EPA's established policies – such uncertainties in storm water permits weigh in favor of BMPs, not numeric limits, particularly not numeric limits tied to extremely onerous weekly monitoring requirements.

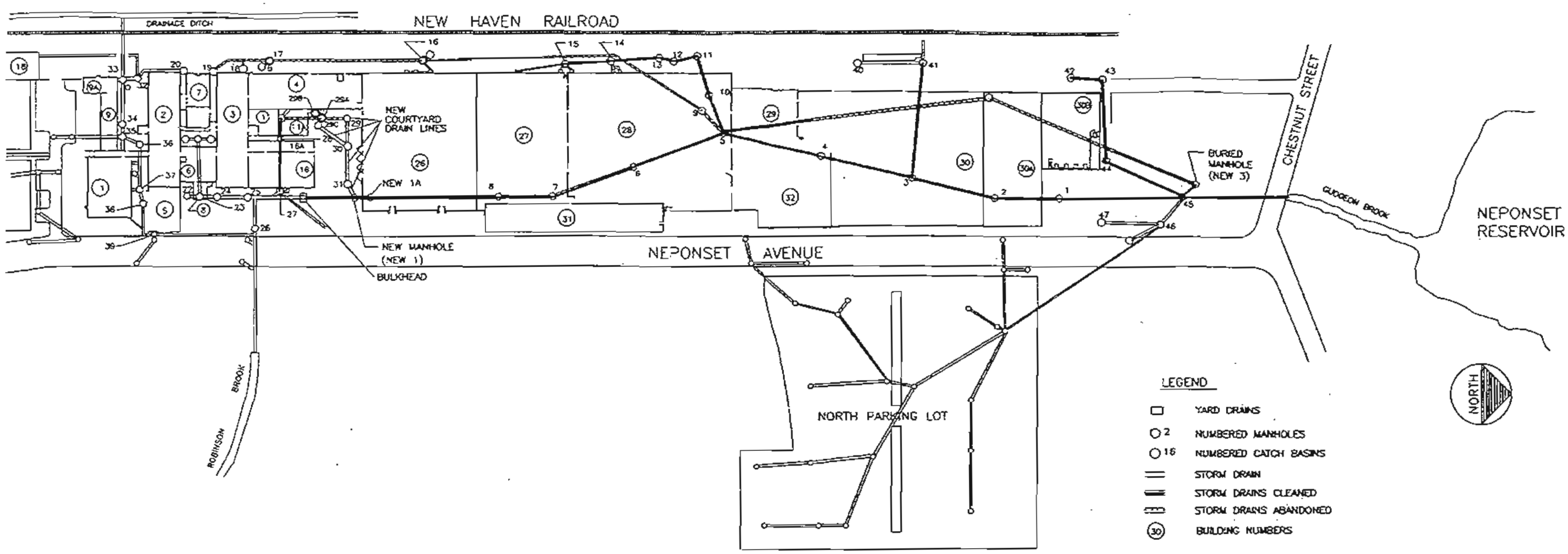
ATTACHMENT 1

Summary of Outfall 001 Cadmium Data and Decrease in Cadmium Concentrations Over Time[1]

TIME PERIOD	ANNUAL AVERAGE CADMIUM
Before 1999, Pre-Cleanout	8.4 ug/l
1999-2005, After Cleanout	1.2 ug/l
2006-2011, Most Recent	0.68 ug/l
Percent decrease in average annual concentration from pre-cleanout to most recent sampling (2006-2011)	**92%**

[1] Data are from quarterly monitoring conducted and reported to EPA as required under the 1991 NPDES Permit. Averages calculated are based on detected values.

ATTACHMENT 2



NEPONSET PLAN

BASE MAP PREPARED BY THE FOXBORO COMPANY 6/97

Environmental Science & Engineering, Inc.
A MACTEC Company

410 Amherst Street
Nashua, NH 03063
(603) 889-3737

THE FOXBORO COMPANY
STORM DRAIN CLEANING
RAM COMPLETION REPORT
(RTN 4-11387)

FIGURE 4

STORM DRAIN CLEANING SUMMARY

DRAWING NAME: DRNCLN.DWG		FILE NUMBER: 719 5388	
SCALE: 1"=200'	REVISION: 1	DRAWN BY: CBG	DATE: 10-8-99

ATTACHMENT 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203

FACT SHEET

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

NPDES PERMIT NO.: MA0004120

STATE PERMIT NO.: 307

NAME AND ADDRESS OF APPLICANT: Richard Mannion
The Foxboro Company
38 Neponset Avenue
Foxboro, MA 02035

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

The Foxboro Company
38 Neponset Avenue
Foxboro, MA 02035

RECEIVING WATER: Neponset Reservoir

CLASSIFICATION: B

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

The above named applicant has applied to the U.S. Environmental Protection Agency for a modification to their existing NPDES permit to discharge into the designated receiving water. The facility is engaged in metal finishing. The discharge is from treated process wastewater and noncontact cooling water.

II. Description of Discharge.

A quantitative description of the discharge in terms of significant effluent parameters based on data submitted on discharge monitoring reports from November of 1986 through April 1987 is shown on Attachment A.

III. Limitations and Conditions.

The effluent limitations of the draft permit, the monitoring requirements, and any implementation schedule (if required) may be found on the following attachments: Attachment B.

IV. Permit Basis and Explanation of Effluent Limitation Derivation.

The Foxboro Company, located in Foxboro, MA, manufactures process control instrumentation. The manufacturing process consists of metal finishing and plating of parts for assembly into control instrumentation. The operation includes cadmium, chromium and cyanide plating, painting and solvent decreasing and machine shop operations. The Foxboro Company is classified as a metal finishing point source category.

The Clean Water Act establishes the national objective "to restore and maintain the chemical and biological integrity of the Nation's waters." The Act requires the Administrator of the EPA to establish effluent limitations which set forth the degree of reduction attainable through the application of best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and best available technology economically achievable (BAT) (Section 301 and 304) for those industries for which national effluent guidelines have been promulgated. In addition, the effluent limitations must insure compliance with water quality standards as established by state law or regulation.

On June 20, 1984, the EPA issued an NPDES permit to the Foxboro Company to discharge treated process wastewater and noncontact cooling water into the Neponset Reservoir. The permit required the facility to meet effluent limitations achievable through the application of the best available technology (BAT) as outlined in the national guidelines for metal finishers. For some pollutants, the facility was required to meet effluent limitations more stringent than those required by the national guidelines. Foxboro's effluent, typical of all metal finishing wastewater, contains a variety of metals, total suspended solids (TSS), organics, cyanide and oil & grease. The permit limited several of these pollutants. Based on the water quality data available for the Reservoir, the limits on these pollutants also satisfied the water quality requirements of the CWA.

The facility also discharges phosphorus. The national guidelines do not establish numerical limits on phosphorus for discharges from metal finishers. In cases such as this, a limit must be established using best professional judgment (BPJ). To obtain more data to establish such a limit, the permit issued in 1984 required the Foxboro Company to monitor the concentration of phosphorus in their effluent for one year. Depending on the monitoring data, the permit would be modified to include a limit for this parameter or delete the monitoring requirement if a limit was not necessary.

In February of 1986, EPA began to review the data submitted by the Foxboro Company on phosphorus. In June of 1986, the Massachusetts DEQE performed a water quality survey to assess the quality of the Neponset Reservoir and its assimilative capacity for the discharge from the Foxboro Company. The water quality survey included taking samples of the surface water at seven locations and the sediments at three locations. Water column samples were analyzed for chemicals, nutrients, bacteria, algal and metals concentrations. Water column samples at three locations were also analyzed for volatile organic componds. The sediment samples were analyzed for nutrient and metal concentrations.

A fish survey was also conducted to assess the numbers and quality of the fish in the reservoir. As part of this survey, tissue samples from the fish in the reservoir were analyzed for metals and organic pollutants to determine if bioaccumulation was a concern.

As a result of concerns from the local citizens on the quality of the public and private water supply wells located adjacent to the reservoir, the DEQE with the aid of the EPA sampled one of the public and two of the private wells. Because of their proximity to the reservoir, these wells have the potential of being recharged by the water in the reservoir. These samples were analyzed for metals and organic compounds.

The data from the water quality survey indicates that the overall water quality in the reservoir is poor. The reservoir is highly eutrophic. Violations of the water quality standard for bacteria were observed. Elevated metals concentrations in both the water column and the sediments were seen near the discharge and at some in-lake stations. Organic compounds were also detected in the water column near the discharge and at one in-lake station.

The data from the fish survey indicates that the reservoir contains a healthy population of fish. None of the fish captured appeared to be stressed by conditions in the reservoir. Analysis of the fish tissue indicated levels which are safe and common for fish from this type of environment.

Finally, the data from the well water analyses indicated that the wells had not been contaminated by the water in the reservoir or by Foxboro Company's discharge. One sample from a private well contained trace levels of benzene and toluene which is expected to be from cross contamination when the sample was taken. All samples presently meet drinking water standards. However, it is important to note that although the wells have not shown any contamination as of yet, there is no assurance that contamination will not occur in the future.

As a result of this new information on the existing quality of the reservoir, EPA decided to modify the permit to include tighter limits which are needed to meet the water quality requirements of the CWA. The Foxboro Company, in turn, has decided to eliminate their process water discharge by "tie-in" to the Mansfield municipal wastewater treatment plant. After consideration of the time needed to obtain the permits necessary for tie-in and to complete the construction of the project, EPA is requiring the Foxboro Company to eliminate their process wastewater discharge by July 1, 1988. The permit has been modified to enforce this decision by only authorizing the process wastewater discharge until July 1, 1988. The facility is allowed to discharge with the same limits as their existing permit until this date.

In addition to restricting the duration of the process wastewater discharge, the modidification also includes a numerical limit on phosphorus. Due to the quality of the reservoir and in particular the eutrophication problem, a phosphorus limit has been established to ensure that best management practices are used in handling and disposing of this compound. The concentration of phosphorus is limited to 1.65 mg/l for the monthly average. This value is the average of the monthly average concentrations reported on the facilities Discharge Monitoring Reports (DMR) for the last six months. Phosphorus is found in the compounds used for cleaning. This limit should be achievable by implementing conservative application and avoiding large batch discharges.

Due to the duration of the discharge, the limits in the current permit are restrictive enough to meet the water quality standards of the CWA. The facility is also under an administrative order from the EPA which requires them to submit interim reports on the progress of the tie-in.

The modification allows for the discharge of noncontact cooling water into the reservoir for the duration of the existing permit. The Foxboro Company has plans to eventually eliminate this discharge by installing a cooling water recycling system. This project will be addressed either by another modification to their existing permit or at the time of permit expiration.

The monitoring program in the permit specifies routine sampling and analysis which will provide continuous general information on the reliability and effectiveness of the installed pollution abatement equipment. The effluent monitoring requirements have been established to reflect state certification requirements under Section 401(a)(1) of the CWA and to yield data representative of the discharge under the authority of section 308(a) of the CWA as required by 40 CFR 122.41(j), 122.44 and 122.48.

The remaining general and special 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.

V. 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 Water Quality Standards. The staff of the Massachusetts Department of Environmental Quality Engineering has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State and expects that the draft permit will be certified.

VI. Comment Period, Hearing Requests, and Procedures for Final Decisions.

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Compliance Branch, JFK Federal Building, Boston, Massachusetts 02203. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Adminsistrator 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 C.F.R. §124.74, 48 Fed. Reg. 14279-14280 (April 1, 1983).

VII. EPA Contact.

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

Lynne Fratus, WCI-2103
Complaince Branch
John F. Kennedy Federal Building
Boston, Massachusetts 02203
Telephone: (617)565-3507

June 30, 1987
Date

David A. Fierra, Director
Water Managment Division
Environmental Protection Agency

ATTACHMENT A

DESCRIPTION OF DISCHARGE: Outfall 001a - treated process water

EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE

Parameter		1986 Nov.	Dec.	1987 Jan.	Feb.	Mar.	Apr.
Flow-mgd	AV.	0.058	0.056	0.056	0.056	0.074	0.085
	MAX.	0.104	0.101	0.124	0.124	0.116	0.103
TSS-mg/l	AV.	10.8	5.0	8.5	12.5	7.0	18.2
	MAX.	18.0	9.0	16.0	16.0	10.0	24.0
Oil &	AV.	–	–	–	–	–	–
Grease-mg/l	MAX.	6.0	0.2	0.2	0.2	0.5	0.2
Cadmium-mg/l	AV.	0.44	0.26	0.22	0.18	0.30	0.44
(total)	MAX.	0.88	0.38	0.34	0.21	0.98	0.56
Chromium-mg/l	AV.	0.22	0.28	0.12	0.19	0.42	0.30
(total)	MAX.	0.37	0.48	0.15	0.25	0.68	0.52
Chromium-mg/l	AV.	0.01	0.01	<0.01	0.06	<0.1	0.06
(hexavalent)	MAX.	0.01	0.01	<0.01	0.1	<0.01	0.05
Copper-mg/l	AV.	0.19	0.207	0.13	0.15	0.29	0.27
(total)	MAX.	0.28	0.26	0.15	0.21	0.55	0.85
Cyanide-mg/l	AV.	0.015	0.045	<0.01	0.01	<0.01	0.01
(total)	MAX.	0.02	0.06	<0.01	0.02	<0.01	0.05
Cyanide-mg/l	AV.	0.006	<0.01	<0.01	<0.01	<0.01	<0.01
(amendable)	MAX.	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel-mg/l	AV.	0.16	<0.15	<0.15	<0.15	<0.15	<0.15
(total)	MAX.	0.20	<0.15	<0.15	<0.15	<0.15	<0.15
Aluminum-mg/l	AV.	1.04	1.0	0.60	1.48	1.35	1.21
(total)	MAX.	1.2	1.2	1.0	2.2	2.2	2.0
Total Toxic	AV.	–	–	–	–	–	–
Organics-mg/l	MAX.	–	–	–	–	–	–
Phosphorus-mg/l	AV.	1.0	1.0	1.0	2.05	3.5	1.4
	MAX.	1.0	1.0	1.0	4.0	7.6	1.54

AV. - indicates monthly average
MAX. - indicates daily maximum
* - The average of the monthly averages is 1.65 mg/l.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through July 1, 1988 the permittee is authorized to discharge from outfall serial number 001a, treated process wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Avg. Monthly	Max. Daily	Measurement Frequency	Sample Type
Flow, MGD	0.185	0.382	Continouous	Total Daily
TSS	20 mg/l	30 mg/l	2/Month	Composite
Oil and Grease	–	15 mg/l	2/Month	Grab
Cadmium (Total)	0.26 mg/l	0.69 mg/l	2/Month	Composite
Chromium (Total)	1.5 mg/l	2.77 mg/l	2/Month	Composite
Chromium, hexavalent	0.1 mg/l	0.25 mg/l	2/Month	Grab
Copper (Total)	1.5 mg/l	3.0 mg/l	2/Month	Composite
Cyanide (Total)	0.25 mg/l	0.65 mg/l	2/Month	Grab
Cyanide, amenable	0.1 mg/l	0.2 mg/l	2/Month	Grab
Nickel (Total)	1.8 mg/l	3.6 mg/l	2/Month	Composite
Aluminum (Total)	1.5 mg/l	2.0 mg/l	2/Month	Composite
* Total Toxic Organics	–	2.13 mg/l	1/Quarter	Grab
Phosphorus	1.65 mg/l	–	2/Month	Composite

* See page 4 of 7 for Total Toxic Organics definition and monitoring requirements.

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units and shall be monitored continously, report daily range.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: the discharge of the wastewater treatment plant, prior to mixing with the noncontact cooling water.

The permittee shall not augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with the above limitations.

ATTACHMENT B

ATTACHMENT 4

Concentrations and Toxicity Test Results Reported in the Phase II Comprehensive Site Assessment[1]

STATION	Station 3	Station 6	Station 7	Station 10	Station 12	Station 3	Station 6	Station 7	Station 10	Station 12
TEST DATE	Mar-99	Mar-99	Mar-99	Mar-99	Mar-99	Jan-00	Jan-00	Jan-00	Jan-00	Jan-00
Dissolved Cadmium concentration in surface water (mg/l)	0.0005	0.0005	0.0005	0.0003	0.0005	0.0014	0.0011	0.002	0.00062	0.0014
C. dubia survival	-	-	-	-	-	-	-	-	-	-
C. dubia repro	+	-	+	-	-	-	-	+	-	-
P. promelas survival	+	+	-	-	+	-	-	-	-	-
P. promelas growth	-	-	-	-	-	-	-	-	-	-

\+ indicates statistically significant decrease in endpoint (survival, growth or reproduction) relative to laboratory control

\- indicates no statistically significant difference in endpoint (survival, growth or reproduction) relative to laboratory control

[1] MACTEC, Final Phase II Comprehensive Site Assessment Report, Release Tracking No. 4-11387, Neponset Reservoir (September 2003).

ATTACHMENT 5

Invensys Systems, Inc. Foxborough, MA

Engineering Analysis of Options to Achieve Compliance with Draft 2011 NPDES Permit

REPORT

WOODARD & CURRAN

Woodard & Curran, Inc.
980 Washington Street
Dedham, Massachusetts 02026
781-251-0200

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COMMITMENT & INTEGRITY DRIVE RESULTS

223812.00
Invensys
October 31, 2011

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APPENDICES

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EXECUTIVE SUMMARY

Woodard & Curran has prepared this report to present our analysis of potential options to achieve compliance with certain requirements within the Draft National Pollutant Discharge Elimination System (NPDES) permit issued for public comment by U.S. Environmental Protection Agency ("EPA" or "the Agency") on August 3, 2011 (the "Draft NPDES Permit"). The Draft NPDES Permit (Permit No. MA0004120) applies to stormwater and groundwater discharge from the Invensys facility located at 38 Neponset Avenue Foxboro, MA. Woodard & Curran has developed a schematic of the NPDES regulated flow for the facility (Appendix A). Woodard & Curran developed five alternatives and conducted a feasibility evaluation summarizing and comparing these options and identifying critical assumptions for each of the alternatives. Finally, Woodard & Curran prepared detailed cost estimates and an implementation schedule for the alternatives described herein.

Multiple options exist to attempt to achieve compliance with the Draft NPDES Permit. EPA has recommended chemical precipitation, ion exchange (IX), and reverse osmosis (RO) as the best available technology (BAT) for metals removal-notably, cadmium. While all of these technologies are theoretically expected to achieve the draft NPDES Permit discharge limits, Woodard & Curran has been unable to find any documentation of an existing treatment system required to meet the cadmium effluent discharge limit of 0.16 ug/l proposed in the Draft NPDES permit. While treatment to low levels of cadmium (and other metals) is theoretically feasible, pilot testing is required to confirm if any of the BATs can actually achieve the desired effluent quality. In addition, based on our experience and the collective experience of several treatment vendors we have discussed this matter with, there are no other examples of treatment systems identified which have been constructed and are operating that achieve the discharge limits proposed by this permit. The engineering options are all costly and additional assessment (such as pilot or hydrological studies) is warranted before proceeding to detailed design. Such studies may indicate that achieving compliance with these proposed limits is technologically infeasible. The schedule required for implementation of these alternatives (including performing pilot studies, permitting and construction) will require 24 to 36 months.

1. BACKGROUND

The Neponset Avenue facility discharges flow to two outfalls, Outfall 001 and Outfall 002, under the draft NPDES permit. Outfall 001 discharges to Gudgeon Brook and Outfall 002 discharges to Robinson Brook. The flow from Outfall 001 consists of stormwater, groundwater infiltration into the existing stormwater drainage system, and groundwater inflow from four building sumps: Sumps H and I located in Building 3, Sump O located in Building 26, and Sump Z located in Building 29. The flow from Outfall 002 consists of stormwater, groundwater infiltration into the existing stormwater drainage system, and groundwater inflow from eight building sumps: Sumps A and B located in Building 1, Sumps C, D, E, and F located in Building 2, Sump J located in Building 3, and Sump L located in Building 5. The discharge to both outfalls is regulated under the draft NPDES permit. Tables 1-1 and 1-2 below show the proposed effluent discharge limitations as well as the average historical concentrations for Outfall 001 and Outfall 002 respectively.

Table 1-1: Effluent Discharge Limitations for Outfall 001

Effluent Characteristic	Units	Discharge Limitation		Average Historical Conc.
		Average Monthly	Maximum Daily	
pH	st. units	6 - 9	6 - 9	5.50 - 6.42
E. coli Bacteria (April 1 – Oct. 31)	cfu/100 ml	126	409	--
Copper, Total	ug/l	5.2	7.3	9.60
Lead, Total	ug/l	1.3	Report	2.05
Zinc, Total	ug/l	66.5	66.5	57.2
Cadmium, Total	ug/l	0.16	1.05	1.04
Aluminum, Total	ug/l	87	Report	150.4
Tetrachloroethylene	ug/l	Report	Report	<1.0
Whole Effluent Toxicity, LC50	%	—	100	99.7
Whole Effluent Toxicity, C-NOEC	%	—	100	100

Note: Historical average metals concentrations are WET test are from quarterly sampling from 1998 to 2010.
Historical average tetrachloroethylene concentration is from the 2011 Fact sheet.

Table 1-2: Effluent Discharge Limitations for Outfall 002

Effluent Characteristic	Units	Discharge Limitation		Average Historical Conc.
		Average Monthly	Maximum Daily	
pH	st. units	6 - 9	6 - 9	5.50 - 6.42
Copper, Total	ug/l	5.2	7.3	64.0
Lead, Total	ug/l	1.3	33.8	14.6
Zinc, Total	ug/l	66.5	66.5	164
Cadmium, Total	ug/l	0.16	1.05	1.98
Aluminum, Total	ug/l	87	Report	333
Iron, Total	ug/l	1000	Report	1180
Mercury, Total	ug/l	Report	Report	<0.5
Trichloroethylene	ug/l	30	Report	<1.0
Tetrachloroethylene	ug/l	3.3	Report	<1.0
Whole Effluent Toxicity, LC50	%	---	100	100
Whole Effluent Toxicity, C-NOEC	%	---	100	100

Note: Historical average concentrations are from the 2011 Fact sheet. Only volatile organic compound (VOC) data collected post drainage system cleanout have been included.

As shown in the above tables, historical site data indicate that metals treatment will be required to meet the average monthly and maximum daily effluent limits. Insufficient information exists to determine whether the concentrations of constituents detected in the effluent are attributable to stormwater, groundwater infiltration into the existing stormwater drainage system, or groundwater inflow from building sumps, or a combination of these flows. Therefore, Woodard & Curran has evaluated various options to both treat the discharges to Outfalls 001 and 002 as well as to reduce the flow that may require treatment. Additional characterization of the effluent will be needed before a determination can be made as to which of the treatment alternative options is most appropriate for attempting to achieve compliance with the proposed effluent limitations.

2. DEVELOPMENT OF TREATMENT TECHNOLOGIES

W&C has identified five options that have the potential to achieve compliance with the NPDES permit. A brief overview of these options is provided below in Table 2-1.

Options A through E are all considered feasible and a detailed description of these options is provided in Section 3.0. All of these options would require a water treatment system to achieve compliance with the NPDES permit. Tables 1-1 and 1-2 indicate that metals are the site's primary contaminants of concern. Therefore, the major treatment objective would be to reduce metals concentrations to meet the monthly average and daily maximum discharge limits proposed by the draft permit. Volatile organic compound (VOC) removal would not be a treatment objective, because historical site data indicate that the VOC concentrations in the discharge to both outfalls have not exceeded the monthly average or daily maximum discharge limits since the cleaning of the stormwater drainage systems.

Table 2-1: Overview of Options A through E

Option	Overview	Water Source Requiring Treatment
A: New Stormwater Drainage & Dry Weather Treatment System	Tie in existing roof drains and parking areas to two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Furnish and install a new 120 gallon per minute (gpm) dry weather infiltration water treatment plant to treat dry weather flow.	Groundwater infiltration into main line under building and groundwater inflow to building sumps
B: Wet Weather Treatment System	Furnish and install a new 400 gpm wet weather treatment plant to treat the combined stormwater and groundwater flow. Provide three new EQ tanks with a total capacity of 2.0 million gallons (MG) to control hydraulic surges.	Stormwater, groundwater infiltration, and groundwater inflow to building sumps
C: Sliplining Existing Drainage Systems	Slipline all existing drainage lines to prevent groundwater infiltration from entering the stormwater drains. Furnish and install a new 10 gpm treatment system to treat building sump water.	Groundwater inflow to building sumps
D: Pipe Bursting Existing Drainage Systems	Pipe bursting of all existing drainage lines to prevent groundwater infiltration from entering the stormwater drains. Furnish and install a new 10 gpm treatments system to treat building sump water.	Groundwater inflow to building sumps
E: New Stormwater Drainage System & Capping/Filling of Existing Drainage System	Roof drains and parking areas tie into two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Cap the existing stormwater drainage system and fill the drainage line under the building with concrete. Furnish and install a new 10 gpm treatments system to treat building sump water.	Groundwater inflow to building sumps

The technology that has been selected to achieve the treatment objective is reverse osmosis (RO) treatment followed by ion exchange (IX) treatment. Current IX and RO technologies both have been able to consistently remove over 90% of metals from an influent water stream. However, this greater than 90% removal efficiency is based on influent metals concentrations of milligrams per liter, not the micrograms per liter concentrations required for this application. At these lower metals concentrations, RO alone cannot meet the required removals. The IX system, however, could be capable of achieving 90% removal efficiencies. An RO system would be installed upstream of the IX system to reduce the influent loading to the IX system, subsequently reducing the frequency of resin regeneration required. Annual O&M costs for regenerating the IX resin would be cost-prohibitive without an upstream RO unit.

3. DESCRIPTION OF TREATMENT OPTIONS

Five options that could feasibly achieve permit compliance have been identified and developed for consideration. Pilot tests, gathering of additional information, and/or hydraulic studies would be required for all options before proceeding to detailed design. A feasibility table summarizing and comparing these options is provided in Appendix B. Process flow diagrams and site layouts for Options A through E are provided in Appendix C. A description of each option is presented below.

3.1 OPTION A: NEW STORMWATER DRAINAGE SYSTEM & DRY WEATHER TREATMENT SYSTEM

Under Option A, two new watertight stormwater drainage systems would be constructed. One system would discharge to Outfall 001 and the other to Outfall 002. A new 120 gpm dry weather treatment system would be installed onsite to treat the existing dry weather flow.

A site plan depicting the proposed drainage systems is provided in Appendix C. The proposed drainage systems would be constructed with watertight materials to prevent infiltration of groundwater. Stormwater discharging from roof drains and parking areas would enter the new drainage systems, thus completely separating the stormwater flow from the groundwater flow. As shown in Appendix C, the new drainage system to Outfall 001 would be constructed exterior of the existing facility buildings, while the existing main drain line located beneath the existing buildings would remain in place. New stormwater drain lines would also be installed in the north parking lot on Neponset Avenue. The existing drain lines in this parking lot would be abandoned, removed or sealed in place. Groundwater infiltration would continue to occur in the existing drain line running under the facility; and this flow would require treatment prior to being discharged. The existing drainage system to Outfall 002 would be completely replaced by a new water-tight stormwater drainage system. The flow from the building sumps that currently discharge to Outfall 002 would be diverted to the proposed dry weather treatment system instead of tying in to the new drainage system.

In Option A, only groundwater infiltration and groundwater inflow from the building sumps would be treated prior to being discharged. Stormwater flow to the two new drainage systems would be discharged directly to their respective outfalls without treatment. A majority of the existing drainage system to Outfall 001 would be expected to remain in place. Groundwater infiltration into this existing system, along with groundwater inflow from all building sumps, would be diverted to a central treatment system prior to being discharged. All influent flows would be monitored, and plant effluent would be divided and discharged to Outfalls 001 and 002 based on the monitored influent flows. Due to capital and O&M cost considerations, one central treatment system has been proposed in lieu of two separate systems, one for each outfall.

The proposed dry weather treatment plant would consist of UF, RO, and IX systems. The Process Flow Diagram of the treatment plant for Option A is presented in Appendix C. A brief description of the treatment process is described below.

3.1.1 Description of Option A's Dry Weather Treatment System:

The influent flow to the proposed treatment plant would consist only of dry weather flow (groundwater infiltration and groundwater inflow).

The dry weather treatment plant has been sized to treat a flow of 120 gallons per minute (gpm) or 0.173 million gallons per day (MGD). This flow has been determined from 2010 and 2011 hourly flow data for Outfall 001 provided by Invensys, flow data to Outfall 002 included in the Section 308(a) Response to EPA (2002), and assumptions made about the rate of dry weather flow from offsite drainage areas. The average dry weather flow from this data is approximately 180 gpm including flow from the two offsite drainage areas. It has been assumed that flow from the offsite drainage areas would make up at least a third of the total dry weather flow, or 60 gpm. Therefore, the treatment plant has been sized to handle a flow of 120 gpm. Average, maximum and minimum daily flow data, along with the daily precipitation at two stations near the site, are provided in Appendix D.

A 200,000 gallon equalization tank would be provided to allow for short term upsets and equipment maintenance. The tank has been sized to provide one day storage for the plant. Due to the site's high groundwater elevation, equalization would be provided in an aboveground tank instead of in an earthen lined lagoon. Equalization would be provided in an aboveground cylindrical storage tank with a diameter of 30 feet and a height of 40 feet.

Influent water would be collected in the Gudgeon Brook Sump and the Robinson Brook sump prior to being pumped to the equalization tank. Influent water would be pumped at a rate of 120 gpm from the equalization tank through an influent screen to the UF Feed Tank. Acid and caustic would be injected after the equalization pumps and prior to the influent screen for in-line pH neutralization. The screen would remove large solids from influent groundwater to prevent the UF membrane from plugging.

Water would be pumped from the UF Feed Tank through the outside/in pressure UF unit to the RO Feed Tank. The UF unit would remove suspended solids from the influent flow, preventing the fouling of the downstream RO unit. Effluent from the UF would be fed to a spiral wound RO unit at a rate of about 120 gpm. The total dissolved solids (TDS) concentration including the concentrations of dissolved metals would be significantly reduced by the RO unit. RO permeate would be fed to a cation IX unit, while RO reject would flow to an evaporator to minimize the waste stream produced. To reduce waste disposal costs, brine from the evaporator would be pumped to the existing onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer. The flow rate of the brine stream would be approximately 1.5 gpm.

The RO unit would be required to reduce the frequency of resin regeneration required by the downstream IX unit. The IX unit would remove heavy metals from the process water. IX treatment would be required to reduce the concentration of cadmium below the effluent discharge limitations. Once the IX resin is exhausted, the resin must be regenerated. Offsite regeneration has been assumed to eliminate the creation of a regeneration waste stream. Effluent from the IX unit would be back neutralized and flow to the Clean Water Storage Tank. This tank would store a small volume of treated effluent (10,000 gallons) to potentially be reclaimed as reuse water by the facility. Treated effluent will be discharged to Outfalls 001 and 002 from the Clean Water Storage Tank.

3.2 OPTION B: WET WEATHER TREATMENT SYSTEM

Under Option B, the current stormwater drainage systems would remain in place and a new 400 gpm wet weather treatment plant would be installed onsite to treat the total flow to Outfall 001 and Outfall 002. Stormwater, groundwater infiltration, and groundwater inflow from building sumps would all be treated. Flow to both outfalls would be monitored and diverted to one central treatment system. Plant effluent would be divided and discharged to Outfalls 001 and 002 based on the monitored influent flows. As in Option A, the use of one central treatment system has been assumed.

The proposed wet weather treatment plant would consist of UF, RO, and IX systems. The Process Flow Diagram of the treatment plant for Option B is presented in Appendix C. A brief description of the treatment process is described below.

3.2.1 Description of Option B's Wet Weather Treatment System:

The influent flow rate to the proposed treatment plant would consist of stormwater, groundwater infiltration, and groundwater inflow, and therefore would vary drastically depending on weather. The average daily flow rate can range from 40 to over 300 gpm during dry weather. During wet weather, the average daily flow rate can be above 2,000 gpm. The proposed treatment system is suited for a constant water flow rate and would not be capable of handling flow spikes created by large storm events. Therefore, 2,000,000 gallons of equalization capacity would be required to minimize hydraulic surges. This equalization capacity has been determined based on containing a 2 year, 24 hour storm event.

Due to the site's high groundwater elevation, equalization would be provided in aboveground tanks rather than an earthen lined lagoon. Due to the site's high groundwater elevations, the use of a lined lagoon would risk the possibility of groundwater infiltration, and the lagoon liner could have the potential to float. Therefore, equalization would be provided in three aboveground cylindrical storage tanks, each with a diameter of 55 feet and a height of 40 feet.

Influent water would be collected in the Gudgeon Brook Sump and the Robinson Brook sump prior to being pumped to one of the three equalization tanks. Influent water would be pumped at a rate of 400 gpm from the equalization tanks through an influent screen and an oil/water separator to the UF Feed Tank. Acid and caustic would be injected after the equalization pumps and prior to the influent screen for in-line pH neutralization. The screen and oil/water separator would remove grit, solids, and oils and grease which may be present in the influent water because of stormwater flow over parking areas.

Water would be pumped from the UF Feed Tank through the outside/in pressure UF unit to the RO Feed Tank. The UF unit would remove suspended solids from the influent flow, preventing the fouling of the downstream RO unit. Effluent from the UF would be fed to a spiral wound RO unit at a rate of about 400 gpm. The total dissolved solids (TDS) concentration including the concentrations of dissolved metals would be significantly reduced by the RO unit. RO permeate would be fed to a cation IX unit, while RO reject would flow to an evaporator to minimize the waste stream produced. To reduce waste disposal costs, brine from the evaporator would be pumped to the existing onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer. The flow rate of the brine stream would be approximately 3 gpm.

The RO unit would be required to reduce the frequency of resin regeneration required by the downstream IX unit. The IX unit would remove heavy metals from the process water. IX treatment would be required to reduce the concentration of cadmium below the effluent discharge limitations. Once the IX resin is exhausted, the resin must be regenerated. Offsite regeneration has been assumed to eliminate the creation of a regeneration waste stream. Effluent from the IX unit would be back neutralized and flow to the Clean Water Storage Tank. This tank would store a small volume of treated effluent (10,000 gallons) to potentially be reclaimed as reuse water by the facility. Treated effluent will be discharged to Outfalls 001 and 002 from the Clean Water Storage Tank.

3.3 OPTION C: SLIPLINING EXISTING DRAINAGE SYSTEMS & SUMP WATER TREATMENT SYSTEM

Under Option C, the existing stormwater drainage systems for Outfalls 001 and 002 would be comprised of watertight sliplining materials and watertight catch basins and drain manhole structures. A new 10 gpm treatment system would be installed onsite to treat building sump water.

As shown in Appendix C, the existing drain lines would be sliplined with high density polyethylene pipe to prevent groundwater infiltration into the drainage systems. Sliplining would make the drain lines water tight without requiring excavation. The existing manholes and catch basins would all be removed and replaced with new water tight drainage structures. Additionally the roof drain tie-ins would be removed and replaced and the building sumps would no longer discharge to either of the existing drainage systems. Only stormwater would flow through the drainage systems, and would be discharged without treatment. Some sections of the drain line are likely inaccessible and therefore not candidates for rehabilitation. The sections are inaccessible due to structural defects and other limitations associated with construction history, as well as significant age of portions of the facility and the associated drainage system components.

A new 10 gpm treatment system would be required to treat groundwater inflow from the building sumps. Flow from the four building sumps currently discharged to Outfall 001 and from the eight building sumps currently discharged to Outfall 002 would be diverted to the proposed treatment system for treatment prior to being discharged. After sliplining is conducted, the inflow to the sumps may need to be increased as a result of changed groundwater infiltration rates (i.e. previous infiltration into drain lines may result in additional flow management needed by sumps to keep basements dry). All influent flows would be monitored, and plant effluent would be divided and discharged to Outfalls 001 and 002 based on the monitored influent flows. This rehabilitation would prevent groundwater inflow from building sumps as well as groundwater infiltration from entering the existing stormwater drainage systems.

The proposed 10 gpm treatment plant would consist of UF, RO, and IX systems. The Process Flow Diagram of the treatment plant for Option C is presented in Appendix C. A brief description of the treatment process is described below.

3.3.1 Description of Option C's Treatment System:

The influent flow to the proposed treatment plant would consist only of groundwater inflow from building sumps. Table 3-1 shows historical sump flow data from the 308 Response Report. Historically, the total average daily flow of all the sumps is 3,401 gpd or 3.4 gpm, while the maximum daily flow is 10,731 gpd or 7.5 gpm.

In the past, groundwater infiltration flows have ranged between 40 to over 300 gpm. Under Option C, groundwater infiltration would no longer occur so instead of being discharged to Outfall 001 or Outfall 002, this flow will remain in the ground. It has been assumed that groundwater inflow to the building sumps would at a minimum be equal to the maximum daily flow (7.5 gpm) because of the site's high groundwater elevations, along with the fact that groundwater infiltration would no longer be occurring. Therefore, the proposed treatment system has been sized for a flow of 10 gpm. A hydrological study would need to be conducted to confirm that groundwater would not flood the facility or back up in any areas near the site as a result of preventing the groundwater infiltration.

Table 3-1: Historical Sump Flows

Sump ID	Outfall	Average Daily Flow (gpd)	Maximum Daily Flow (gpd)
H	001	4	79
I	001	2	57
O	001	4	124
Z	001	1,449	4,332
Sub Total to Outfall 001		**1,459**	**4,592**
A	002	3,337	5,595
B	002	20	175
C	002	0	0
D	002	0	0
E	002	0	0
F	002	0	0
J	002	44	369
L	002	0	0
Sub Total to Outfall 002		**3,401**	**6,139**
Total Sump Flow		**4,860**	**10,731**

Influent flow would be pumped from the building sumps to a 60,000 gallon equalization tank provided in the proposed 10 gpm treatment plant. Four days of equalization storage has been assumed because the influent flow rate has the potential to be greater than 10 gpm. Influent water would be pumped at a rate of 10 gpm from the equalization tank through an influent screen to the UF Feed Tank. Acid and caustic would be injected after the equalization pumps and prior to the influent screen for in-line pH neutralization. The screen would remove large solids from influent groundwater to prevent the UF membrane from plugging.

Water would be pumped from the UF Feed Tank through the outside-in hollow fiber membrane UF unit to the RO Feed Tank. The UF unit would remove suspended solids from the influent flow, preventing the fouling of the downstream RO unit. Effluent from the UF would be fed to a spiral wound RO unit at a rate of about 10 gpm. The total dissolved solids (TDS) concentration including the concentrations of dissolved metals would be significantly reduced by the RO unit. RO permeate would be fed to a cation IX unit, while RO reject would flow to the existing onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer. The flow rate of the RO reject stream would be approximately 1.5 to 2 gpm.

The RO unit would be required to reduce the frequency of resin regeneration required by the downstream IX unit. The IX unit would remove heavy metals from the process water. IX treatment would be required to reduce the concentration of cadmium below the effluent discharge limitations. Once the IX resin is exhausted, the resin must be regenerated. Offsite regeneration has been assumed to eliminate the creation of a regeneration waste stream. Effluent from the IX unit would be back neutralized and flow to the Clean Water Storage Tank. This tank would store a small volume of treated effluent (5,000 gallons) to potentially be reclaimed as reuse water by the facility. Treated effluent will be discharged to Outfalls 001 and 002 from the Clean Water Storage Tank.

3.4 OPTION D: PIPE BURSTING EXISTING DRAINAGE SYSTEMS & SUMP WATER TREATMENT SYSTEM

Under Option D, the existing stormwater drainage systems for Outfalls 001 and 002 would be made water tight through pipe bursting and a new 10 gpm treatment system would be installed onsite to treat building sump water.

Pipe bursting is a trenchless method of replacing the existing drain lines. An expander head would be pulled through the existing drain lines. As the expander head is being pulled, the existing drain line would be fragmented and immediately replaced by a new pipe being pulled behind the expander head. No excavation would be required and the new drain lines would be water tight. Some sections of the drain line are likely inaccessible and therefore not candidates for rehabilitation. The sections are inaccessible due to structural defects and other limitations associated with construction history, as well as significant age of portions of the facility and the associated drainage system components.

In Option D, the existing manholes and catch basins would all be removed and replaced with new water tight drainage structures. Similar to Option C, the roof drain tie-ins would be removed and replaced and the building sumps would no longer discharge to either of the existing drainage systems. Only stormwater would flow through the drainage systems, and would be discharged without treatment.

A new 10 gpm treatment system would be required to treat groundwater inflow from the building sumps. Flow from the four building sumps currently discharged to Outfall 001 and from the eight building sumps currently discharged to Outfall 002 would be diverted to the proposed treatment system for treatment prior to being discharged. All influent flows would be monitored, and plant effluent would be divided and discharged to Outfalls 001 and 002 based on the monitored influent flows. This rehabilitation would prevent groundwater inflow from building sumps as well as groundwater infiltration from entering the existing stormwater drainage systems.

The 10 gpm treatment plant would be the same plant proposed in Option C. It would consist of UF, RO, and IX systems. The Process Flow Diagram of the treatment plant for Option D is presented in Appendix C. See Section 3.4 for a brief description of the treatment process of the proposed plant.

3.5 OPTION E: NEW STORMWATER DRAINAGE SYSTEM, CAPPING/FILLING OF EXISTING DRAINAGE SYSTEM & SUMP WATER TREATMENT SYSTEM

Under Option E, two new stormwater drainage systems would be constructed; one would discharge to Outfall 001 and the other to Outfall 002. The existing drainage system under the building that discharges to Outfall 001 would be completely sealed off, and the existing drainage system that discharges to Outfall 002 would be completely removed and replaced. A new 10 gpm treatment system would be installed onsite to treat building sump water.

The new drainage systems discharging to Outfalls 001 and 002 would be watertight to prevent the infiltration of groundwater. Stormwater discharging from roof drains and parking areas would enter the new drainage systems, thus completely separating the stormwater flow from the groundwater flow. As in Option A, the new drainage system to Outfall 001 would be constructed exterior of the existing facility buildings. However, in Option E, the existing drain line running under the buildings would be filled with concrete. New stormwater drain lines would also be installed in the north parking lot on Neponset Avenue. The existing drainage system in this parking lot would be abandoned; it would be capped and sealed off so no flow would be discharged from this segment of the system. The existing segments of the Outfall 001 drainage system would be either filled with concrete or sealed off preventing groundwater infiltration. The existing drainage system to Outfall 002 would be completely replaced by a new water tight stormwater drainage system.

In Option E, only groundwater inflow from the building sumps would require treatment prior to being discharged. Stormwater flow to the two new drainage systems would be discharged directly to their respective outfalls without treatment and groundwater infiltration would be completely prevented. A new 10 gpm treatment system would be installed to treat groundwater inflow. Flow from the four building sumps currently discharged to Outfall 001 and from the eight building sumps currently discharged to Outfall 002 would be diverted to the proposed treatment system prior to being discharged. All influent flows would be monitored, and plant effluent would be divided and discharged to Outfalls 001 and 002 based on the monitored influent flows.

The 10 gpm treatment plant would be the same plant proposed in Option C. It would consist of UF, RO, and IX systems. The Process Flow Diagram of the treatment plant for Option E is presented in Appendix C. See Section 3.4 for a brief description of the treatment process of the proposed plant.

4. COST ESTIMATE & ASSOCIATED ASSUMPTIONS

Preliminary capital and operation and maintenance (O&M) cost estimates for each of the five feasible treatment options have been completed by Woodard & Curran. Table 4-1 shows the total capital cost and annual O&M cost for each of the options. A detailed break down of all cost estimates can be viewed in Appendix E.

Table 4-1: Cost Summary Table for Options A through E

Option	Capital Cost	Annual O&M Cost
A: New Stormwater Drainage & Dry Weather Treatment System	$12,772,896	$507,371
B: Wet Weather Treatment System	$16,976,588	$891,945
C: Sliplining Existing Drainage Systems	$6,033,627	$280,857
D: Pipe Bursting Existing Drainage Systems	$7,871,198	$280,857
E: New Stormwater Drainage System & Capping/Filling of Existing Drainage System	$8,593,369	$280,857

The assumptions and cost basis of each are listed below.

4.1.1 Cost Basis and Assumptions of Applicable to All Options:

- Cost estimates are based on available site data, budgetary equipment quotes, RSMeans cost data, and allowances for major subsystems and utilities.
- Taxes are not included in the estimates.
- The use of one central treatment system has been assumed because the use of two separate treatment systems, one for flow from Outfall 001 and the other for that of Outfall 002, would increase both the capital and O&M costs for all options.
- Low flow waste steams generated by the proposed treatment system would be transferred to the onsite industrial wastewater treatment plant prior for treatment prior to being discharged to the sewer. This would include the UF concentrate as well as any sludge produced.
- IX resin would be regenerated offsite to prevent the creation of a regeneration waste stream.

- The frequency of resin regeneration would be once every 2 weeks (26 times per year). This is a conservative estimate because the flow to the IX unit has been pretreated by an RO system, and therefore the loading to the unit would be minimal.
- The northeast parking lot on Neponset Avenue would be rehabilitated in all options to develop a comparable cost estimates for all options.

4.1.2 Cost Basis and Assumptions of Option A:

- The new stormwater drainage systems contain all new catch basins and manholes. Existing drainage structures would not be connected to the new drainage systems.
- All pipe line sizes of the new stormwater drainage systems are assumed to be 12 ", 24", or 30".
- The proposed treatment plant would be located in the northwest corner of the site.
- Dry weather flow from offsite drainage areas is not contaminated. This offsite dry weather flow would be piped to the new stormwater drainage systems for discharge without treatment.
- The dry weather treatment plant has been sized to treat a flow of 120 gpm or 0.173 MGD. This flow has been determined from 2010 and 2011 hourly flow data for Outfall 001, flow data to Outfall 002 included in Response 308, and assumptions made about the rate of dry weather flow from offsite drainage areas.
- The 200,000 gallon equalization tank would be provided to allow for short term upsets or equipment maintenance. The tank has been sized to provide one day storage for the plant.
- The evaporator has been included to minimize the waste stream produced by the RO (the RO Reject stream). Evaporator brine generated by the proposed treatment system would by transferred to the onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer.
- One full time operator would be required to operate the proposed treatment plant.

4.1.3 Cost Basis and Assumptions of Option B:

- The proposed treatment plant would be located in the northeast parking lot on Neponset Ave.
- An equalization capacity of 2.0 MG would be provided. The equalization capacity has been sized to contain a 2 year storm. The 400 gpm flow rate of the plant has been determined based on 2010 and 2011 historical flow and precipitation data along with the assumption the treatment system would be bypassed during heavy rain events. It is assumed that the total flow would be adequately diluted by stormwater during heavy rain events.
- Due to the site's high groundwater elevation, equalization would be provided in three aboveground cylindrical storage tanks, each with a diameter of 55 feet and a height of 40 feet.
- The evaporator has been included to minimize the waste stream produced by the RO (the RO Reject stream). Evaporator brine generated by the proposed treatment system would by transferred to the onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer.
- One full time operator would be required to operate the proposed treatment plant.

4.1.4 Cost Basis and Assumptions of Option C:

- Dry weather flow from offsite drainage areas is not contaminated. This offsite dry weather flow would be piped to the water tight stormwater drainage systems for discharge without treatment.
- The total length of the existing drain lines is approximately 8,000 linear feet. 25% of this total length is assumed to be 12" pipe; 50% is assumed to be 24" pipe; 25% is assumed to be 30" pipe.
- All existing drainage structures would be replaced with new water tight structures.
- Sufficient excess capacity exists in both stormwater drainage systems to allow for the reduction of capacity through sliplining.
- The existing drain line that runs under the facility and discharges to Outfall 001 is not a foundation drainage system. Therefore making this line water tight would not cause the facility to be flooded with groundwater.
- Groundwater would not back up in nearby areas as a result of preventing groundwater infiltration at the site.
- The proposed treatment plant would be located in the northwest corner of the site.
- The plant has been sized for a flow of 10 gpm. It has been sized based on the maximum recorded sump flows prior to sealing storm drains.
- RO reject generated by the proposed treatment system would by transferred to the onsite industrial wastewater treatment plant for treatment prior to being discharged to the sewer.
- One half time operator would be required to operate the proposed treatment plant.

4.1.5 Cost Basis and Assumptions of Option D:

- Dry weather flow from offsite drainage areas is not contaminated. This offsite dry weather flow would be piped to the water tight stormwater drainage systems for discharge without treatment.
- The total length of the existing drain lines is approximately 8,000 linear feet. 25% of this total length is assumed to be 12" pipe; 50% is assumed to be 24" pipe; 25% is assumed to be 30" pipe.
- All existing drainage structures would be replaced with new water tight structures.
- The existing drain line that runs under the facility and discharges to Outfall 001 is not a foundation drainage system. Therefore making this line water tight would not cause the facility to be flooded with groundwater.
- Groundwater would not back up in nearby areas as a result of preventing groundwater infiltration at the site.
- The proposed treatment plant would be located in the northwest corner of the site.
- The plant has been sized for a flow of 10 gpm. It has been sized based on the maximum recorded sump flows.
- RO reject generated by the proposed treatment system would by transferred to the onsite industrial wastewater treatment plant prior for treatment prior to being discharged to the sewer.
- One half time operator would be required to operate the proposed treatment plant.

4.1.6 Cost Basis and Assumptions of Option E:

- Dry weather flow from offsite drainage areas is not contaminated. This offsite dry weather flow would be piped to the new stormwater drainage systems for discharge without treatment.
- All pipe line sizes of the new stormwater drainage systems are assumed to be 12 ", 24", or 30".
- The new stormwater drainage systems contain all new catch basins and manholes. Existing drainage structures would not be connected to the new drainage systems.
- The existing drain line that runs under the facility and discharges to Outfall 001 is not a foundation drainage system. Therefore filling this line with concrete would not cause the facility to be flooded with groundwater.
- Groundwater would not back up in nearby areas as a result of preventing groundwater infiltration at the site.
- The proposed treatment plant would be located in the northwest corner of the site.
- The plant has been sized for a flow of 10 gpm. It has been sized based on the maximum recorded sump flows.
- RO reject generated by the proposed treatment system would by transferred to the onsite industrial wastewater treatment plant prior for treatment prior to being discharged to the sewer.
- One half time operator would be required to operate the proposed treatment plant.

5. ESTIMATED SCHEDULE

Tables 5-1 through 5-5 provide the estimated schedule associated with the options developed by Woodard & Curran. Each of the alternatives requires a step-wise approach to engineer, conduct field/pilot studies, design, permit, and construct the required system to meet proposed limits.

Table 5 -1
Invensys Systems Inc
Option A - Implementation Schedule

Item No	Activity	Duration (weeks)	Comments
1.01	WW Characterization	4 to 8	Dry weather and wet weather sampling and analysis
1.02	Treatability Studies	6 to 10	Bench and pilot scale testing of UF / RO / IX systems
1.03	Surveys	8 to 12	Ground survey, TV, smoke and dye tests, geotechnical study,
1.04	Basis of Design Report	4	Finalize design loadings, conceptual drawings, material balances,
1.05	Preliminary Design	6 to 10	PFD, P&IDs, GA, Elect 1-Line, cost est., Equipment Procurement Specifications, storm drain routing
1.06	Final Design	12 to 16	Detailed Design Packages for multiple sub contracts
1.07	Permitting	6 to 12	Environmental and building permits
1.08	Bid and Award	4 to 6	
1.09	Construction	40	
1.10	Commisioning and Start-up	6 to 8	
	Total Duration (weeks) (1)	**84 to 112**	

Notes
1 The total project duration is based on concurrent execution of portions of tasks 1.01 through 1.04

Table 5 -2
Invensys Systems Inc
Option B - Implementation Schedule

Item No	Activity	Duration (weeks)	Comments
1.01	WW Characterization	4 to 8	Dry weather and wet weather sampling and analysis
1.02	Treatability Studies	6 to 10	Bench and pilot scale testing of UF / RO / IX systems
1.03	Surveys	8 to 12	Ground survey, TV, smoke and dye tests, geotechnical study,
1.04	Basis of Design Report	4	Finalize design loadings, conceptual drawings, material balances,
1.05	Preliminary Design	6 to 10	PFD, P&IDs, GA, Elect 1-Line, cost est., Equipment Procurement Specifications
1.06	Final Design	12 to 16	Detailed Design Packages for multiple sub contracts
1.07	Permitting	6 to 12	Environmental and building permits
1.08	Bid and Award	4 to 6	
1.09	Construction	54 to 60	
1.10	Commisioning and Start-up	8 to 12	
	Total Duration (weeks) (1)	**102 to 140**	

Notes
1 The total project duration is based on concurrent execution of portions of tasks 1.01 through 1.04

Table 5 -3
Invensys Systems Inc
Option C - Implementation Schedule

Item No	Activity	Duration (weeks)	Comments
1.01	WW Characterization	4 to 8	Dry weather and wet weather sampling and analysis
1.02	Treatability Studies	6 to 10	Bench scale testing of UF / RO / IX systems
1.03	Surveys	8 to 12	Ground survey, TV, smoke and dye tests, geotechnical study, hydrologic study
1.04	Basis of Design Report	4	Finalize design loadings, conceptual drawings, material balances,
1.05	Preliminary Design	6 to 10	PFD, P&IDs, GA, Elect 1-Line, cost est., Equipment Procurement Specifications, Slip lining design concept.
1.06	Final Design	8 to 12	Detailed Design Packages for multiple sub contracts
1.07	Permitting	4 to 8	Environmental and building permits
1.08	Bid and Award	4 to 6	
1.09	Construction	24	
1.10	Commisioning and Start-up	4 to 8	
	Total Duration (weeks) (1)	**68 to 84**	

Notes
1 The total project duration is based on concurrent execution of portions of tasks 1.01 through 1.04

Table 5 -4
Invensys Systems Inc
Option D - Implementation Schedule

Item No	Activity	Duration (weeks)	Comments
1.01	WW Characterization	4 to 8	Dry weather and wet weather sampling and analysis
1.02	Treatability Studies	6 to 10	Bench scale testing of UF / RO / IX systems
1.03	Surveys	8 to 12	Ground survey, TV, smoke and dye tests, geotechnical study, hydrologic study
1.04	Basis of Design Report	4	Finalize design loadings, conceptual drawings, material balances,
1.05	Preliminary Design	6 to 10	PFD, P&IDs, GA, Elect 1-Line, cost est., Equipment Procurement Specifications, Pipe Bursting design concept.
1.06	Final Design	8 to 12	Detailed Design Packages for multiple sub contracts
1.07	Permitting	4 to 8	Environmental and building permits
1.08	Bid and Award	8	
1.09	Construction	26	
1.10	Commisioning and Start-up	4	
	Total Duration (weeks) (1)	**70 to 96**	

Notes
1 The total project duration is based on concurrent execution of portions of tasks 1.01 through 1.04

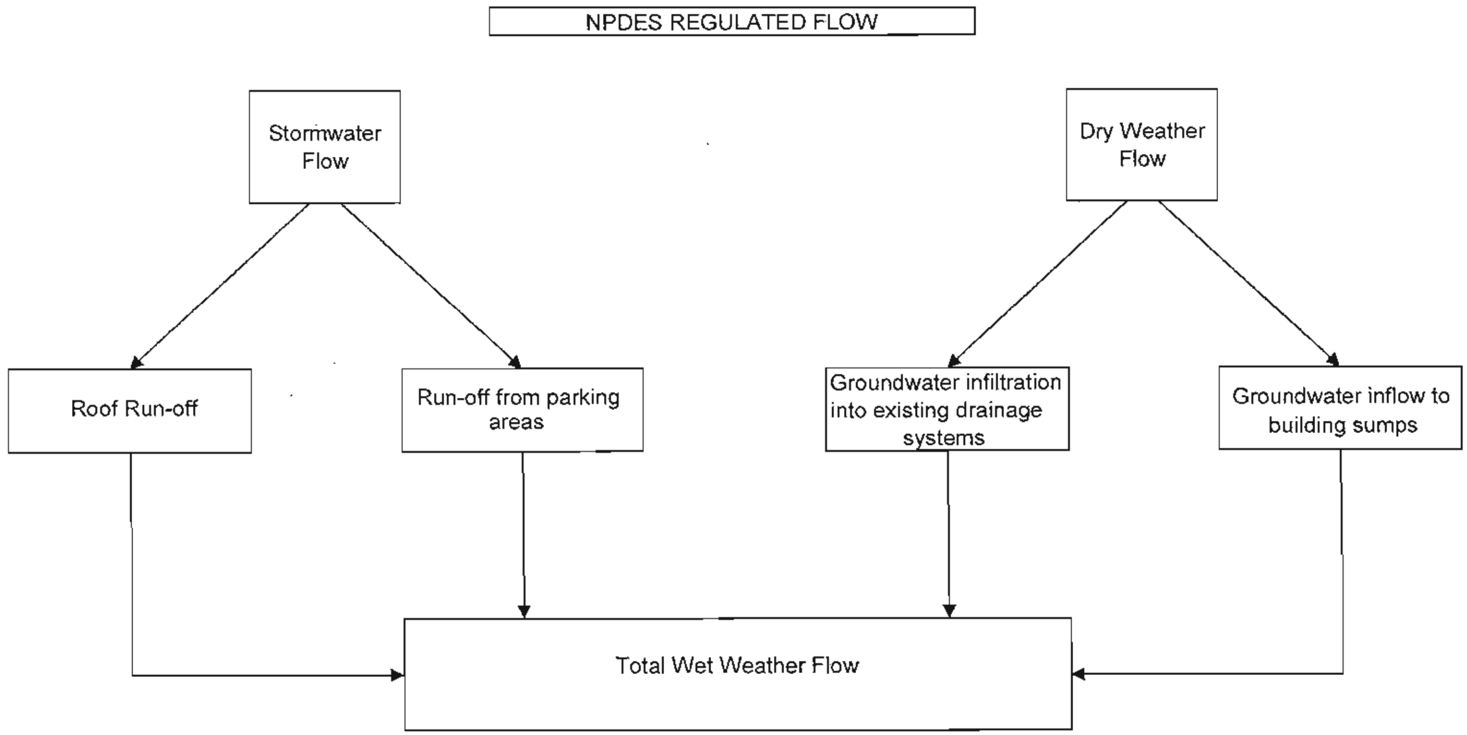
Table 5 -5
Invensys Systems Inc
Option E - Implementation Schedule

Item No	Activity	Duration (weeks)	Comments
1.01	WW Characterization	4 to 8	Dry weather and wet weather sampling and analysis
1.02	Treatability Studies	6 to 10	Bench scale testing of UF / RO / IX systems
1.03	Surveys	8 to 12	Ground survey, TV, smoke and dye tests, geotechnical study, hydrologic study
1.04	Basis of Design Report	4	Finalize design loadings, conceptual drawings, material balances,
1.05	Preliminary Design	8 to 12	PFD, P&IDs, GA, Elect 1-Line, cost est., Equipment procurement specifications, preliminary storm drain routing.
1.06	Final Design	10	Detailed Design Packages for multiple sub contracts
1.07	Permitting	4 to 12	Environmental and building permits
1.08	Bid and Award	8	
1.09	Construction	40	
1.10	Commissioning and Start-up	4 to 8	
	Total Duration (weeks) (1)	**100 to 120**	

Notes
1 The total project duration is based on concurrent execution of portions of tasks 1.01 through 1.04

APPENDIX A: NPDES REGULATED FLOW DIAGRAM

ATTACHMENT A
Invensys Systems, Inc.
Background Flow Diagram



APPENDIX B: FEASIBILITY TABLE

Invensys Systems, Inc.
Feasibility Evaluation of Options A through E

Item No	Evaluation Criteria	OPTION A New Stormwater Drainage System & Dry Weather Treatment System	OPTION B Wet Weather Treatment System	OPTION C Sliplining Existing Drainage Systems	OPTION D Pipe Bursting Existing Drainage Systems	OPTION E New Stormwater Drainage System & Capping/Filling of Existing Drainage System
1.0	System Description[1]	Roof drains and parking areas tie into two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Existing line under building to remain. Furnish and install a new 120 gpm dry weather water treatment plant to treat existing groundwater infiltration and inflow. 14,000 square yards of employee parking area will be replaced with new drainage and pavement system.	Furnish and install a new 400 gpm wet weather treatment plant to treat the combine stormwater and groundwater flow. 2,000,000 gallons of equalization capacity is required to minimize the flow spike to the treatment plant during a storm event. 14,000 square yards of employee parking area will be replaced. This will be the location of the proposed treatment plant.	Slipline all existing drainage lines to prevent groundwater infiltration. Furnish and install a new 10 gpm treatments system to treat building sump water. 14,000 square yards of employee parking area will be replaced.	Pipe Burst all existing drainage lines to prevent groundwater infiltration. Furnish and install a new 10 gpm treatments system to treat building sump water. 14,000 square yards of employee parking area will be replaced.	Roof drains and parking areas tie into two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Cap the existing stormwater drainage system and fill the drainage line under the building with concrete. Furnish and install a new 10 gpm treatments system to treat building sump water. 14,000 square yards of employee parking area will be replaced with new drainage and pavement system.
2.0	Design Criteria	Proposed drain lines will be replaced with in-kind sizes that will be watertight. Standard catch basins, manholes, and drain lines will be installed. Existing drainage structures will be replaced with watertight manholes and catch basins. Dry weather treatment system designed for a flow of 120 gpm. One day of equalization storage is provided. Treatment consists of reverse osmosis system followed by an ion exchange system.	Wet weather flow ranges from 40 gpm to over 2,000 gpm. Wet weather treatment system designed for a flow of 400 gpm. Equalization sized for moderate storm events. During large storm events (i.e. 100 year storm event) the treatment system will be bypassed. Treatment consists of reverse osmosis system followed by an ion exchange system.	Slipline existing pipes with smaller pipe diameters. Hydraulic evaluation of closed drainage system will need to be performed. Proposed drain lines will be watertight. Existing drainage structures will be replaced with watertight manholes and catch basins. Treatment would be sized for a flow of 10 gpm and would consist of reverse osmosis system followed by an ion exchange system.	The existing drain line will be fragmented by an expander head and immediately replaced by a new pipe being pulled behind the expander head. Proposed drain lines will be replaced with in-kind sizes that will be watertight. Existing drainage structures will be replaced with watertight manholes and catch basins. Treatment would be sized for a flow of 10 gpm and would consist of reverse osmosis system followed by an ion exchange system.	Proposed drain lines will be replaced with in-kind sizes that will be watertight. Existing drainage structures will be replaced with watertight manholes and catch basins. Treatment would be sized for a flow of 10 gpm and would consist of reverse osmosis system followed by an ion exchange system.
3.0	Advantages	Stormwater flow form roof tops and surface area exterior of building is completely separated from groundwater flow. Most robust treatment option.	No earthwork is required in areas except in the employee parking area and the location of the proposed treatment. Minimum disruption to existing structures and operations. Simplified construction activities.	Lowest capital cost. Low O&M cost. Stormwater flow form roof tops and surface area exterior of building is completely separated from groundwater flow. No earthwork is required in areas except in the employee parking area and the location of the proposed treatment. Sliplining cost less than pipe bursting by almost 50% Sliplining can be water tight.	Lower capital cost. Low O&M cost. Stormwater flow form roof tops and surface area exterior of building is completely separated from groundwater flow. Pipe bursting can have the same or larger inner diameter than existing. The capacity of the drainage systems would not be reduced by pipe bursting. Pipe bursting can be water tight. CI, DI, PVC, RCP can be pipe bursted, other pipe material will be replaced with typical construction techniques.	Lower capital cost. Low O&M cost. Stormwater flow form roof tops and surface area exterior of building is completely separated from groundwater flow.

Invensys Systems, Inc. Feasibility Evaluation of Options A through E						
Item No	**Evaluation Criteria**	**OPTION A** **New Stormwater Drainage System & Dry Weather Treatment System**	**OPTION B** **Wet Weather Treatment System**	**OPTION C** **Sliplining Existing Drainage Systems**	**OPTION D** **Pipe Bursting Existing Drainage Systems**	**OPTION E** **New Stormwater Drainage System & Capping/Filling of Existing Drainage System**
4.0	Disadvantages	High capital and O&M costs. Pilot study required prior to detailed design of treatment system. Complicated construction due to maintaining existing infrastructure at utility crossings. Tight construction, access, and working space constraints around portions of the existing facility. Extensive earthwork activities Requires that all tie-ins to the existing drainage systems be completely sealed.	High capital and O&M costs. Pilot study required prior to detailed design of treatment system. During heavy storm events treatment is bypassed, however discharge limits are still expected to be achieved. Proposed treatment plant located on the north most parking lot on Neponset Ave. This may cause permitting issues if this area is considered wetlands.	Pilot study required prior to detailed design of treatment system. Hydrological study of groundwater flow required. Groundwater may back up into the building or in nearby areas. The flowrate from all of the building sumps has the potential to be greater than 10 gpm. The system could be undersized. Sliplining will decrease the size of the existing pipe which will decrease the capacity of the pipe. Lower reliability. Difficulties could arise due to the lack of information available on the existing stormwater drainage systems.	Pilot study required prior to detailed design of treatment system. Hydrological study of groundwater flow required. Groundwater may back up into the building or in nearby areas. The flowrate from all of the building sumps has the potential to be greater than 10 gpm. The system could be undersized. Pipe bursting cost more than Sliplining by almost 50%. Lower reliability. Difficulties could arise due to the lack of information available on the existing stormwater drainage systems.	Pilot study required prior to detailed design of treatment system. Hydrological study of groundwater flow required. Groundwater may back up into the building or in nearby areas. The flowrate from all of the building sumps has the potential to be greater than 10 gpm. The system could be undersized. Complicated construction due to maintaining existing infrastructure at utility crossing. Tight construction, access, and working space constraints around portions of the existing facility. Extensive earthwork activities. Requires that all tie-ins to the existing drainage systems be completely sealed.
5.0	Capital Cost[2]	$12,772,896	$16,976,588	$6,033,627	$7,871,198	$8,593,369
6.0	O&M Cost[2]	$507,371	$891,945	$280,857	$280,857	$280,857
7.0	Feasible?	Yes	Yes	Yes	Yes	Yes

Notes:
1. See memo titled "Conceptual Cost Estimates of Options to Achieve Compliance with Draft NPDES Permit" for a detailed description of each option.
2. See Attachment D for detailed capital and O&M cost estimates.

APPENDIX C: DRAWINGS

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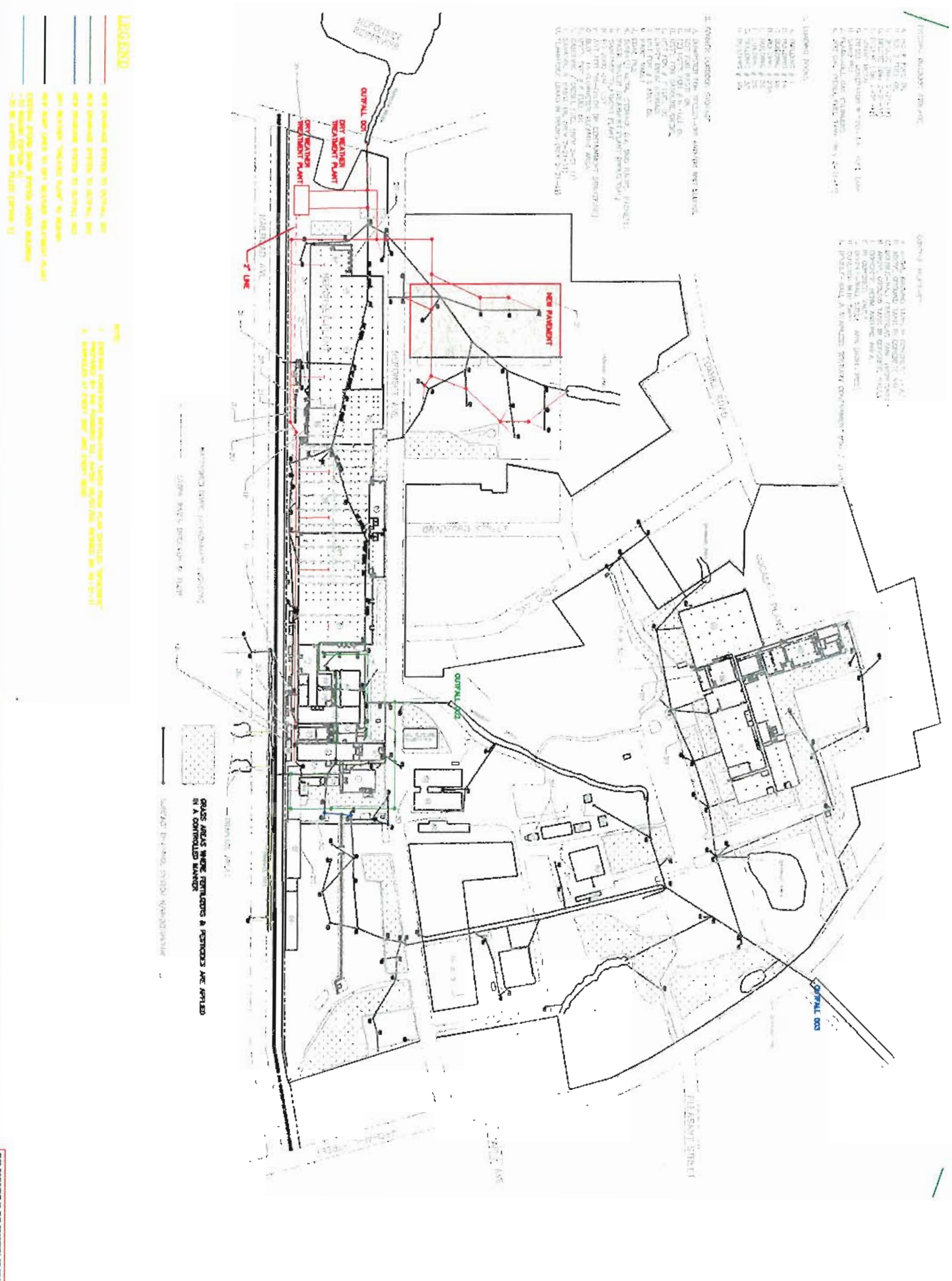

C-100	JOB NO.: 222812 DATE: AUGUST 2011 SCALE: AS SHOWN SHEET: OF	INVENSYS SYSTEMS INC. 33 COMMERCIAL ST. FOXBORO, MA INVENSYS FACILITY FOXBORO, MA	OPTION A & E

REV	DESCRIPTION	DATE

DESIGNED BY: | CHECKED BY: JCS
DRAWN BY: MCP | Options.dwg

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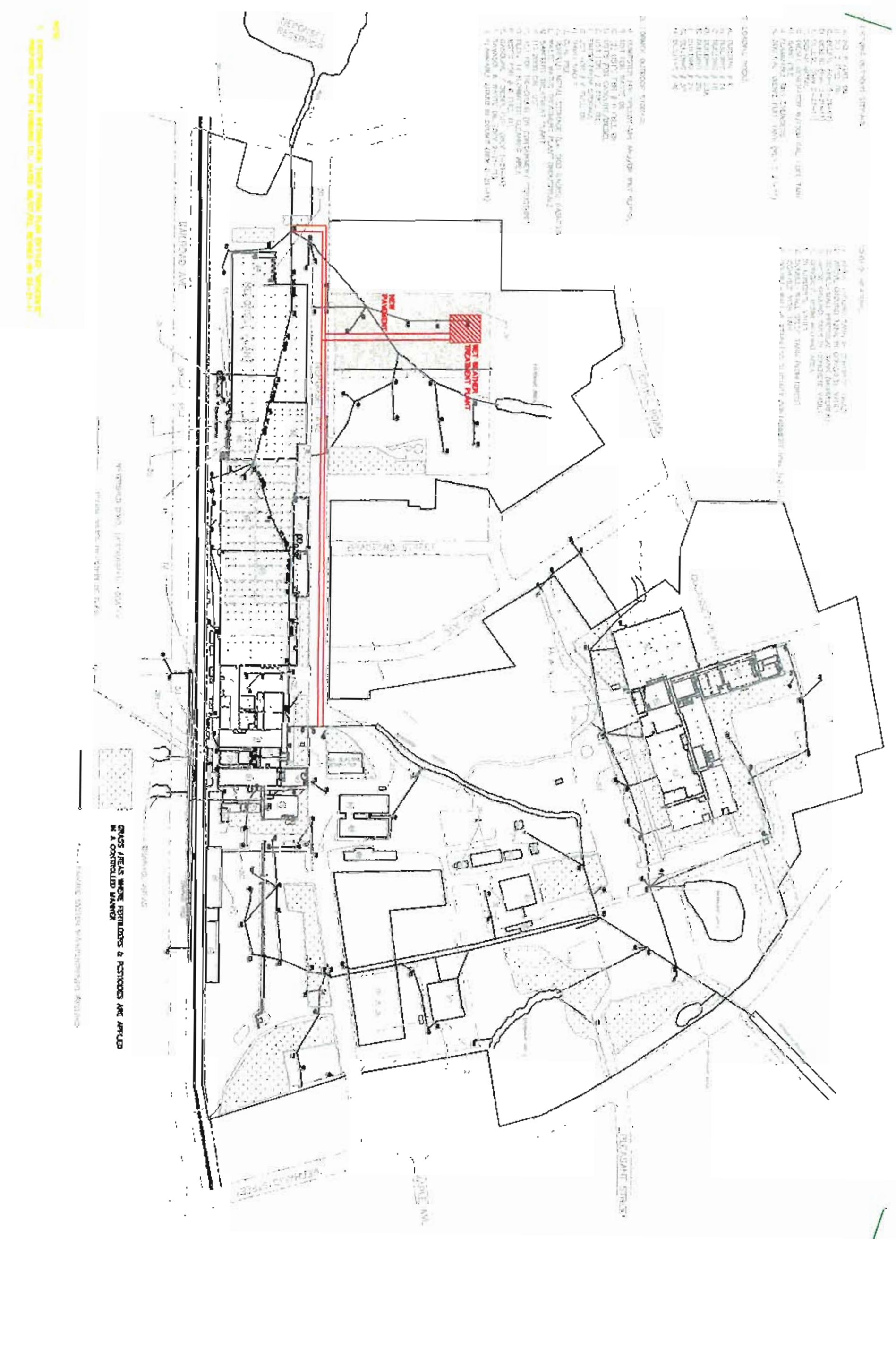
G:\Documents and Settings\[illegible]\My Documents\Invensys\Options.dwg, Sep 12, 2011 - 8:12am



C-101	JOB NO.: 223812
	DATE: AUGUST 2011
	SCALE: AS SHOWN
	SHEET: OF

INVENSYS SYSTEMS INC.
33 COMMERCIAL ST
FOXBORO, MA

INVENSYS FACILITY
FOXBORO, MA

OPTION B

REV	DESCRIPTION	DATE

DESIGNED BY: | CHECKED BY: JCS
DRAWN BY: HCP | Options.dwg

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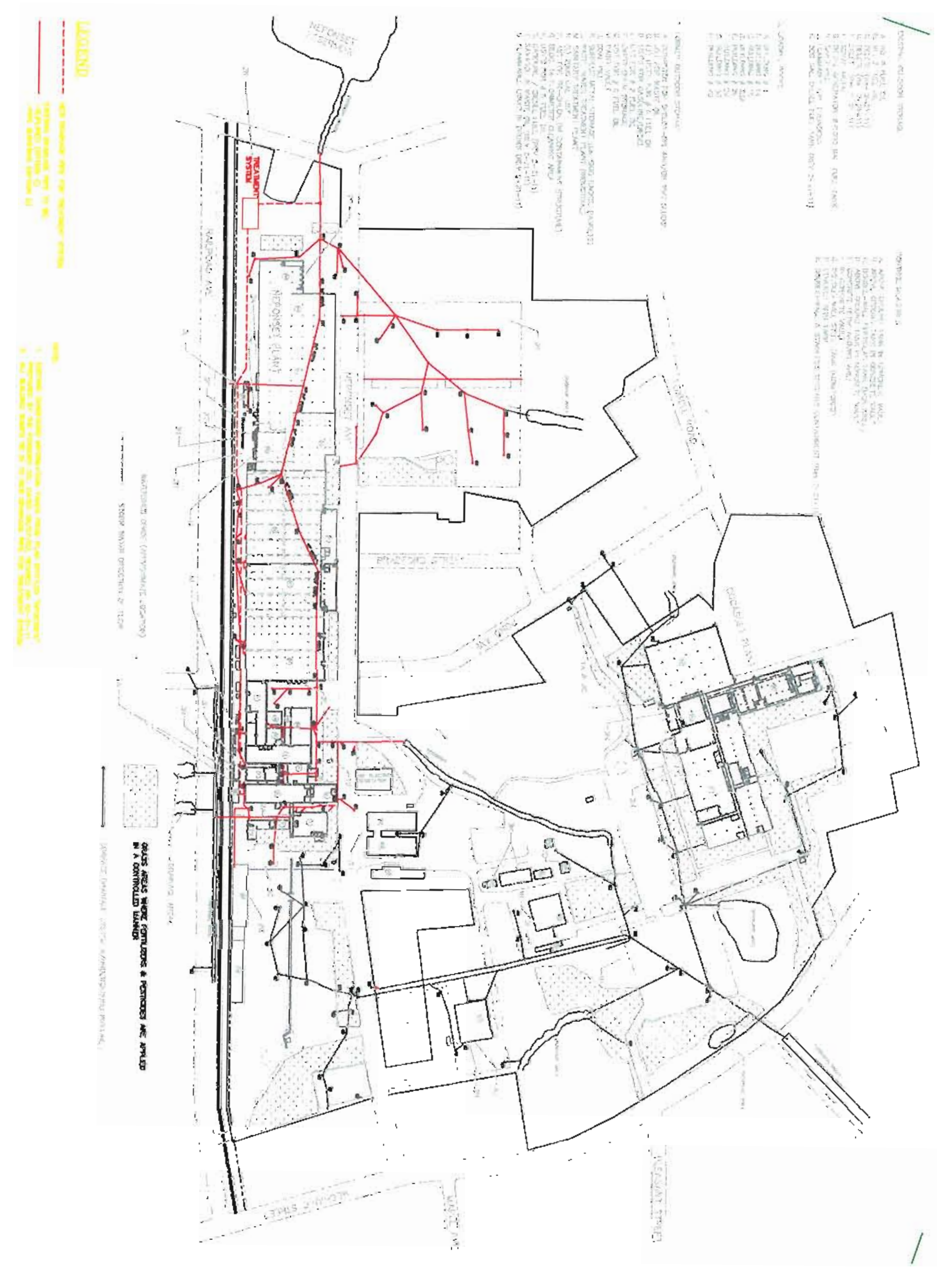

C-102	JOB NO.: 222812 DATE: AUGUST 2011 SCALE: AS SHOWN SHEET: OF	INVENSYS SYSTEMS INC. 33 COMMERCIAL ST. FOXBORO, MA INVENSYS FACILITY FOXBORO, MA	OPTION C & D

REV	DESCRIPTION	DATE

DESIGNED BY: CHECKED BY: JCB
DRAWN BY: HCP OptCand.dwg

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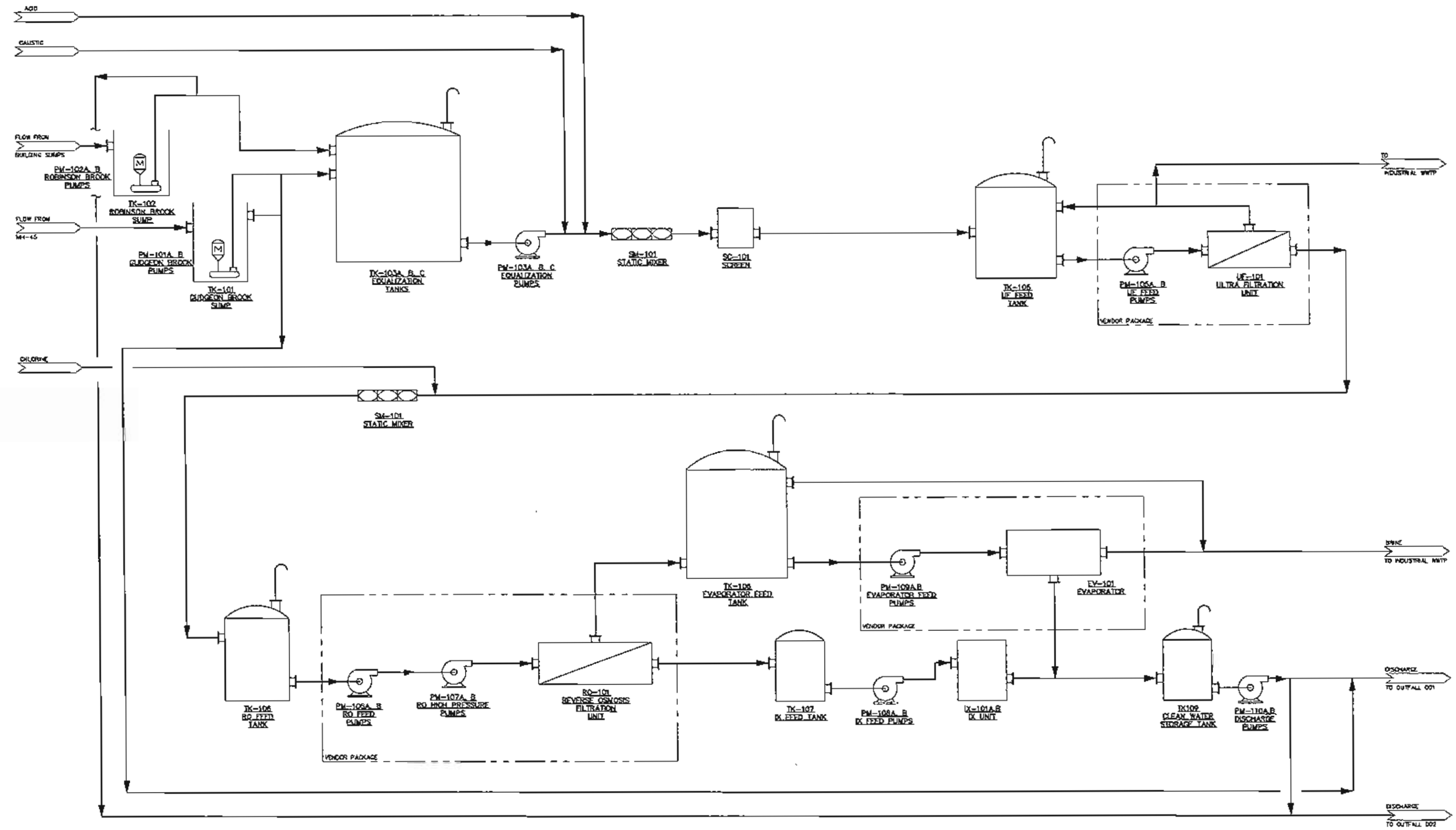

NAME	GUDGEON BROOK SUMP	GUDGEON BROOK SUMP PUMPS	ROBINSON BROOK SUMP	ROBINSON BROOK SUMP PUMPS	EQUALIZATION TANK	EQUALIZATION PUMPS	UF FEED TANK	UF FEED PUMPS	ULTRAFILTRATION UNIT	RO FEED TANK
TAG	TK-101	PM-101A, 101B	TK-102	PM-102A, 102B	TK-103	PM-103A, 103B	TK-105	PM-105A, 105B	UF-101	TK-106
TYPE	CONCRETE SUMP	SUBMERSIBLE, NON CLOG CENTR	CONCRETE SUMP	SUBMERSIBLE	CYLINDRICAL, CLOSED TOP	HORIZONTAL CENTRIFUGAL	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	OUTSIDE/IN PRESSURE UF	VERTICAL CYLINDRICAL
SIZE		10 HP	6' DIA. X 8' DEEP	6 HP	30' DIA. X 40' HT EA	5 HP		6 HP		7' DIA. X 12' HT
CAP		200 GPM	900 GAL WORKING VOL	10 GPM	200,000 GAL	120 GPM	7,000 GAL	120 GPM	120 GPM	3,000 GAL
MOC	REINFORCED CONCRETE	CS/316 SS TRIM	REINFORCED CONCRETE	CS/316 SS TRIM	EPOXY COATED CS	CS/316 SS TRIM	FRP	CS/316 SS TRIM	PVDF	FRP
PRESS	ATM	100 FT	ATM	200 FT	ATM	50 FT	ATM	60 PSID		ATM
TEMP	AMB	AMB	AMB	AMB	AMB	AMB	AMB	AMB		AMB
ELEC	NA	480V, 3PH, 60 HZ	NA	480V, 3PH, 60 HZ	NA	480V, 3PH, 60 HZ	NA	480V, 3PH, 60 HZ	480V, 3PH, 60HZ	NA
NOTES		2-100%, WITH VFDS		2-100% WITH VFDS		0 - 100%		2 - 100%	VENDOR PACKAGE	

NAME	RO FEED PUMPS	RO HIGH PRESSURE PUMPS	REVERSE OSMOSIS UNIT	RO WATER STORAGE TANK	DISCHARGE PUMPS	EVAPORATOR	EVAPORATOR FEED TANK	EVAPORATOR FEED PUMPS
TAG	PM-106A, 106B	PM-107A, 107B	RO-101	TK-107	PM-110A, 110B	EV-101	TK-108	PM-109A, 109B
TYPE	HORIZONTAL CENTRIFUGAL	MULTI STAGE CENTRIFUGAL	SPIRAL WOUND	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	MECHANICAL VAPOR COMPRESS		
SIZE	5 HP	25 HP		10' DIA. X 20' HT	5 HP			HORIZONTAL CENTRIFUGAL
CAP	120 GPM	120 GPM	120 GPM	10,000 GAL	120 GPM	20 GPM	60,000 GAL	
MOC	CS/316 SS TRIM	CS/316 SS TRIM		FRP	CS/316 SS TRIM			
PRESS		300 PSID		ATM	60 FT			
TEMP	AMB	AMB		AMB	AMB			
ELEC	480V, 3PH, 60 HZ	480V, 3PH, 60 HZ		NA	480V, 3PH, 60 HZ			
NOTES	2 - 100%	2 - 100%						

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REV	DESCRIPTION	DATE
DESIGNED BY: JB	CHECKED BY: PDB	
DRAWN BY: JAR	223612.00-PFD-101_102.dwg	

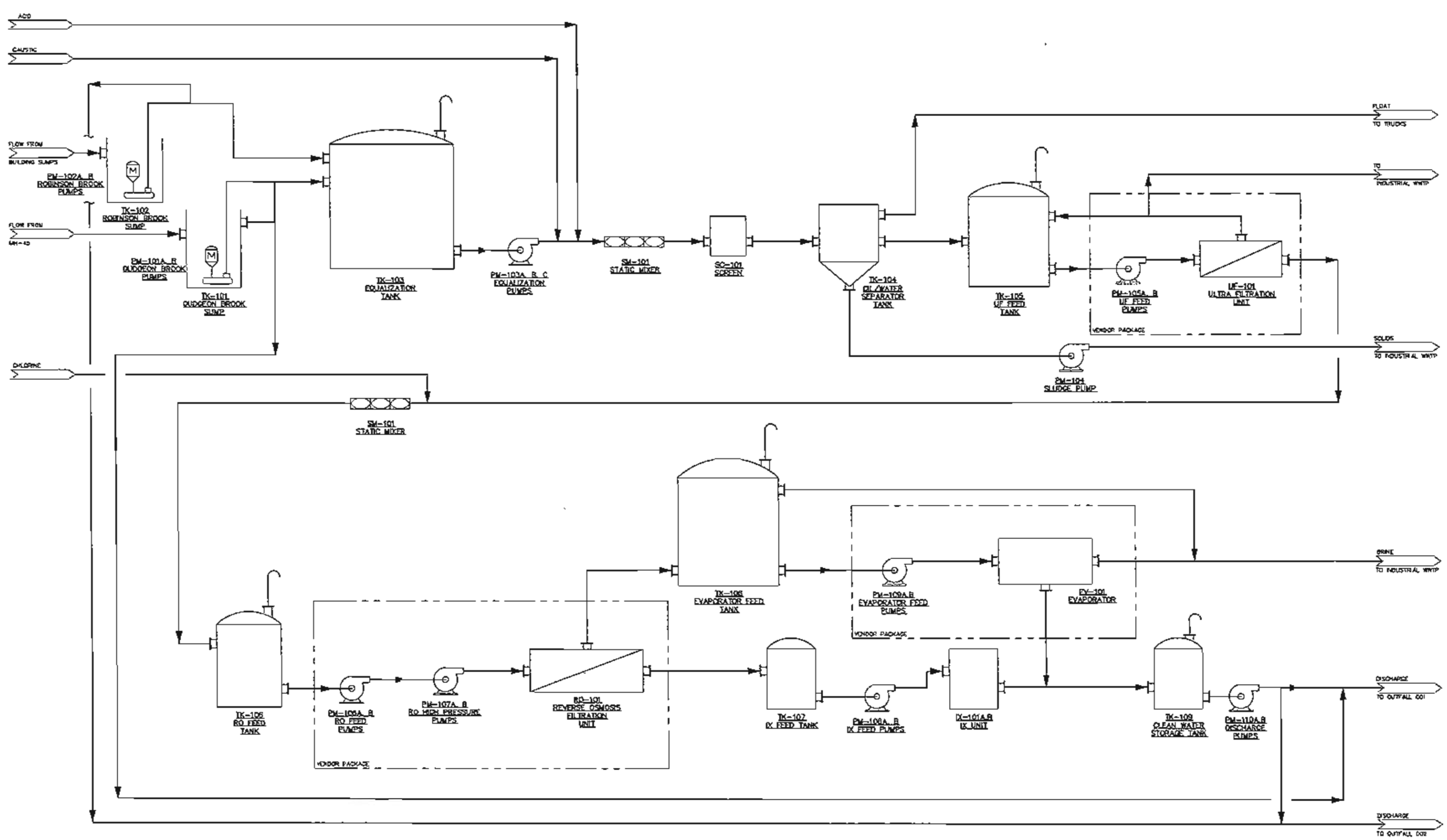
PROCESS FLOW DIAGRAM
OPTION A
120 GPM TREATMENT SYSTEM

INVENSYS

WET WEATHER FLOW TREATMENT PLANT

JOB NO.: 223612.00
DATE: AUGUST 2011
SCALE: NONE
SHEET: OF

PFD-101



NAME	DUDGEON BROOK SUMP	DUDGEON BROOK SUMP PUMPS	EQUALIZATION TANK	EQUALIZATION PUMPS	UF FEED TANK	UF FEED PUMPS	ULTRAFILTRATION UNIT	RO FEED TANK	RO FEED PUMPS	RO HIGH PRESSURE PUMPS
TAG	TK-101	PM-101A, 101B	TK-103	PM-103A, 103B	TK-105	PM-105A, 105B	UF-101	TK-106	PM-106A, 106B	PM-107A, 107B
TYPE	CONCRETE SUMP	SUBMERSIBLE, NON CLOG CENTR	CYLINDRICAL, CLOSED TOP	HORIZONTAL CENTRIFUGAL	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	OUTSIDE-IN PRESSURE UF	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	MULTI STAGE CENTRIFUGAL
SIZE		10 HP	80' DIA X 40' HT EA	5 HP		5 HP		7' DIA X 12' HT	5 HP	25 HP
CAP		200 GPM	200,000 GAL	120 GPM	7,000 GAL	120 GPM	120 GPM	3000 GAL	120 GPM	120 GPM
MOC	REINFORCED CONCRETE	CS/316 SS TRIM	EPOXY COATED CS	CS/316 SS TRIM	FRP	CS/316 SS TRIM	PVDF	FRP	CS/316 SS TRIM	CS/316 SS TRIM
PRESS	ATM	100 FT	ATM	60 FT	ATM	50 PSID		ATM		300 PSIG
TEMP	AMB	AMB	AMB	AMB	AMB	AMB		AMB	AMB	AMB
ELEC	NA	480V, 3PH, 60 HZ	NA	480V, 3PH, 60 HZ	NA	480V, 3PH, 60 HZ	480V, 3PH, 60HZ	NA	480V, 3PH, 60 HZ	480V, 3PH, 60 HZ
NOTES		2-100%, WITH VFDS		3 - 100%		2 - 100%	VENDOR PACKAGE		2 - 100%	2 - 100%

NAME	REVERSE OSMOSIS UNIT	RO WATER STORAGE TANK	DISCHARGE PUMPS	EVAPORATOR	EVAPORATOR FEED TANK	EVAPORATOR FEED PUMPS	ROBINSON BROOK SUMP	ROBINSON BROOK SUMP PUMPS
TAG	RO-101	TK-107	PM-108A, 108B	EV-101	TK-108	PM-109A, 109B	TK-102	PM-102A, 102B
TYPE	SPIRAL WOUND	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	MECHANICAL VAPOR COMPRESS			CONCRETE SUMP	SUBMERSIBLE
SIZE		10' DIA X 20' HT	5 HP			HORIZONTAL CENTRIFUGAL	6' DIA X 8' DEEP	5 HP
CAP	120 GPM	10,000 GAL	120 GPM	20 GPM	50,000 GAL		800 GAL WORKING VOL	10 GPM
MOC		FRP	CS/316 SS TRIM				REINFORCED CONCRETE	CS/316 SS TRIM
PRESS		ATM	80 FT				ATM	200 FT
TEMP		AMB	AMB				AMB	AMB
ELEC		NA	480V, 3PH, 60 HZ				NA	480V, 3PH, 60 HZ
NOTES								2-100% WITH VFDS

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REV	DESCRIPTION	DATE
DESIGNED BY: JB	CHECKED BY: PDB	
DRAWN BY: JAR	22381200-PFD-101_102.dwg	

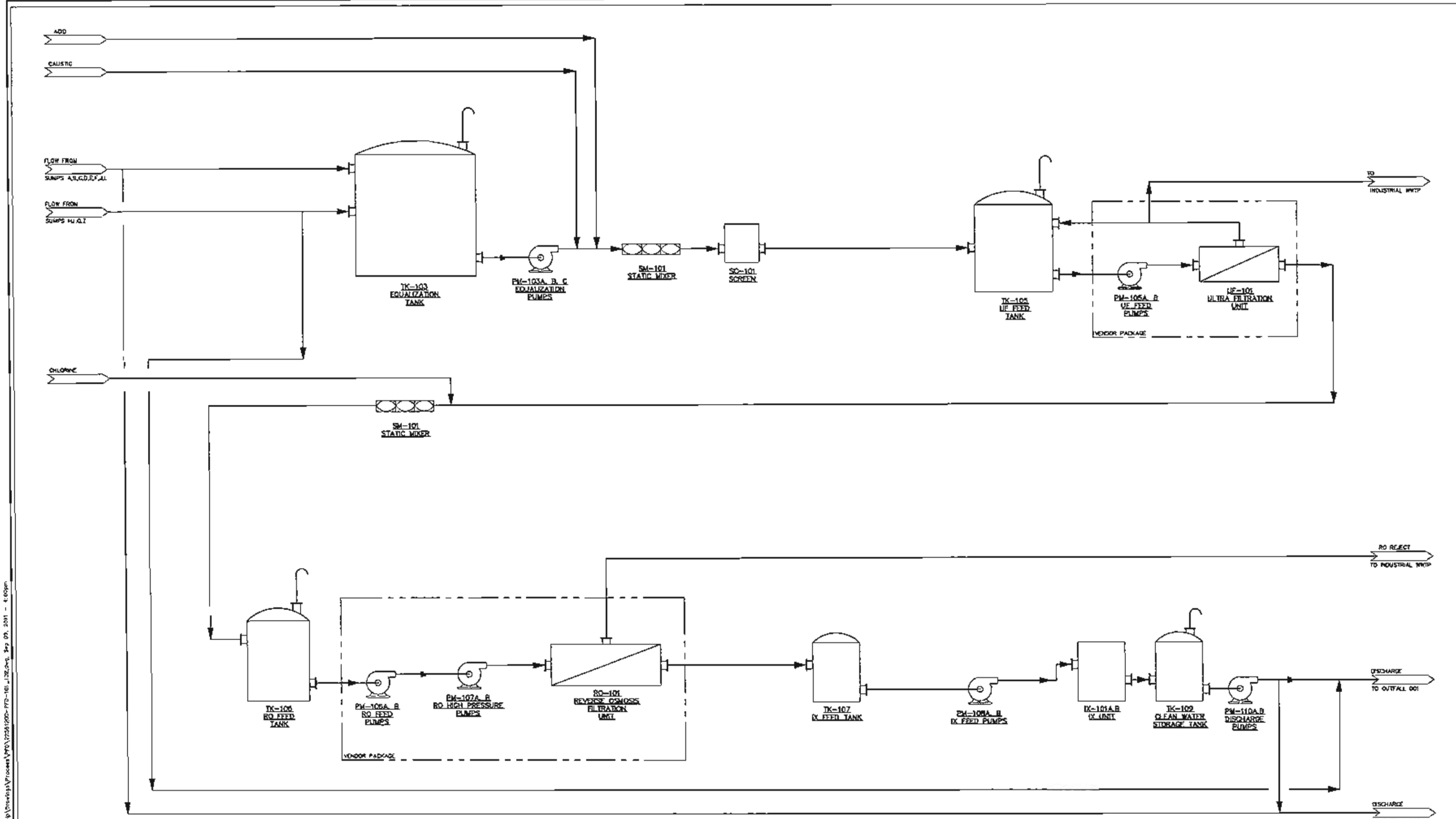
PROCESS FLOW DIAGRAM
OPTION B
400 GPM TREATMENT SYSTEM

INVENSYS

WET WEATHER FLOW TREATMENT PLANT

JOB NO. 223812.00
DATE: AUGUST 2011
SCALE: NONE
SHEET: OF

PFD-102



NAME	EQUALIZATION TANKS	EQUALIZATION PUMPS	UF FEED TANK	UF FEED PUMPS	ULTRAFILTRATION UNIT
TAG	TK-103A, 103B, 103C	PM-103A, 103B	TK-105	PM-105A, 105B	UF-101
TYPE	CYLINDRICAL, CLOSED TOP	HORIZONTAL CENTRIFUGAL	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	OUTSIDE/IN PRESSURE UF
SIZE		0.5 HP		1 HP	
CAP	80,000 GAL EA	10 GPM	2,000 GAL	10 GPM	10 GPM
MOC	EPOXY COATED CS	CS/316 SS TRIM	FRP	CS/316 SS TRIM	PVDF
PRESS	ATM	50 FT	ATM	60 PSIG	
TEMP	AMB	AMB	AMB	AMB	
ELEC	NA	460V, 3PH, 60 HZ	NA	460V, 3PH, 60 HZ	460V, 3PH, 60HZ
NOTES		3 - 100%		2 - 100%	VENDOR PACKAGE

NAME	RO FEED TANK	RO FEED PUMPS	RO HIGH PRESSURE PUMPS	REVERSE OSMOSIS UNIT	RO WATER STORAGE TANK
TAG	TK-106	PM-106A, 106B	PM-107A, 107B	RO-101	TK-108
TYPE	VERTICAL CYLINDRICAL	HORIZONTAL CENTRIFUGAL	MULTI STAGE CENTRIFUGAL		VERTICAL CYLINDRICAL
SIZE		0.5 HP	2 HP		
CAP	1,000 GAL	10 GPM	10 GPM	8 GPM PERMEATE	5,000 GAL
MOC	FRP	CS/316 SS TRIM	CS/316 SS TRIM		FRP
PRESS	ATM		300 PSIG		ATM
TEMP	AMB	AMB	AMB		AMB
ELEC	NA	460V, 3PH, 60 HZ	460V, 3PH, 60 HZ		NA
NOTES		2 - 100%	2 - 100%		

NAME	DISCHARGE PUMPS
TAG	PM-108A, 108B
TYPE	HORIZONTAL CENTRIFUGAL
SIZE	0.5 HP
CAP	8 GPM
MOC	CS/316 SS TRIM
PRESS	60 FT
TEMP	AMB
ELEC	460V, 3PH, 60 HZ
NOTES	

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REV	DESCRIPTION	DATE
DESIGNED BY: JB	CHECKED BY: PGB	
DRAWN BY: JAS	223812.00-PFD-101_102.dwg	

PROCESS FLOW DIAGRAM OPTIONS C, D, & E 10 GPM TREATMENT SYSTEM

INVENSYS

WET WEATHER FLOW TREATMENT PLANT

JOB NO.: 223812.00
DATE: AUGUST 2011
SCALE: NONE
SHEET OF

PFD-103

APPENDIX D: 2010 & 2011 DAILY FLOW & PRECIPITATION DATA

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
1/1/2010	241	288	222	T	0.02
1/2/2010	227	272	212	0.09	0.15
1/3/2010	255	296	209	0.02	0.02
1/4/2010	269	292	250	0	0
1/5/2010	247	272	219	0	0
1/6/2010	260	276	236	0	0
1/7/2010	271	292	236	0	T
1/8/2010	223	265	186	T	T
1/9/2010	222	239	199	0	0
1/10/2010	195	219	165	0	0
1/11/2010	186	205	162	0	T
1/12/2010	192	229	162	0	0
1/13/2010	209	232	174	T	0
1/14/2010	196	219	162	0	0
1/15/2010	190	239	151	0	0.79
1/16/2010	223	380	171	0	0.69
1/17/2010	331	1266	162	0.46	0.24
1/18/2010	622	1417	328	0.85	T
1/19/2010	376	679	280	0.21	0
1/20/2010	312	470	269	T	0
1/21/2010	256	292	219	0	0
1/22/2010	225	261	189	0	0
1/23/2010	235	261	196	0	0
1/24/2010	229	269	202	0	0
1/25/2010	815	2362	205	1.24	1.32
1/26/2010	461	526	398	0.03	0.05
1/27/2010	375	421	316	T	0
1/28/2010	314	358	261	0.03	0.06
1/29/2010	330	353	284	T	0
1/30/2010	301	349	247	0	0
1/31/2010	294	316	257	0	0
2/1/2010	290	320	250	0	0
2/2/2010	258	299	219	0	0
2/3/2010	236	265	209	T	0.02
2/4/2010	251	280	212	0	0
2/5/2010	216	257	189	0	0
2/6/2010	203	236	186	T	T
2/7/2010	220	236	196	0	0
2/8/2010	217	239	199	0	0
2/9/2010	201	229	174	0	0
2/10/2010	183	212	162	0.18	0.7
2/11/2010	230	292	193	0	T
2/12/2010	222	250	186	-	-
2/13/2010	188	209	171	0	0
2/14/2010	230	299	199	0	0
2/15/2010	224	320	174	0	0
2/16/2010	201	239	174	0.35	0.19
2/17/2010	215	276	183	T	0.01
2/18/2010	259	548	171	0	0
2/19/2010	234	426	165	0	T
2/20/2010	241	366	183	0	0
2/21/2010	217	257	199	0	0
2/22/2010	224	280	189	0	0
2/23/2010	314	1258	193	0.2	0.31
2/24/2010	1036	2077	303	1.48	1.65
2/25/2010	897	2319	375	1.59	1.31
2/26/2010	635	1124	455	0.13	T
2/27/2010	472	532	421	0.04	0.02
2/28/2010	386	455	345	T	T
3/1/2010	487	1218	336	0.19	0.39

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
3/2/2010	387	426	332	0	0
3/3/2010	385	697	320	0.07	0.19
3/4/2010	406	637	345	0.03	0.13
3/5/2010	381	470	332	0.02	0.03
3/6/2010	335	371	288	0	0
3/7/2010	318	353	276	0	0
3/8/2010	312	341	265	0	0
3/9/2010	318	336	288	0	0
3/10/2010	294	324	250	0	0
3/11/2010	285	320	254	0.06	0.04
3/12/2010	288	320	254	T	T
3/13/2010	793	1713	269	1.38	1.73
3/14/2010	1734	2494	1101	3.25	2.42
3/15/2010	1481	2439	837	2.07	0.99
3/16/2010	679	877	521	0	0
3/17/2010	527	626	470	0	0
3/18/2010	444	485	384	0	0
3/19/2010	409	475	332	0	0
3/20/2010	395	445	336	0	0
3/21/2010	386	440	336	0	0
3/22/2010	363	516	320	0	0.09
3/23/2010	1085	2006	516	0	2.31
3/24/2010	534	667	450	0	0.03
3/25/2010	389	455	328	0	0
3/26/2010	469	870	332	0	0.33
3/27/2010	385	426	324	0	0
3/28/2010	355	402	316	0	0
3/29/2010	1282	2276	316	0	2.27
3/30/2010	1505	1886	905	0	4.21
3/31/2010	735	1056	532	0	0.01
4/1/2010	496	558	375	M	0
4/2/2010	486	532	416	M	0
4/3/2010	448	505	402	M	0
4/4/2010	442	480	384	M	0
4/5/2010	408	455	362	M	0
4/6/2010	395	440	362	M	T
4/7/2010	382	421	349	M	0
4/8/2010	387	426	345	M	0
4/9/2010	697	1557	341	M	0.58
4/10/2010	435	505	371	M	0
4/11/2010	361	389	332	M	0
4/12/2010	359	384	320	M	0
4/13/2010	342	366	299	M	0
4/14/2010	322	366	284	M	0
4/15/2010	318	353	284	M 0.00	0
4/16/2010	386	1093	280	0.39	0.35
4/17/2010	337	495	299	0.08	0.14
4/18/2010	310	341	280	0.1	0.08
4/19/2010	313	336	288	0	0
4/20/2010	294	324	265	T	T
4/21/2010	289	312	254	0	0
4/22/2010	337	1366	261	0.1	0.12
4/23/2010	295	332	265	0	0
4/24/2010	262	296	229	0	0
4/25/2010	231	254	215	0	0.03
4/26/2010	268	500	225	0.16	0.08
4/27/2010	304	603	247	0.18	0.11
4/28/2010	266	341	219	0.03	0.04
4/29/2010	265	292	232	0	0
4/30/2010	251	272	225	0	0

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
5/1/2010	275	299	250	0	0
5/2/2010	266	296	247	0	0
5/3/2010	280	521	236	0.04	0.25
5/4/2010	285	532	236	0.03	0.11
5/5/2010	255	284	229	0	0
5/6/2010	241	280	205	T	T
5/7/2010	242	272	215	0	0
5/8/2010	362	1139	202	0.6	1.06
5/9/2010	251	272	239	0	0
5/10/2010	239	254	215	0	0
5/11/2010	220	243	196	0	0
5/12/2010	205	222	183	T	T
5/13/2010	215	243	199	0	0
5/14/2010	202	257	183	0.05	0.02
5/15/2010	230	247	196	T	T
5/16/2010	222	243	199	0	0
5/17/2010	210	225	189	0	0
5/18/2010	514	2629	189	0.59	0.81
5/19/2010	290	505	225	0.71	0.16
5/20/2010	232	254	202	0.01	0
5/21/2010	224	236	189	0	0
5/22/2010	209	232	180	0	0
5/23/2010	206	229	186	0	0
5/24/2010	206	222	189	0	0.01
5/25/2010	191	219	177	0	0
5/26/2010	193	236	177	0.01	T
5/27/2010	277	1063	174	0.24	0.14
5/28/2010	193	209	171	0	T
5/29/2010	179	199	165	0.18	0.12
5/30/2010	193	215	168	0.01	0.01
5/31/2010	193	219	171	0	0
6/1/2010	413	1789	171	0.28	0.41
6/2/2010	253	299	225	-	-
6/3/2010	221	254	202	0.02	0.04
6/4/2010	232	250	205	0	0
6/5/2010	335	1495	222	0.08	0.55
6/6/2010	215	243	186	0.07	0.01
6/7/2010	231	239	219	0	0
6/8/2010	229	247	202	0.02	0.03
6/9/2010	273	626	202	0.22	0.3
6/10/2010	257	542	196	0.14	0.05
6/11/2010	230	250	205	0	0
6/12/2010	329	990	196	0.22	0.62
6/13/2010	273	421	229	0.02	0.16
6/14/2010	252	727	205	0.01	0.02
6/15/2010	254	288	239	0	0.01
6/16/2010	221	269	196	0.06	0.12
6/17/2010	230	254	199	0.01	0.02
6/18/2010	239	250	219	0	0
6/19/2010	220	250	199	0	0
6/20/2010	235	740	180	0.15	0.1
6/21/2010	229	239	205	0.01	0
6/22/2010	208	229	186	0	0.01
6/23/2010	283	1210	180	0.06	0.14
6/24/2010	199	232	174	T	0
6/25/2010	214	229	193	0	0
6/26/2010	194	212	183	0	T
6/27/2010	196	212	183	0.1	0
6/28/2010	182	316	117	0	0.24
6/29/2010	215	239	202	0	0

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.)	
				Norwood (42 11 N, 71 01 W)	Taunton (41 53 N, 71 01 W)
6/30/2010	203	219	183		
7/1/2010	199	215	174	0	0.01
7/2/2010	196	215	174	0	0
7/3/2010	183	209	165	0	0
7/4/2010	178	199	162	0	0
7/5/2010	200	219	186	0	0
7/6/2010	206	229	177	0	0
7/7/2010	197	212	180	0	0
7/8/2010	187	205	165	0	0
7/9/2010	174	215	151	0.01	T
7/10/2010	179	485	96	0.05	0.05
7/11/2010	185	205	70	0.01	T
7/12/2010	184	199	168	0	0
7/13/2010	168	219	107	0.08	0.35
7/14/2010	228	1078	105	0.3	1.66
7/15/2010	125	189	57	0.01	0
7/16/2010	168	324	137	0.07	0
7/17/2010	102	186	45	0.01	0
7/18/2010	175	186	159	0	0
7/19/2010	163	626	94	0.03	0.27
7/20/2010	107	180	40	0	0
7/21/2010	155	174	135	0	0.02
7/22/2010	171	186	143	0	0
7/23/2010	228	1366	117	0.52	0.79
7/24/2010	469	4579	52	0.09	0.72
7/25/2010	201	284	154	T	0.03
7/26/2010	130	159	94	0	0
7/27/2010	89	107	56	0	0
7/28/2010	65	107	35	0	0
7/29/2010	74	135	27	0.06	0.02
7/30/2010	69	92	36	0	0
7/31/2010	78	88	56	0	0
8/1/2010				0	0
8/2/2010	67	94	46	0	0
8/3/2010	66	94	43	0	0
8/4/2010	41	68	28	0	0
8/5/2010	130	912	17	0.26	0.3
8/6/2010	135	196	96	0.01	T
8/7/2010	91	103	70	0	0.29
8/8/2010	80	98	57	0	0
8/9/2010	58	85	34	T	0
8/10/2010	147	431	72	0.18	0.29
8/11/2010	89	101	73	0	0
8/12/2010	88	101	24	T	0
8/13/2010	89	98	77	0	0
8/14/2010	71	96	43	0	0
8/15/2010	58	81	39	0	0
8/16/2010	150	480	35	0.13	0.04
8/17/2010	183	1071	88	0	T
8/18/2010	68	98	40	0	0
8/19/2010	40	59	22	0.01	0
8/20/2010	77	92	42	0	0
8/21/2010	71	96	42	0	0
8/22/2010	246	898	56	0.29	0.66
8/23/2010	569	1316	215	1.34	0.54
8/24/2010	434	1101	202	1.28	0.69
8/25/2010	587	2814	186	1.75	1.31
8/26/2010	249	292	215	0	0
8/27/2010	Error	Error	Error	0	0
8/28/2010	Error	Error	Error	0	0

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
8/29/2010	Error	Error	Error	0	0
8/30/2010	Error	Error	Error	0	0
8/31/2010	Error	Error	Error	0	0
9/1/2010	Error	Error	Error	0	0
9/2/2010	127	162	90	0	0
9/3/2010	251	1751	62	0.33	1.46
9/4/2010	311	1408	193	0.07	0.05
9/5/2010	180	196	159	0	0
9/6/2010	145	171	92	0	0
9/7/2010	99	157	57	T	0
9/8/2010	149	516	54	0.06	T
9/9/2010	141	162	117	T	0
9/10/2010	151	159	143	0	0
9/11/2010	149	162	127	0	0
9/12/2010	137	162	110	T	T
9/13/2010	62	85	35	0.01	0
9/14/2010	66	117	35	T	0
9/15/2010	112	124	83	0	0
9/16/2010	120	643	29	-	-
9/17/2010	301	1837	157	0.23	0.35
9/18/2010	134	162	92	0	0
9/19/2010	93	132	61	0	0
9/20/2010	110	151	59	0	0
9/21/2010	98	143	54	0	0
9/22/2010	71	122	40	T	0
9/23/2010	113	174	59	0	0
9/24/2010	55	90	39	0	0
9/25/2010	67	137	36	0	0
9/26/2010	127	135	115	0	0
9/27/2010	105	353	52	0.25	0.23
9/28/2010	269	1266	38	0.76	0.11
9/29/2010	159	261	122	0	0.01
9/30/2010	88	140	61	0.01	0.03
10/1/2010	398	940	45	0.62	0.68
10/2/2010	153	366	115	0	0
10/3/2010	123	145	96	T	T
10/4/2010	224	797	36	0.7	0.16
10/5/2010	202	1996	48	0.18	0.16
10/6/2010	484	2461	73	1.33	1.22
10/7/2010	122	189	85	T	0
10/8/2010	141	189	88	0	0
10/9/2010	170	183	143	0	0
10/10/2010	107	174	57		
10/11/2010	132	162	98		
10/12/2010	133	165	92	T	T
10/13/2010	133	159	81	0	0.01
10/14/2010	92	145	48	0.4	0
10/15/2010	629	2384	122	1.15	0.68
10/16/2010	194	209	168	0	0.77
10/17/2010	140	180	83	0	0
10/18/2010	133	171	83	0	0
10/19/2010	131	165	77	0	0
10/20/2010	95	140	59	T	0
10/21/2010	94	186	51	0.09	0
10/22/2010	177	199	145	0	0.28
10/23/2010	168	199	112	0	0
10/24/2010	144	199	88	T	0
10/25/2010	85	119	70	T	T
10/26/2010	146	180	81	0	0.01
10/27/2010	126	215	92	0.1	0.01

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
10/28/2010	112	165	73	0.01	0.2
10/29/2010	152	180	101	T	T
10/30/2010	113	177	66	0	0
10/31/2010	152	215	70	0	0
11/1/2010	176	222	92	0	0
11/2/2010	105	145	72	0	0
11/3/2010	81	117	62	0	0.95
11/4/2010	293	1186	66	0.78	0.24
11/5/2010	435	1713	229	0.57	0
11/6/2010	262	316	219	0	0.25
11/7/2010	184	272	115	0.15	0.65
11/8/2010	640	1383	157	0.94	0.12
11/9/2010	269	475	202	0.12	0.12
11/10/2010	384	673	239	0.09	0
11/11/2010	328	389	261	0	0
11/12/2010	242	324	174	0	0
11/13/2010	192	202	180	0	0
11/14/2010	214	280	186	0	T
11/15/2010	188	212	171	0	T
11/16/2010	191	239	162	0.08	0.05
11/17/2010	709	2428	174	1	1.29
11/18/2010	384	445	272	0	0
11/19/2010	371	402	299	0	0
11/20/2010	284	407	209	0	0
11/21/2010	366	412	296	0	0
11/22/2010	240	299	209	T	T
11/23/2010	226	288	212	0	0
11/24/2010	350	393	299	0	0
11/25/2010	318	384	215	0	0
11/26/2010	294	495	205	0.1	0.09
11/27/2010	332	402	272	0	0
11/28/2010	333	353	307	0	0
11/29/2010	301	336	229	0	-
11/30/2010	244	320	171	T	T
12/1/2010	436	1630	168	0.5	0.53
12/2/2010	348	398	276	0	0
12/3/2010	245	353	180	0	0
12/4/2010	188	236	168	0	0
12/5/2010	206	269	177	-	0
12/6/2010	203	257	168	0	0
12/7/2010	298	345	232	0	0
12/8/2010	330	349	288	T	0
12/9/2010	312	341	261	0	0
12/10/2010	246	303	180	0	0
12/11/2010	196	247	154	0	0
12/12/2010	646	1818	159	-	-
12/13/2010	632	2362	362	0.01	0.22
12/14/2010	448	495	380	T	0
12/15/2010	406	440	345	T	T
12/16/2010	353	412	280	0	0
12/17/2010	351	384	276	0	0
12/18/2010	314	380	243	0	-
12/19/2010	249	303	212	0	T
12/20/2010	222	269	193	0.1	0.07
12/21/2010	265	332	193	T	0.01
12/22/2010	258	299	225	0.04	0.06
12/23/2010	332	421	215	0.02	0.03
12/24/2010	356	389	284	0	0
12/25/2010	311	362	254	0	0
12/26/2010	242	316	209	-	1.04

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.) Norwood (42 11 N, 71 01 W)	Precipitation (in.) Taunton (41 53 N, 71 01 W)
12/27/2010	328	412	219	0.05	T
12/28/2010	370	398	284	T	0
12/29/2010	375	393	328	0	0
12/30/2010	316	371	250	0	0
12/31/2010	315	426	222	0	0
1/1/2011	430	586	296	0	0
1/2/2011	540	1425	292	0.23	0.23
1/3/2011	303	380	257	0	0
1/4/2011	213	269	189	0	0
1/5/2011	233	269	199	0	0
1/6/2011	217	247	199	0	0
1/7/2011	212	236	199	0	0
1/8/2011	224	261	209	0.08	0.19
1/9/2011	342	393	219	-	0.02
1/10/2011	343	389	269	0	0
1/11/2011	293	375	209	0	0
1/12/2011	245	336	168	0.86	1.14
1/13/2011	324	341	272	0	0
1/14/2011	299	341	222	0	0
1/15/2011	233	299	174	T	T
1/16/2011	298	402	196	0	0
1/17/2011	309	332	257	0	0
1/18/2011	330	721	171	0.78	0.64
1/19/2011	494	643	345	0.11	0.04
1/20/2011	318	402	180	T	0
1/21/2011	257	398	180	0.36	0.39
1/22/2011	325	393	239	0	0
1/23/2011	287	380	212	T	T
1/24/2011	321	375	261	T	0
1/25/2011	221	296	186	0.05	0.08
1/26/2011	225	272	193	0.16	0.25
1/27/2011	338	402	219	0.4	0.4
1/28/2011	347	375	265	T	T
1/29/2011	344	389	296	0	0
1/30/2011	353	380	269	0	0
1/31/2011	347	380	269	0	T
2/1/2011	259	332	205	0.57	0.44
2/2/2011	339	709	209	0.85	0.78
2/3/2011	343	402	250	T	T
2/4/2011	245	450	202	0	0
2/5/2011	283	569	212	0.21	0.32
2/6/2011	516	649	328	T	0
2/7/2011	333	412	254	0.03	0
2/8/2011	383	603	265	0.21	0.28
2/9/2011	316	412	225	0	0
2/10/2011	272	345	219	0	0
2/11/2011	255	307	209	0	0
2/12/2011	258	389	205	T	0
2/13/2011	305	398	225	0	0
2/14/2011	404	685	239	T	0
2/15/2011	406	470	288	T	0
2/16/2011	267	307	229	0	0
2/17/2011	400	797	254	0	0
2/18/2011	443	919	265	0.04	T
2/19/2011	374	480	303	T	T
2/20/2011	361	455	265	T	0
2/21/2011	296	389	261	0.02	0.04
2/22/2011	325	375	280	0	0
2/23/2011	329	426	272	0	0
2/24/2011	288	328	257	T	1.87

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.)	
				Norwood (42 11 N, 71 01 W)	Taunton (41 53 N, 71 01 W)
2/25/2011	898	2439	276	1.05	T
2/26/2011	456	691	324	0.03	0.12
2/27/2011	356	416	307	0.19	0.4
2/28/2011	532	2160	284	0.39	
3/1/2011	512	609	445	0	0
3/2/2011	411	564	324	T	0
3/3/2011	449	548	345	0	0
3/4/2011	369	460	299	-	-
3/5/2011	381	521	288	-	-
3/6/2011	578	721	445	0.12	-
3/7/2011	1097	2108	667	0.58	0.38
3/8/2011	589	649	470	0	0
3/9/2011	472	580	380	0	0
3/10/2011	376	500	349	0.03	0.08
3/11/2011	653	1986	389	0.42	0.48
3/12/2011	504	558	460	0	0
3/13/2011	483	558	389	-	-
3/14/2011	510	537	455	T	T
3/15/2011	447	516	366	0	0
3/16/2011	563	1713	328	0.48	0.43
3/17/2011	458	548	366	0	0.01
3/18/2011	449	575	341	0	0
3/19/2011	547	575	500	T	0
3/20/2011	469	542	380	0	0
3/21/2011	405	597	336	0.2	0.15
3/22/2011	512	580	426	0	0
3/23/2011	400	505	328	-	-
3/24/2011	442	521	336	0.01	0.05
3/25/2011	463	521	366	0	0
3/26/2011	468	516	402	0	0
3/27/2011	433	511	345	0	0
3/28/2011	468	526	393	0	0
3/29/2011	474	526	384	0	0
3/30/2011	432	521	332	0	0
3/31/2011	416	580	349	0.31	0.53
4/1/2011	603	1116	349	0.38	0.59
4/2/2011	437	542	332	0.01	T
4/3/2011	495	548	412	0	0
4/4/2011	496	1443	353	0.41	0.08
4/5/2011	447	679	320	0.13	0.16
4/6/2011	460	526	332	0	0
4/7/2011	434	511	332	0	0
4/8/2011	428	505	345	0	0
4/9/2011	404	470	332	0	0
4/10/2011	413	505	328	T	T
4/11/2011	357	460	332	0.02	T
4/12/2011	546	1155	412	0.19	0.18
4/13/2011	823	2128	380	1.07	1.61
4/14/2011	473	553	375	T	0
4/15/2011	446	516	362	0	0
4/16/2011	407	877	296	0.17	0.21
4/17/2011	886	2202	526	1.07	1.22
4/18/2011	509	614	389	T	T
4/19/2011	491	569	407	0.07	0.05
4/20/2011	396	516	341	T	T
4/21/2011	495	569	431	0	0
4/22/2011	466	553	380	0	0
4/23/2011	544	1584	345	0.42	0.51
4/24/2011	423	485	362	0.03	0.01
4/25/2011	451	537	384	T	0.01

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.)	
				Norwood (42 11 N, 71 01 W)	Taunton (41 53 N, 71 01 W)
4/26/2011	384	475	341	0.02	0
4/27/2011	365	426	328	0.02	0.16
4/28/2011	365	558	284	0.03	0.73
4/29/2011	327	371	269	0	0.01
4/30/2011				0	T
5/1/2011	318	362	247	0	T
5/2/2011	274	341	219	0	0
5/3/2011	243	299	205	0	0
5/4/2011	384	1250	205	0.51	0.34
5/5/2011	278	435	219	0.01	0.07
5/6/2011	277	336	209	0	0
5/7/2011	364	2276	193	0.5	0
5/8/2011	293	328	232	0	0
5/9/2011	245	303	196	0	-
5/10/2011	274	332	215	0.06	T
5/11/2011	290	366	215	0.09	0.04
5/12/2011	246	292	215	0	0
5/13/2011	206	250	174	0	0
5/14/2011	202	250	177	T	0.03
5/15/2011	313	877	168	0.51	0.45
5/16/2011	379	1593	225	0.37	0.22
5/17/2011	324	844	209	0.38	0.49
5/18/2011	229	265	189	0.22	0.09
5/19/2011	377	830	232	0.43	0.49
5/20/2011	334	727	225	0.03	-
5/21/2011	320	380	257	0	0.02
5/22/2011	501	837	353	0.01	0
5/23/2011	672	1630	426	0.12	0.05
5/24/2011	1285	4465	288	0.25	0.15
5/25/2011	1175	9824	212	0	0
5/26/2011	319	426	209	0	0
5/27/2011	400	734	229	0	0
5/28/2011	294	393	236	0	0
5/29/2011	228	272	189	0	0.01
5/30/2011	239	276	174	0	0
5/31/2011	256	284	209	0	0
6/1/2011	219	407	145	0.67	0.02
6/2/2011	283	362	229	0.01	0
6/3/2011	267	288	225	0	0
6/4/2011	258	280	225	0	0
6/5/2011	Error	Error	Error	0	0
6/6/2011	Error	Error	Error	0	0
6/7/2011	Error	Error	Error	0	0
6/8/2011	Error	Error	Error	T	0.02
6/9/2011	Error	Error	Error	0.67	0.54
6/10/2011	Error	Error	Error	0	0
6/11/2011	369	2191	225	0.78	0.34
6/12/2011	405	1504	199	0.48	1.33
6/13/2011	267	316	209	0.08	0.03
6/14/2011	294	353	236	0.03	0.05
6/15/2011	255	564	183	0	T
6/16/2011	405	1093	215	0	0
6/17/2011	344	1242	225	0.08	0.28
6/18/2011	447	1809	196	0	0.01
6/19/2011	532	3739	254	0	0
6/20/2011	274	667	199	0	0
6/21/2011	247	272	209	-	-
6/22/2011	602	2330	219	1.1	0.63
6/23/2011	924	7261	349	0.17	0.25
6/24/2011	577	1109	362	0.03	0.05

ATTACHMENT D
Daily Flow to Outfall 001

Date	Avg Daily Flow (GPM)	Max Day Flow (GPM)	Min Day Flow (GPM)	Precipitation (in.)	
				Norwood (42 11 N, 71 01 W)	Taunton (41 53 N, 71 01 W)
6/25/2011	468	1283	307	0.25	0.02
6/26/2011	485	1033	307	0.01	0.04
6/27/2011	866	1828	358	0	0

APPENDIX E: DETAILED COST ESTIMATES FOR OPTIONS A THROUGH E

ATTACHMENT E

Rev 0

INVENSYS SYSTEMS, INC.
COST OVERVIEW

Option	Description	Capital Cost	O&M Cost
A: New Stormwater Drainage & Dry Weather Treatment System	Roof drains and parking areas tie into two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Furnish and install a new 120 gpm dry weather water treatment plant to treat existing groundwater infiltration.	$12,772,896	$507,371
B: Wet Weather Treatment System	Furnish and install a new 400 gpm wet weather treatment plant to treat the combine stormwater and groundwater flow. 2,000,000 gallons of equalization capacity is required to minimize the flow spike to the treatment plant during a storm event.	$16,976,588	$891,945
C: Sliplining Existing Drainage Systems	Slipline all existing drainage lines to prevent groundwater infiltration. Furnish and install a new 10 gpm treatments system to treat building sump water.	$6,033,627	$280,857
D: Pipe Bursting Existing Drainage Systems	Pipe Burst all existing drainage lines to prevent groundwater infiltration. Furnish and install a new 10 gpm treatments system to treat building sump water.	$7,871,198	$280,857
E: New Stormwater Drainage System & Capping/Filling of Existing Drainage System	Roof drains and parking areas tie into two completely new stormwater drainage systems (one to Outfall 001, one to Outfall 002). Cap the existing stormwater drainage system and fill the drainage line under the building with concrete. Furnish and install a new 10 gpm treatments system to treat building sump water.	$8,593,369	$280,857

Table A-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION A: NEW STORMWATER DRAINAGE SYSTEM & DRY WEATHER TREATMENT SYSTEM

		Description	Units	Quantity	Unit Cost	Total Cost	
I	**Equipment Procurement**						
1.0	**New Process Equipment for Treatment Plant**						
1.01	Robinson Brook Sump Pumps	Submersible centrifugal w/ VFD; 10 gpm	ea	2	$5,000	$10,000	
1.02	Gudgeon Brook Sump Pumps	Submersible centrifugal w/ VFD, 200 gpm	ea	2	$10,000	$20,000	
1.03	Equalization Tanks	200,000 gallons	ea	1	$400,000	$400,000	
1.04	Equalization Pumps	Centrifugal; 120 gpm; 5 HP	ea	2	$10,000	$20,000	
1.05	Static Mixer	For pH adjustment	ea	1	$4,000	$4,000	
1.06	Influent Screen	Duplex Basket 316 SS	ea	1	$70,000	$70,000	
1 07	Ultrafiltration (UF) Feed Tank	7,000 gallons	ea	1	$15,000	$15,000	
1 08	UF System	Vendor UF System Package includes the following:	ls	1	$130,000	$130,000	
	UF Feed Pumps	Centrifugal; 120 gpm; 5 HP	ea	2	(included in 1 08)		
	UF Feed Unit	120 gpm; outside/in pressure UF	ea	1	(included in 1 08)		
1.09	Static Mixer	Prior to RO Feed tank	ea	1	$4,000	$4,000	
1.10	RO Feed Tank	3,000 gallon; 7' diameter x 12' high	ea	1	$8,500	$8,500	
1.11	RO System	Vendor RO System Package includes the following:	ls	1	$275,000	$275,000	
	RO Feed Pumps	Centrifugal; 120 gpm, 5 HP	ea	2	(included in 1.11)		
	RO High Pressure Pumps	Multi-stage centrifugal; 120 gpm; 35 HP	ea	2	(included in 1.11)		
	Reverse Osmosis Unit	Spiral Wound; 120 gpm	ea	2	(included in 1.11)		
	RO CIP Tank	Poly tank	ea	1	(included in 1 11)		
	RO CIP Pump	End suction centrifugal	ea	1	(included in 1 11)		
	Anti-Scalant Pumps	Solenoid metering pumps	ea	2	(included in 1.11)		
	Chloramine Pumps	Solenoid metering pumps	ea	2	(included in 1.11)		
1.12	Evaporator Feed Tank	50,000 gal tank	ls	1	$100,000	$100,000	
1.13	Evaporator	Vendor Evaporator Package included the following:	ls	1	$650,000	$650,000	
	Evaporator	Mechanical Vapor Compression Evaporator (900 gal/hr unit)	ea	1	(included in 1.13)		
	Feed/CIP Pump	End suction centrifugal	ea	1	(included in 1 13)		
	Evaporator Feed Heat Exchanger	Plate & Frame	ea	1	(included in 1.13)		
	Evaporator Main Heat Exchanger	Plate & Frame	ea	1	(included in 1.13)		
	Evaporator Vapor Compressor	Rotary lobe	ea	1	(included in 1.13)		
	Evaporator Recirculation Pump	End suction centrifugal	ea	1	(included in 1.13)		
	Residue Pump	Air diaphragm pump	ea	1	(included in 1.13)		
	CIP Tank	Cone bottom cylindrical	ea	1	(included in 1.13)		
	Distillate Pump	End suction centrifugal	ea	1	(included in 1.13)		
1 14	IX Feed Tank	7,000 gal FRP Tank	ea	1	$15,000	$15,000	
1.15	IX Feed Pumps	Centrifugal; 105 gpm	ea	2	$10,000	$20,000	
1.16	Ion Exchange (IX) Units	Cation resin packed bed; rubber lined steel pressure vessel	ea	2	$45,000	$90,000	
1.17	Clean Water Storage Tank	10,000 gal FRP Tank	ea	1	$20,000	$20,000	
1.18	Discharge Pumps	Centrifugal; 120 gpm	ea	2	$10,000	$20,000	
1.19	Chemical Feed Systems	Caustic and acid for neutralization; chlorination system	ea	3	$12,000	$36,000	
1.20	Control Panel		ea	1	$75,000	$75,000	
1 21	Instruments (analog)	LIT, pH, DO, Temp, PIT, FIT	ea	30	$2,500	$75,000	
1.22	Instruments (digital switches)	LS, XS, SS, PS	ea	15	$500	$7,500	
1.23	Instruments (control valves)	FCV, MOV	ea	25	$3,500	$87,500	
1.24	Instruments (non I/O)	PI, TI	ea	8	$300	$2,400	
		Total Equipment Procurement Cost					$ 2,154,900
II	**Construction**						
2.0	**Civil/Structural**						
2.01	New Stormwater Drainage System	See Table A-2 (Detailed Cost Estimate for New Stormwater Drainage System Proposed in Option A)	ls	1	$2,899,600	$2,899,600	
2.02	Civil/Structural For Dry Weather Treatment System	See 2 03 through 2.13.	ls	1	(included in 2.03 - 2.13)		
2.03	Excavation	Excavation Items - excavate and dispose of excess material	cy	400	$28	$11,200	
2.04	Backfill & compaction	F&I structural fill under new foundations, and compact	cy	100	$38	$3,800	
2.05	Underground Piping	allowance for minor modifications to existing underground utilities	ls	1	$10,000	$10,000	
2.06	Grading	finish grading	sf	3,000	$2	$6,000	
2.07	Paving	Buried piping trench repaving + paving disturbed areas around WWTP	sf	500	$6	$3,000	
2.08	Reinforced Concrete (in place) (equipment pads)	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	30	$1,500	$45,000	
2.09	Reinforced Concrete (in place) (tanks, slabs & walls) for all concrete tanks and building slab	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	650	$750	$487,500	
2 10	Structural Steel	Access platforms, pipe racks	ton	4	$3,200	$12,800	
2.11	Miscellaneous Metals	ladders, railings, brackets etc.	ls	1	$10,000	$10,000	
2.12	Pre-Engineered Bldg	Pre-engineered building	sf	2,000	$85	$170,000	
2 22	Clean-up	Clean-up the site and repair any damage	ls	1	$10,000	$10,000	
		Civil/Structural Sub Total					$ 3,668,900
3.0	**Mechanical**						
3.01	1.5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	300	$26	$7,800	
3.02	4" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	550	$54	$29,700	
3.03	1" PVC sch 80 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	150	$14	$2,100	
3 04	1 5" CS Valve	Valves with CS bodies, flanged connections; and supports	ea	15	$290	$4,350	
3.05	4" CS Valve	Valves with CS bodies; flanged connections; and supports	ea	50	$1,700	$85,000	
3.06	1" PVC Valve	Valves with PVC bodies; SW connections; and supports	ea	9	$50	$450	
3 07	Bldg HVAC	allowance for building HVAC	sf	2,000	$20	$40,000	
3.08	Bldg Plumbing	Allowance for building plumbing (lab)	ls	1	$10,000	$10,000	
3 09	Fire protection	Allowance for sprinkler system	ls	1	$15,000	$15,000	
3 10	Equipment installation	Unload, rigging and setting equipment 15% of equipment cost	%	15%	$2,154,900	$323,235	
		Mechanical Sub Total					$ 517,635
4.0	**Electrical / I&C**						
4.01	Utility Coordination		ea	1	$50,000	$50,000	
4.02	Intellicenter Motor Control Center	Electrical Distribution	ea	1	$170,000	$170,000	
4.03	Emergency Generator	with integral diesel belly tank	ea	1	$155,000	$155,000	
4.04	Motor Control Center (MCC)	Motor starters in MCC	ea	28	$2,500	$70,000	
4.05	VFD's		ea	14	$3,000	$42,000	
4.06	Interior Facility Lighting	Lighting panel and distribution in building	ea	1	$20,000	$20,000	
4.07	Yard Lighting	Lighting around new equip and structures	ea	1	$12,000	$12,000	
4.08	Instrumentation Installation	Install, wiring, calibrate and loop check	ea	70	$2,500	$175,000	
4.09	Grounding / Lightning Protection	New grounding grid and lightning protection	ea	1	$12,500	$12,500	
4 10	Building Power	Rcpts, devices, equipment connections, etc	ea	1	$25,000	$25,000	
4.11	Control Systems	See 4.12 - 4.14	ea	1	(included in 4.12 - 4.14)		
4.12	Main Control Panel		ea	1	$80,000	$80,000	
4 13	Control Systems Integration		ea	1	$125,000	$125,000	

Table A-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION A: NEW STORMWATER DRAINAGE SYSTEM & DRY WEATHER TREATMENT SYSTEM

		Description	Units	Quantity	Unit Cost	Total Cost	
4.14	SCADA System Hardware/Software		ea	1	$70,000	$70,000	
4.15	Miscellaneous	Fire alarm system, security alarm system, communications, etc.	ea	1	$15,000	$15,000	
		Electrical / I&C Sub Total					$ 1,021,500
5.0	Indirects and O&P						
5.01	Total Direct Construction Cost						5,208,035
5.02	Indirect Project Costs	Craft supervision and misc matl - inc above	%	10%	$5,208,035	$520,804	
5.03	Taxes	Not included in estimate	%	0%	$7,362,935	$0	
5.04	Contractors Overhead		%	10%	$5,208,035	$520,804	
5.05	Contractors Profit		%	7%	$5,208,035	$364,562	
		Indirects and O&P Sub Total					$ 1,406,169
		Total Construction Cost					$ 6,614,204
III	**Services**						
6.0	**CM /Eng/ Procurement**						
6.01	Pilot Study	Required prior to beginning detailed design phase	ls	1	$90,000	$90,000	
6.02	Survey/Geotechnical Pre-engineering	Required prior to detailed design of the stormwater drainage system	ls	1	$75,000	$75,000	
6.03	Detailed Eng/ Design	Prepare Construction Design Package	%	7%	$8,769,104	$613,837	
6.04	H.O. Services during Const	Engineering Services During Construction	%	3%	$8,769,104	$263,073	
6.05	Construction Management	Full Time CM	%	7%	$8,769,104	$613,837	
6.06	Permitting	Allowance for bldg. and environmental permits	%	2.5%	$8,769,104	$219,228	
		Total Services Cost					$ 1,874,975
		TOTAL PROJECT COST					$ 10,644,080
		Recommended Contingency	%	20%	$10,644,080		2,128,816
		Request for Authorization Budget					12,772,896

Notes
1. This is a conceptual cost estimate based on preliminary data, budgetary equipment quotes and allowances for major subsystems.
2. Estimate does not include sales or other taxes (see item 5.03)

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CLIENT	Invensys Systems, Inc.				
PROJECT	223812				
DESIGNED BY	Hernan Peralta		DATE	8/22/2011	
CHECKED BY	Jeff Stearns		DATE	8/22/2011	
PROJECT NO.	223812.00	SHEET NO.	1	OF	1

TABLE A-2
Detailed Cost Estimate for New Stormwater Drainage System Proposed in Option A

	ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
Site Preparation					
1	Mobilization/Demobilization	LS	1 0	$15,000.00	$15,000 00
2	Dewatering	LS	1 0	$25,000.00	$25,000.00
3	Site Preparation - Erosion Control	LS	1 0	$10,000.00	$10,000.00
Drainage Structures and Piping					
4	Catch Basin	EA	60.0	$2,500.00	$150,000.00
5	Catch Basin - Frame & Grate	EA	60.0	$600.00	$36,000.00
6	Manhole	EA	26.0	$7,000.00	$182,000.00
7	Manhole - Frame & Cover	EA	26.0	$600.00	$15,600.00
8	Cap pipe	EA	40 0	$200.00	$8,000.00
9	12" HDPE (water tight)	LF	1,200.0	$45.00	$54,000.00
10	24" HDPE (water tight)	LF	4,500.0	$50.00	$225,000.00
11	30" HDPE (water tight)	LF	1,500.0	$70.00	$105,000.00
12	2" Class 150 PVC	LF	3,800.0	$5.00	$19,000.00
13	Roof Drain Tie-In	EA	7.0	$25,000.00	$175,000.00
14	Remove & Dispose Catch Basins	EA	45.0	$200 00	$9,000.00
15	Utility Allowance	LS	1.0	$150,000.00	$150,000.00
Excavation					
16	Trench Excavation	CY	25,000.0	$20.00	$500,000.00
17	Backfill and Compaction	SY	16,000.0	$20.00	$320,000.00
18	Pavement Excavation	SY	14,000.0	$10.00	$140,000.00
Restoration					
19	Pavement	TON	5,000.0	$70.00	$350,000.00
20	Base Course	CY	10,000.0	$25.00	$250,000.00
21	Geotextile Fabric	SY	14,000.0	$5.00	$70,000.00
22	Excess Soil Disposal	CY	18,200.0	$5 00	$91,000.00
Construction Subtotal		-	-	-	**$2,899,600.00**

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Table A-3
INVENSYS SYSTEMS, INC.
ANNUAL O&M COST ESTIMATE
OPTION A: NEW STORMWATER DRAINAGE SYSTEM & DRY WEATHER TREATMENT SYSTEM

Item No.	Category	Description	Units	Annual Quantity	Unit Cost	Annual Cost	Comments
1	Labor	1 full time operator (40hr/wk) + Tech Support + Overtime + On-call pager pay, etc.	ls	1	$138,600	$138,600	Operator wage = $45/hr
2	Power	Connected Load x % usage	kwh	804,533	$0.17	$136,771	
3	Other Utilities	Inst air, plant water, etc.	ls	1	$10,000	$10,000	
4	Chemicals	Acid, Caustic, and other	ls	1	$50,000	$50,000	
5	Repair and Maintenance	Maintenance matl & spare parts	ls	1	$65,000	$65,000	
6	Sludge Disposal		ton	0	$200	$0	Assumes sludge flows to onsite industrial WWTP and is discharged to sewer
7	Evaporator Brine Disposal	2 gpm (2,880 gpd) brine produced	gal	0	$0.06	$0	Assumes brine flows to onsite industrial WWTP and is discharged to sewer
8	Ion Exchange Resin Change Out	Occurs once every two weeks (26 times annually). Cost is $3,000 per change out.	ea	26	$3,200.00	$83,200	Assumes resin is regenerated offsite
9	Laboratory Costs	Analytical costs and lab supplies	ls	0	$0	$0	Laboratory costs have been included in the Annual Cost of Compliance Estimate
10	Heating System	Operate building heating system	ls	1	$4,000	$4,000	
11	Inspection of Stormwater Drainage System	Occurs once annually	ls	1	$5,000	$5,000	
12	Drainage Line Cleanout	Occurs once annually	ls	1	$10,000	$10,000	
13	Catch Basin Cleanout	Cost is $80 per catch basin. Occurs once annually	ea	60	$80	$4,800	
				Total Annual O&M Cost		$507,371	

Table B-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION B: WET WEATHER TREATMENT SYSTEM

		Description	Units	Quantity	Unit Cost	Total Cost	
I	**Equipment Procurement**						
1.0	**New Process Equipment**						
1.01	Robinson Brook Sump Pumps	Submersible centrifugal w/ VFD; 200 gpm	ea	2	$10,000	$20,000	
1.02	Gudgeon Brook Sump Pumps	Submersible centrifugal w/ VFD; 2,000 gpm	ea	2	$25,000	$50,000	
1.03	Equalization Tanks	675,000 gal ea; 55' diameter x 40' high	ea	3	$1,012,500	$3,037,500	
1.04	Equalization Pumps	Centrifugal; 400 gpm; 10 HP	ea	3	$13,000	$39,000	
1.05	Static Mixer	For pH adjustment	ea	1	$4,500	$4,500	
1.06	Influent Screen	Duplex Basket 316 SS	ea	1	$100,000	$100,000	
1.07	Oil/Water Separator		ea	1	$120,000	$120,000	
1.08	Ultrafiltration (UF) Feed Tank	25,000 gallon; 14' diameter x 24' high	ea	1	$50,000	$50,000	
1.09	UF System	Vendor UF System Package includes the following:	ls	1	$400,000	$400,000	
	UF Feed Pumps	Centrifugal; 400 gpm; 20 HP	ea	2	(included in 1.09)		
	UF Feed Unit	400 gpm; outside/in pressure UF	ea	1	(included in 1.09)		
1.10	Static Mixer	Prior to RO Feed tank	ea	1	$4,500	$4,500	
1.11	RO Feed Tank	12,000 gallons	ea	1	$24,000	$24,000	
1.12	RO System	Vendor RO System Package includes the following:	ls	1	$675,000	$675,000	
	RO Feed Pumps	Centrifugal; 400 gpm, 10 HP	ea	2	(included in 1.12)		
	RO High Pressure Pumps	Multi-stage centrifugal; 400 gpm; 100 HP	ea	2	(included in 1.12)		
	Reverse Osmosis Unit	Spiral Wound; 400 gpm	ea	2	(included in 1.12)		
	RO CIP Tank	Poly tank	ea	1	(included in 1.12)		
	RO CIP Pump	End suction centrifugal	ea	1	(included in 1.12)		
	Anti-Scalant Pumps	Solenoid metering pumps	ea	2	(included in 1.12)		
	Chloramine Pumps	Solenoid metering pumps	ea	2	(included in 1.12)		
1.13	Evaporator Feed Tank	200,000 gal tank	ls	1	$400,000	$400,000	
1.14	Evaporator	Vendor Evaporator Package included the following:	ls	1	$1,250,000	$1,250,000	
	Evaporator	Mechanical Vapor Compression Evaporator (1800 gal/hr unit)	ea	1	(included in 1.13)		
	Feed/CIP Pump	End suction centrifugal	ea	1	(included in 1.13)		
	Evaporator Feed Heat Exchanger	Plate & Frame	ea	1	(included in 1.13)		
	Evaporator Main Heat Exchanger	Plate & Frame	ea	1	(included in 1.13)		
	Evaporator Vapor Compressor	Rotary lobe	ea	1	(included in 1.13)		
	Evaporator Recirculation Pump	End suction centrifugal	ea	1	(included in 1.13)		
	Residue Pump	Air diaphragm pump	ea	1	(included in 1.13)		
	CIP Tank	Cone bottom cylindrical	ea	1	(included in 1.13)		
	Distillate Pump	End suction centrifugal	ea	1	(included in 1.13)		
1.15	IX Feed Tank	12,000 gallons	ea	1	$24,000	$24,000	
1.16	IX Feed Pumps	Centrifugal; 340 gpm	ea	2	$13,000	$26,000	
1.17	Ion Exchange (IX) Units	Cation resin packed bed; rubber lined steel pressure vessel 8' diameter	ea	2	$80,000	$160,000	
1.18	Clean Water Storage Tank	10,000 gal FRP Tank	ea	1	$20,000	$20,000	
1.19	Discharge Pumps	Centrifugal; 340 gpm	ea	2	$13,000	$26,000	
1.20	Chemical Feed Systems	Caustic and acid for neutralization; chlorination system	ea	3	$12,000	$36,000	
1.21	Control Panel		ea	1	$100,000	$100,000	
1.22	Instruments (analog)	LIT, pH, DO, Temp, PIT, FIT	ea	30	$2,500	$75,000	
1.23	Instruments (digital switches)	LS, XS, SS, PS	ea	15	$500	$7,500	
1.24	Instruments (control valves)	FCV, MOV	ea	25	$3,500	$87,500	
1.25	Instruments (non I/O)	PI, TI	ea	8	$300	$2,400	
		Total Equipment Procurement Cost					$ 6,738,900
II	**Construction**						
2.0	**Civil/Structural**						
2.01	New Stormwater Drainage System	See Table B-2 (Detailed Cost Estimate for Rehabilitation the North Parking Lot on Neponset Ave. Proposed in Option B)	ls	1	$453,650	$453,650	
2.02	Civil/Structural For Wet Weather Treatment System	See 2.03 through 2.13.	ls	1	(included in 2.03 - 2.16)		
2.03	Excavation	Excavation items - excavate and dispose of excess material	cy	815	$28	$22,820	
2.04	Backfill & compaction	F&I structural fill under new foundations, and compact	cy	300	$38	$11,400	
2.05	Gudgeon Brook Pump Station	10' diameter, 20' deep, precast structure	ls	1	$8,000.00	$8,000	
2.06	Robinson Brook Pump Station	6' diameter, 8' deep, precast structure	ls	1	$5,000.00	$5,000	
2.07	Buried 2" HDPE Piping - Double Wall	trench excavation, pipe installation, backfill and compaction	lf	5,500	$14.24	$78,320	
2.08	Buried 8" HDPE Piping - Double Wall	trench excavation, pipe installation, backfill and compaction	lf	600	$40.84	$24,504	
2.09	Underground Piping	allowance for minor modifications to existing underground utilities	ls	1	$10,000	$10,000	
2.10	Grading	finish grading	sf	3,000	$2	$6,000	
2.11	Reinforced Concrete (in place) (equipment pads)	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	30	$1,500	$45,000	
2.12	Reinforced Concrete (in place) (tanks, slabs & walls) for all concrete tanks and building slab	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	850	$750	$637,500	
2.13	Structural Steel	Access platforms, pipe racks	ton	5	$3,200	$16,000	
2.14	Miscellaneous Metals	ladders, railings, brackets etc	ls	1	$10,000	$10,000	
2.15	Pre-Engineered Bldg	Pre-engineered building	sf	2,500	$85	$212,500	
2.16	Clean-up	Clean-up the site and repair any damage	ls	1	$10,000	$10,000	
		Civil/Structural Sub Total					$ 1,550,694
3.0	**Mechanical**						
3.01	1.5" CS sch 40 threaded pipe	F&I piping, with flngs, hangers & fittings	lf	200	$26	$5,200	
3.02	8" CS sch 40 threaded pipe	F&I piping, with flngs, hangers & fittings	lf	550	$122	$67,100	
3.03	1" PVC sch 80 threaded pipe	F&I piping, with flngs, hangers & fittings	lf	150	$14	$2,100	
3.04	1.5" CS Valve	Valves with CS bodies; flanged connections; and supports	ea	15	$290	$4,350	
3.05	8" CS Valve	Valves with CS bodies; flanged connections; and supports	ea	50	$2,500	$125,000	
3.06	1" PVC Valve	Valves with PVC bodies; SW connections; and supports	ea	9	$50	$450	
3.07	Bldg HVAC	allowance for building HVAC	sf	2,500	$20	$50,000	
3.08	Bldg Plumbing	Allowance for building plumbing (lab)	ls	1	$10,000	$10,000	
3.09	Fire protection	Allowance for sprinkler system	ls	1	$15,000	$15,000	
3.10	Equipment installation	Unload, rigging and setting equipment 15% of equipment cost	%	15%	$6,738,900	$1,010,835	
		Mechanical Sub Total					$ 1,290,035
4.0	**Electrical / I&C**						
4.01	Utility Coordination		ea	1	$50,000	$50,000	
4.02	Intellicenter MotorControl Center	Electrical Distribution	ea	1	$215,000	$215,000	
4.03	Emergency Generator	with integral diesel belly tank	ea	1	$173,000	$173,000	
4.04	Motor Control Center (MCC)	Motor starters in MCC	ea	28	$2,500	$70,000	
4.05	VFD's		ea	14	$3,000	$42,000	
4.06	Interior Facility Lighting	Lighting panel and distribution in building	ea	1	$25,000	$25,000	
4.07	Yard Lighting	Lighting around new equip and structures	ea	1	$15,000	$15,000	
4.08	Instrumentation Installation	Install, wiring, calibrate and loop check	ea	70	$2,500	$175,000	
4.09	Grounding / Lightning Protection	New grounding grid and lightning protection	ea	1	$15,500	$15,500	
4.10	Building Power	Rcpts, devices, equipment connections, etc.	ea	1	$30,000	$30,000	

Table B-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION B: WET WEATHER TREATMENT SYSTEM

		Description	Units	Quantity	Unit Cost	Total Cost	
4.11	Control Systems	See 4.12 - 4.14	ea	1	(included in 4.12 - 4.14)		
4 12	Main Control Panel		ea	1	$95,000	$95,000	
4.13	Control Systems Integration		ea	1	$125,000	$125,000	
4 14	SCADA System Hardware/Software		ea	1	$70,000	$70,000	
4.15	Miscellaneous	Fire alarm system, security alarm system, communications, etc	ea	1	$15,000	$15,000	
		Electrical / I&C Sub Total					$ 1,115,500
5.0	**Indirects and O&P**						
5 01	Total Direct Construction Cost						3,956,229
5.02	Indirect Project Costs	Craft supervision and misc matl - inc above	%	10%	$3,956,229	$395,623	
5.03	Taxes	Not included in estimate	%	0%	$10,695,129	$0	
5.04	Contractors Overhead		%	10%	$3,956,229	$395,623	
5 05	Contractors Profit		%	7%	$3,956,229	$276,936	
		Indirects and O&P Sub Total					$ 1,068,182
		Total Construction Cost					$ 6,024,411
III	**Services**						
6.0	**CM /Eng/ Procurement**						
6.01	Pilot Study	Required prior to beginning detailed design phase	ls	1	$90,000	$90,000	
6.02	Detailed Eng/ Design	Prepare Construction Design Package	%	7%	$11,763,311	$823,432	
6.03	H.O. Services during Const	Engineering Services During Construction	%	3%	$11,763,311	$352,899	
6.04	Construction Management	Full Time CM	%	7%	$11,763,311	$823,432	
6.05	Permitting	Allowance for bldg. and environmental permits	%	2.5%	$11,763,311	$294,083	
		Total Services Cost					$ 2,383,846
		TOTAL PROJECT COST					$ 14,147,156
		Recommended Contingency	%	20%	$14,147,156		2,829,431
		Request for Authorization Budget					16,976,588

Notes
1. This is a conceptual cost estimate based on preliminary data, budgetary equipment quotes and allowances for major subsystems.
2. Estimate does not include sales or other taxes (see item 5 03)

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781.251.0200 | www.woodardcurran.com

CLIENT	Invensys Systems, Inc.		
PROJECT	223812		
DESIGNED BY	Hernan Peralta	DATE	8/22/2011
CHECKED BY	Jeff Stearns	DATE	8/22/2011
PROJECT NO.	223812.00	SHEET NO.	1 OF 1

TABLE B-2
Detailed Cost Estimate for Rehabilitation the North Parking Lot on Neponset Ave. Proposed in Option B

ITEM		UNIT	QUANTITY	UNIT COST	EXTENDED COST
Repaving Parking Lot					
1	Pavement Excavation	SY	14,000.0	$10.00	$140,000.00
2	Pavement	TON	2,070.0	$70.00	$144,900.00
3	Base Course	CY	4,230.0	$25.00	$105,750.00
4	Geotextile Fabric	SY	12,600.0	$5.00	$63,000.00
Total					**$453,650.00**

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Table B-3
INVENSYS SYSTEMS, INC.
ANNUAL O&M COST ESTIMATE
OPTION B: WET WEATHER TREATMENT SYSTEM

Item No.	Category	Description	Units	Annual Quantity	Unit Cost	Annual Cost	Comments
1	Labor	1 full time operator (40hr/wk) + Tech. Support + Overtime + On-call pager pay, etc.	ls	1	$138,600	$138,600	Operator wage = $45/hr
2	Power	Connected Load x % usage	kwh	1,700,268	$0.17	$289,045	
3	Other Utilities	Inst air, plant water, etc.	ls	1	$10,000	$10,000	
4	Chemicals	Acid, Caustic, and other	ls	1	$80,000	$80,000	
5	Repair and Maintenance	Maintenance matl & spare parts	ls	1	$90,000	$90,000	
6	Sludge Disposal		ton	0	$200	$0	Assumes sludge flows to onsite industrial WWTP and is discharged to sewer
7	Evaporator Brine Disposal	2 gpm (2,880 gpd) brine produced	gal	0	$0.06	$0	Assumes brine flows to onsite industrial WWTP and is discharged to sewer
8	Ion Exchange Resin Change Out	Occurs once every two weeks (26 times annually). Cost is $10,000 per change out.	ea	26	$10,000.00	$260,000	Assumes resin is regenerated offsite
9	Laboratory Costs	Analytical costs and lab supplies	ls	0	$0	$0	Laboratory costs have been included in the Annual Cost of Compliance Estimate
10	Heating System	Operate building heating system	ls	1	$4,500	$4,500	
11	Inspection of Stormwater Drainage System	Occurs once annually	ls	1	$5,000	$5,000	
12	Drainage Line Cleanout	Occurs once annually	ls	1	$10,000	$10,000	
13	Catch Basin Cleanout	Cost is $80 per catch basin. Occurs once annually	ea	60	$80	$4,800	
				Total Annual O&M Cost		$891,945	

Table C-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION C: SLIPLINING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
I	**Equipment Procurement**						
1.0	**New Process Equipment for Treatment Plant**						
1.01	Equalization Tanks	60,000 gallons	ea	1	$120,000	$120,000	
1.02	Equalization Pumps	Centrifugal, 10 gpm	ea	2	$4,000	$8,000	
1.03	Static Mixer	For pH adjustment	ea	1	$3,500	$3,500	
1.04	Influent Screen	Duplex Basket 316 SS	ea	1	$25,000	$25,000	
1.05	Ultrafiltration (UF) Feed Tank	2,000 gallons	ea	1	$5,500	$5,500	
1.06	UF System	Vendor UF System Package includes the following:	ls	1	$40,000	$40,000	
	UF Feed Pumps	Centrifugal, 10 gpm	ea	2	(included in 1.06)		
	UF Feed Unit	10 gpm; outside/in pressure UF	ea	1	(included in 1.06)		
1.07	Static Mixer	Prior to RO Feed tank	ea	1	$3,500	$3,500	
1.08	RO Feed Tank	1,000 gal FRP Tank	ea	1	$3,500	$3,500	
1.09	RO System	Vendor RO System Package includes the following:	ls	1	$95,000	$95,000	
	RO Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	RO High Pressure Pumps	Multi-stage centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	Reverse Osmosis Unit	Spiral Wound; 10 gpm	ea	2	(included in 1.09)		
	RO CIP Tank	Poly tank	ea	1	(included in 1.09)		
	RO CIP Pump	End suction centrifugal	ea	1	(included in 1.09)		
	Anti-Scalant Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
	Chloramine Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
1.10	RO Reject Storage Tank	3,000 gal FRP Tank	ea	1	$7,000	$7,000	
1.11	RO Reject Transfer Pumps	Centrifugal; 20 gpm	ea	2	$6,000	$12,000	
1.12	IX Feed Tank	1,000 gal FRP Tank	ea	1	$10,000	$10,000	
1.13	IX Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1.14	Ion Exchange (IX) Units	Cation resin packed bed; rubber lined steel pressure vessel 2' diameter	ea	2	$10,000	$20,000	
1.15	Clean Water Storage Tank	5,000 gal FRP Tank	ea	1	$10,000	$10,000	
1.16	Discharge Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1.17	Chemical Feed Systems	Caustic and acid for neutralization; chlorination system	ea	3	$12,000	$36,000	
1.18	Control Panel		ea	1	$50,000	$50,000	
1.19	Instruments (analog)	LIT, pH, DO, Temp, PIT, FIT	ea	27	$2,500	$67,500	
1.20	Instruments (digital switches)	LS, XS, SS, PS	ea	15	$500	$7,500	
1.21	Instruments (control valves)	FCV, MOV	ea	25	$3,500	$87,500	
1.22	Instruments (non I/O)	PI, TI	ea	8	$300	$2,400	
		Total Equipment Procurement Cost					$ 629,900
II	**Construction**						
2.0	Civil/Structural						
2.01	Sliplining of Existing Stormwater Drainage System	See Table C-2 (Detailed Cost Estimate for Sliplining of Existing Stormwater Drainage System Proposed in Option C)	ls	1	$1,938,500	$1,938,500	
2.02	Civil/Structural For Dry Weather Treatment System	See 2.03 through 2.13.	ls	1	(included in 2.03 - 2.16)		
2.03	Excavation	excavate and dispose of excess material	cy	300	$28	$8,400	
2.04	Backfill & compaction	F&I structural fill under new foundations, and compact	cy	75	$38	$2,850	
2.05	Buried 1" HDPE Piping, Double Wall	trench excavation, pipe installation, backfill and compaction	lf	500	$12.39	$6,195	
2.06	Underground Piping	allowance for minor modifications to existing underground utilities	ls	1	$10,000	$10,000	
2.07	Grading	finish grading	sf	2,000	$2	$4,000	
2.08	Paving		sf	500	$6	$3,000	
2.09	Reinforced Concrete (in place) (equipment pads)	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	15	$1,500	$22,500	
2.10	Reinforced Concrete (in place) (tanks, slabs & walls) for all concrete tanks and building slab	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	170	$750	$127,500	
2.11	Structural Steel	Access platforms, pipe racks	ton	4	$3,200	$12,800	
2.12	Miscellaneous Metals	ladders, railings, brackets etc.	ls	4	$5,000	$20,000	
2.13	Pre-Engineered Bldg	Pre-engineered building	sf	1,000	$85	$85,000	
2.14	Clean-up	Clean-up the site and repair any damage	ls	1	$10,000	$10,000	
		Civil/Structural Sub Total					$ 2,250,745
3.0	Mechanical						
3.01	0.5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,560	$23	$35,100	
3.02	1.0" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	2,400	$21	$50,400	
3.03	1.5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,240	$26	$32,240	
3.04	1" PVC sch 80 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	150	$14	$2,100	
3.05	0.5" CS Valve	Valves with CS bodies; flanged connections	ea	10	$165	$1,650	
3.06	1" CS Valve	Valves with CS bodies; flanged connections	ea	2	$200	$400	
3.07	1.5" CS Valve	Valves with CS bodies; flanged connections	ea	42	$290	$12,180	
3.08	1" PVC Valve	Valves with PVC bodies; SW connections	ea	9	$50	$450	
3.09	Bldg HVAC	allowance for building HVAC	sf	1,000	$20	$20,000	
3.10	Bldg Plumbing	Allowance for building plumbing (lab)	ls	1	$10,000	$10,000	
3.11	Fire protection	Allowance for sprinkler system	ls	1	$10,000	$10,000	
3.12	Equipment installation	Unload, rigging and setting equipment 15% of equipment cost	%	15%	$629,900	$94,485	
		Mechanical Sub Total					$ 269,005
4.0	Electrical / I&C						
4.01	Electrical / I&C Allowance	20% of Equipment Procurement Cost	ls	20%	$629,900	$125,980	
		Electrical / I&C Sub Total					$ 125,980
5.0	Indirects and O&P						
5.01	Total Direct Construction Cost						2,645,730
5.02	Indirect Project Costs	Craft supervision and misc matl - inc above	%	10%	$2,645,730	$264,573	
5.03	Taxes	Not included in estimate	%	0%	$3,275,630	$0	
5.04	Contractors Overhead		%	10%	$2,645,730	$264,573	
5.05	Contractors Profit		%	7%	$2,645,730	$185,201	
		Indirects and O&P Sub Total					$ 714,347
		Total Construction Cost					$ 3,360,077
III	**Services**						
6.0	CM /Eng/ Procurement						
6.01	Hydrological Study	Required to identify groundwater flow patterns	ls	1	$150,000	$150,000	
6.02	Pilot Study	Required prior to beginning detailed design phase	ls	1	$90,000	$90,000	
6.03	Survey/Geotechnical Pre-engineering	Required prior to detailed design of the drainage system	ls	1	$20,000	$20,000	
6.04	Detailed Eng/ Design	Prepare Construction Design Package	%	7%	$3,989,977	$279,298	
6.05	H.O. Services during Const	Engineering Services During Construction	%	3%	$3,989,977	$119,699	
6.06	Construction Management	Full Time CM	%	7%	$3,989,977	$279,298	

Table C-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION C: SLIPLINING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
6.07	Permitting	Allowance for bldg. and environmental permits	%	2.5%	$3,989,977	$99,749	
		Total Services Cost					$ 1,038,046
		TOTAL PROJECT COST					$ 5,028,023
		Recommended Contingency	%	20%	$5,028,023		1,005,605
		Request for Authorization Budget					6,033,627

Notes
1 This is a conceptual cost estimate based on preliminary data, budgetary equipment quotes and allowances for major subsystems.
2. Estimate does not include sales or other taxes (see item 5.03)
3. Estimate is based on the maximum sump flow of 10 gpm.
4. Estimate assumes the RO reject is treated by the site's existing industrial wastewater treatment plant prior to being discharged to the sewer.

WOODARD & CURRAN
COMMITMENT & INTEGRITY DRIVE RESULTS
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Dedham, Massachusetts 02026
781 251.0200 | www.woodardcurran.com

CLIENT	Invensys Systems, Inc.				
PROJECT	223812				
DESIGNED BY	Hernan Peralta			DATE	8/22/2011
CHECKED BY	Jeff Stearns			DATE	8/22/2011
PROJECT NO.	223812.00	SHEET NO.	1	OF	1

TABLE C-2
Detailed Cost Estimate for Sliplining of Existing Stormwater Drainage System Proposed in Option C

	ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
Sliplining					
1	Mobilization/Demobilization	LS	1.0	$10,000.00	$10,000.00
2	12" (25% of total pipe length)	LF	2,000.0	$50.00	$100,000.00
3	24" (50% of total pipe length)	LF	4,000.0	$105.00	$420,000.00
4	30" (25% of total pipe length)	LF	2,000.0	$160.00	$320,000.00
5	Replace Roof Drain Tie-In	EA	7.0	$25,000.00	$175,000.00
6	Cleaning and Video Inspection	LF	8,000.0	$5.00	$40,000.00
7	Catch Basin	EA	60.0	$2,500.00	$150,000.00
8	Catch Basin - Frame & Grate	EA	60.0	$600.00	$36,000.00
9	Manhole	EA	20.0	$7,000.00	$140,000.00
10	Manhole - Frame & Cover	EA	20.0	$600.00	$12,000.00
11	Pavement Excavation	SY	14,000.0	$10.00	$140,000.00
12	Pavement	TON	2,300.0	$70.00	$161,000.00
13	Base Course	CY	4,700.0	$25.00	$117,500.00
14	Geotextile Fabric	SY	14,000.0	$5.00	$70,000.00
15	Allowance for Pumping during Inspection	LS	1.0	$20,000.00	$20,000.00
16	Flowable Fill	CY	100.0	$110.00	$11,000.00
17	Remove & Dispose Drain Structures	EA	80.0	$200.00	$16,000.00
Total					**$1,938,500.00**

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Table C-3
INVENSYS SYSTEMS, INC.
ANNUAL O&M COST ESTIMATE
OPTION C: SLIPLINING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT;

Item No.	Category	Description	Units	Annual Quantity	Unit Cost	Annual Cost	Comments
1	Labor	1 half time operator (20hr/wk) + Tech. Support + Overtime + On-call pager pay, etc.	ls	1	$91,800	$91,800	Operator wage = $45/hr
2	Power	Connected Load x % usage	kwh	136,803	$0.17	$23,257	
3	Other Utilities	Inst air, plant water, etc.	ls	1	$10,000	$10,000	
4	Chemicals	Acid, Caustic, and other	ls	1	$15,000	$15,000	
5	Repair and Maintenance	Maintenance matl & spare parts	ls	1	$40,000	$40,000	
6	Sludge Disposal		ton	0	$200	$0	Assumes sludge flows to onsite industrial WWTP and is discharged to sewer
7	RO Reject	2 gpm (2,880 gpd) RO reject produced	gal	0	$0.06	$0	Assumes RO reject flows to onsite industrial WWTP and is discharged to sewer
8	Ion Exchange Resin Change Out	Occurs once every two weeks (26 times annually). Cost is $3,000 per change out.	ea	26	$3,000.00	$78,000	Assumes resin is regenerated offsite
9	Laboratory Costs	Analytical costs and lab supplies	ls	0	$0	$0	Laboratory costs have been included in the Annual Cost of Compliance Estimate
10	Heating System	Operate building heating system	ls	1	$3,000	$3,000	
11	Inspection of Stormwater Drainage System	Occurs once annually	ls	1	$5,000	$5,000	
12	Drainage Line Cleanout	Occurs once annually	ls	1	$10,000	$10,000	
13	Catch Basin Cleanout	Cost is $80 per catch basin. Occurs once annually	ea	60	$80	$4,800	
				Total Annual O&M Cost		$280,857	

Table D-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION D: PIPE BURSTING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
I	**Equipment Procurement**						
1.0	**New Process Equipment for Treatment Plant**						
1.01	Equalization Tanks	60,000 gallons	ea	1	$120,000	$120,000	
1.02	Equalization Pumps	Centrifugal; 10 gpm	ea	2	$4,000	$8,000	
1.03	Static Mixer	For pH adjustment	ea	1	$3,500	$3,500	
1 04	Influent Screen	Duplex Basket 316 SS	ea	1	$25,000	$25,000	
1.05	Ultrafiltration (UF) Feed Tank	2,000 gallons	ea	1	$5,500	$5,500	
1 06	UF System	Vendor UF System Package includes the following:	ls	1	$40,000	$40,000	
	UF Feed Pumps	Centrifugal; 10 gpm	ea	2	(included in 1.06)		
	UF Feed Unit	10 gpm, outside/in pressure UF	ea	1	(included in 1.06)		
1 07	Static Mixer	Prior to RO Feed tank	ea	1	$3,500	$3,500	
1 08	RO Feed Tank	1,000 gal FRP Tank	ea	1	$3,500	$3,500	
1.09	RO System	Vendor RO System Package includes the following:	ls	1	$95,000	$95,000	
	RO Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	RO High Pressure Pumps	Multi-stage centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	Reverse Osmosis Unit	Spiral Wound; 10 gpm	ea	2	(included in 1.09)		
	RO CIP Tank	Poly tank	ea	1	(included in 1.09)		
	RO CIP Pump	End suction centrifugal	ea	1	(included in 1 09)		
	Anti-Scalant Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
	Chloramine Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
1.10	RO Reject Storage Tank	3,000 gal FRP Tank	ea	1	$7,000	$7,000	
1.11	RO Reject Transfer Pumps	Centrifugal; 20 gpm	ea	2	$6,000	$12,000	
1.12	IX Feed Tank	1,000 gal FRP Tank	ea	1	$10,000	$10,000	
1.13	IX Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1.14	Ion Exchange (IX) Units	Cation resin packed bed; rubber lined steel pressure vessel 2' diameter	ea	2	$10,000	$20,000	
1.15	Clean Water Storage Tank	5,000 gal FRP Tank	ea	1	$10,000	$10,000	
1.16	Discharge Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1.17	Chemical Feed Systems	Caustic and acid for neutralization, chlorination system	ea	3	$12,000	$36,000	
1.18	Control Panel		ea	1	$50,000	$50,000	
1.19	Instruments (analog)	LIT, pH, DO, Temp, PIT, FIT	ea	27	$2,500	$67,500	
1 20	Instruments (digital switches)	LS, XS, SS, PS	ea	15	$500	$7,500	
1.21	Instruments (control valves)	FCV, MOV	ea	25	$3,500	$87,500	
1 22	Instruments (non I/O)	PI, TI	ea	8	$300	$2,400	
		Total Equipment Procurement Cost					$ 629,900
II	**Construction**						
2.0	**Civil/Structural**						
2.01	Pipe Bursting of Existing Stormwater Drainage System	See Table D-2 (Detailed Cost Estimate for Pipe Bursting of Existing Stormwater Drainage System Proposed in Option D)	ls	1	$2,947,500	$2,947,500	
2.02	Civil/Structural For Dry Weather Treatment System	See 2.03 through 2.13.	ls	1	(included in 2 03 - 2.16)		
2 03	Excavation	excavate and dispose of excess material	cy	300	$28	$8,400	
2.04	Backfill & compaction	F&I structural fill under new foundations, and compact	cy	75	$38	$2,850	
2.05	Buried 1" HDPE Piping; Double	trench excavation, pipe installation, backfill and compaction	lf	500	$12.39	$6,195	
2 06	Underground Piping	allowance for minor modifications to existing underground utilities	ls	1	$10,000	$10,000	
2 07	Grading	finish grading	sf	2,000	$2	$4,000	
2 08	Paving		sf	500	$6	$3,000	
2.09	Reinforced Concrete (in place) (equipment pads)	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	15	$1,500	$22,500	
2.10	Reinforced Concrete (in place) (tanks, slabs & walls) for all concrete tanks and building slab	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	170	$750	$127,500	
2.11	Structural Steel	Access platforms, pipe racks	ton	4	$3,200	$12,800	
2.12	Miscellaneous Metals	ladders, railings, brackets etc.	ls	4	$5,000	$20,000	
2 13	Pre-Engineered Bldg	Pre-engineered building	sf	1,000	$85	$85,000	
2 14	Clean-up	Clean-up the site and repair any damage	ls	1	$10,000	$10,000	
		Civil/Structural Sub Total					$ 3,259,745
3.0	**Mechanical**						
3.01	0 5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,560	$23	$35,100	
3.02	1 0" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	2,400	$21	$50,400	
3.03	1 5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,240	$26	$32,240	
3.04	1" PVC sch 80 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	150	$14	$2,100	
3.05	0.5" CS Valve	Valves with CS bodies; flanged connections	ea	10	$165	$1,650	
3 06	1" CS Valve	Valves with CS bodies; flanged connections	ea	2	$200	$400	
3 07	1 5" CS Valve	Valves with CS bodies; flanged connections	ea	42	$290	$12,180	
3 08	1" PVC Valve	Valves with PVC bodies; SW connections	ea	9	$50	$450	
3.09	Bldg HVAC	allowance for building HVAC	sf	1,000	$20	$20,000	
3.10	Bldg Plumbing	Allowance for building plumbing (lab)	ls	1	$10,000	$10,000	
3 11	Fire protection	Allowance for sprinkler system	ls	1	$10,000	$10,000	
3.12	Equipment installation	Unload, rigging and setting equipment 15% of equipment cost	%	15%	$629,900	$94,485	
		Mechanical Sub Total					$ 269,005
4.0	**Electrical / I&C**						
4.01	Electrical / I&C Allowance	20% of Equipment Procurement Cost	ls	20%	$629,900	$125,980	
		Electrical / I&C Sub Total					$ 125,980
5.0	**Indirects and O&P**						
5 01	Total Direct Construction Cost						3,654,730
5.02	Indirect Project Costs	Craft supervision and misc matl - inc above	%	10%	$3,654,730	$365,473	
5.03	Taxes	Not included in estimate	%	0%	$4,284,630	$0	
5.04	Contractors Overhead		%	10%	$3,654,730	$365,473	
5.05	Contractors Profit		%	7%	$3,654,730	$255,831	
		Indirects and O&P Sub Total					$ 986,777
		Total Construction Cost					$ 4,641,507
III	**Services**						
6.0	**CM /Eng/ Procurement**						
6.01	Hydrological Study	Required to identify groundwater flow patterns	ls	1	$150,000	$150,000	
6.02	Pilot Study	Required prior to beginning detailed design phase	ls	1	$90,000	$90,000	
6.03	Survey/Geotechnical Pre-engineering	Required prior to detailed design of the drainage system	ls	1	$20,000	$20,000	
6.04	Detailed Eng/ Design	Prepare Construction Design Package	%	7%	$5,271,407	$368,998	
6.05	H.O Services during Const	Engineering Services During Construction	%	3%	$5,271,407	$158,142	
6.06	Construction Management	Full Time CM	%	7%	$5,271,407	$368,998	

Table D-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION D: PIPE BURSTING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
6.07	Permitting	Allowance for bldg. and environmental permits	%	2.5%	$5,271,407	$131,785	
		Total Services Cost					$ 1,287,924
		TOTAL PROJECT COST					$ 6,559,331
		Recommended Contingency	%	20%	$6,559,331		1,311,866
		Request for Authorization Budget					7,871,198

Notes
1. This is a conceptual cost estimate based on preliminary data, budgetary equipment quotes and allowances for major subsystems.
2. Estimate does not include sales or other taxes (see item 5.03)
3. Estimate is based on the maximum sump flow of 10 gpm.
4. Estimate assumes the RO reject is treated by the site's existing industrial wastewater treatment plant prior to being discharged to the sewer.

WOODARD & CURRAN
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Dedham, Massachusetts 02026
781 251 0200 | www.woodardcurran.com

CLIENT	Invensys Systems, Inc.				
PROJECT	223812				
DESIGNED BY	Hernan Peralta		DATE	8/22/2011	
CHECKED BY	Jeff Stearns		DATE	8/22/2011	
PROJECT NO.	223812.00	SHEET NO.	1	OF	1

TABLE D-2
Detailed Cost Estimate for Pipe Bursting of Existing Stormwater Drainage System Proposed in Option D

	ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
Pipe Bursting					
1	Mobilization/Demobilization	LS	1.0	$10,000.00	$10,000.00
2	12" (25% of total pipe length)	LF	2,000.0	$100.00	$200,000.00
3	24" (50% of total pipe length)	LF	4,000.0	$250.00	$1,000,000.00
4	30" (25% of total pipe length)	LF	2,000.0	$350.00	$700,000.00
5	Replace Roof Drain Tie-In	EA	7.0	$25,000.00	$175,000.00
6	Catch Basin	EA	60.0	$2,500.00	$150,000.00
7	Catch Basin - Frame & Grate	EA	60.0	$600.00	$36,000.00
8	Manhole	EA	20.0	$7,000.00	$140,000.00
9	Manhole - Frame & Cover	EA	20.0	$600.00	$12,000.00
10	Pavement Excavation	SY	14,000.0	$10.00	$140,000.00
11	Pavement	TON	2,300.0	$70.00	$161,000.00
12	Base Course	CY	4,700.0	$25.00	$117,500.00
13	Geotextile Fabric	SY	14,000.0	$5.00	$70,000.00
14	Allowance for Pumping	LS	1.0	$20,000.00	$20,000.00
15	Remove & Dispose Drain Structures	EA	80.0	$200.00	$16,000.00
Total					**$2,947,500.00**

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Table D-3
INVENSYS SYSTEMS, INC.
ANNUAL O&M COST ESTIMATE
OPTION D: PIPE BURSTING EXISTING DRAINAGE SYSTEMS & 10 GPM DRY WEATHER TREATMENT; AND

Item No.	Category	Description	Units	Annual Quantity	Unit Cost	Annual Cost	Comments
1	Labor	1 half time operator (20hr/wk) + Tech. Support + Overtime + On-call pager pay, etc.	ls	1	$91,800	$91,800	Operator wage = $45/hr
2	Power	Connected Load x % usage	kwh	136,803	$0.17	$23,257	
3	Other Utilities	Inst air, plant water, etc.	ls	1	$10,000	$10,000	
4	Chemicals	Acid, Caustic, and other	ls	1	$15,000	$15,000	
5	Repair and Maintenance	Maintenance matl & spare parts	ls	1	$40,000	$40,000	
6	Sludge Disposal		ton	0	$200	$0	Assumes sludge flows to onsite industrial WWTP and is discharged to sewer
7	RO Reject	2 gpm (2,880 gpd) RO reject produced	gal	0	$0 06	$0	Assumes RO reject flows to onsite industrial WWTP and is discharged to sewer
8	Ion Exchange Resin Change Out	Occurs once every two weeks (26 times annually). Cost is $3,000 per change out.	ea	26	$3,000 00	$78,000	Assumes resin is regenerated offsite
9	Laboratory Costs	Analytical costs and lab supplies	ls	0	$0	$0	Laboratory costs have been included in the Annual Cost of Compliance Estimate
10	Heating System	Operate building heating system	ls	1	$3,000	$3,000	
11	Inspection of Stormwater Drainage System	Occurs once annually	ls	1	$5,000	$5,000	
12	Drainage Line Cleanout	Occurs once annually	ls	1	$10,000	$10,000	
13	Catch Basin Cleanout	Cost is $80 per catch basin. Occurs once annually	ea	60	$80	$4,800	
				Total Annual O&M Cost		$280,857	

ATTACHMENT E

Table E-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION E: NEW STORMWATER DRAINAGE SYSTEM;
CAPPING/FILLING OF EXISTING DRAINAGE SYSTEM & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
I	**Equipment Procurement**						
1.0	**New Process Equipment for Treatment Plant**						
1.01	Equalization Tanks	60,000 gallons	ea	1	$120,000	$120,000	
1.02	Equalization Pumps	Centrifugal; 10 gpm	ea	2	$4,000	$8,000	
1.03	Static Mixer	For pH adjustment	ea	1	$3,500	$3,500	
1.04	Influent Screen	Duplex Basket 316 SS	ea	1	$25,000	$25,000	
1.05	Ultrafiltration (UF) Feed Tank	2,000 gallons	ea	1	$5,500	$5,500	
1.06	UF System	Vendor UF System Package includes the following:	ls	1	$40,000	$40,000	
	UF Feed Pumps	Centrifugal; 10 gpm	ea	2	(included in 1.06)		
	UF Feed Unit	10 gpm, outside/in pressure UF	ea	1	(included in 1.06)		
1.07	Static Mixer	Prior to RO Feed tank	ea	1	$3,500	$3,500	
1.08	RO Feed Tank	1,000 gal FRP Tank	ea	1	$3,500	$3,500	
1.09	RO System	Vendor RO System Package Includes the following:	ls	1	$95,000	$95,000	
	RO Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	RO High Pressure Pumps	Multi-stage centrifugal; 10 gpm with VFD	ea	2	(included in 1.09)		
	Reverse Osmosis Unit	Spiral Wound; 10 gpm	ea	2	(included in 1.09)		
	RO CIP Tank	Poly tank	ea	1	(included in 1.09)		
	RO CIP Pump	End suction centrifugal	ea	1	(included in 1.09)		
	Anti-Scalant Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
	Chloramine Pumps	Solenoid metering pumps	ea	2	(included in 1.09)		
1.10	RO Reject Storage Tank	3,000 gal FRP Tank	ea	1	$7,000	$7,000	
1.11	RO Reject Transfer Pumps	Centrifugal; 20 gpm	ea	2	$6,000	$12,000	
1.12	IX Feed Tank	1,000 gal FRP Tank	ea	1	$10,000	$10,000	
1.13	IX Feed Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1 14	Ion Exchange (IX) Units	Cation resin packed bed, rubber lined steel pressure vessel 2' diameter	ea	2	$10,000	$20,000	
1.15	Clean Water Storage Tank	5,000 gal FRP Tank	ea	1	$10,000	$10,000	
1 16	Discharge Pumps	Centrifugal; 10 gpm with VFD	ea	2	$4,000	$8,000	
1.17	Chemical Feed Systems	Caustic and acid for neutralization; chlorination system	ea	3	$12,000	$36,000	
1 18	Control Panel		ea	1	$50,000	$50,000	
1.19	Instruments (analog)	LIT, pH, DO, Temp, PIT, FIT	ea	27	$2,500	$67,500	
1.20	Instruments (digital switches)	LS, XS, SS, PS	ea	15	$500	$7,500	
1.21	Instruments (control valves)	FCV, MOV	ea	25	$3,500	$87,500	
1 22	Instruments (non I/O)	PI, TI	ea	8	$300	$2,400	
		Total Equipment Procurement Cost					$ 629,900
II	**Construction**						
2.0	**Civil/Structural**						
2.01	New Stormwater Drainage System & Capping/Filling of Existing Drainage System	See Table E-2 (Detailed Cost Estimate for New Stormwater Drainage System & Capping/Filling of Existing Drainage System Proposed in Option E)	ls	1	$3,307,800	$3,307,800	
2.02	Civil/Structural For Dry Weather Treatment System	See 2 03 through 2.13.	ls	1	(included in 2.03 - 2 16)		
2.03	Excavation	excavate and dispose of excess material	cy	300	$28	$8,400	
2.04	Backfill & compaction	F&I structural fill under new foundations, and compact	cy	75	$38	$2,850	
2.05	Buried 1" HDPE Piping; Double	trench excavation, pipe installation, backfill and compaction	lf	500	$12.39	$6,195	
2.06	Underground Piping	allowance for minor modifications to existing underground utilities	ls	1	$10,000	$10,000	
2.07	Grading	finish grading	sf	2,000	$2	$4,000	
2 08	Paving		sf	500	$6	$3,000	
2.09	Reinforced Concrete (in place) (equipment pads)	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	15	$1,500	$22,500	
2.10	Reinforced Concrete (in place) (tanks, slabs & walls) for all concrete tanks and building slab	F&I 4,000psi reinforced concrete, including formwork, reinforcement, curing and finishing	cy	170	$750	$127,500	
2.11	Structural Steel	Access platforms, pipe racks	ton	4	$3,200	$12,800	
2.12	Miscellaneous Metals	ladders, railings, brackets etc.	ls	4	$5,000	$20,000	
2 13	Pre-Engineered Bldg	Pre-engineered building	sf	1,000	$85	$85,000	
2.14	Clean-up	Clean-up the site and repair any damage	ls	1	$10,000	$10,000	
		Civil/Structural Sub Total					$ 3,620,045
3.0	**Mechanical**						
3.01	0.5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,560	$23	$35,100	
3.02	1.0" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	2,400	$21	$50,400	
3.03	1.5" CS sch 40 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	1,240	$26	$32,240	
3 04	1" PVC sch 80 threaded pipe	F&I piping , with flngs, hangers & fittings	lf	150	$14	$2,100	
3.05	0.5" CS Valve	Valves with CS bodies; flanged connections	ea	10	$165	$1,650	
3 06	1" CS Valve	Valves with CS bodies; flanged connections	ea	2	$200	$400	
3.07	1.5" CS Valve	Valves with CS bodies; flanged connections	ea	42	$290	$12,180	
3.08	1" PVC Valve	Valves with PVC bodies; SW connections	ea	9	$50	$450	
3.09	Bldg HVAC	allowance for building HVAC	sf	1,000	$20	$20,000	
3.10	Bldg Plumbing	Allowance for building plumbing (lab)	ls	1	$10,000	$10,000	
3.11	Fire protection	Allowance for sprinkler system	ls	1	$10,000	$10,000	
3.12	Equipment installation	Unload, rigging and setting equipment 15% of equipment cost	%	15%	$629,900	$94,485	
		Mechanical Sub Total					$ 269,005
4.0	**Electrical / I&C**						
4.01	Electrical / I&C Allowance	20% of Equipment Procurement Cost	ls	20%	$629,900	$125,980	
		Electrical / I&C Sub Total					$ 125,980
			.				
5.0	**Indirects and O&P**						
5.01	Total Direct Construction Cost						4,015,030
5 02	Indirect Project Costs	Craft supervision and misc matl - inc above	%	10%	$4,015,030	$401,503	
5.03	Taxes	Not included in estimate	%	0%	$4,644,930	$0	
5.04	Contractors Overhead		%	10%	$4,015,030	$401,503	
5 05	Contractors Profit		%	7%	$4,015,030	$281,052	
		Indirects and O&P Sub Total					$ 1,084,058
		Total Construction Cost					$ 5,099,088
III	**Services**						
6.0	**CM /Eng/ Procurement**						
6.01	Hydrological Study	Required to identify groundwater flow patterns	ls	1	$150,000	$150,000	
6.02	Pilot Study	Required prior to beginning detailed design phase	ls	1	$90,000	$90,000	
6.03	Survey/Geotechnical Pre-engineering	Required prior to detailed design of the drainage system	ls	1	$75,000	$75,000	
6.04	Detailed Eng/ Design	Prepare Construction Design Package	%	7%	$5,728,988	$401,029	

Table E-1
INVENSYS SYSTEMS, INC.
PRELIMINARY COST ESTIMATE
OPTION E: NEW STORMWATER DRAINAGE SYSTEM;
CAPPING/FILLING OF EXISTING DRAINAGE SYSTEM & 10 GPM DRY WEATHER TREATMENT

		Description	Units	Quantity	Unit Cost	Total Cost	
6.05	H.O. Services during Const	Engineering Services During Construction	%	3%	$5,728,988	$171,870	
6.06	Construction Management	Full Time CM	%	7%	$5,728,988	$401,029	
6.07	Permitting	Allowance for bldg. and environmental permits	%	2.5%	$5,728,988	$143,225	
		Total Services Cost					$ 1,432,153
		TOTAL PROJECT COST					$ 7,161,141
		Recommended Contingency	%	20%	$7,161,141		1,432,228
		Request for Authorization Budget					8,593,369

Notes
1. This is a conceptual cost estimate based on preliminary data, budgetary equipment quotes and allowances for major subsystems.
2. Estimate does not include sales or other taxes (see item 5.03)
3. Estimate is based on the maximum sump flow of 10 gpm.
4. Estimate assumes the RO reject is treated by the site's existing industrial wastewater treatment plant prior to being discharged to the sewer.

COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN
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Dedham, Massachusetts 02026
781.251.0200 | www.woodardcurran.com

CLIENT	Invensys Systems, Inc.				
PROJECT	223812				
DESIGNED BY	Hernan Peralta		DATE	8/22/2011	
CHECKED BY	Jeff Stearns		DATE	8/22/2011	
PROJECT NO.	223812.00	SHEET NO.	1	OF	1

TABLE E-2
Detailed Cost Estimate for New Stormwater Drainage System & Capping/Filling of Existing Drainage System Proposed in Option E

	ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
Site Preparation					
1	Mobilization/Demobilization	LS	1.0	$15,000.00	$15,000.00
2	Dewatering	LS	1.0	$25,000.00	$25,000.00
3	Site Preparation - Erosion Control	LS	1 0	$10,000.00	$10,000.00
Drainage Structures and Piping					
4	Catch Basin	EA	60.0	$2,500.00	$150,000.00
5	Catch Basin - Frame & Grate	EA	60.0	$600.00	$36,000.00
6	Manhole	EA	26 0	$7,000.00	$182,000.00
7	Manhole - Frame & Cover	EA	26 0	$600.00	$15,600.00
8	Cap pipe	EA	40.0	$200.00	$8,000.00
9	12" HDPE (water tight)	LF	1,200.0	$45.00	$54,000.00
10	24" HDPE (water tight)	LF	4,500.0	$50.00	$225,000.00
11	30" HDPE (water tight)	LF	1,500.0	$70.00	$105,000.00
13	Roof Drain Tie-In	EA	7.0	$25,000.00	$175,000.00
14	Remove & Dispose Catch Basins	EA	45.0	$200.00	$9,000.00
15	Utility Allowance	LS	1.0	$150,000.00	$150,000.00
16	Flowable Fill	CY	3,560.0	$120.00	$427,200.00
Excavation					
17	Trench Excavation	CY	25,000.0	$20.00	$500,000.00
18	Backfill and Compaction	SY	16,000.0	$20.00	$320,000.00
19	Pavement Excavation	SY	14,000.0	$10.00	$140,000.00
Restoration					
20	Pavement	TON	5,000.0	$70.00	$350,000.00
21	Base Course	CY	10,000.0	$25 00	$250,000.00
22	Geotextile Fabric	SY	14,000.0	$5.00	$70,000.00
23	Excess Soil Disposal	CY	18,200.0	$5.00	$91,000 00
Construction Subtotal		-	-	-	**$3,307,800.00**

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Table E-3
INVENSYS SYSTEMS, INC.
ANNUAL O&M COST ESTIMATE
OPTION E: NEW STORMWATER DRAINAGE SYSTEM;
CAPPING/FILLING OF EXISTING DRAINAGE SYSTEM & 10 GPM DRY WEATHER TREATMENT

Item No.	Category	Description	Units	Annual Quantity	Unit Cost	Annual Cost	Comments
1	Labor	1 half time operator (20hr/wk) + Tech. Support + Overtime + On-call pager pay, etc.	ls	1	$91,800	$91,800	Operator wage = $45/hr
2	Power	Connected Load x % usage	kwh	136,803	$0.17	$23,257	
3	Other Utilities	Inst air, plant water, etc.	ls	1	$10,000	$10,000	
4	Chemicals	Acid, Caustic, and other	ls	1	$15,000	$15,000	
5	Repair and Maintenance	Maintenance matl & spare parts	ls	1	$40,000	$40,000	
6	Sludge Disposal		ton	0	$200	$0	Assumes sludge flows to onsite industrial WWTP and is discharged to sewer
7	RO Reject	2 gpm (2,880 gpd) RO reject produced	gal	0	$0.06	$0	Assumes RO reject flows to onsite industrial WWTP and is discharged to sewer
8	Ion Exchange Resin Change Out	Occurs once every two weeks (26 times annually). Cost is $3,000 per change out	ea	26	$3,000.00	$78,000	Assumes resin is regenerated offsite
9	Laboratory Costs	Analytical costs and lab supplies	ls	0	$0	$0	Laboratory costs have been included in the Annual Cost of Compliance Estimate
10	Heating System	Operate building heating system	ls	1	$3,000	$3,000	
11	Inspection of Stormwater Drainage System	Occurs once annually	ls	1	$5,000	$5,000	
12	Drainage Line Cleanout	Occurs once annually	ls	1	$10,000	$10,000	
13	Catch Basin Cleanout	Cost is $80 per catch basin. Occurs once annually	ea	60	$80	$4,800	
				Total Annual O&M Cost		$280,857	

ATTACHMENT 6

invensys.

By Hand Delivery

October 31, 2011

Ann Lowery, Acting Assistant Commissioner
Bureau of Resource Protection
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: NPDES Permit MA0004120
Invensys Systems, Inc., 38 Neponset Avenue, Foxborough, MA
Request for Development of Site Specific Water Quality Criteria

Dear Ms Lowery:

I write on behalf of Invensys Systems, Inc. (i.e. "Invensys") to request that the Massachusetts Department of Environmental Protection (i.e. "MassDEP") develop site-specific water quality criteria (SSWQC) for the receiving waters identified in the above-referenced NPDES permit. Invensys and our consultants are prepared to present to MassDEP a work plan containing a detailed technical approach for this SSWQC determination.

The Invensys facility located on Neponset Avenue in Foxborough is currently subject to a NPDES permit which was issued in 1991. The 1991 Permit is currently undergoing renewal and in August 2001 the U.S. Environmental Protection Agency (i.e. "EPA") released a draft renewal permit (i.e. the "2011 Draft Permit").

Under the 2011 Draft Permit, EPA proposes to require that facility effluent that is discharged to two receiving waters—Neponset Reservoir / Gudgeon Brook (via Outfall 001) and Robinson Brook (via Outfall 002)—meet numeric effluent limitations which are based on national recommended water quality criteria (i.e. "NRWQC). For the reasons stated in our comments on the 2011 Draft Permit (which are being submitted to EPA and MassDEP today under separate cover), Invensys believes that NRWQC are not appropriate for these receiving waters because of site-specific biological and chemical characteristics. Therefore, if the final permit is to impose numeric effluent limits, such limits should be based on SSWQC, not NRWQC.

Invensys Systems, Inc.
33 Commercial Street, B51-2J, Foxboro Massachusetts 02035 USA
Telephone +1 508 549 4949 Facsimile +1 508 549 4653
Paul.Ahearn@invensys.com

We therefore respectfully request that MassDEP develop site-specific water quality criteria for the receiving waters at issue. To that end, we have developed a conceptual approach to the development of SSWQC and would like to schedule a meeting to discuss this approach with you prior to submitting a written work plan.

We look forward to discussing this matter with MassDEP.

Sincerely,

Paul A. Ahearn
Director of Special Projects – Environmental

cc: Seth Jaffe, Esq. - Foley Hoag LLP
Dr. Kim Groff - MassDEP-DWM, Worcester
Steven Perkins - USEPA-OEP, Boston
Stephen Silva - USEPA-OEP, Boston
Ellen Weitzler - USEPA-OEP, Boston
David Pincumbe - USEPA-OEP, Boston

ATTACHMENT 7

Hardness Data for Outfall 001
2006 - 2nd Quarter 2011[1]

Sample Period	Hardness Concentration (mg/l $CaCO_3$)
1st Quarter 06	67
2nd Quarter 06	73
3rd Quarter 06	52.5
4th Quarter 06	69
1st Quarter 07	55
2nd Quarter 07	52.4
3rd Quarter 07	66.3
4th Quarter 07	69.4
1st Quarter 08	56.1
2nd Quarter 08	58.5
3rd Quarter 08	83.2
4th Quarter 08	64.3
1st Quarter 09	72.8
2nd Quarter 09	93
3rd Quarter 09	91
4th Quarter 09	*7.7*
1st Quarter 10	92
2nd Quarter 10	88
3rd Quarter 10	69.8
4th Quarter 10	*11.03*
1st Quarter 11	64.09
2nd Quarter 11	63.43

Average Annual Hardness

Year	2006	2007	2008	2009*	2010*	2011	Last 3 Years*
Average Annual $CaCO_3$ (mg/l)	65.4	60.8	65.5	85.6	83.3	63.8	78

* Outliers removed. (4th Quarter 2009 and 4th Quarter 2010, hardness was observed at 7.7 mg/l and 11 mg/l, respectively. These values represent statistical outliers and are not consistent with results from any other sampling event. Accordingly, these values have been removed from the dataset.)

[1] Data are from quarterly monitoring conducted and reported to EPA as required under the 1991 NPDES Permit.

ATTACHMENT 8

Federal Permit No. MA0004120
State Permit No. 307
State Application No. 517

OCT 14 1974

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

Foxboro Company (Neponset Plant)

is authorized to discharge from a facility located at

38 Neponset Avenue
Foxboro, Massachusetts 02035

to receiving waters named

Neponset Reservoir

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective 30 days after the date of signing.

This permit and the authorization to discharge shall expire at midnight, 5 years from signing date.

Signed this 8th day of October, 1974

Jeffrey G. Miller, Director
Enforcement Division
Environmental Protection Agency

Thomas C. McMahon, Director
Division of Water Pollution Control
Commonwealth of Massachusetts

ATTACHMENT 9

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),

The Foxboro Company
(Neponset Plant)

is authorized to discharge from the facility located at

38 Neponset Avenue
Foxboro, MA

to receiving waters named

Neponset Reservoir

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the date of signature.

This permit and the authorization to discharge expire at midnight, five years from the date of issuance.

This permit supersedes the permit issued on October 23, 1980.

This permit consists of 7 pages in Part I including effluent limitations, monitoring requirements, etc., and 19 pages in Part II including General Conditions and Definitions.

Signed this 20th day of June 1984

Edward K. McSweeney
Director
Water Management Division
Environmental Protection Agency
Region I
Boston, MA

Thomas C. McMahon
Director, Division of Water Pollution Control
Department of Environmental Quality Engineering
Commonwealth of Massachusetts
Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through the expiration date the permittee is authorized to discharge from outfall serial number 001a, treated process wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Avg. Monthly	Max. Daily	Measurement Frequency	Sample Type
Flow, MGD	0.185	0.382	Continous	Total Daily
TSS	20 mg/l	30 mg/l	2/Month	Composite
Oil and Grease		15 mg/l	2/Month	Grab
Cadmium (Total)	0.26 mg/l	0.69 mg/l	2/Month	Composite
Chromium (Total)	1.5 mg/l	2.77 mg/l	2/Month	Composite
Chromium, hexavalent	0.1 mg/l	0.25 mg/l	2/Month	Grab
Copper (Total)	1.5 mg/l	3.0 mg/l	2/Month	Composite
Cyanide (Total)	0.25 mg/l	0.65 mg/l	2/Month	Grab
Cyanide, amenable	0.1 mg/l	0.2 mg/l	2/Month	Grab
Nickel (Total)	1.8 mg/l	3.6 mg/l	2/Month	Composite
Aluminum (Total)	1.5 mg/l	2.0 mg/l	2/Month	Composite
* Total Toxic Organics		2.13 mg/l	1/Quarter	Grab
** Phosphorus			2/Month	Composite

* See page 4 of 7 for Total Toxic Organics definition and monitoring requirements.

** The permittee shall monitor for this parameter for one year after permit issuance. Depending on the monitoring data, either the permit will be modified to include a specific limit for this parameter or the monitoring requirement will be deleted.

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units and shall be monitored continously, report daily range.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: the discharge of the wastewater treatment plant, prior to mixing with the noncontact cooling water.

The permittee shall not augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with the above limitations.

PART I

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through the expiration date the permittee is authorized to discharge from outfall serial number 001b, non-contact cooling water.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Avg. Monthly	Max. Daily	Measurement Frequency	Sample Type
Flow, gallons/day	-	320,000	Estimate	Daily Total
Temperature	-	83°F	2/Quarter	Grab
Oil & Grease	-	15 mg/l	2/Quarter	Grab

The noncontact cooling water shall not be used to dilute the process wastewater

The pH shall not be less than 6.5 standard units nor greater than 8.0 standard units and shall be monitored by a grab sample, once a quarter.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: at the outfall.

The discharge shall be sampled once a quarter during rainfall and once a quarter during dry conditions. One grab sample is required. The sample during rainfall shall be taken wihtin thirty (30) minutes of the beginning of the rainfall.

Total Toxic Organics

The term "Total Toxic Organics" (TTO) is the summation of all quantifiable values greater than 0.01 milligrams per liter (mg/l) for the following toxic organics:

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
2-chloroethyl vinyl ether (mixed)
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)
Benzo(a)pyrene (3,4-benzopyrene)
3,4-Benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene)
Indeno(1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane (1,3-dichloropropene)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene chloride (dichloromethane)
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromomethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
N-nitrosodiphenylamine
Trichloroethylene
Vinyl chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture and metabolites)
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
(BHC-hexachlorocyclohexane)
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
(PCB-polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)
Toxaphene
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

In monitoring for Total Toxic Organics, the permittee need analyze for only those pollutants which would reasonably be expected to be present. The permittee may make the following certification on its monitoring reports in lieu of conducting an analysis: "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitations for total toxic organics (TTO). I certify that, to the best of my knowedge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the permitting authority.

In requesting the certification alternative the permittee shall submit a solvent management plan that specifies, to the satisfaction of the permitting authority, the toxic organic compounds used: the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration: and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater. This plan shall become a part of and an enforceable provision of this permit.

2. 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 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 or

(4) Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f).

b. 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.

C. MONITORING AND REPORTING

1. Reporting

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the month following the completed reporting period. The first report is due on the 15th day of the month following the effective date of the permit.

Signed copies of these, and all other reports required herin, shall be submitted to the Director at the following address:

Permit Compliance Section
Compliance Branch
Water Management Division
Environmental Protection Agency
JFK Federal Building
Boston, MA 02203

Duplicate signed copies of all monitoring reports shall be submitted to the State at:

Massachusetts Department of Environmental Quality Engineering
Massachusetts Division of Water Pollution Control
Southeastern Regional Office
Lakeville Hospital
Lakeville, Massachussetts 02346

Signed copies of all other notifications and reports required by this permit shall be submitted to the State at:

Massachusetts Department of Environmental Quality Engineering
Massachusetts Division of Water Pollution Control
Regulatory Branch
1 Winter Street
Boston, Massachusetts 02108

D. STATE PERMIT CONDITIONS

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency and the Division of Water Pollution Control 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 Director of the Massachusetts Division of Water Pollution Control pursuant to M.G.L. Chap. 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.

ATTACHMENT 10

State Permit No. 307
Federal Permit No. MA0004120

MODIFICATION OF
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),

The Foxboro Company
38 Neponset Avenue
Foxboro, MA 02035

is authorized to discharge in accordance with effluent limitations, monitoring requirements and other conditions set in the previous permit, except as set forth herein and listed as follows:

Replace page 2 of 7 with the attached page.

This modifies the permit issued on June 20, 1984.

This permit modification shall become effective 30 days from date of signature.

This permit modification and the authorization to discharge shall expire at midnight, June 20, 1989.

Signed this 16th day of November, 1987

Director
Water Management Division
Environmental Protection Agency
Region I
Boston, MA

Director, Division of Water Pollution Control
Department of Environmental Quality Engineering
Commonwealth of Massachusetts
Boston, MA

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through July 1, 1988 the permittee is authorized to discharge from outfall serial number 001a, treated process wastewater.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Avg. Monthly	Max. Daily	Measurement Frequency	Sample Type
Flow, MGD	0.185	0.382	Continouous	Total Daily
TSS	20 mg/l	30 mg/l	2/Month	Composite
Oil and Grease	-	15 mg/l	2/Month	Grab
Cadmium (Total)	0.26 mg/l	0.69 mg/l	2/Month	Composite
Chromium (Total)	1.5 mg/l	2.77 mg/l	2/Month	Composite
Chromium, hexavalent	0.1 mg/l	0.25 mg/l	2/Month	Grab
Copper (Total)	1.5 mg/l	3.0 mg/l	2/Month	Composite
Cyanide (Total)	0.25 mg/l	0.65 mg/l	2/Month	Grab
Cyanide, amenable	0.1 mg/l	0.2 mg/l	2/Month	Grab
Nickel (Total)	1.8 mg/l	3.6 mg/l	2/Month	Composite
Aluminum (Total)	1.5 mg/l	2.0 mg/l	2/Month	Composite
* Total Toxic Organics	-	2.13 mg/l	1/Quarter	Grab
** Phosphorus	2.0 mg/l	-	2/Month	Composite

* See page 4 of 7 for Total Toxic Organics definition and monitoring requirements.

** The permittee shall continue to use diligent efforts to reduce the level of phosphorus in their discharge as much as practical.

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units and shall be monitored continously, report daily range.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: the discharge of the wastewater treatment plant, prior to mixing with the noncontact cooling water.

NOTE: The limits established above are based on water quality considerations and the fact that the discharge, as limited above, is only permitted until July 1, 1988. More stringent limits will be imposed by EPA to protect water quality standards if the discharge continues beyond July 1, 1988.

ATTACHMENT 11