

**RESPONSE TO COMMENTS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
DRAFT HiPOx PILOT STUDY WORK PLAN FOR THE GROUNDWATER  
EXTRACTION AND TREATMENT SYSTEM  
NAVAL AIR STATION BRUNSWICK, MAINE**

<b>Commentor: Michael Daly, Remedial Project Manager</b>	
<b>Comment Issue Date: 25 August 2009</b>	<b>Navy Response Date: 22 September 2009</b>

The U.S. Environmental Protection Agency has reviewed the subject document and comments are below:

**GENERAL COMMENTS:**

1. Successful implementation of this pilot study to bring Eastern Plume extraction well EW-5B online along with the advanced oxidation system to treat influent 1,4-dioxane and CVOC ground water contamination relies on the Navy's ability to discharge untreated and treated Eastern Plume ground water to the Brunswick POTW for treatment. A revised pilot study strategy will need to be prepared should the Brunswick sewer district reject the Navy's request to discharge extracted ground water to their treatment works. EPA is supportive of the Navy's approach in trying to establish a more realistic revised "steady state" GWETS flow rate and CVOC/1,4-dioxane concentration in order to optimize O<sub>3</sub> and H<sub>2</sub>O<sub>2</sub> dosing rates to the advanced oxidation treatment unit. EPA also strongly supports the Navy's efforts through this pilot study to simplify and improve the energy efficiency of the GWETS by evaluating the elimination of the air stripping unit operation once the advanced oxidation unit becomes operational.

**Response:** Comment noted. The Brunswick Sewer District has conditionally approved the Navy's request to discharge plant effluent to their treatment facility for this pilot test. The Navy appreciates EPA's comment regarding our efforts to optimize the NAS Brunswick GWETS and promote energy efficient remediation.

2. Although not part of the scope of the work plan, the Navy/ECC will need to update the O&M Plan for the GWETS system to account for the addition of the HiPOx unit and the optimized extraction well scheme.

**Response:** After the HiPOx Pilot Test Report is issued, the GWETS Operations and Maintenance manual will be updated to reflect the changes to the plant.

**SPECIFIC COMMENTS:**

- 3a. **Section 4.2 – HiPOx System Prove-out & Section 4.3 – Pilot Test Procedures:** It is EPA's understanding that EW-5B will be turned on 7-10 days ahead of the start of the pilot test in order to establish a steady state operational pumping rate and CVOC/1,4-dioxane concentration. This operational flow rate/contaminant concentration for EW-5B will then be combined with extracted ground water from operating EWs-1, 2A, & 4. This combined flow/contaminant loading rate will be the basis for HiPOx system prove-out and pilot testing. This element of the pilot study, although not detailed in this work plan, will also require the Navy to discharge untreated EW-5B water to the Brunswick Sewer District, subject to their approval. EPA further understands that EW-5B start-up testing and operations will be detailed in a separate technical memo that will be forthcoming.

**Response:** The Navy has issued a technical memorandum entitled "Extraction Well EW-5B Activation" on 11 September 2009 to the US EPA and MEDEP. In addition, the Navy has received conditionally approval from the Brunswick Sewer District to discharge effluent to the Sewer District for the Pilot Test including the start up of EW-5B prior to installation of HiPOx HCU unit. The Brunswick Sewer District's correspondence dated 4 September 2009 will be attached to the final work plan.

- 3b. While these two sections describe the frequency and types of analytical sampling that will be conducted on influent, intermediate treatment processes, and effluent water to demonstrate achievement of treatment system goals and meet regulatory compliance requirements for activities specified in this work plan, EPA requests that a table be generated along with this work plan that provides details of the sampling program (i.e., type of sample, frequency, lab turn-around requirements for samples) needed to evaluate GWETS performance and meet regulatory compliance requirements.

**Response:** The HiPOx Pilot Test sample summary table will be provided in the final work plan and is included in the response to comment for your review.

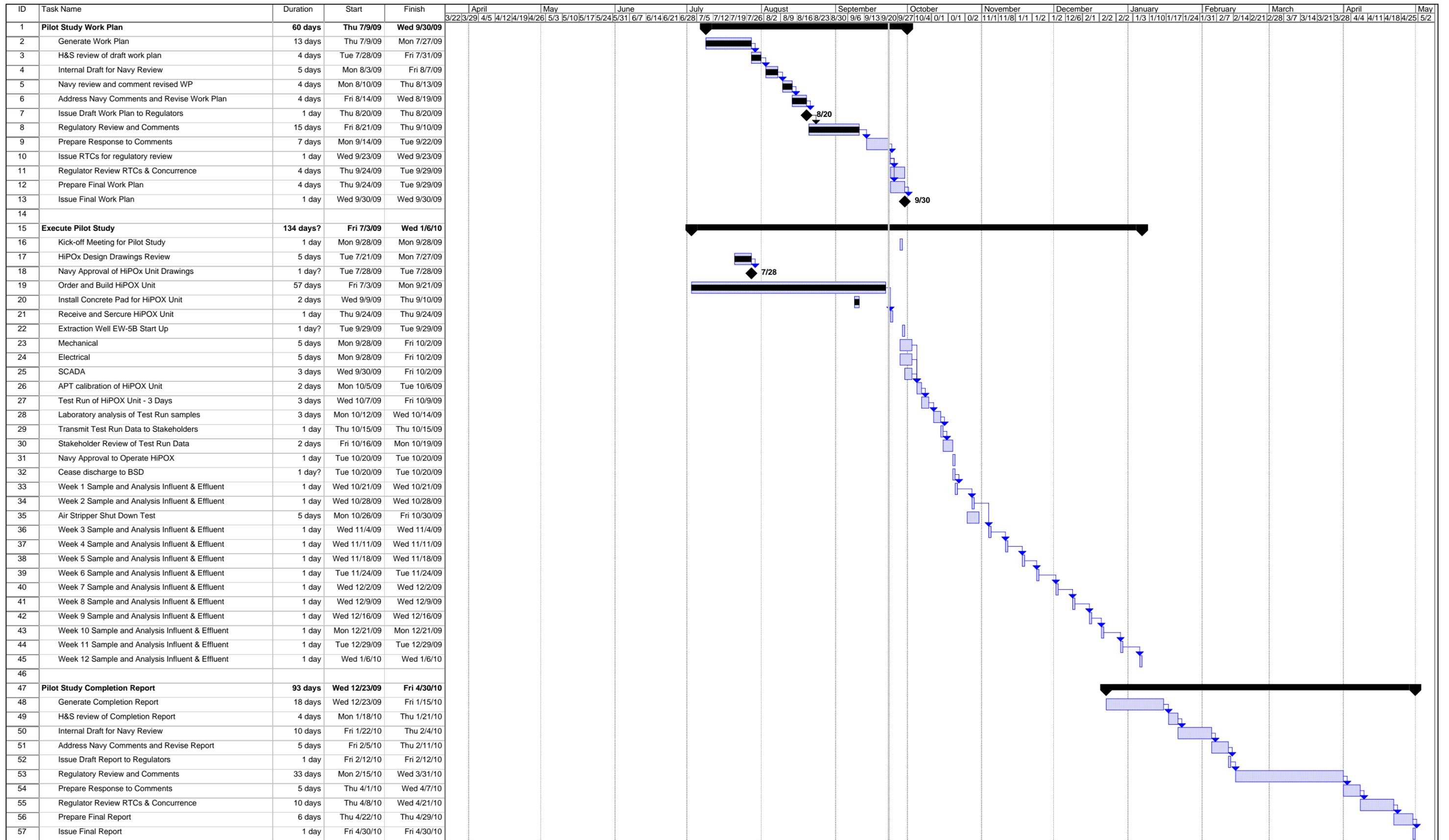
- 3c. Although not completely clear on this point in the work plan, the Navy intends to begin sending GWETS effluent to the infiltration gallery after the 1-week GWETS prove-out (with the HiPOx unit online) is completed. The work plan does not specify when analytical lab results from the 1-week system prove-out sampling will become available in order to determine if the treated effluent is of adequate quality to discharge to the infiltration gallery. EPA assumes the Navy will specify a 24-48hr turnaround lab analysis of these samples and provide the data quickly to the project team for timely review and discussion. An optimistic expectation of this prove-out phase is that regulator approval can be granted to the Navy to switch the discharge of treated effluent from the sanitary sewer to the infiltration gallery

immediately upon completion of the prove-out phase, providing the prove-out effluent data sets are favorable. EPA is willing to provide the Navy with timely review of sampling data so that a timely and cost effective decision can be made for handling GWETS effluent upon completion on the GWETS system prove-out phase.

**Response:** During the 3 day test run period (currently scheduled for 7 October through 9 October 2009), analytical samples will be collected as presented in the sample summary table. These daily samples will be submitted to an analytical laboratory for a 3 day turn around time. Once each day's analytical data is received from the laboratory by the Navy, it will be forwarded that same day to the MEDEP and EPA Remedial Project Managers for their review and information. All sample data is expected to be received by close of business on 14 October 2009. The Navy intends to convene a conference call on 16 October 2009 (Friday) with the regulators to review the analytical data from the 3 day test run and seek approval to cease discharge to the Brunswick Sewer District and re-direct the plant effluent to the on-site infiltration gallery.

## **ATTACHMENTS**

- 1. HiPOx Pilot Study Schedule, 23 September 2009**
- 2. HiPOx Pilot Study Laboratory Sample Summary Table**
- 3. Brunswick Sewer District Conditional Approval Letter**



Project: dioxane pilot study REVISED  
Date: Wed 9/23/09

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

**Table 1  
HiPOx Pilot Study  
Analytical Summary  
30 September 2009**

Task	Sample Location	Sample Frequency	Laboratory Analysis		QA/QC Samples			Total Laboratory Analysis		
			VOCs (8260B)	1,4-dioxane (8260B SIMs)	Trip Blank	Duplicate	MS/MSD	VOC	1,4-Dioxane	Total
<b>1</b> <i>3-Day Prove Out</i>	Influent	2 sample/day x 3 days	6	6	0	0	0	6	6	12
	After HiPOx	2 sample/day x 3 days	6	6	0	0	0	6	6	12
	Effluent	2 sample/day x 3 days	6	6	3	3	3	18	18	36
<b>2</b> <i>12 Week Pilot Period</i>	Influent	1 sample/week x 12 wks	12	12	0	0	0	12	12	24
	After HiPOx	1 sample/week x 12 wks	12	12	0	0	0	12	12	24
	Effluent	1 sample/week x 12 wks	12	12	12	12	1	38	38	76
<b>3</b> <i>Liquid-Phase GAC During Week 2 of Pilot Test</i>	Influent to GAC	1 sample on First Day	1	1	0	0	0	1	1	2
	Mid-Point GAC	1 sample on First Day	1	1	0	0	0	1	1	2
	Plant Effluent*	1 sample/day x 4 days	4	4	0	0	0	4	4	8
								98	98	196

Notes:  
1) Trip and Duplicate samples require separate analyses for VOC and 1,4-dioxane.  
2) MS/MSD includes two analyses, costs reflected in totals.  
\* During the liquid-phase GAC testing, plant effluent samples will be collected every day for 5 days, only 4 samples are shown because 1 is included with weekly sampling.  
3) The 3-Day Prove Out Samples will be submitted for 3 day turn around time with the analytical laboratory.

# Brunswick Sewer District

10 PINE TREE ROAD  
BRUNSWICK, MAINE 04011  
[bsd@brunswicksewer.org](mailto:bsd@brunswicksewer.org)

TELEPHONE (207) 729-0148

FAX (207) 729-0149

04 September 2009

Environmental Department  
Naval Air Station Brunswick  
437 Huey Drive  
Brunswick, Maine 04011

Attn: Mr. Walter A. Lach  
Environmental Protection Specialist

Re: Extraction Well EW-05B Activation  
Effluent Discharge to the Municipal Sanitary Sewer System

Subject: Authorization to Discharge

Dear Mr. Lach:

Based on the recommendation of our consultant following their review of the data provided to us in TABLE 1 – CONSERVATIVE ESTIMATE OF TREATED EFFLUENT AT 50-60 GPM FROM EXTRACTION WELLS EW-01; EW-02; EW-04; AND EW-05B GROUND-WATER EXTRACTION AND TREATMENT SYSTEM (BUILDING 50) NAVAL AIR STATION, BRUNSWICK, MAINE, attached herein and made part of this authorization, the Brunswick Sewer District is granting authorization to proceed with the proposed effluent discharge from the Ground-Water Extraction and Treatment System (GWETS) to the municipal sanitary sewer system per the:

- o Quantity requested: 50-60 GPM;
- o Time frame requested: 24 hours per day, for 2-3 weeks;
- o And within the Discharge Limits indicated in Table 1.

This authorization to discharge is conditioned upon:

1. The District receiving confirmation, prior to commencement of discharge, that the following metals of concern do not exceed the District's effluent toxicity discharge limit as established by MeDEP, which limits have been provided to the US Navy's consultant ECC for review and report: aluminum, copper, mercury, silver, and selenium.
2. The District to be furnished timely all testing results derived from the HiPOx confirmatory samples collected during the HiPOx pilot testing conducted during the term of this authorization. It is our understanding that the sampling schedule will be daily for the first week, then weekly thereafter.

Yours,  
BRUNSWICK SEWER DISTRICT



Leonard Blanchette  
Assistant General Manager

Copy: Gregory H. Thulen, Treatment Operations Supervisor, Brunswick Sewer District

Encl. (1)

TABLE 1

**CONSERVATIVE ESTIMATE OF TREATED EFFLUENT  
WITH EXTRACTION WELLS EW-01; EW-02A; EW-04; AND EW-05B  
GROUND-WATER EXTRACTION AND TREATMENT SYSTEM (BUILDING 50)  
NAVAL AIR STATION, BRUNSWICK, MAINE**

Parameter <sup>(a)</sup>	Method	Anticipated Range	Discharge Limit <sup>(b)</sup>	MEG (ppb)	MCL (ppb)
<b>TREATMENT PLANT EFFLUENT</b>					
Arsenic, Total	EPA6010B	1 - 3	50	10	10
Chromium, Total	EPA6010B	0.25 - 2	10	40	100
Cyanide, Total	EPA9010	0	34	140	200
Nickel, Total	EPA6010B	0.25 - 2	78	140	100*
Lead, Total	EPA6010B	0	15	10	15
Zinc, Total	EPA6010B	3 - 8	200	2,000	2,000*
Iron, Total	EPA6010B	2 - 8	NA	NA	NA
Manganese, Total	EPA6010B	0 - 2	NA	500	NA
1,1,1-Trichloroethane	EPA8260B	0	750	200	200
1,1-Dichloroethane	EPA8260B	0	94	70	NA
1,1-Dichloroethene	EPA8260B	0	7	0.6	7
<i>cis</i> -1,2-Dichloroethene	EPA8260B	0	70 <sup>(c)</sup>	70	70
<i>trans</i> -1,2-Dichloroethene	EPA8260B	0	--	140	100
Methylene chloride	EPA8260B	0	5	NA	NA
Tetrachloroethene	EPA8260B	0	5	7	5
Trichloroethene	EPA8260B	0	5	32	5
Vinyl chloride	EPA8260B	0	2	0.2	2
1,4-Dioxane	EPA8260B/SIM	20 - 50	NA	32	NA
<p>(a) Results reported in µg/L.            (b) Maximum effluent discharge limit established by Brunswick Sewer District Draft Permit (Dec. 1994).            (c) Combined 1, 2-dichloroethane (<i>cis</i> and <i>trans</i>) not to exceed 70 µg/L.            * - EPA Health Advisory</p> <p>NOTE: EPA = U.S. Environmental Protection Agency.            NA = Discharge limit applicable to treatment plant effluent only.            SIM = Selective Ion Monitoring</p>					