



*Environmental Chemical Corporation
33 Boston Post Road West, Suite 340
Marlborough, MA 01752*

18 November 2009
ECC Job No. 5564.001

TO: Mr. Todd Bober, RPM

LOCATION: BRAC PMO NE

FROM: Bob Phinney, Plant Operator

LOCATION: ECC–NAS Brunswick

SUBJECT: Monthly Operations Report for 1-31 October 2009
Groundwater Extraction and Treatment System, Building 50
Naval Air Station, Brunswick, Maine
Contract No. N40085-09-D-7035, Task Order No. 0002

The following is the October 2009 monthly operations report for the Groundwater Extraction and Treatment System (GWETS) located at Naval Air Station, Brunswick, Maine. The GWETS effluent was discharged to the Brunswick Sewer District collection system during this period to allow for HiPOx system installation and prove-out testing.

Table 1 summarizes the GWETS process flow data and results of the daily in-plant water quality analysis. Table 2 provides a summary of daily individual extraction well pumping performance as well as monthly pumping efficiency during the reporting period. Table 3 provides the monthly laboratory analytical results for the Eastern Plume influent and GWETS effluent samples. Table 4 summarizes the quarterly laboratory analytical results from the vapor-phase granular activated carbon filter influent and effluent air quality samples collected.

The GWETS treatment plant was operational for 95.29 % of the available hours during October 2009. Well performance based on well system capacity (including EW-01, EW-02A, EW-04, and EW-05B) was 82.0%. There were thirteen operational interruptions or corrective actions necessary to restore plant operations during October 2009, two due to power outages. The remaining operational interruptions occurred during HiPOx installation and system calibration.

The combined treatment plant influent flow from Eastern Plume groundwater extraction wells EW-01, EW-02A, EW-04, and EW-05B averaged approximately 55 gpm through 31 October 2009.

Activities performed during October 2009 included:

- Performed routine cleaning, calibration, and equipment maintenance activities.
- Prepared and submitted monthly operations report.
- Performed Monthly Safety inspections of fire extinguishers and building equipment.
- Conducted quarterly sampling.
- Fabricated and installed covers and drop tubes for the equalization tank and the HiPOx feed tank to minimize loss of VOCs.
- HiPOx HCU system installed.
- Conducted Pilot Study to insure optimized performance of the HiPOx unit
- Completed initial system prove-out and sampling operations.
- Drilling and development of new extraction wells EW-08 and EW-09.
- Plant computer system (i.e., PCL and SCADA systems) updated to incorporate HiPOx.
- Building 50 roof repairs completed by public works.
- NAS Brunswick base fire department performed annual inspection of GWETS.

I certify by my signature affixed that I have personally examined the information contained herein, and based on my inquiry of those individuals immediately responsible for obtaining and providing the information, I further certify that the information contained herein is true, accurate, and complete.



Robert Phinney
MEDEP Wastewater Operator No. 626

18 November 2009

Date

cc: BRAC PMO NE (P. Burgio)
NAVFACLANT (J. Wright, A. Van Dercook, B. Capito)
USEPA (M. Daly)
MEDEP (C. Sait, C. Evans)
NASB (L. Joy, M. Fagan)
ECC (A. Easterday, G. Calderone, M. Johanson, C. Guido)
Lepage Environmental (C. Lepage)
TTNUS (L. Klink, J. Orient)
H&S (J. Parrett, E. King)

Table 1
Summary of Treatment System
Process Flow and In-Plant Water Quality
Groundwater Extraction and Treatment System (Building 50)
Naval Air Station Brunswick, Maine

| Date | Turbidity | Daily Flow ^(c) | pH |
|--|------------------|----------------------------------|----------------|
| October 2009 | NTU | Gallons | Standard Units |
| 1 | 0.28 | 66,482 | 6.59 |
| 2 | 0.25 | 80,735 | 6.59 |
| 3 | (a) | 68,850 | 6.59 |
| 4 | (a) | 62,895 | 6.59 |
| 5 | 0.49 | 83,460 | 6.63 |
| 6 | 0.17 | 140,930 | 6.59 |
| 7 | 0.37 | 83,353 | 6.60 |
| 8 | 0.15 | 139,866 | 6.62 |
| 9 | 0.17 | 68,705 | 6.63 |
| 10 | (a) | 69,486 | 6.63 |
| 11 | (a) | 69,620 | 6.64 |
| 12 | 0.11 | 69,482 | 6.62 |
| 13 | 0.21 | 69,294 | 6.63 |
| 14 | 0.06 | 64,391 | 6.62 |
| 15 | 0.29 | 57,287 | 6.59 |
| 16 | 0.26 | 71,076 | 6.61 |
| 17 | (a) | 68,626 | 6.58 |
| 18 | (a) | 70,370 | 6.59 |
| 19 | 0.31 | 69,914 | 6.59 |
| 20 | 0.06 | 69,755 | 6.55 |
| 21 | 0.36 | 69,184 | 6.55 |
| 22 | 0.38 | 67,059 | 6.58 |
| 23 | 0.37 | 69,332 | 6.58 |
| 24 | (a) | 67,480 | 6.59 |
| 25 | (a) | 65,514 | 6.52 |
| 26 | 0.31 | 62,475 | 6.57 |
| 27 | 0.22 | 89,127 | 6.60 |
| 28 | 0.33 | 65,966 | 6.56 |
| 29 | 0.27 | 65,589 | 6.58 |
| 30 | 0.34 | 54,114 | 6.58 |
| 31 | (a) | 59,243 | 6.54 |
| Monthly Average pH (standard units) 6.59 | | | |
| Monthly Process Flow Total (gallons) 2,279,658 | | | |
| Monthly VOCs Removed (pounds) 6.80 lbs ^(b) | | | |

Notes:

(a) Weekend/Holiday/Operator not present.

(b) Based in most recent quarterly composite influent VOC sample.

(c) Daily flow estimated on pump run times and flow history.

Table 2
Summary of Extraction Well Performance
Groundwater Extraction and Treatment System (Building 50)
Naval Air Station Brunswick, Maine

| DATE | EW-01 | | | EW-02A | | | EW-04 | | | EW-05B | | |
|------------------|---------------|----------------|-----------------------|---------------|----------------|-----------------------|---------------|----------------|-----------------------|---------------|----------------|-----------------------|
| October 2009 Day | Flow Rate GPM | Run Time Hours | Total Pumpage Gallons | Flow Rate GPM | Run Time Hours | Total Pumpage Gallons | Flow Rate GPM | Run Time Hours | Total Pumpage Gallons | Flow Rate GPM | Run Time Hours | Total Pumpage Gallons |
| 1 | 10.0 | 23.0 | 13779.5 | 15.0 | 23.0 | 20669.3 | 17.0 | 23.0 | 23425.2 | 16.0 | 23.0 | 22047.2 |
| 2 | 10.0 | 23.6 | 14140.8 | 15.0 | 23.6 | 21211.3 | 17.0 | 23.6 | 24039.4 | 16.0 | 22.2 | 21345.3 |
| 3 | 10.0 | 21.2 | 12696.0 | 15.0 | 21.2 | 19044.0 | 17.0 | 21.2 | 21583.2 | 16.0 | 21.2 | 20313.6 |
| 4 | 10.0 | 24.0 | 14390.2 | 15.0 | 24.0 | 21585.3 | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.3 |
| 5 | 10.0 | 24.0 | 14390.0 | 15.0 | 24.0 | 21585.0 | 17.0 | 24.0 | 24462.7 | 16.0 | 24.0 | 23023.7 |
| 6 | 10.0 | 23.8 | 14308.7 | 15.0 | 23.8 | 21463.0 | 17.0 | 23.8 | 24324.7 | 16.0 | 23.8 | 22893.9 |
| 7 | 10.0 | 24.0 | 14371.3 | 15.0 | 24.0 | 21557.0 | 17.0 | 24.0 | 24431.3 | 16.0 | 24.0 | 22994.1 |
| 8 | 10.0 | 24.0 | 14390.0 | 15.0 | 24.0 | 21585.0 | 17.0 | 24.0 | 24463.0 | 16.0 | 23.9 | 22940.0 |
| 9 | 10.0 | 24.0 | 14390.0 | 15.0 | 24.0 | 21585.0 | 17.0 | 24.0 | 24463.0 | 16.0 | 24.0 | 23024.0 |
| 10 | 10.0 | 24.0 | 14390.2 | 15.0 | 24.0 | 21585.3 | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.3 |
| 11 | 10.0 | 24.0 | 14390.3 | 15.0 | 24.0 | 21585.5 | 17.0 | 24.0 | 24463.6 | 16.0 | 24.0 | 23024.5 |
| 12 | 10.0 | 24.0 | 14390.2 | 15.0 | 24.0 | 21585.3 | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.3 |
| 13 | 10.0 | 22.3 | 13386.3 | 15.0 | 22.3 | 20104.3 | 17.0 | 22.2 | 22666.7 | 16.0 | 22.2 | 21314.4 |
| 14 | 10.0 | 19.3 | 11576.0 | 15.0 | 19.4 | 17417.3 | 17.0 | 19.4 | 19738.4 | 16.0 | 19.3 | 18520.5 |
| 15 | 10.0 | 23.6 | 14181.7 | 16.0 | 23.6 | 22648.3 | 17.0 | 23.5 | 23987.3 | 16.0 | 23.4 | 22511.2 |
| 16 | 10.0 | 23.4 | 14041.5 | 15.0 | 23.4 | 21062.5 | 17.0 | 23.2 | 23679.9 | 16.0 | 23.2 | 22297.9 |
| 17 | 10.0 | 24.0 | 14390.0 | 15.0 | 24.0 | 21585.0 | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.3 |
| 18 | 10.0 | 24.0 | 14390.0 | 16.0 | 24.0 | 23024.0 | 17.0 | 24.0 | 24463.0 | 16.0 | 24.0 | 23024.0 |
| 19 | 10.0 | 24.0 | 14390.2 | 16.0 | 24.0 | 23024.3 | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.3 |
| 20 | 10.0 | 24.0 | 14390.0 | 16.0 | 24.0 | 23024.0 | 17.0 | 24.0 | 24463.0 | 16.0 | 24.0 | 23024.0 |
| 21 | 10.0 | 23.2 | 13896.5 | 15.0 | 23.2 | 20844.5 | 17.0 | 23.2 | 23623.8 | 16.0 | 23.2 | 22234.1 |
| 22 | 10.0 | 24.0 | 14389.8 | 15.0 | 24.0 | 21584.8 | 17.0 | 24.0 | 24463.0 | 16.0 | 24.0 | 23024.0 |
| 23 | 10.0 | 6.8 | 4092.8 | 16.0 | 24.0 | 23024.5 | 17.0 | 24.0 | 24463.6 | 16.0 | 24.0 | 23024.3 |
| 24 | * | * | * | 16.0 | 24.0 | 23019.7 | 17.0 | 24.0 | 24458.5 | 16.0 | 24.0 | 23019.7 |
| 25 | * | * | * | 16.0 | 10.9 | 10472.0 | 17.0 | 11.0 | 11171.3 | 16.0 | 11.0 | 10520.5 |
| 26 | * | * | * | 16.0 | 21.3 | 20472.3 | 17.0 | 21.2 | 21638.7 | 16.0 | 21.2 | 20365.6 |
| 27 | * | * | * | 16.0 | 24.0 | 23024.0 | 18.0 | 24.0 | 25902.0 | 16.0 | 24.0 | 23024.0 |
| 28 | * | * | * | 16.0 | 24.0 | 23024.0 | 18.0 | 24.0 | 25902.0 | 16.0 | 24.0 | 23024.0 |
| 29 | * | * | * | 16.0 | 19.6 | 18849.3 | 17.0 | 19.6 | 20032.2 | 16.0 | 19.6 | 18857.6 |
| 30 | 10.0 | 13.8 | 8301.5 | 15.0 | 10.4 | 9403.3 | 18.0 | 22.1 | 23825.4 | 16.0 | 22.1 | 21177.6 |
| 31 | 10.0 | 24.0 | 14390.2 | * | * | * | 17.0 | 24.0 | 24463.3 | 16.0 | 24.0 | 23024.0 |
| TOTALS | | 559.74 | 335,844 | | 673.39 | 620,649 | | 708.54 | 726,914 | | 707.00 | 678,715 |

| | | | | |
|-----------------------|--------------|--------------|--------------|--------------|
| EXPECTED WELL GPM | 10.0 | 15.0 | 25.0 | 16.0 |
| EFFECTIVENESS OF WELL | 75.2% | 92.7% | 65.1% | 95.0% |
| MONTH AVERAGE GPM | 8.1 | 14.9 | 17.1 | 16.0 |

PERFORMANCE BASED ON WELL SYSTEM CAPACITY (all four wells): 82.0%

* Note: Extraction well temporarily deactivated to allow pump testing at new extraction well.

Table 3
Summary of Analytical Results
Treatment System Influent and Effluent
Samples Collected on 1 October 2009
Groundwater Extraction and Treatment System (Building 50)
Naval Air Station Brunswick, Maine

| Parameter ^(a) | Method | Result | Treatment Plant Duplicate | Discharge Limit ^(b) | MEG (ppb) | MCL (ppb) |
|----------------------------------|--------------|-------------|---------------------------|--------------------------------|-----------|-----------|
| EASTERN PLUME INFLUENT | | | | | | |
| 1,1,1-Trichloroethane | EPA8260B | 163 | NR | NA | 200 | 200 |
| 1,1-Dichloroethane | EPA8260B | 16.4 | NR | NA | 70 | NA |
| 1,1-Dichloroethene | EPA8260B | 55.4 | NR | NA | 0.6 | 7 |
| <i>cis</i> -1,2-Dichloroethene | EPA8260B | 8.2 | NR | NA | 70 | 70 |
| <i>trans</i> -1,2-Dichloroethene | EPA8260B | (<1.0 U) | NR | NA | 140 | 100 |
| Methylene chloride | EPA8260B | (<2.0 U) | NR | NA | 47 | 5 |
| Tetrachloroethene | EPA8260B | 6.1 | NR | NA | 7 | 5 |
| Trichloroethene | EPA8260B | 108 | NR | NA | 32 | 5 |
| Vinyl chloride | EPA8260B | (<1.0 U) | NR | NA | 0.2 | 2 |
| 1,4-Dioxane | EPA8260B/SIM | 32.4 | NR | NA | 32 | NA |
| Arsenic, Total | EPA6010B | 4.8 | NR | NA | 10 | 10 |
| Iron, Total | EPA6010B | 1,260 | NR | NA | NA | NA |
| Manganese, Total | EPA6010B | 107 | NR | NA | 500 | *300 |
| TREATMENT PLANT EFFLUENT | | | | | | |
| Arsenic, Total | EPA6010B | (<2.0 U) | (<2.0 U) | 50 | 10 | 10 |
| Chromium, Total | EPA6010B | 2.4 J | 3.4 J | 10 | 40 | 100 |
| Cyanide, Total | EPA9010 | (<0.0010 U) | (<0.0010 U) | 34 | 140 | 200 |
| Nickel, Total | EPA6010B | (<10.0 U) | 0.58 J | 78 | 140 | *100 |
| Lead, Total | EPA6010B | 0.068 J | 0.18 J | 15 | 10 | 15 |
| Zinc, Total | EPA6010B | 3.7 J | 10.5 | 200 | 2000 | *2000 |
| Iron, Total | EPA6010B | 24.6 J | 24.4 J | NA | NA | NA |
| Manganese, Total | EPA6010B | 0.73 J | 0.78 J | NA | 500 | *300 |
| 1,1,1-Trichloroethane | EPA8260B | (<1.0 U) | (<1.0 U) | 750 | 200 | 200 |
| 1,1-Dichloroethane | EPA8260B | (<1.0 U) | (<1.0 U) | 94 | 70 | NA |
| 1,1-Dichloroethene | EPA8260B | (<1.0 U) | (<1.0 U) | 7 | 0.6 | 7 |
| <i>cis</i> -1,2-Dichloroethene | EPA8260B | (<1.0 U) | (<1.0 U) | 70 ^(c) | 70 | 70 |
| <i>trans</i> -1,2-Dichloroethene | EPA8260B | (<1.0 U) | (<1.0 U) | -- | 140 | 100 |
| Methylene chloride | EPA8260B | (<2.0 U) | (<2.0 U) | 5 | 47 | 5 |
| Tetrachloroethene | EPA8260B | (<1.0 U) | (<1.0 U) | 5 | 47 | 5 |
| Trichloroethene | EPA8260B | (<1.0 U) | (<1.0 U) | 5 | 32 | 5 |
| Vinyl chloride | EPA8260B | (<1.0 U) | (<1.0 U) | 2 | 0.2 | 2 |
| 1,4-Dioxane | EPA8260B/SIM | 24.9 | 28.2 | NA | 32 | NA |

(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 (*cis* and *trans*) not to exceed 70 µg/L.

* - EPA Health Advisory

NOTE: EPA = U.S. Environmental Protection Agency.

D = Analysis conducted at a secondary dilution factor.

NR = Analysis not required.

NA = Discharge limit applicable to treatment plant effluent only.

B = Compound also detected in associated method blank.

NS = Not Sampled

SIM = Selective Ion Monitoring

U = Not detected. Sample quantitation limits are shown as (<__U).

Trip blank (TP-170-QT1) results for EPA Method 8260B/SIM were non-detect.

Table 4
Summary of Analytical Results for Vapor-Phase GAC Air Samples
Collected 1 October 2009
Groundwater Extraction and Treatment System (Building 50)
Naval Air Station Brunswick, Maine

| Parameter | Method ^(a) | Result ^(b) | Detection Limit |
|---|-----------------------|-----------------------|-----------------|
| VAPOR-PHASE GAC FILTER INFLOW | | | |
| 1,1,1-Trichloroethane | EPA TO-15 | 171 | 4.0 |
| 1,1-Dichloroethane | EPA TO-15 | 19.2 | 0.40 |
| 1,1-Dichloroethene | EPA TO-15 | 52.3 | 0.40 |
| <i>cis</i> -1,2-Dichloroethene | EPA TO-15 | 11.7 | 0.40 |
| <i>Trans</i> -1,2-Dichloroethene | EPA TO-15 | (<0.40 U) | 0.40 |
| Tetrachloroethene | EPA TO-15 | 5.0 | 0.40 |
| Trichloroethene | EPA TO-15 | 113 | 4.0 |
| Vinyl chloride | EPA TO-15 | ND | 0.40 |
| VAPOR-PHASE GAC FILTER EMISSION | | | |
| 1,1,1-Trichloroethane | EPA TO-15 | (<0.20 U) | 0.20 |
| 1,1-Dichloroethane | EPA TO-15 | (<0.20 U) | 0.20 |
| 1,1-Dichloroethene | EPA TO-15 | (<0.20 U) | 0.20 |
| <i>cis</i> -1,2-Dichloroethene | EPA TO-15 | (<0.20 U) | 0.20 |
| <i>Trans</i> -1,2-Dichloroethene | EPA TO-15 | (<0.20 U) | 0.20 |
| Tetrachloroethene | EPA TO-15 | (<0.20 U) | 0.20 |
| Trichloroethene | EPA TO-15 | (<0.20 U) | 0.20 |
| Vinyl chloride | EPA TO-15 | (<0.20 U) | 0.20 |
| <p>(a) Analysis of air is by EPA Method Total Organics (TO)-15, a gas chromatograph/mass spectrometry full scan analysis.</p> <p>(b) Results reported in parts per billion volume (ppb_v).</p> <p>NOTE: EPA= U.S. Environmental Protection Agency. GAC = Granular Activated Carbon ND = Not detected. Influent air sample collected just prior to the vapor-phase GAC vessels. Emission air sample collected after filtration by both vapor-phase GAC vessels. Laboratory blank sample results for EPA Method TO-15 were non-detect.</p> | | | |