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FINAL TECHNICAL MEMORANDUM REGARDING SUPPLEMENTAL GROUNDWATER  
SURFACE WATER INTERFACE INVESTIGATION REPORT FOR MERRICONEAG STREAM  
AND MERE BROOK NAS BRUNSWICK ME

4/13/2012  
CH2M HILL

**Supplemental Groundwater-Surface Water Interface (GSI)  
Investigation Report for Merriconeag Stream and Mere Brook  
Naval Air Station Brunswick - Brunswick, Maine  
Contract No. N62470-08-D-1006; Task Order WE09**

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This report documents the results of Supplemental Groundwater-Surface Water Interface (GSI) Investigation of Mere Brook and Merriconeag Stream conducted in September 2011 at Naval Air Station (NAS) Brunswick in Brunswick, Maine ([Figure 1](#)). This version incorporates Maine Department of Environmental Protection (MEDEP) and US Environmental Protection Agency (USEPA) comments on the Draft Technical Memorandum dated February 17, 2012.

This sampling event is part of an ongoing GSI Investigation for Mere Brook and Merriconeag Stream and was conducted as a follow up to the November 2010 investigation that was documented in the *Investigation Report Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation* (AGVIQ-CH2M HILL, 2011), which will be referred to hereafter as the “November 2010 GSI Investigation Report”. The primary objective of the overall GSI investigation is to determine the extent to which contaminated groundwater, associated with the Eastern Plume, is upwelling to surface water of Mere Brook and Merriconeag Stream and evaluates the potential degradation of contaminants (primarily chlorinated solvents and 1,4-dioxane) as the groundwater discharges. Investigation data is also assisting with the characterization of the geologic and hydrologic conditions at the site and refining the understanding of the conceptual site model (CSM). The Supplemental GSI Investigation was proposed to determine if seasonal variability has any impact on the results of the investigation that was completed in November 2010 and performed following a significant rain event. As such, the September 2011 event was conducted following a period of relatively dry conditions. This technical memorandum summarizes the September 2011 results with respect to the Data Quality Objectives (DQOs) developed for the overall GIS investigation as part of the UFP-SAP. A comparison of the 2010 and 2011 results are discussed. However, to extent practical, this memorandum does not duplicate information pertinent to the overall GSI investigation and already presented in the November 2010 GSI Investigation Report (e.g., background, site description, previous investigation history, CSM).

## November 2010 Investigation Summary

The 2010 investigation was conducted on November 15 to 21. Based on weather data obtained for Brunswick, Maine (weather gauge MC0774; Weather Underground, 2011), minimal rainfall occurred during the majority of the investigation period. However, a significant rain event occurred on Wednesday, November 17, when 2.04 inches of rainfall was reported in Brunswick. This single event accounted for approximately 66 percent of Brunswick's total rainfall for the month of November 2010 (3.08 inches). While all surface water samples were collected on November 16, 2010, prior to the rain event, all groundwater, pore water and sediment samples were collected after the rain event. However, groundwater, pore water and sediment samples were delayed until near baseline stream conditions returned from November 18 to 21.

During this investigation, several Eastern Plume-related constituents were detected in samples collected across the plume-to-stream transport pathway (groundwater → pore water/sediment → surface water) as follows:

- Groundwater - 11 VOCs (chloroethane, carbon disulfide, chloroform, 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and VC) and 1,4-dioxane.
- Pore water - 5 VOCs (chloroethane, chloroform, 1,1-DCA, cis-1,2-DCE, VC) and 1,4-dioxane
- Sediment - three VOCs (acetone, carbon disulfide, and chloroform)
- Surface water - Only 1,4-dioxane

The tables from the 2010 GSI Investigation Report are included as [Attachment A](#). Chlorinated solvents present in the transport pathway were shown to degrade prior to upwelling at the GSI, while 1,4-dioxane was shown to persist into surface water within or below the tap water screening level. These constituents were detected at concentrations exceeding some human health risk-based screening levels. However, no unacceptable human health risks are expected under the current and foreseeable future exposure scenarios.

While no constituents detected in ecologically relevant media (pore water, sediment and surface water) exceeded available screening values, no screening values were available to evaluate other detected constituents in pore water, surface water and/or sediment (e.g., chloroethane, 1,4-dioxane, acetone, or chloroform). Regardless, it was determined that aquatic receptor exposures are expected to be minimal following discharges at the GSI because of the volatile nature of these constituents. Therefore, it was concluded that no unacceptable risks would be expected for aquatic receptors of Mere Brook or Merriconeag Stream.

The analysis of natural attenuation suggested that the observed chlorinated solvents are degrading completely prior to reaching the GSI of Mere Brook and Merriconeag Stream. However, 1,4-dioxane does not degrade within or prior to the GSI as readily and has even been detected in surface water. In areas where the 1,4-dioxane plume has been projected to occur close to the stream, there were also detections of this constituent in pore water, often in the shallowest sample interval (2 to 8 inches).

The geologic and hydrogeologic conditions evaluated during the November 2010 investigation, including subsurface borings logs, pressure gradient measurements, and analysis of contaminants in the transport pathway, supported the existing CSM.

## September 2011 Conditions

The 2011 sampling event was conducted following a relatively dry period. Based on weather data obtained for Brunswick, Maine, minimal rainfall occurred leading up to and during the investigation period. Rainfall data were obtained online via The Weather Channel<sup>1</sup> and Weather Underground<sup>2</sup> and a complete compilation of these precipitation data are included as **Attachment B**. Since results from both sources were similar, only the Weather Underground data are discussed in this section. A total of 0.14 inches of rain was recorded for the 10 days prior to the event, with no measurable rain recorded for the three days leading up to the September 20<sup>th</sup> start of the event. During the three-day sampling period, 0.01, 0.0 and 0.64 inches of rain fell in the area on September 20<sup>th</sup>, 21<sup>st</sup> and 22<sup>nd</sup>, respectively. Additionally, a common garden rain gauge was also used at the site directly adjacent to the confluence area. While no accumulation of rain was observed on September 20<sup>th</sup> and 21<sup>st</sup>, approximately 0.6 inches of rain was observed in this gauge on September 22<sup>nd</sup>.

The surface water conditions at all GSI sample stations, which are shown on **Figure 2**, were monitored on September 22<sup>nd</sup>. While no significant changes in the surface water level were observed at Merriconeag Stream stations GSI-03, -04 or -06 or Mere Brook station GSI-14, there was an observable increase in surface water level depths for the other stations (GSI-05, -07, -08 and -12), relative to the levels at installation on September 19<sup>th</sup>. At GSI-12 (Mere Brook, west of the confluence area) the surface water was up approximately 1.5 inches, whereas the levels were up about 3.5 inches at GSI-05, -07 and -08 (Mere Brook side of the confluence area). **Attachment C** contains photographs taken during the field investigation within the study area.

Finally, there was a beaver dam built in Mere Brook, south of the confluence area south of GSI-14 (between 2010 sample stations GSI-15 and -16) that impacted the stream at and around this sample station. The flow has been greatly reduced and the water level was increased relative to November 2010.

## September 2011 Field Activities

Field investigation activities were performed September 19 to 22, 2011 and consisted of shallow groundwater (piezometer), pore water, sediment and surface water sampling. **Table 1** lists the samples collected and analyzed. **Attachment D** contains all the raw analytical data for all media. Additionally, in-stream measurements of the subsurface hydraulic pressure (e.g., upwelling/ down welling conditions) were measured at select locations of the confluence area. The same methods used during the November 2010 Investigation were used. The subsections below summarize the aspects of the field activities that are unique to the September 2011 Investigation.

<sup>1</sup> <http://www.weather.com/weather/monthly/USME0056>

<sup>2</sup> <http://www.wunderground.com/cgi-bin/findweather/getForecast?query=zmw:04011.1.99999>

All samples, except two groundwater sample locations (BN-B4A-0911 at GSI-08 and BN-PZ-GSI-04-10-0911 at GSI-04), one pore water location (BN-PW-GSI-04-02-0911 and BN-PW-GSI-04-08-0911 at GSI-04) and one sediment sample location (BN-SD-GSI-14-00-0911 at GSI-14) were collected before the minimal rain event on September 22<sup>nd</sup> ([Table 1](#)). All other samples, including all surface water and the remaining groundwater, pore water and sediment samples were collected on September 20<sup>th</sup> or 21<sup>st</sup> during the period of negligible rain.

## Surface Water Investigation

Surface water samples were collected at eight locations ([Figure 2](#)) using the same methods as the November 2010 samples on September 20 or 21, 2011. The tubing was held to within 1 inch of the sediment surface and extra caution was utilized to minimize agitation to the sediment. This procedure prevented intake of disturbed sediment/silt. Water quality parameters, including pH, specific conductance, temperature, oxidation-reduction potential (ORP), turbidity and dissolved oxygen (DO), were measured at each surface water sample location prior to collecting a sample using either a Yellow Springs Instruments (YSI) 556 water quality meter. [Table 2](#) summarizes the water quality parameters measured during surface water sampling. Samples were collected in containers provided by the laboratory and submitted to Accutest Laboratories on ice for analysis of select VOCs by Environmental Protection Agency (EPA) Method SW-846 8260B, and tetrachloroethene, vinyl chloride and 1,4-dioxane by EPA Method SW-846 8260B Select Ion Monitoring (SIM). The surface water sampling field forms are provided in [Attachment E](#).

## Pore Water Investigation

A total of 22 pore water samples (including field duplicates) were collected from eight locations (GSI-03 through GSI-08, GSI-12 and GSI-14; [Figure 2](#)) using the “well-point method”. At locations GSI-05, GSI-06, GSI-07 and GSI-08, shallow (2 to 8 inches), intermediate (8 to 14 inches), and deep (14 to 26 inches) pore water samples were collected. At locations GSI-03, GSI-04, GSI-12 and GSI-14, only shallow and intermediate samples were collected.

## Sampling

All samples were collected in containers provided by the laboratory and submitted on ice to Accutest Laboratories for analysis of select VOCs by EPA Method SW-846 8260B, and tetrachloroethene, vinyl chloride, and 1,4-dioxane EPA Method SW-846 8260B SIM. Monitored natural attenuation (MNA) parameters (dissolved iron and manganese, total organic carbon [TOC], methane, ethane, ethane, nitrate and sulfate), were also performed for all shallow pore water samples.

Water quality data were also collected during pore water sampling in both pore water samples collected from well-points and the surface water column adjacent to well-points using either a YSI 556 water quality meter. Measured water quality parameters included pH, specific conductance, temperature, ORP and turbidity. For pore water, parameters were measured before and immediately after pore water sampling. The relative differences in data between surface water and pore water, and throughout the pore water sampling process, were used to help verify the surface water-to-pore water profile. That is, they

helped confirm that pore water was being sampled/ collected instead of surface water. **Table 3** summarizes the water quality parameters measured during pore water sampling. The pore water sampling field forms are also provided in **Attachment E**.

## Hydraulic Pressure Measurements

On September 22 2011, measurements of the hydraulic pressure differences at select pore water sample locations were performed to help characterize conditions at the GSI. Due to time constraints, pressure observations were only performed for sample five GSI sample locations north of (GSI-03) and at the Confluence Area (GSI-05, -06, -07 and -08) stations). The hydraulic pressure estimates were performed using the PushPoint sampler (MHE Products) "tube test" in lieu of a Capsuhelic® Differential Pressure Gauge. According to technical guidance from the manufacturer, the PushPoint can be used as a mini-piezometer to determine the static head of the pore/groundwater and the potential direction of hydraulic movement. To do this, a tube was connected to the sample port at the top of the sampler. **Attachment F** includes an illustration from MHE Products depicting the PushPoint settings for this application, as well as photos of the set-up in the field for this study. Once installed, a continuous stream of water was established through the PushPoint using a peristaltic pump to remove any air remaining in the PushPoint and sample tubing. When the tube was disconnected from pump, the static water level in the tube represented the static water level at the depth that the screened-zone occupies in the subsurface sediment. At each station, this pressure test was performed at each pore water sample interval by inserting the PushPoint such that the screened-zone of the probe was at the center of the well point screen zone. The pressure test was performed at least three times at each sample depth before the pressure level (in cm of water) was recorded. The pressure readings recorded in the field are summarized in **Table 4**.

## Groundwater Investigation

### Sampling

A total of nine shallow groundwater samples (including field duplicated) were collected from September 20 through 22, 2011. Groundwater samples were collected from eight existing temporary piezometer locations (**Figure 2**). These groundwater samples were collected using low-flow sampling methods as specified in the Long-Term Monitoring Plan (ECC, 2008b) in accordance with EPA low-flow (minimal drawdown) groundwater sampling procedures. Samples were collected using a low-flow purging technique with the use of a peristaltic pump while being monitored with a YSI 556 water quality meter with a flow-through cell. Dedicated, polyethylene tubing was lowered into the well to the depth of the well screen. Water was extracted using a peristaltic pump at a flow rate of 100 to 500 milliliters per minute. Groundwater-sampling parameters (pH, conductivity, DO, temperature, turbidity and ORP) were recorded every 3 to 5 minutes until stabilization had occurred. Piezometers GSI-03 and PZB3A were sampled prior to stabilization due to the insufficient groundwater recharge within the piezometer. **Table 5** summarizes the water quality parameters measured during groundwater sampling. Water level readings were taken continuously to minimize drawdown and ensure formation groundwater was entering the well.

Samples were collected in containers provided by the laboratory and submitted on ice to Accutest Laboratories for analysis of select VOCs by EPA Method SW-846 8260B, and tetrachloroethene, vinyl chloride, and 1,4-dioxane EPA Method SW-846 8260B SIM, and MNA parameters. The low-flow groundwater sampling field forms are provided in [Attachment G](#).

### Water Level Measurements

Overall groundwater water level trends were evaluated to determine if there were any significant changes in the hydrogeologic environment. Since the deep aquifer contains the majority of the groundwater contamination and is known to upwell in the confluence area, this was the area of focus for evaluation of groundwater changes. Using data provided by Watermark/ECC, deep groundwater potentiometric surface maps were contoured and are included as [Attachment H](#). [Table H-1](#) summarizes the groundwater level measurement data used to generate groundwater potentiometric surface maps for September 2010 ([Figure H-1](#)), April 2011 ([Figure H-2](#)) and September 2011 ([Figure H-3](#)). Based on these maps, it was determined that the gradient direction and magnitude do not vary significantly during the period evaluated.

### Sediment Investigation

A total of seven sediment samples (including field duplicates) were collected from six GSI locations ([Figure 2](#)) using manual coring techniques. The cores were used to visually characterize the top one foot of sediment and to collect material for chemical analysis from the top six inches of sediment. Because of the volatile nature of the constituents of concern, the latter samples were collected and bottled in as close to in-situ conditions as possible. Sediment samples were collected using Lexane core tubes that were lowered gently into the sediment/surface water interface and pushed gently into the soft sediment to reduce compaction. A rubber mallet was then used to gently advance the bottom of the tube into the subsurface to approximately 1.5 feet below sediment surface. The tube was filled to the top with surface water and an end cap placed over the top end of the tube. The core tube was then pulled slowly from the sediment and another end cap was placed at the bottom. The cores were first visually observed in order to collect qualitative descriptions of the sediment stratigraphy and profile. Sediment descriptions—color relative density, consistency, soil structure, and other relevant information (odor or additional materials)—were recorded. The physical sediment characterization parameters are provided in [Table 6](#).

The top cap was then removed and the overlying water was slowly decanted, taking care not to disturb the sediment surface. An un-homogenized sediment sample from within the 0- to 6-inch interval was placed directly from the core tube into the sample jar, which was filled to the top and sealed with no head space (i.e., air pocket). These samples were collected in containers provided by the laboratory and submitted on ice to Accutest Laboratories for analysis of select VOCs by EPA Method SW-846 8260B, and tetrachloroethene, vinyl chloride, and 1,4-dioxane EPA Method SW-846 8260B SIM. Additional cores were collected at the same location, homogenized and transferred to sample containers for the remaining non-VOC parameters (grain size, TOC and percent moisture). The grain size, TOC, and percent moisture results are also included in [Table 6](#).

## Data Quality Assessment

Pore water, groundwater, surface water, and sediment samples collected during field activities were sent to Accutest Laboratories for analysis. AGVIQ-CH2M HILL performed data review, validation and verification as described in the UFP-SAP (AGVIQ-CH2M HILL, 2010). The data quality of 10 percent of the analytical results for each sample matrix collected during the field investigation were assessed.

The overall data review indicated that the sample handling, shipment, and analytical procedures were adequately completed, and that the analytical results should be considered usable as qualified to help make site management decisions. The Quality Assurance Review Memorandum, and well as medium-specific laboratory data reports for reviewed samples<sup>3</sup> are presented as [Appendix I](#).

## Deviations from the UFP-SAP

As part of the investigation, field decisions were required which represent minor deviations from the original UFP-SAP (AGVIQ-CH2M HILL, 2010). The following deviations from the SAP were implemented, with concurrence from the Navy, MEDEP and USEPA:

- Due to time constraints, pressure observations were only performed for sample five GSI sample locations (GSI-03, -05, -06, -07 and -08) using the PushPoint sampler (MHE Products) "tube test" method in lieu of a Capsuhelic® Differential Pressure Gauge method that was used in November 2010. This approach was discussed with and approved by MEDEP representatives while in the field.
- As a result of slow recharge and drawdown of water levels, piezometer samples BN-PZ-GSI-03-10 and PZC3A-0911 were not sampled using low-flow methods. Instead, piezometers were purged dry and a minimum of three casing volumes were removed. Each piezometer was allowed to recharge before the sample was collected. However, samples were collected as grab samples prior to stabilization because of the lack of recharge within the monitoring wells.

## September 2011 Results

Site-specific DQOs were developed according to the USEPA seven-step process (EPA, 2006a) for the overall GSI investigation as part of the UFP-SAP (AGVIQ-CH2M HILL, 2010). These DQOs, presented as Table 3-1 of the November 2010 GSI Investigation Report, were developed to address the following four principal study questions:

1. (A) What are the concentrations of Eastern Plume constituents across the potential migration pathway (groundwater → pore water/sediment → surface water)?; (B) Are concentrations of Eastern Plume constituents detected in groundwater (deep, shallow)

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<sup>3</sup> The full laboratory reports for all sample data packages are too large to include with this memorandum. However, these reports are available by request in electronic format

and pore water samples greater than action levels<sup>4</sup>; and (C) Does the data support that groundwater is discharging to surface water?

2. Are concentrations of detected Eastern Plume constituents across the migration pathway representative of potential exposure risks for current or future human health receptor populations and/or ecological receptor populations?
3. Is natural degradation of Eastern Plume constituents occurring across the migration pathway?
4. Are the geologic and hydrogeologic conditions consistent with the existing CSM?

The November 2010 results were used to answer these study questions in the November 2010 GSI Investigation Report. The September 2011 GSI Investigation results will be used in this technical memorandum to address the same DQOs and answer the same study questions, using the same approach (including the same human health and ecological screening values, except where noted below).

### DQOs 1A (Migration Pathway Constituent Concentrations) and 1B (Action Levels Exceedances)

The detected constituents for each sample are summarized in medium-specific tables presented in the subsections below. The spatial distribution of these detections is also depicted on site maps as indicated in the subsections below.

#### Groundwater

A total of ten VOCs (1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, chloroethane, chloroform, cis-1,2-dichloroethene, tetrachloroethene, trichloroethene and vinyl chloride) and 1,4-dioxane were detected in groundwater samples (Table 7). The locations and concentrations of the groundwater sample detections are shown on Figure 3 and summarized as follows:

- **North of Confluence (Merriconeag Stream)** - Only one VOC (chloroform) was detected at GSI-03, while all *but two* of these constituents (chloroethane, chloroform) were detected in GSI-04.
- **Confluence (Mere Brook & Merriconeag Stream)** - Only one of the 11 constituents detected in groundwater (chloroform), was *not* detected in confluence GSI stations.
- **West of Confluence (Mere Brook)** - Four of the 11 constituents were detected in GSI-12 (1,4-dioxane, cis-1,2-dichloroethene, tetrachloroethene and vinyl chloride).
- **South of Confluence (Mere Brook)** - Five of the 11 constituents were detected in GSI-14 (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane and 1,4-dioxane and vinyl chloride).

Figure 3 also presents the groundwater sample results observed during the 2010 GSI Investigation. In general, the concentrations of detected constituents in groundwater

<sup>4</sup> In this context, "action levels" refer to constituent concentrations which serve as basis for laboratory quantitation. These levels also represent thresholds for identifying potential human health or ecological risks as discussed in further worksheets. They are not considered "clean-up" levels for the Merriconeag and Mere Brook.

decreased from those observed during the November 2010 GSI Investigation. However, the overall results of screening comparisons to human health screening levels in terms of the locations of exceedances and chemicals exceeding screening levels remains consistent.

The results of comparison of maximum detected concentrations in groundwater to the human health screening levels are presented in [Table 7](#). Concentrations of nine of the detected constituents exceed at least one of the human health screening levels identified for groundwater. Four constituents (1,1-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride) were detected at the concentrations exceeding all of the three drinking water screening levels (i.e., Maximum Exposure Guideline [MEG], maximum contaminant limit [MCL], and Tapwater Regional Screening Level [RSL]). One constituent, 1,4-dioxane, exceeded both the MEG and Tapwater RSL; the MCL was not available for this constituent. In addition to these five constituents, four additional constituents (1,1-dichloroethane, 1,2-dichloroethane, chloroform, and cis-1,2-dichloroethene) were detected in groundwater at concentrations exceeding their Tapwater RSLs. Furthermore, the maximum concentrations of four constituents (chloroform, tetrachloroethene, trichloroethene and vinyl chloride) exceed the groundwater screening levels for protection of indoor air.

### Pore Water

A total of 8 VOCs (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, chloroethane, chloromethane, cis-1,2-dichloroethene, vinyl chloride and xylene [total]) and 1,4-dioxane were detected in pore water samples at various depths ([Table 8](#)). The locations and concentrations of the pore water samples detections are also shown on [Figure 3](#) and summarized as follows:

- **North of Confluence (Merriconeag Stream)** – Only two of the VOCs (1,2-dichloroethane and chloroethane) and 1,4-dioxane were detected in samples collected in this area.
  - [GSI-03](#) – 1,4-dioxane was detected at both shallow and intermediate depths.
  - [GSI-04](#) – 1,4-dioxane was detected at both shallow and intermediate depths. Chloroethane was detected at both shallow and intermediate depths, but 1,2-dichloroethane was detected at only the intermediate depth.
- **Confluence (Mere Brook & Merriconeag Stream)** – Six VOCs (1,1-dichloroethane, chloroethane, chloromethane, cis-1,2-dichloroethene, vinyl chloride and total xylene) and 1,4-dioxane were detected in samples collected in the confluence area.
  - [GSI-05](#) – Cis-1,2-dichloroethene and 1,4-dioxane were detected at all three sample depths. 1,1-dichloroethane and vinyl chloride were only detected in the intermediate sample. Chloroethane was only detected in the deep sample.
  - [GSI-06](#) – 1,4-Dioxane were detected at all three sample depths. Chloromethane was only detected in the shallow sample. Total xylene was only detected in the intermediate and deep samples.
  - [GSI-07](#) – 1,4-Dioxane were detected at all three sample depths. 1,1-Dichloroethane was only detected in the deep sample

- GSI-08 – 1,4-Dioxane were detected at all three sample depths. Chloroethane was only detected in the deep sample.
- **West of Confluence (Mere Brook)** – Only 1,4-dioxane was detected in the intermediate sample depth at GSI-12.
- **South of Confluence (Mere Brook)** – Only two of the VOCs (1,1-dichloroethene and chloroethane) and 1,4-dioxane were detected in samples collected at GSI-14. 1,1-dichloroethene and chloroethane were both only detected in the intermediate sample depth. Whereas, 1,4-dioxane was detected in samples from both the shallow and intermediate depths.

**Figure 3** also presents the porewater sample results observed during the 2010 GSI Investigation. In general, the concentrations of common detected constituents between November 2010 and September 2011 in pore water (1,1-dichloroethane, 1,4-dioxane, chloroethane, cis-1,2-dichloroethene and vinyl chloride) were similar. While the maximum concentration of two of these constituents were slightly lower in 2011 (1,1-dichloroethane and vinyl chloride), the other three were slightly higher during the Supplemental GSI Investigation. However, the overall results of screening comparisons to ecological screening levels<sup>5</sup> in terms of the locations of exceedances and chemicals exceeding screening levels remains consistent.

### Surface Water and Sediment

In 2010, three VOCs (acetone, carbon disulfide, and chloroform) were detected in sediment, and 1,4-dioxane was detected surface water. However, there were no detections of VOCs or 1,4-dioxane in any of the surface water or sediment samples collected during the September 2011 Investigation (**Attachment C**). All surface water and sediment sample locations and concentrations are presented on **Figure 4**. For 2011 sediment samples, the TOC levels were fairly low at the sampled GSI stations, with concentrations ranging from 0.24 (GSI-07) to 1.67 (GSI-08) percent (**Table 6**). These TOC levels were within the range observed during the November 2010 GSI Investigation (**Attachment A**). The grain size analysis indicated that the sediment in the study area are primarily comprised of sand (at least 74.9 percent or more in each sample). The dominance of sand was also the primary observation recorded during the visually characterization of each sediment core and is considered conducive to potential increased communication with shallow groundwater. There was far less of the other primary grain size fractions in these samples, with the percent gravel ranging from 0.04 (GSI-08) to 2.3 (GSI-06) and the percent silt/clay/colloid ranging from 5.6 (GSI-08) to 24.8 (GSI-12).

<sup>5</sup> The primary source of these screening values for this report was again the Region 3 Biological Technical Assistance Group (BTAG) (EPA, 2006b). If BTAG Region 3 values were not available, EPA Region 4 values (EPA, 2001) were used. Furthermore, for the November 2010 GSI Investigation Report, there was not value for 1,4-dioxane. However, the lowest effect level reported in USEPA's ECOTOX database (<http://cfpub.epa.gov/ecotox/>) for relevant aquatic biota (fish and amphipods) was used.

## DQO 2 – Potential Risks

### Ecological Risk Evaluation

None of the detected constituents in pore water exceeded screening values when one was available (**Table 8**). There were no detections in other ecologically-relevant media (surface water [**Table 9**] and sediment [**Table 10**]). Therefore, no unacceptable risks are expected for aquatic receptors based on the presence of and potential exposure to these constituents. However, no screening value was available to evaluate the detections of chloroethane in pore water. Therefore, potential risks to aquatic biota could not be evaluated for this constituent. Even though the presence of this constituent represents a potential for exposure risks, there is uncertainty regarding this potential. Based on the volatile nature of these constituents, aquatic receptor exposures are expected to be minimal after discharge at the GSI.

### Human Health Risk Evaluation

As discussed in the previous section, several chlorinated VOCs and 1,4-dioxane were detected in groundwater at concentrations exceeding at least one of the human health screening levels identified for groundwater. As observed during the November 2010 GSI Investigation, many of these screening level exceedances were observed on the eastern/southeastern edge of the Eastern Plume and the confluence of Merriconeag Stream and Mere Brook (**Table 8; Figure 3**). While the maximum detected concentrations of many of the chlorinated VOCs were observed near the confluence of the two streams (i.e., GSI-04, PZB3A [GSI-06] and PZ01A [GSI-07]), the maximum detected concentration of 1,4-dioxane was observed at GSI-14 which is in Mere Brook south of Merriconeag Stream/Mere Brook confluence, and at the southeastern edge of the Eastern Plume. Although detected concentrations of various constituents exceeded their drinking water standards and indoor air groundwater screening levels (IA GWSLs), this does not necessarily indicate current risk concerns because the Eastern Plume groundwater is not currently used as a drinking water supply and no buildings are currently present in the vicinity of the Eastern Plume. These conditions are not expected to change in the foreseeable future. Should these conditions change in the future (e.g., potable use of site groundwater and/or construction of buildings), further investigation of the exposure pathways is recommended.

No constituents were detected in surface water (**Table 9**) or sediment (**Table 10**). Because of the lack of detections in these exposure media and also the nature of potential human exposures to sediment and surface water in the water body (i.e., short duration and infrequent nature), the direct exposures to these exposure media were concluded not to pose unacceptable risks to potential human receptors (i.e., recreators and trespassers). Additionally, the indirect exposures to site-related constituents through the ingestion of fish pathway were also concluded not to pose unacceptable risk to potential angler. Further, the narrow and shallow characteristics of the streams adjacent to the site also would likely limit the potential for anglers to fish at suspected plume discharge areas.

## DQO 3 – Assessment of Natural Degradation

This assessment of natural attenuation follows EPA guidelines for evaluation (EPA, 1998). This evaluation is an update to the analysis completed for the initial GSI investigation in the November 2010 GSI Investigation (Agviq-CH2M HILL, 2011) and focuses on the potential

biodegradation of chlorinated solvents detected at the site. The CSM for the study area is well established from previous reports and will be revised based on new information gathered during the investigation. This evaluation of natural attenuation is not being presented as a remedial solution for the contamination at the site, but rather to determine if degradation is removing the constituents from the groundwater prior to discharging into Mere Brook and Merriconeag Stream at the GSI.

### Temporal Comparison

Comparison of the data collected from the current sampling event and data collected in November of 2011 shows an overall comparable level of contamination. There is no discernable increasing or decreasing trend. 1,4-dioxane was detected in 19 of 20 pore water samples (the only sample in which it was not detected was the shallow sample at GSI-12; [Table 8](#)). Of these detections, eight increased and eight decreased with an average increase of 40 percent and an average decrease of 34 percent. Pore water VOC detections do not exhibit a significant trend either way, but there were additional detections of breakdown products such as vinyl chloride, cis- 1,2-dichloroethene at low levels from within four additional pore water sample locations including GSI-04, -05, -07 and -14 that were previously undetected. The concentrations of 1,4-dioxane in shallow groundwater appear to have decreased since November 2010; concentrations in samples from six piezometers (PZ01A, PZB3A, PZGSI-04, PZC3A, PZ-GSI-12 and PZB4A) were declining with an average decrease of 45 percent, while one piezometer (PZ-GSI-14) increased and another (PZ-GSI-3) was non-detect. Additional, shallow groundwater VOC detections did not show a discernable trend from November 2010 and September 2011, with four wells exhibiting increased concentrations and three wells exhibiting decreasing concentrations.

The September 2011 pore water sample results are comparable with those from November 2010, but any minor differences could be related to the need for re-installation of the well point samples for the Supplemental GSI Investigation. The difference in rainfall conditions between the 2010 and 2011 studies ([Attachment B](#)) does not appear to have influenced the results as there is very little difference in the overall mass of contamination in the shallow sampling zones, including results for 1,4-dioxane. There are overall more detections of breakdown products in pore water samples in 2011, but this is not believed to have been related to the differences in rainfall between 2010 and 2011. Groundwater data with upland groundwater contamination were not available for comparison in for this report.

Although the comparisons between 2010 and 2011 results do not show a consistently decreasing trend, the overall site conditions suggest a long-term decreasing trend in groundwater contamination when also considering the 2005 and 2009 investigations. Data from these older investigations were previously discussed in the November 2010 GSI Investigation Report (Agviq-CH2MHILL, 2011).

### Constituents of Concern

The September 2011 pore water and shallow groundwater (piezometer) sampling results have continued to show that chlorinated solvents are being degraded throughout the study area in shallow sediments and that 1,4-dioxane does not typically undergo significant biodegradation under ambient conditions. The following subsections discuss these observations in more detail for each constituent of concern (COC). The COCs are specified

for the groundwater media; however, the same COCs are evaluated for other media for consistency.

### *Chlorinated Solvents*

The most recent data were evaluated in the same way that the previous data were with an evaluation of anaerobic biodegradation via reductive dechlorination using the technical protocol for analyzing natural attenuation of chlorinated solvents in groundwater. The current understanding of the CSM suggests that groundwater is flowing from the deep aquifer where it is contaminated with trichloroethene and other chlorinated solvents, up through the shallow aquifer where it eventually discharges into the surface water at the GSI. Groundwater samples were collected and analyzed from several areas throughout this potential migration pathway.

The November 2010 study showed that trichloroethene is present in the deep groundwater and as it migrates to the shallow groundwater, the mass of contaminants shifts to degradation products such as cis-1,2-dichloroethene and vinyl chloride, and by the time the water migrates to the GSI, the contaminants are fully attenuating (AGVIQ-CH2MHILL, 2011). This is shown in particular at GSI-05 (**Figure 5**). Trichloroethene was detected at a level of 43 ug/L in the shallow piezometer PZ-MB-B3A (**Table 7**) and although there is a detection of cis-1,2-dichloroethene 0.99 ug/L in the most shallow pore water zone (2 to 8 inches; **Table 8**) the mass of VOCs is nearly attenuated. This is the only detection of a chlorinated solvent breakdown product that has been seen in the area of the confluence. The results of pressure readings in September 2011 show that a similar area around GSI-05 has a relatively substantial upwelling condition (**Table 4**). Sampling station GSI-03 also shows a strong upwelling gradient at the depths sampled, while GSI-06 and GSI-07 show some minimal upward pressure. The upwelling condition at GSI-05 was the greatest observed in the study area and suggests strong communication with the aquifer and the stream at the GSI, at least at the time of sampling in September 2011.

### *Chloroethane*

Chloroethane is a further breakdown product that is most often associated with the degradation of 1,2-dichloroethane or 1,1-dichloroethane, but is also known to be generated with the breakdown of vinyl chloride in a reducing environment (EPA, 1998). The presence of chloroethane is evidence that chlorinated solvents are breaking down rather than being diluted or flushed out of groundwater into the stream.

### *1,4-Dioxane*

**Figure 3** shows the spatial distribution of 1,4-dioxane in the study area for both pore water and groundwater samples. This map shows that 1,4-dioxane has been detected throughout the study area and in pore water samples. Levels of 1,4-dioxane have decreased throughout the study area since the fall of 2010. In addition, 1,4-dioxane decreases as the groundwater approaches the GSI. These reduced levels might be explained by dilution and dispersion and not necessarily by biodegradation processes. 1,4-Dioxane is known to be degraded by uptake from trees through phytovolatilization. The downward trending results from the 2011 investigation could indicate there was a period of increased 1,4-dioxane degradation that occurs during warmer periods, such as September 2011, due to increased photosynthetic activity. However, the decrease could also be due to effectiveness of the groundwater extraction and Hi POx treatment system or other processes not taken into account during this investigation.

### *Analysis of Conditions for Biodegradation*

Using new data from the September 2011 Supplemental GSI Investigation results, the evidence for biodegradation is stronger largely due to increased detections of chlorinated solvent breakdown products. Using the Preliminary screening for Anaerobic Biodegradation Process set forth by EPA (EPA, 1998), the study area presents “Strong evidence for anaerobic biodegradation (reductive dechlorination) of chlorinated organics”. The majority of wells score above 20 (strong evidence) or 15 to 20 (adequate evidence) for biodegradation with only two wells scoring below these categories. The data used to evaluate the natural attenuation are summarized in MNA results summary [Table 11](#) (groundwater) and [Table 12](#) (pore water), as well as water quality summary [Table 3](#) (pore water) and [Table 5](#) (groundwater). Pore water results show slightly lower scores but when considering the entire system it is apparent that significant biodegradation is occurring for VOCs.

### **DQOs 1C and 4 - Conceptual Site Model Refinements**

The results of this investigation do not change the basic understanding of the site-specific CSM. The following discussion, presented by DQO provides the rationale for this conclusion:

- **DQO 1C** – VOCs were again detected across the groundwater-to-stream transport pathway (shallow groundwater →pore water). Seven constituents (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,4-dioxane, chloroethane, cis-1,2-Dichloroethene and vinyl chloride) were detected in both groundwater and stream pore water. Analysis of contamination in the matrices of the flow channels show that there are site-related (Eastern Plume) groundwater discharge occurring in Mere Brook and Merriconeag Stream. However, the analysis of natural attenuation shows that the observed chlorinated solvents are degrading completely prior to reaching the GSI of Mere Brook and Merriconeag Stream, with 1,4-dioxane likely persisting all the way through the transport pathway.
- **DQO 4** – The geologic and hydrogeologic data collected and evaluated during the September 2011 Investigation, which included groundwater sampling, pore water sampling (as well as hydraulic pressure measures), sediment sampling (which also included sediment core characterization) and surface water sampling, suggest there are no changes to the CSM.

## **Summary and Conclusions**

The primary objective of the Supplemental GSI Investigation was to determine if seasonal variability has any impact on the results of the investigation that was completed in November 2010 and performed following a significant rain event. In September 2011, several site-related constituents related to the Eastern Plume (chlorinated solvents and 1,4-dioxane) were detected in samples from select media across of the plume-to-stream transport pathway (shallow groundwater →pore water), that were also detected in November 2010. Evidence collected to this investigation suggests that chlorinated solvents

present in the transport pathway degrade prior to upwelling at the GSI, while 1,4-dioxane persists into pore water. Despite being detected in surface water during the November 2010 GSI Investigation, 1,4-dioxane was not detected in surface water in September 2011.

In September 2011, these constituents were detected in groundwater at concentrations exceeding some human health risk-based screening levels (there were no detections in surface water or sediment). In general, the concentrations of detected constituents in groundwater decreased from those observed during the November 2010 GSI Investigation. However, the overall results of screening comparisons to human health screening levels in terms of the locations of exceedances and chemicals exceeding screening levels remained consistent. However, no unacceptable human health risks are expected under the current and foreseeable future exposure scenarios because the groundwater in the Eastern Plume is not currently being used as a drinking water supply and no buildings are currently present in the vicinity of the Eastern Plume. These conditions are not expected to change in the foreseeable future.

The concentrations of detected constituents that were in common between the November 2010 and the September 2011 events in pore water were consistent. While the maximum concentration of two of these constituents were slightly lower in 2011 (1,1-dichloroethane and vinyl chloride), the other three were slightly higher during the Supplemental GSI Investigation. However, the overall results of screening comparisons to ecological screening levels in terms of the locations of exceedances and chemicals exceeding screening levels remain consistent. Furthermore, none of the constituents detected in ecologically relevant media (pore water, sediment and surface water) exceeded available screening values. No screening values were available to evaluate other detected constituents in pore water, surface water and/or sediment (e.g., chloroethane). Aquatic receptor exposures are expected to be minimal following discharges at the GSI because of the volatile nature of these constituents. Therefore, based on the screening evaluation, no unacceptable risks are expected for aquatic receptors of Mere Brook or Merriconeag Stream.

The analysis of natural attenuation shows that the observed chlorinated solvents are degrading completely prior to reaching the GSI of Mere Brook and Merriconeag Stream. However, evidence suggests that 1,4-dioxane does not degrade within or prior to the GSI as readily as the other solvents and persists to the shallowest pore water locations. Adjacent samples of sediment and surface water collected during the 2011 Supplemental Investigation showed there were no detections of 1,4-dioxane, suggesting that it is attenuating from groundwater to surface water.

The difference in rainfall conditions between the 2010 and 2011 studies does not appear to have influenced the results as there is very little difference in the overall mass of contamination in the shallow sampling zones, including results for 1,4-dioxane, the most frequently detected constituent in both studies. There are overall more detections of breakdown products in pore water samples in 2011, but this is not believed to have been related to the differences in rainfall between 2010 and 2011.

The geologic and hydrogeologic conditions evaluated during this investigation, including subsurface borings logs, pressure gradient measurements, and analysis of contaminants in the transport pathway, support the existing CSM.

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## Tables

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**TABLE 1**  
 Physical Characterization Parameters for Sediment  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Medium	Location	Sample ID	Sample Depth	Sample Date	North of Confluence (Merriconeag Stream)	Confluence (Mere Brook & Merriconeag Stream)	West of Confluence (Mere Brook)	South of Confluence (Mere Brook)	Upgradient (Merriconeag Stream)	Upgradient (Mere Brook)
Groundwater	BN-B4A (GSI-08)	BN-B4A-0911	7-12 ft	9/22/2011		x				
		BN-B4A-D-0911	7-12 ft	9/22/2011						
	BN-PZ01A (GSI-07)	PZ01A-0911	7-12 ft	9/21/2011		x				
	BN-PZB3A (GSI-05)	PZB3A-0911	7-12 ft	9/21/2011		x				
	BN-PZC3A (GSI-06)	PZC3A-0911	7-12 ft	9/21/2011		x				
	BN-GSI-03	BN-PZ-GSI-03-10-0911	4.2-9.2 ft	9/20/2011	x					
	BN-GSI-04	BN-PZ-GSI-04-10-0911	3.6-8.6 ft	9/22/2011	x					
	BN-GSI-12	BN-PZ-GSI-12-10-0911	6.7-11.7 ft	9/20/2011			x			
BN-GSI-14	BN-PZ-GSI-14-10-0911	4.8-9.8 ft	9/20/2011				x			
Porewater	BN-GSI-03	BN-PW-GSI-03-02-0911	2-8 in	9/20/2011	x					
		BN-PW-GSI-03-08-0911	8-14 in	9/20/2011						
	BN-GSI-04	BN-PW-GSI-04-02-0911	2-8 in	9/22/2011	x					
		BN-PW-GSI-04-08-0911	8-14 in	9/22/2011						
	BN-GSI-05	BN-PW-GSI-05-02-0911	2-8 in	9/21/2011						
		BN-PW-GSI-05-08-0911	8-14 in	9/21/2011		x				
		BN-PW-GSI-05-08-D-0911	8-14 in	duplicate						
	BN-GSI-06	BN-PW-GSI-05-14-0911	14-24 in	9/21/2011						
		BN-PW-GSI-06-02-0911	2-8 in	9/21/2011						
		BN-PW-GSI-06-02-D-0911	2-8 in	duplicate		x				
	BN-GSI-07	BN-PW-GSI-06-08-0911	8-14 in	9/21/2011						
		BN-PW-GSI-06-14-0911	14-24 in	9/21/2011						
		BN-PW-GSI-07-02-0911	2-8 in	9/21/2011		x				
	BN-GSI-08	BN-PW-GSI-07-08-0911	8-14 in	9/21/2011						
		BN-PW-GSI-07-14-0911	14-24 in	9/21/2011						
		BN-PW-GSI-08-02-0911	2-8 in	9/21/2011		x				
BN-GSI-12	BN-PW-GSI-08-08-0911	8-14 in	9/22/2011							
	BN-PW-GSI-08-14-0911	14-24 in	9/21/2011							
	BN-PW-GSI-12-02-0911	2-8 in	9/20/2011			x				
		BN-PW-GSI-12-08-0911	8-14 in	9/20/2011						

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Medium	Location	Sample ID	Sample Depth	Sample Date						
					North of Confluence (Merriconeag Stream)	Confluence (Mere Brook & Merriconeag Stream)	West of Confluence (Mere Brook)	South of Confluence (Mere Brook)	Upgradient (Merriconeag Stream)	Upgradient (Mere Brook)
Porewater	BN-GSI-14	BN-PW-GSI-14-02-0911	2-8 in	9/20/2011				X		
		BN-PW-GSI-14-08-0911	8-14 in	9/20/2011						
Sediment	SD-GSI-03	BN-SD-GSI-03-00-0911	1-6 in	9/21/2011	X					
	SD-GSI-06	BN-SD-GSI-06-00-0911	1-6 in	9/21/2011		X				
		BN-SD-GSI-06-00-D-0911	1-6 in	duplicate						
	SD-GSI-07	BN-SD-GSI-07-00-0911	1-6 in	9/21/2011		X				
	SD-GSI-08	BN-SD-GSI-08-00-0911	1-6 in	9/21/2011		X				
	SD-GSI-12	BN-SD-GSI-12-00-0911	1-6 in	9/21/2011			X			
	SD-GSI-14	BN-SD-GSI-14-00-0911	1-6 in	9/22/2011				X		
Surface Water	BN-SW-17	BN-SW-17-00-0911	<1 in	9/20/2011					X	
	BN-SW-18	BN-SW-18-00-0911	<1 in	9/21/2011						X
	PW-GSI-03	BN-SW-GSI-03-00-0911	<1 in	9/20/2011	X					
	SW-GSI-06	BN-SW-GSI-06-00-0911	<1 in	9/21/2011		X				
		BN-SW-GSI-06-00-D-0911	<1 in	duplicate						
	SW-GSI-07	BN-SW-GSI-07-00-0911	<1 in	9/21/2011		X				
	SW-GSI-08	BN-SW-GSI-08-00-0911	<1 in	9/21/2011		X				
	SW-GSI-12	BN-SW-GSI-12-00-0911	<1 in	9/20/2011			X			
SW-GSI-14	BN-SW-GSI-14-00-0911	<1 in	9/20/2011				X			

**TABLE 2**

Water Quality Parameters Measured During Surface Water Sampling

2011 Supplemental GSI Investigation

Naval Air Station Brunswick, Brunswick, Maine

Area	Station ID	Sample Time	Sample Date	Temperature (°C)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	pH
North of Confluence (Merriconeag Stream)	GSI-03	15:53	9/20/11	15.9	0.127	7.06	32.6	3.99	6.94
Confluence (Mere Brook & Merriconeag Stream)	GSI-06	9:30	9/21/11	14.4	0.261	7.67	207.7	9.11	7.03
	GSI-07	11:11	9/21/11	16.8	0.19	8.6	52.9	16.9	7.32
	GSI-08	15:39	9/21/11	16.9	0.193	7.7	81.5	22.7	7.09
East of Confluence (Mere Brook)	GSI-12	13:02	9/20/11	14.2	0.214	9.45	204.9	4.17	7.12
South of Confluence (Mere Brook)	GSI-14	9:55	9/20/11	13.8	0.397	8.37	231.1	20.9	7.14
Upgradient (Merriconeag Stream)	SW-17*	16:00	9/20/11	15.2	0.109	8.35	67.5	2.8	6.98
Upgradient (Mere Brook)	SW-18*	15:45	9/21/11	15.0	0.157	9.68	69.1	4.9	6.77

**Notes:**

°C - degrees Celsius

mg/L - milligrams per liter

uS/cm - microSiemens per centimeter

DO - dissolved oxygen

ORP - oxidation-reduction potential

mV - millivolt

\* - Samples collected upgradient.

**TABLE 3**  
 Water Quality Parameters Measured During Pore Water Sampling  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Area	Station	Sample Date	Parameters collected compared to when sample was collected	Water Quality Measurements																							
				Surface Water (<2")						Shallow Pore Water (2-8")						Intermediate Pore Water (8-14")						Deep Pore Water (14-26")					
				Conductivity (mS/cm)	Temp (°C)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Conductivity (mS/cm)	Temp (°C)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Conductivity (mS/cm)	Temp (°C)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Conductivity (mS/cm)	Temp (°C)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
North of Confluence (Merriconeag Stream)	GSI-03	09/20/11	before	0.127	15.89	6.94	7.06	32.6	3.99	0.940	15.48	6.1	3.6	71.2	157.0	0.075	15.49	5.83	6.64	173.3	193.0						
			after*																								
	GSI-04	09/22/11	before	0.126	15.94	6.76	6.59	26.3	10.5	0.216	16.23	6.46	3.36	-9	>1000	0.192	16.78	6.3	3.1	37.6	165						
			after																								
Confluence (Mere Brook & Merriconeag Stream)	GSI-05	09/21/11	before	0.269	13.66	7.13	8.88	217.3	4.78	0.194	16.96	6.84	6.5	51.5	964	0.171	17.37	6.22	2.83	27.7	>1000	0.144	17.68	6.44	7.68	51.4	182
			after																								
	GSI-06	09/21/11	before	0.261	14.41	7.03	7.67	207.7	9.11	0.171	11.84	6.77	4.53	233	120	0.224	16.69	6.52	4.0	47.1	16.4	0.229	17.04	6.43	2.01	59.3	431
			after																								
	GSI-07	09/21/11	before	0.190	16.77	7.12	8.6	52.9	16.9	0.184	17.88	6.34	3.6	28.9	>1000	0.188	16.77	6.13	3.62	48.6	176	0.181	16.93	6.12	2.47	69.1	>1000
			after																								
	GSI-08	09/21/11	before	0.193	16.90	7.09	7.7	81.5	22.7	0.210	16.65	6.37	3.4	26.5	204	0.359	16.65	6.37	3.62	228.1	188	0.164	16.63	6.16	2.4	30.1	800
			after																								
West of Confluence (Mere Brook)	GSI-12	09/20/11	before	0.214	14.21	7.12	9.45	204.9	4.17	0.163	14.74	7.02	7.52	184.7	4.13	0.153	13.81	6.32	3.83	54.8	48.5						
			after																								
South of Confluence (Mere Brook)	GSI-14	09/20/11	before	0.397	13.81	7.14	8.37	231.1	20.9	0.165	14.14	6.49	3.86	74.8	>1000	0.149	14.02	6.23	4.16	46.1	124						
			after																								

Notes:  
 °C - degrees Celsius  
 mS/cm - milliSiemens per centimeter  
 mV - millivolt  
 ORP - oxidation-reduction potential  
 TDS - total dissolved solids  
 mg/L - milligrams per liter  
 \* well went dry while collecting water quality

**TABLE 4**

Hydraulic Pressure Measurements  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Area	Station	Hydraulic Pressure Readings (centimeters of water)					Comment
		Date	Time	Pore Water Interval			
				Shallow (2-8")	Intermediate (8-14")	Deep (14-26")	
North of Confluence (Merriconeag Stream)	GSI-03	22-Sep-2011	315p	4 up	12 up	--	
Confluence (Mere Brook & Merriconeag Stream)	GSI-05	22-Sep-2011	250p	0 --	12 up	30 up	Shallow readings of 2 down and 2 up; pressure assumed equal
	GSI-06	22-Sep-2011	215p	2 down	1 up	1 up	
	GSI-07	22-Sep-2011	230p	5 up	2 up	2 up	
	GSI-08	22-Sep-2011	130p	0 --	0 --	1 down	

**Notes:**

- up - "upwelling" (GW to PW/SD to SW)
- down - "downwelling" (SW to SD/PW to GW)

**TABLE 5**  
 Low-Flow Groundwater Quality Parameters  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Area	Station ID	Sample ID	Sample Date	pH	Conductivity (mS/cm)	Temp (°C)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Purge Rate (L/min)	Pump Intake Depth (ft btoc)	Total Volume Purged (gallons)
North of Confluence (Merriconeag Stream)	GSI-03	BN-PZ-GSI-03-10*	9/20/11	6.57	0.089	14.37	47	4.72	157	0.3	8	1.0
	GSI-04	BN-PZ-GSI-04-10	9/22/11	7.03	0.749	12.92	61.9	0.52	5.81	0.4	11.0	3.4
Confluence (Mere Brook & Merriconeag Stream)	GSI-05 (PZ-MB-B3-A)	PZB3A-0911	9/21/11	6.46	0.241	14.00	54.2	0.95	3.32	0.3	9.0	1.0
	GSI-06 (PZ-MB-C3-A)	PZC3A-0911*	9/21/11	7.27	0.228	18.31	-62.2	2.56	32.3	0.3	10	0.25
	GSI-07 (PZ-MB-01-A)	PZ01A-0911	9/21/11	6.4	0.253	14.40	-2.6	0.15	4.9	0.25	8.5	2.6
	GSI-08 (PZ-MB-B4-A)	PZB4A-0911	9/22/11	6.14	0.121	14.42	2.3	0.28	0.83	0.25	10	2.8
West of Confluence (Mere Brook)	GSI-12	BN-PZ-GSI-12-10	9/20/11	6.49	0.122	12.11	-24.9	0.31	7.57	0.4	12.5	2.4
South of Confluence (Mere Brook)	GSI-14	BN-PZ-GSI-14-10	9/20/11	8.02	0.123	12.03	-109.4	0.21	10.3	0.4	11.0	4.6

**Notes:**

- mS/cm - milliSiemens per centimeter
- mV - millivolts
- mg/L - milligrams per liter
- NTU - nephelometric turbidity units
- L/min - liters per minute
- ft btoc - feet below top of casing

\*Monitoring well went dry before stabilization of water quality parameters therefore water quality parameters may not be representative of "stable" conditions.

**TABLE 6**  
 Physical Characterization Parameters for Sediment  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Area	Sample	Time	Date	% Moisture	% Total Organic Carbon	% Gravel	% Sand	% Silt, Clay, Colloids	Core Description
North of Confluence (Merriconeag Stream)	GSI-03	945	9/21/11	25.7	0.63	0.38	87.2	12.4	0-1.5"; silty sand, dark brown
									1.5-8"; dark brown (lighter than above), very sandy, drak streaking at 6"
Confluence (Mere Brook & Merriconeag Stream)	GSI-06	1030	9/21/11	23.1	0.96	2.3	89.2	8.4	0-2"; homogenous silty sand, drak brown
									2-4"; darker, silty sand with transitions to clay
									4-8"; transitions to brownish gray clay
	GSI-07	1320	9/21/11	25.5	0.24	0.31	90.6	9.1	0-0.25"; fluffy, silty fines
									0.25-2"; silty sand, dark brown
									2-6"; homogenous fine sand, light brown
GSI-08	1130	9/21/11	37.1	1.67	0.04	94.4	5.6	6-7"; clayey sand, light brown	
								7-9"; coarse sand, light brown	
								0-0.25"; fines, silt	
West of Confluence (Mere Brook)	GSI-12	1630	9/21/11	19.6	0.37	0.32	74.9	24.8	0.25-2"; silty sand, dark with dark streaks
									2-8"; homogenous silty sand, light brown
									0-4"; coarse sand, drak brown
									4-6"; silty clay sand, dark brown, some plant detritus
South of Confluence (Mere Brook)	GSI-14	830	9/22/11	28.7	0.33	0.33	91.4	8.3	6-8"; clayey sand, dark brown
									8-9"; sandy clay, gray
									0-0.5"; fluffy silt/debris
									0.5-3"; silty coarse sand, dark brown
									3-7"; coarse sand, light brown
									7-10"; dark, clayey sand with plant detritus

TABLE 7

Detected Constituents and Comparison to Human Health Screening Levels - Groundwater  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	North of Confluence (Merriconeag Stream)		Confluence (Mere Brook & Merriconeag Stream)					West of Confluence (Mere Brook)	South of Confluence (Mere Brook)	Minimum Detected Concentration	Maximum Detected Concentration	MEG <sup>2</sup>		MCL <sup>3</sup>		Tapwater RSL <sup>4,8</sup>		IA GWSL <sup>5</sup>	
	GSI-03	GSI-04	BN-PZB3A (GSI-05)	BN-PZC3A (GSI-06)	BN-PZ01A (GSI-07)	BN-B4A (GSI-08)		GSI-12	GSI-14			Concentration	Concentration	Exceed? <sup>7</sup>	Exceed? <sup>7</sup>	Exceed? <sup>7</sup>	Exceed? <sup>7</sup>		
	BN-PZ-GSI-03-10-0911	BN-PZ-GSI-04-10-0911	PZB3A-0911	PZC3A-0911	PZ01A-0911	BN-B4A-0911	BN-B4A-D-0911	BN-PZ-GSI-12-10-0911	BN-PZ-GSI-14-10-0911										
	4.2-9.2 (ft)	3.6-8.6 (ft)	7-12 (ft)	7-12 (ft)	7-12 (ft)	7-12 (ft)	7-12 (ft)	6.7-11.7 (ft)	4.8-9.8 (ft)										
9/20/2011	9/22/2011	9/21/2011	9/21/2011	9/21/2011	9/22/2011	9/22/2011	9/20/2011	9/20/2011											
1,1,1-Trichloroethane	0.55 U	78.4	17.6	0.55 U	2.8	0.55 U	0.55 U	0.55 U	0.55 U	2.8	78.4	10000	No	200	No	910	No	3100	No
1,1-Dichloroethane	0.33 U	25.3	8.8	49.6	18.7	16.5	18.2	0.33 U	18.5	8.8	49.6	60	No	NC	No	2.4	Yes	2200	No
1,1-Dichloroethene	0.8 U	51.4	17.9	39.5	5.6	8.7	9.1	0.8 U	7.8	5.6	51.4	40	Yes	7	Yes	34	Yes	190	No
1,2-Dichloroethane	0.44 U	1.2	0.44 U	1.4	0.44 U	0.44 U	0.44 U	0.44 U	0.83 J	0.83	1.4	4	No	5	No	0.15	Yes	2.3	No
1,4-Dioxane, SIM <sup>1</sup>	0.19 U	51.7	21	63.4	35.2	75.7	70.4	0.53 J	95.1	0.53	95.1	4	Yes	NC	No	0.67	Yes	NC	No
Chloroethane	0.32 U	0.32 U	0.32 U	0.32 U	0.86 J	0.32 U	0.32 U	0.32 U	0.32 U	0.86	0.86	7	No	NC	No	2100	No	2800	No
Chloroform	1.7	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	1.7	1.7	70	No	80	No	0.19	Yes	0.71	Yes
cis-1,2-Dichloroethene	0.69 U	11.6	6.1	6.1	4.4	4.6	4.7	1.5	0.69 U	1.5	11.6	20	No	70	No	7.3	Yes	210	No
Tetrachloroethene	0.36 U	5.9	8.8	0.36 U	0.36 U	0.36 U	0.36 U	0.77 J	0.36 U	0.77	8.8	0.6	Yes	5	Yes	0.11	Yes	0.55	Yes
Tetrachloroethene, SIM	0.1 U	4.9	7	0.25	0.34	0.1 U	0.1 U	0.68	0.1 U	0.25	7	0.6	Yes	5	Yes	0.11	Yes	0.55	Yes
Trichloroethene <sup>8</sup>	0.75 U	85.1	43	19.4	12.2	4.3	4.1	0.75 U	0.75 U	4.1	85.1	4	Yes	5	Yes	0.66	Yes	1.4	Yes
Vinyl chloride	0.82 U	0.82 U	0.82 U	3.2	3.5	2	2.8	0.82 U	0.82 U	2	3.5	0.2	Yes	2	Yes	0.016	Yes	0.15	Yes
Vinyl chloride, SIM	0.1 U	0.093	0.31	2.7	2.8	2.5	2.6	0.11	0.13	0.093	2.8	0.2	Yes	2	Yes	0.016	Yes	0.15	Yes

Notes:

- NC - No criteria/ho ecological screening available for the constituent.
- Concentrations are reported in units of ug/L
- Shaded concentrations indicate detections
- U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.
- J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.
- 1 - Analytical method was SW-846-8260-SIM (selective ion monitoring); PCE and VC were analyzed via both SIM and non-SIM methods, but 1,4-Dioxane was only analyzed via SIM methods
- 2 - Maine CDC Maximum Exposure Guidelines (MEG) for drinking water (2011).
- 3 - Federal Maximum Contaminant Levels (MCL).
- 4 - EPA Regional Screening Levels for Tapwater (06/2011) based on an excess lifetime cancer risk of 1x10<sup>-6</sup> and hazard quotient of 0.1.
- 5 - Draft guidance for evaluating the vapor intrusion to indoor air pathway from groundwater and soils (subsurface vapor intrusion guidance) (EPA, 2002).  
 The groundwater screening levels for protection of indoor air (IA GWSL) are based on an excess lifetime cancer risk of 1x10<sup>-6</sup> and hazard quotient of 1.  
 Risk-based IA GWSLs were calculated for the chemicals whose screening levels are defaulted to MCL in the EPA's document (Attachment I of Final Investigation Report: CH2M, 04/2011).
- 6 - Groundwater Remediation Goal - As defined in the ROD (ABB-ES, 1998) and Explanation of Significant Differences (Navy, 2010)
- \*\*Revised MEG recommended by the State of Maine on June 19, 1995 - These were used where applicable
- 7 - The maximum detected Concentrations were compared to the respective Human Health Screening Levels.
- 8 - TCE Tapwater RSL and IA GWSL were calculated based on the updated toxicity values published in September 2011 without Mutagenic Mode of Action (MMAO) adjustment (NAVFAC, 2011).  
 Note that when the MMAO adjustment is incorporated for the child receptor (e.g. day care), the calculated screening levels will be significantly more conservative.

**TABLE 8**  
 Detected Constituents and Comparison to Ecological Screening  
 Levels - Pore Water  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)		North of Confluence (Merriconeag Stream)				Confluence (Mere Brook & Merriconeag Stream)							
			GSI-03		GSI-04		GSI-05			GSI-06				
			Shallow <sup>3</sup>	Intermediate <sup>4</sup>	Shallow	Intermediate	Shallow	Intermediate		Deep <sup>5</sup>	Shallow		Intermediate	Deep
9/20/2011	9/20/2011	9/22/2011	9/22/2011	9/21/2011	9/21/2011	Duplicate	9/21/2011	9/21/2011	Duplicate	9/21/2011	9/21/2011			
1,1-Dichloroethane	47	EPA, 2006b	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.82 J	0.63 J	0.33 U	0.33 U	0.33 U	0.33 U	
1,1-Dichloroethene	25	EPA, 2006b	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	
1,2-Dichloroethane	100	EPA, 2006b	0.44 U	0.44 U	0.44 U	1.1	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	
1,4-Dioxane	22,740	ECOTOX <sup>1</sup>	0.76 J	0.72 J	10	66.3	2.6	5.8	6.9	9.3	0.88 J	0.19 U	3.3	2.7
Chloroethane	NC	--	0.32 U	0.32 U	9	48.4	0.32 U	0.32 U	0.32 U	1.3 J	0.32 U	0.32 U	0.32 U	0.32 U
Chloromethane	5,500	EPA, 2001	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	1.9 J	0.71 U	0.71 U
cis-1,2-Dichloroethene	590	EPA, 2006b <sup>2</sup>	0.69 U	0.69 U	0.69 U	0.69 U	0.99 J	2.7	2.7	1.5	0.69 U	0.69 U	0.69 U	0.69 U
Vinyl chloride	930	EPA, 2006b	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	1.1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Xylene (total)	13	EPA, 2006b	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.64 J	0.52 J

**Notes:**  
 NC - No criteria/no ecological screening available for the constituent.  
 Concentrations are reported in units of ug/L  
 Shaded concentrations indicate detections  
 U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - lowest effect level reported in USEPA's ECOTOX database (<http://cfpub.epa.gov/ecotox/>) for relevant aquatic biota (fish and amphipods)

2 - value for 1,2-Dichloroethene

3 - "Shallow" indicates a sampling interval from 2 to 8 inches

4 - "Intermediate" indicates a sampling interval from 8 to 14 inches

5 - "Deep" indicates a sampling interval from 14 to 26 inches

**TABLE 8**  
 Detected Constituents and Comparison to Ecological Screening  
 Levels - Pore Water  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)		Confluence (Mere Brook & Merriconeag Stream)						West of Confluence (Mere Brook)		South of Confluence (Mere Brook)	
			GSI-07			GSI-08			GSI-12		GSI-14	
			Shallow	Intermediate	Deep	Shallow	Intermediate	Deep	Shallow	Intermediate	Shallow	Intermediate
			9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/22/2011	9/21/2011	9/20/2011	9/20/2011	9/20/2011	9/20/2011
1,1-Dichloroethane	47	EPA, 2006b	0.33 U	0.33 U	0.49 J	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
1,1-Dichloroethene	25	EPA, 2006b	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2.2
1,2-Dichloroethane	100	EPA, 2006b	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,4-Dioxane	22,740	ECOTOX <sup>1</sup>	3.3	8	10	6.6	15.1	48	0.19 U	0.59 J	8.8	87.6
Chloroethane	NC	--	0.32 U	0.32 U	0.43 J	0.32 U	0.32 U	7.4	0.32 U	0.32 U	0.32 U	5.6
Chloromethane	5,500	EPA, 2001	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
cis-1,2-Dichloroethene	590	EPA, 2006b <sup>2</sup>	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Vinyl chloride	930	EPA, 2006b	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Xylene (total)	13	EPA, 2006b	0.32 U	0.32 U	0.32 U	0.55 J	0.32 U	0.61 J	0.32 U	0.32 U	0.32 U	0.32 U

**Notes:**  
 NC - No criteria/no ecological screening available for the constituent.  
 Concentrations are reported in units of ug/L  
 Shaded concentrations indicate detections  
 U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - lowest effect level reported in USEPA's ECOTOX database (<http://cfpub.epa.gov/ecotox/>) for relevant aquatic biota (fish and amphipods)

2 - value for 1,2-Dichloroethene

3 - "Shallow" indicates a sampling interval from 2 to 8 inches

4 - "Intermediate" indicates a sampling interval from 8 to 14 inches

5 - "Deep" indicates a sampling interval from 14 to 26 inches

TABLE 9

Analytical Results - Surface Water  
2011 Supplemental GSI Investigation  
Naval Air Station Brunswick, Brunswick, Maine

VOC	BN-SW-17	BN-SW-18	PW-GSI-03	SW-GSI-06		SW-GSI-07	SW-GSI-08	SW-GSI-12	SW-GSI-14	
	BN-SW-17-00-0911 9/20/2011	BN-SW-18-00-0911 9/21/2011	BN-SW-GSI-03-00-0911 9/20/2011	BN-SW-GSI-06-00-0911 9/21/2011	BN-SW-GSI-06-00-D-0911 9/21/2011	BN-SW-GSI-07-00-0911 9/21/2011	BN-SW-GSI-08-00-0911 9/21/2011	BN-SW-GSI-12-00-0911 9/20/2011	BN-SW-GSI-14-00-0911 9/20/2011	
1,1,1-Trichloroethane	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U
1,1,2,2-Tetrachloroethane	0.79	U	0.79	U	0.79	U	0.79	U	0.79	U
1,1,2-Trichloroethane	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U
1,1-Dichloroethane	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U
1,1-Dichloroethene	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
1,2-Dichloroethane	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U
1,2-Dichloropropane	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
1,4-Dioxane, SIM <sup>1</sup>	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
2-Butanone (MEK)	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U
2-Hexanone	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
4-Methyl-2-pentanone (MIBK)	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
Acetone	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Benzene	0.46	U	0.46	U	0.46	U	0.46	U	0.46	U
Bromodichloromethane	0.49	U	0.49	U	0.49	U	0.49	U	0.49	U
Bromoform	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
Bromomethane	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Carbon disulfide	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
Carbon tetrachloride	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U
Chlorobenzene	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U
Chloroethane	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U
Chloroform	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U
Chloromethane	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
cis-1,2-Dichloroethene	0.69	U	0.69	U	0.69	U	0.69	U	0.69	U
cis-1,3-Dichloropropene	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U
Dibromochloromethane	0.89	U	0.89	U	0.89	U	0.89	U	0.89	U
Ethylbenzene	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
Methylene chloride	0.99	U	0.99	U	0.99	U	0.99	U	0.99	U
Styrene	0.97	U	0.97	U	0.97	U	0.97	U	0.97	U
Tetrachloroethene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Tetrachloroethene, SIM	0.1	U	0.1	U	NA	U	0.1	U	0.1	U
Toluene	0.59	U	0.59	U	0.59	U	0.59	U	0.59	U
trans-1,2-Dichloroethene	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
trans-1,3-Dichloropropene	0.49	U	0.49	U	0.49	U	0.49	U	0.49	U
Trichloroethene	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Vinyl chloride	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U
Vinyl chloride, SIM	0.1	U	0.1	U	NA	U	0.1	U	0.1	U
Xylene (total)	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U

## Notes:

Concentrations are reported in units of ug/L

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

1 - Analytical method was SW-846-8260-SIM (selective ion monitoring); PCE and VC were analyzed via both SIM and non-SIM methods, but 1,4-Dioxane was only analyzed via SIM methods

TABLE 10  
Analytical Results - Sediment  
2011 Supplemental GSI Investigation  
Naval Air Station Brunswick, Brunswick, Maine

VOC	SD-GSI-03 BN-SD-GSI-03-00-0911 9/21/2011		SD-GSI-06 BN-SD-GSI-06-00-0911 9/21/2011		SD-GSI-07 BN-SD-GSI-07-00-0911 9/21/2011		SD-GSI-08 BN-SD-GSI-08-00-0911 9/21/2011		SD-GSI-12 BN-SD-GSI-12-00-0911 9/21/2011		SD-GSI-14 BN-SD-GSI-14-00-0911 9/22/2011	
		U		U		U		U		U		U
1,1,1-Trichloroethane	16	U	19	U	15	U	14	U	18	U	14	U
1,1,2,2-Tetrachloroethane	15	U	18	U	14	U	13	U	18	U	13	U
1,1,2-Trichloroethane	22	U	27	U	20	U	19	U	25	U	19	U
1,1-Dichloroethane	13	U	16	U	12	U	12	U	15	U	11	U
1,1-Dichloroethene	27	U	33	U	25	U	24	U	32	U	24	U
1,2-Dichloroethane	12	U	15	U	12	U	11	U	14	U	11	U
1,2-Dichloropropane	20	U	24	U	18	U	17	U	23	U	17	U
1,4-Dioxane	0.32	U	0.38	U	0.3	U	0.33	U	0.33	U	0.27	U
2-Butanone (MEK)	100	U	120	U	95	U	91	U	120	U	88	U
2-Hexanone	90	U	110	U	84	U	80	U	100	U	78	U
4-Methyl-2-pentanone (MIBK)	72	U	88	U	67	U	64	U	84	U	62	U
Acetone	99	U	120	U	92	U	89	U	120	U	86	U
Benzene	11	U	13	U	10	U	9.6	U	12	U	9.3	U
Bromodichloromethane	18	U	22	U	17	U	16	U	21	U	16	U
Bromoform	41	U	49	U	38	U	36	U	47	U	35	U
Bromomethane	58	U	71	U	54	U	52	U	67	U	50	U
Carbon disulfide	83	U	100	U	77	U	74	U	97	U	72	U
Carbon tetrachloride	19	U	24	U	18	U	17	U	22	U	17	U
Chlorobenzene	8	U	9.8	U	7.5	U	7.2	U	9.3	U	6.9	U
Chloroethane	22	U	27	U	21	U	20	U	26	U	19	U
Chloroform	13	U	16	U	12	U	11	U	15	U	11	U
Chloromethane	19	U	23	U	17	U	17	U	22	U	16	U
cis-1,2-Dichloroethene	23	U	28	U	22	U	21	U	27	U	20	U
cis-1,3-Dichloropropene	86	U	100	U	80	U	76	U	100	U	74	U
Dibromochloromethane	56	U	68	U	52	U	50	U	65	U	48	U
Ethylbenzene	11	U	14	U	10	U	9.9	U	13	U	9.6	U
Methylene chloride	31	U	38	U	29	U	28	U	36	U	27	U
Styrene	43	U	52	U	40	U	38	U	50	U	37	U
Tetrachloroethene	14	U	18	U	13	U	13	U	17	U	12	U
Toluene	15	U	19	U	14	U	14	U	18	U	13	U
trans-1,2-Dichloroethene	22	U	26	U	20	U	19	U	25	U	19	U
trans-1,3-Dichloropropene	59	U	72	U	55	U	52	U	68	U	51	U
Trichloroethene	17	U	21	U	16	U	15	U	19	U	14	U
Vinyl chloride	55	U	68	U	51	U	49	U	64	U	48	U
Xylene (total)	11	U	13	U	10	U	9.6	U	13	U	9.3	U

Notes:  
Concentrations are reported in units of ug/kg  
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

**TABLE 11**  
 Groundwater MNA Parameters Compared Against PILs  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Parameter	Units	Project Indicator Limits (PILs)	BN-PZ-GSI-03-10 11/18/2010 4.2-9.2 ft	BN-PZ-GSI-04-10 11/18/2010 3.6-8.6 ft	PZB3A-111810 11/18/2010 7-12 ft	PZC3A-111910 11/19/2010 7-12 ft	PZ01A-111810 11/18/2010 7-12 ft	PZB4A-111910 11/19/2010 7-12 ft	BN-PZ-GSI-12-10 11/21/2010 6.7-11.7 ft	BN-PZ-GSI-14-10 11/21/2010 4.8-9.8 ft
<b>Water Quality Parameters</b>										
Dissolved Oxygen (mg/L)	mg/L	<0.5 mg/L	4.72	0.52	0.95	2.56	0.15	0.28	0.31	0.21
pH		5<pH<9	6.57	7.03	6.46	7.27	6.4	6.14	6.49	8.02
ORP	mV	<50/<-100mV	47	61.9	54.2	-62.2	-2.6	2.3	-24.9	-109.4
Temperature	Deg C	>20 C	14.37	12.92	14.00	18.31	14.40	14.42	12.11	12.03
<b>GC Volatiles (SW846 8015)</b>										
Methane	ug/L	>500/<500	0.62	0.64	35.5	83	1010	822	67.4	15.6
Ethane	ug/L	>10	0.056	0.056	0.056	0.056	0.69	0.056	0.056	0.056
Ethene	ug/L	>100	0.075	0.075	0.075	0.35	1.3	0.65	0.075	0.075
<b>Metals Analysis</b>										
Iron	ug/L	>1,000	187	ND	44.8	51.1	2640	1530	6670	140
<b>General Chemistry</b>										
Nitrogen, Nitrate	mg/L	<1	0.11	0.69	0.41	0.17	0.25	0.11	0.54	ND
Sulfate	mg/L	<20	8.3	10.4	13.3	ND	ND	ND	5	ND
Total Organic Carbon	mg/L	>20	ND	ND	ND	ND	2.2	3.7	1.1	ND
Chloroethane	ug/L	Present	ND	ND	ND	ND	0.86	ND	ND	ND
1,1-Dichloroethane	ug/L	Present	ND	25.3	8.8	49.6	18.7	16.5	ND	18.5
1,2-Dichloroethane	ug/L	Present	ND	1.2	ND	1.4	ND	ND	ND	0.83
1,1-Dichloroethene	ug/L	Present	ND	51.4	17.9	39.5	5.6	8.70	ND	7.8
cis-1,2-Dichloroethene	ug/L	Present	ND	11.6	6.1	6.1	4.4	4.6	1.5	ND
Tetrachloroethene, SIM <sup>1</sup>	ug/L	Present	ND	4.9	7	ND	0.34	ND	0.68	ND
1,1,1-Trichloroethane	ug/L	Present	ND	78.4	17.6	ND	2.8	ND	ND	ND
Trichloroethene	ug/L	Present	ND	85.1	43	19.4	12.2	4.3	ND	ND
Vinyl chloride, SIM	ug/L	Present	ND	0.093	0.31	2.7	2.8	2.5	0.11	0.13
MNA Total Score			6	23	18	18	29	24	19	13

**Notes:**

- ug/L - micrograms per liter
- mg/L - milligrams per liter
- 0 to 5 - inadequate evidence for anaerobic biodegradation
- 6 to 14 - limited evidence for anaerobic biodegradation
- 14 to 20 - adequate evidence for anaerobic biodegradation
- >20 - strong evidence for anaerobic biodegradation
- 1 - Analytical method was SW-846-8260-SIM (selective ion monitoring); PCE and VC analyzed via both SIM and non-SIM methods; only SIM results used for MNA evaluation

TABLE 12

Pore Water MNA preliminary screening for individual wells  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

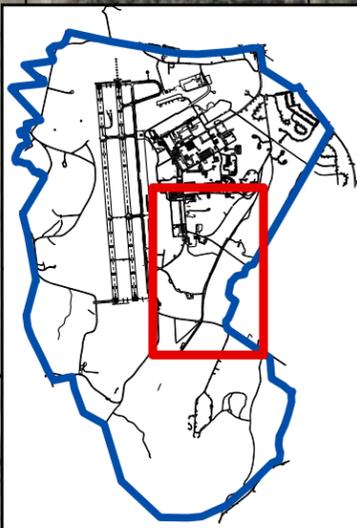
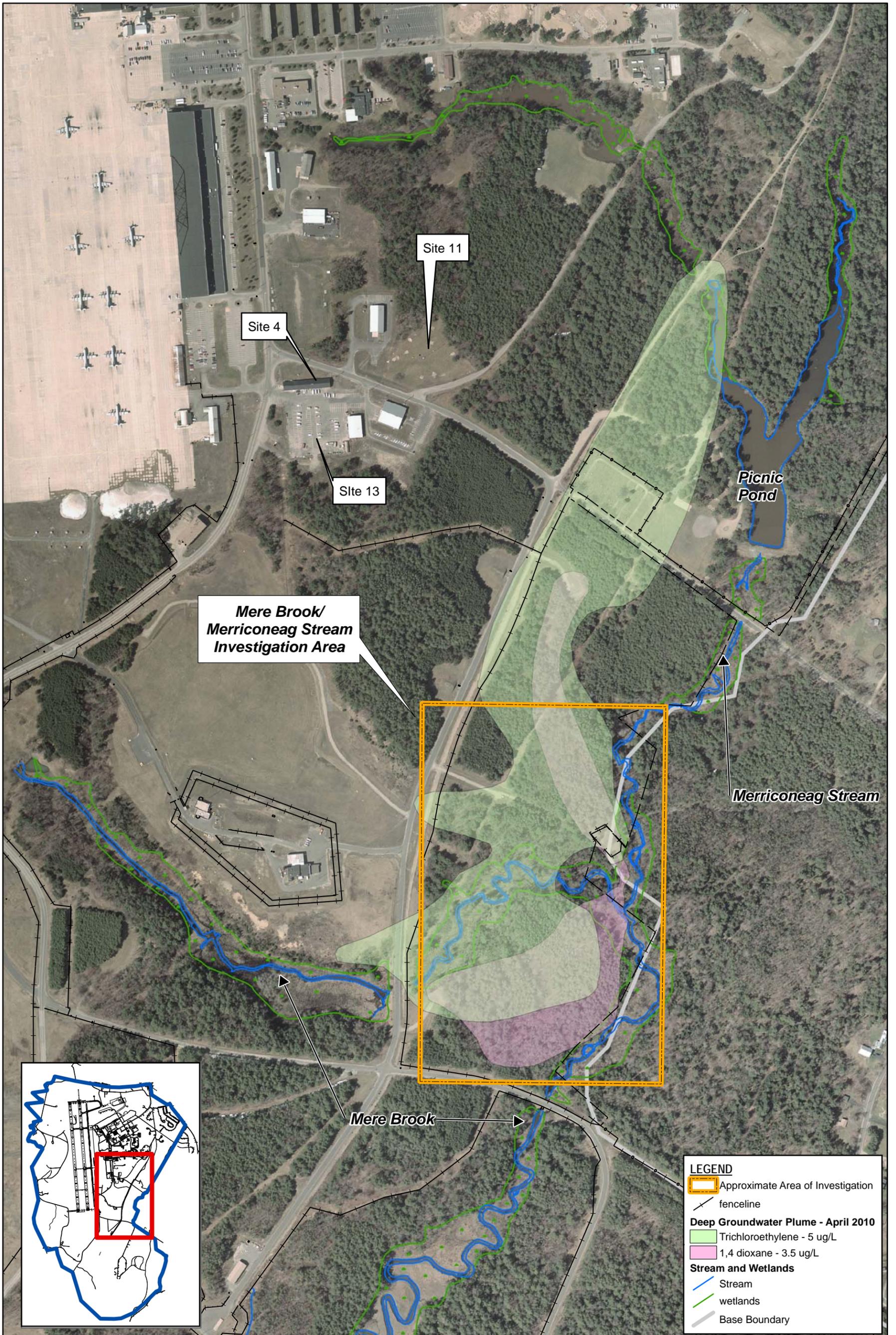
Parameter	Units	Project Indicator Limits (PILs)	BN-PW-GSI-03-02 11/19/2010 2-8	BN-PW-GSI-04-02 11/20/2010 2-8	BN-PW-GSI-05-02 11/20/2010 2-8	BN-PW-GSI-06-02 11/20/2010 2-8	BN-PW-GSI-07-02 11/20/2010 2-8	BN-PW-GSI-08-02 11/20/2010 2-8	BN-PW-GSI-12-02 11/20/2010 2-8	BN-PW-GSI-14-02 11/20/2010 2-8
<b>Water Quality Parameters</b>										
Dissolved Oxygen (mg/L)	mg/L	<0.5 mg/L	4.23 0	3.58 0	6.5 0	4.2 0	3.4 0	2.29 0	8.14 0	2.61 0
pH		5<pH<9	6.14 0	6.58 0	6.84 0	6.67 0	6.3 0	6.48 0	6.79 0	6.34 0
ORP	mV	<50/<-100mV	48.2 1	-33 2	51.5 0	-33 2	31.5 1	-33.9 2	146.6 0	14.4 1
Temperature	Deg C	>20 C	16.22 0	15.94 0	16.96 0	16.59 0	16.84 0	15.88 0	14.40 0	13.96 0
<b>GC Volatiles (SW846 8015)</b>										
Methane	ug/L	>500/<500	7.3 0	1170 3	372 0	531 3	1420 3	2880 3	37.7 0	1110 3
Ethane	ug/L	>10	ND 0	3.91 0	ND 0	ND 0	ND 0	0.079 0	ND 0	ND 0
Ethene	ug/L	>100	ND 0							
<b>Metals Analysis</b>										
Iron II	ug/L	>1,000	319 0	8290 3	1950 3	790 0	8490 3	10000 3	76.5 0	13300 3
<b>General Chemistry</b>										
Nitrogen, Nitrate	mg/L	<1	0.68 2	0.74 2	0.62 2	0.3 2	0.4 2	2.5 0	0.79 2	0.51 2
Sulfate	mg/L	<20	8.6 2	8.1 2	8.3 2	10.6 2	11.9 2	9.3 2	12.4 2	8.2 2
Total Organic Carbon	mg/L	>20	2.3 0	3.2 0	2.9 0	3.4 0	7.1 0	7.9 0	1.5 0	4.5 0
Chloroethane	ug/L	Present	ND 0	9 2	1.3 2	ND 0	0.43 2	ND 0	ND 0	5.6 2
Chloroform	ug/L	Present	ND 0							
1,1-Dichloroethane	ug/L	Present	ND 0	ND 0	0.82 2	ND 0	0.49 2	ND 0	ND 0	ND 0
cis-1,2-Dichloroethene	ug/L	Present	ND 0	ND 0	0.99 2	ND 0				
Vinyl chloride	ug/L	Present	ND 0	ND 0	1.1 2	ND 0				
<b>Total MNA Score</b>			5	14	15	9	15	10	4	13

Notes:

- ug/L - micrograms per liter
- mg/L - milligrams per liter
- 0 to 5 - inadequate evidence for anaerobic biodegradation
- 6 to 14 - limited evidence for anaerobic biodegradation
- 14 to 20 - adequate evidence for anaerobic biodegradation
- >20 - strong evidence for anaerobic biodegradation

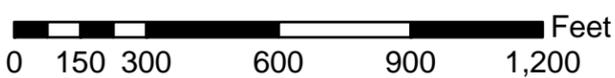
# Figures

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**LEGEND**

- Approximate Area of Investigation
- fenceline
- Deep Groundwater Plume - April 2010**
- Trichloroethylene - 5 ug/L
- 1,4 dioxane - 3.5 ug/L
- Stream and Wetlands**
- Stream
- wetlands
- Base Boundary



**Figure 1**  
 Mere Brook/Merriconeag Stream Investigation Area  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick  
 Brunswick, Maine

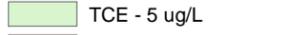
**Legend**

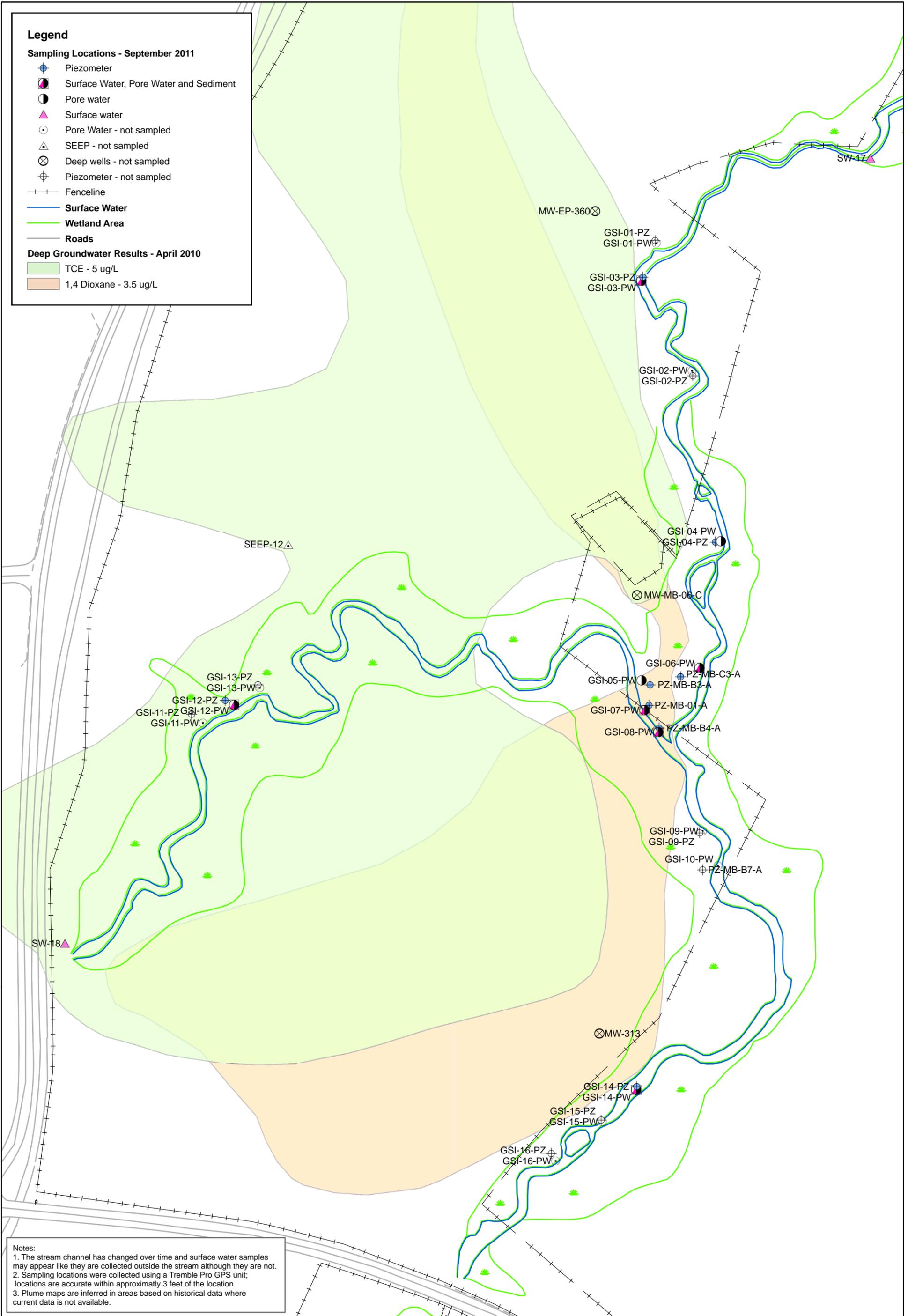
**Sampling Locations - September 2011**

-  Piezometer
-  Surface Water, Pore Water and Sediment
-  Pore water
-  Surface water
-  Pore Water - not sampled
-  SEEP - not sampled
-  Deep wells - not sampled
-  Piezometer - not sampled

-  Fenceline
-  Surface Water
-  Wetland Area
-  Roads

**Deep Groundwater Results - April 2010**

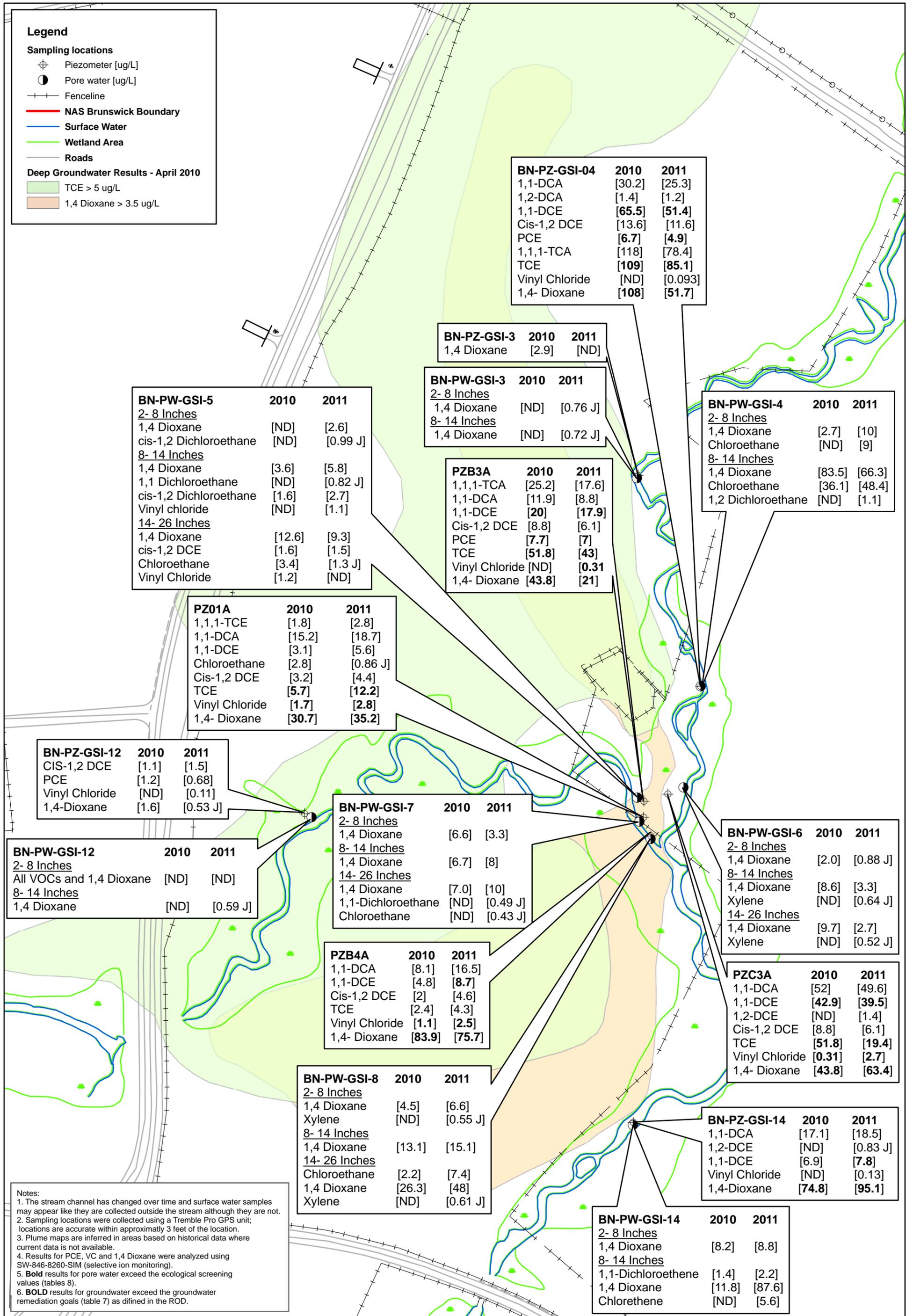
-  TCE - 5 ug/L
-  1,4 Dioxane - 3.5 ug/L

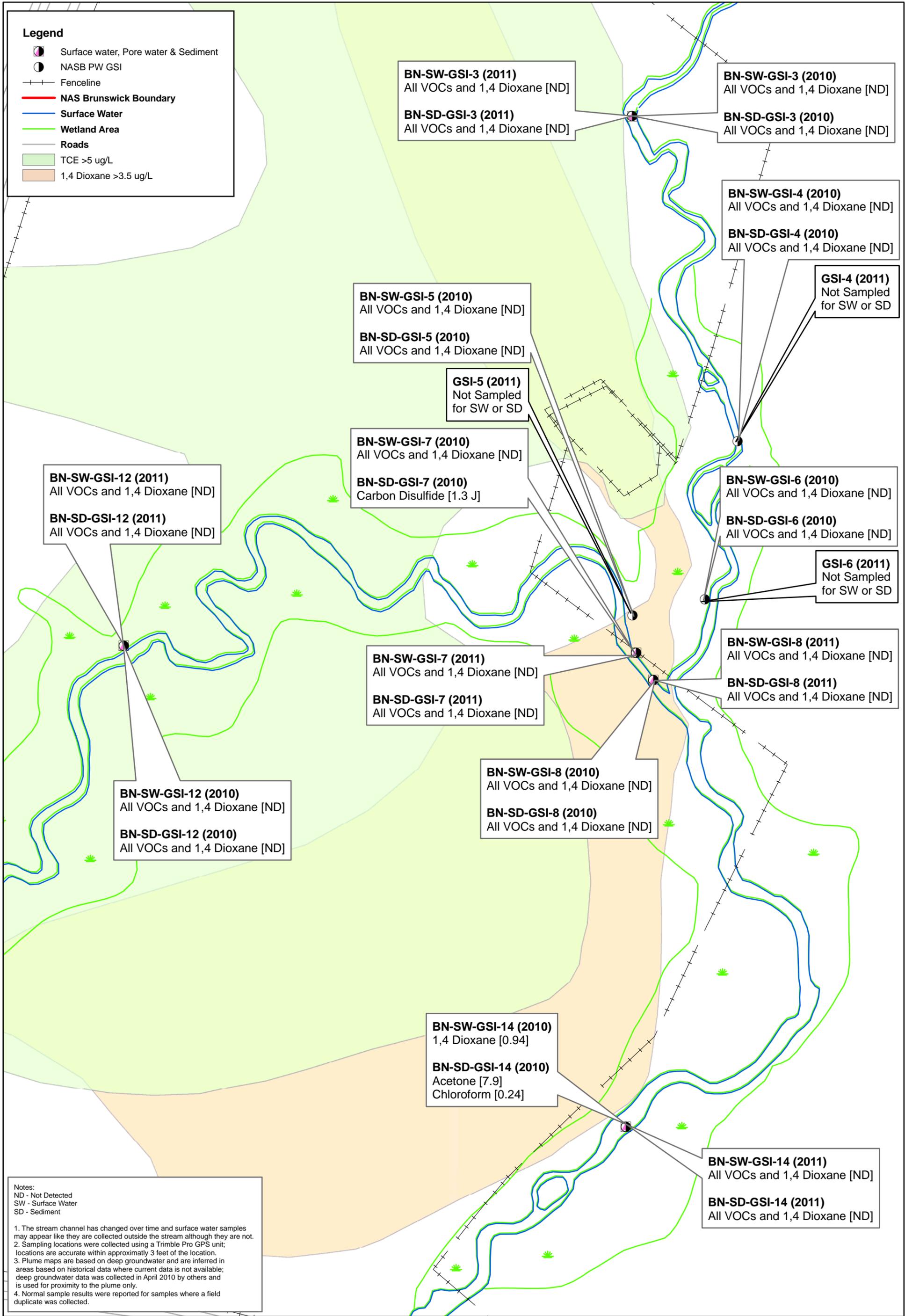


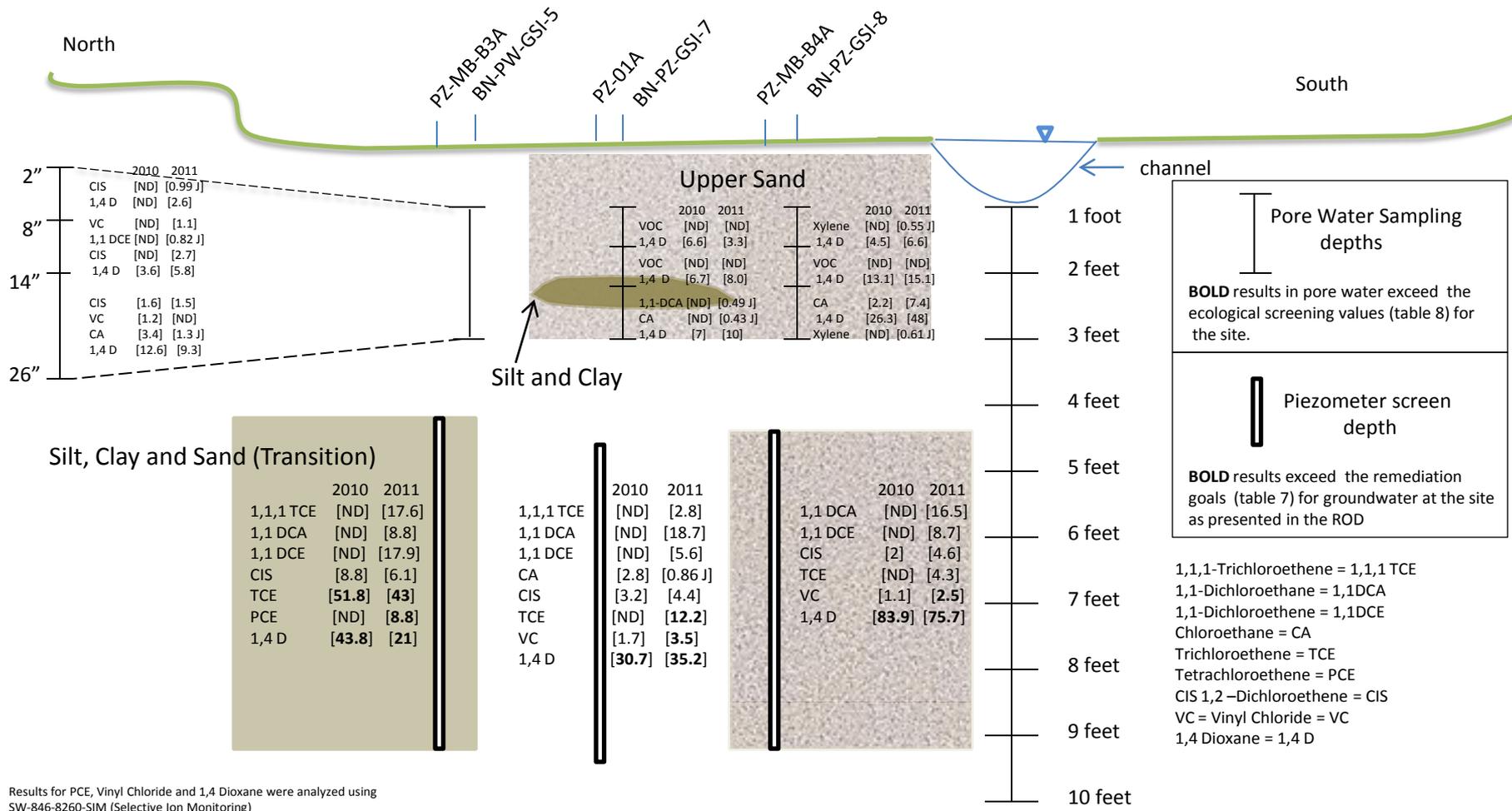
Notes:  
 1. The stream channel has changed over time and surface water samples may appear like they are collected outside the stream although they are not.  
 2. Sampling locations were collected using a Tremble Pro GPS unit; locations are accurate within approximately 3 feet of the location.  
 3. Plume maps are inferred in areas based on historical data where current data is not available.



**Figure 2**  
 Sampling Locations  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick  
 Brunswick, Maine







Results for PCE, Vinyl Chloride and 1,4 Dioxane were analyzed using SW-846-8260-SIM (Selective Ion Monitoring)

**Figure 5**  
 Confluence Area Cross Section  
 GSI Additional Sampling  
 Naval Air Station Brunswick  
 Brunswick, Maine

# Attachments

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**Attachment A**  
**2010 GSI Study Report Tables**

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TABLE 4-1

Detected Constituents - Groundwater

Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation

Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	MEG	MCL	RSL	IAMI SL	Groundwater Remediation Goal	BN-PZ-GSI-01-10 11/18/2010 5-10	BN-PZ-GSI-02-10 11/18/2010 3.8-8.8	BN-PZ-GSI-03-10 11/18/2010 4.2-9.2	BN-PZ-GSI-04-10 11/18/2010 3.6-8.6	BN-PZ-GSI-04-D- 11/18/2010 3.6-8.6	BN-GW-MW-EP- 11/19/2010 40-50	PZB3A-111810 11/18/2010 7-12	PZC3A-111910 11/19/2010 7-12	PZ01A-111810 11/18/2010 7-12							
<b>Volatile Organic Compounds (SW846 8260B)</b>																					
1,1,1-Trichloroethane	10000	200	910	3100	200	0.35	U	0.35	U	0.35	U	118	120	U	5.7	25.2	U	0.35	U	1.8	
1,1-Dichloroethane	60	NC	2.4	2200	5(70**)	0.63	U	0.63	U	0.63	U	30.2	31	U	20.4	11.9	U	52	U	15.2	
1,1-Dichloroethene	40	7	34	190	7	0.70	U	0.70	U	0.70	U	65.6	66.3	U	19.2	20	U	42.9	U	3.1	
1,2-Dichloroethane	4	5	0.15	2.3	NC	0.74	U	0.74	U	0.74	U	1.4	1.4	U	0.74	U	U	1.4	U	0.74	U
Carbon disulfide	600	NA	100	560	NC	0.35	U	0.35	U	0.35	U	0.35	U	U	0.35	U	U	0.35	U	0.35	U
Chloroethane	7	NA	2100	2800	NC	0.76	U	0.76	U	0.76	U	0.76	U	U	0.76	U	U	0.76	U	2.8	
Chloroform	70	80	0.19	0.71	NC	0.72	U	0.72	U	2	U	0.72	U	U	0.72	U	U	0.72	U	0.72	U
cis-1,2-Dichloroethene	70	70	7.3	210	70	0.66	U	0.66	U	0.66	U	13.6	14.1	U	3.6	8.8	U	4.5	U	3.2	
Tetrachloroethene	0.6	5	0.11	0.55	3	0.39	U	0.39	U	0.39	U	6.7	6.2	U	1.1	8.1	U	0.39	U	0.39	U
Trichloroethene	30	5	2	2.9	5	0.49	U	0.49	U	0.49	U	109	108	U	46.5	51.8	U	20.1	U	5.7	
Vinyl chloride	0.2	2	0.016	0.15	0.15	0.86	U	0.86	U	0.86	U	0.86	U	U	0.86	U	U	2.8	U	2.6	
<b>Volatile Organic Compounds (SW846 8260B BY SIM)</b>																					
1,4-Dioxane	30	NC	0.67	NC	3.5	2.9	U	0.39	U	0.39	U	108	85.7	U	62.7	43.8	U	112	U	30.7	
Tetrachloroethene	0.6	5	0.11	0.55	3	0.10	U	0.10	U	0.10	U	6	E	-	2.1	7.7	E	0.35	U	0.16	
Vinyl chloride	0.2	2	0.016	0.15	0.15	0.10	U	0.10	U	0.10	U	0.10	U	-	0.2	0.31	U	3.2	U	1.7	

Notes:

Concentrations are reported in units of ug/L.

NC - No screening criteria

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

UJ - Not detected; estimated quantitation limit.

\*\*Revised MEG recommended by the State of Maine on June 19, 1995 - These were used where applicable

MEG - Maine CDC Maximum Exposure Guideline for Drinking Water

MCL - Federal Maximum Contaminant Level

RSL - EPA Regional Screening Level for Tapwater (05/2010)

IAMI SL - Groundwater screening level for protection of indoor air was obtained from draft guidance for evaluating the vapor intrusion to indoor air pathway from groundwater and soils (subsurface vapor intrusion guidance (EPA, 2002). For those constituents whos vapor intrusion screening levels were defaulted to the MCL, the risk-based screening levels were calculated (Attachment E) based on an excess lifetime cancer risk of 10-5 and a hazard quotient of 1.

Groundwater Remediation Goal - As defined in the ROD (ABB-ES, 1998) and Explanation of Significant Differences (Navy, 2010)

TABLE 4-1

Detected Constituents - Groundwater  
Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	MEG	MCL	RSL	IAMI SL	Groundwater Remediation Goal	PZB4A-111910 11/19/2010 7-12	BN-PZ-GSI-09-10 11/21/2010 7.8-12.8	PZB7A-1112010 11/21/2010 7-12	BN-MW-MB-06-A 11/21/2010 5-15	BN-MW-MB-06-C 11/19/2010 40-50	BN-MW-MB-06-C- 11/19/2010 40-50	BN-PZ-GSI-11-10 11/19/2010 6.8-11.8	BN-PZ-GSI-12-10 11/21/2010 6.7-11.7	BN-PZ-GSI-13-10 11/21/2010 6.8-11.8							
<b>Volatile Organic Compounds (SW846 8260B)</b>																					
1,1,1-Trichloroethane	10000	200	910	3100	200	0.35	U	0.35	U	0.35	U	10.7	1.6	2	0.35	U	0.35	U	0.92	J	
1,1-Dichloroethane	60	NC	2.4	2200	5(70**)	8.1	U	0.98	J	8.6	U	4.2	9.4	8.8	0.63	U	0.63	U	0.63	U	
1,1-Dichloroethene	40	7	34	190	7	4.8	U	0.70	U	7.9	U	7.5	11.8	12.3	0.70	U	0.70	U	0.70	U	
1,2-Dichloroethane	4	5	0.15	2.3	NC	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U
Carbon disulfide	600	NA	100	560	NC	0.35	U	0.52	J	0.35	U	0.35	U	0.35	U	0.35	U	0.35	U	0.35	U
Chloroethane	7	NA	2100	2800	NC	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
Chloroform	70	80	0.19	0.71	NC	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U	0.72	U
cis-1,2-Dichloroethene	70	70	7.3	210	70	2	U	0.66	U	0.66	U	0.85	J	2.4	2.3	0.66	U	1.1	0.66	U	
Tetrachloroethene	0.6	5	0.11	0.55	3	0.39	U	0.39	U	0.39	U	0.39	U	2.8	3	0.39	U	1.2	2	U	
Trichloroethene	30	5	2	2.9	5	2.4	U	0.49	U	0.49	U	13.7	20.7	21.4	0.49	U	1	2.3	U		
Vinyl chloride	0.2	2	0.016	0.15	0.15	1.1	U	0.86	U	0.86	U	0.86	U	0.86	U	0.86	U	0.86	U	0.86	U
<b>Volatile Organic Compounds (SW846 8260B BY SIM)</b>																					
1,4-Dioxane	30	NC	0.67	NC	3.5	83.9	U	11.5	U	39.1	U	8.2	38.3	J	30.7	11.3	1.6	0.97	J		
Tetrachloroethene	0.6	5	0.11	0.55	3	0.10	U	-	-	-	-	2.6	2.7	0.13	0.13	0.10	U	-	-		
Vinyl chloride	0.2	2	0.016	0.15	0.15	1.1	U	-	-	-	-	0.14	0.13	0.10	U	0.10	U	-	-		

Notes:

Concentrations are reported in units of ug/L.

NC - No screening criteria

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

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\*\*Revised MEG recommended by the State of Maine on June 19, 1995 - These were used where applicable

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Groundwater Remediation Goal - As defined in the ROD (ABB-ES, 1998) and Explanation of Significant Differences (Navy, 2010)

TABLE 4-1

Detected Constituents - Groundwater  
Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	MEG	MCL	RSL	IAMI SL	Groundwater Remediation Goal	BN-PZ-GSI-14-10 11/21/2010 4.8-9.8	BN-PZ-GSI-15-10 11/21/2010 4.5-9.5	BN-PZ-GSI-16-10 11/21/2010 4.3-9.3	BN-GW-MW-313 11/19/2010 27-37	SEEP-12 11/19/2010 NA					
<b>Volatile Organic Compounds (SW846 8260B)</b>															
1,1,1-Trichloroethane	10000	200	910	3100	200	0.35	U	0.35	U	0.35	U	0.35	U		
1,1-Dichloroethane	60	NC	2.4	2200	5(70**)	17.1		0.63	U	0.63	U	20.5	0.63	U	
1,1-Dichloroethene	40	7	34	190	7	6.9		0.70	U	0.70	U	25.8	0.70	U	
1,2-Dichloroethane	4	5	0.15	2.3	NC	0.74	U	0.74	U	0.74	U	0.74	0.74	U	
Carbon disulfide	600	NA	100	560	NC	0.35	U	0.35	U	0.35	U	0.35	0.35	U	
Chloroethane	7	NA	2100	2800	NC	0.76	U	0.76	U	0.76	U	0.76	0.76	U	
Chloroform	70	80	0.19	0.71	NC	0.72	U	0.72	U	0.72	U	0.72	0.72	U	
cis-1,2-Dichloroethene	70	70	7.3	210	70	0.66	U	0.66	U	0.66	U	0.66	0.66	U	
Tetrachloroethene	0.6	5	0.11	0.55	3	0.39	U	0.39	U	0.39	U	0.39	0.39	U	
Trichloroethene	30	5	2	2.9	5	0.49	U	0.49	U	0.49	U	2.6	0.49	U	
Vinyl chloride	0.2	2	0.016	0.15	0.15	0.86	U	0.86	U	0.86	U	0.86	0.86	U	
<b>Volatile Organic Compounds (SW846 8260B BY SIM)</b>															
1,4-Dioxane	30	NC	0.67	NC	3.5	74.8		8.3		0.39	U	178	0.39	U	
Tetrachloroethene	0.6	5	0.11	0.55	3	-		-		-		0.10	U	0.10	U
Vinyl chloride	0.2	2	0.016	0.15	0.15	-		-		-		0.13		0.10	U

Notes:

Concentrations are reported in units of ug/L.

NC - No screening criteria

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

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\*\*Revised MEG recommended by the State of Maine on June 19, 1995 - These were used where applicable

MEG - Maine CDC Maximum Exposure Guideline for Drinking Water

MCL - Federal Maximum Contaminant Level

RSL - EPA Regional Screening Level for Tapwater (05/2010)

IAMI SL - Groundwater screening level for protection of indoor air was obtained from draft guidance for evaluating the vapor intrusion to indoor air pathway from groundwater and soils (subsurface vapor intrusion guidance (EPA, 2002). For those constituents whos vapor intrusion screening levels were defaulted to the MCL, the risk-based screening levels were calculated (Attachment E) based on an excess lifetime cancer risk of 10-5 and a hazard quotient of 1.

Groundwater Remediation Goal - As defined in the ROD (ABB-ES, 1998) and Explanation of Significant Differences (Navy, 2010)

TABLE 4-2

Comparison to Human Health Screening Levels - Groundwater  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Analyte	No. of Detection	No. of Non-detects	No. of Analysis	Frequency of Detection	Non-Detected Results		Detected Results			MEG <sup>1</sup>	MCL <sup>2</sup>	Tapwater RSL <sup>3</sup>	IA GWSL <sup>4</sup>	MaxDet Exceeds MEG?	MaxDet Exceeds MCL?	MaxDet Exceeds RSL?	MaxDet Exceeds IAVI?	
					Min	Max	Min	Max (MaxDet)	MaxDet Qualifier									MaxDet Sample ID
1,1,1-Trichloroethane	9	13	22	41%	0.35	0.35	0.92	120		GSI-04	10000	200	910	3100	N	N	N	N
1,1-Dichloroethane	14	8	22	64%	0.63	0.63	0.98	52		PZC3A-111910	60	NA	2.4	2200	N	--	Y	N
1,1-Dichloroethene	13	9	22	59%	0.7	0.7	3.1	66.3		GSI-04	40	7	34	190	Y	Y	Y	N
1,2-Dichloroethane	3	19	22	14%	0.74	0.74	1.4	1.4		GSI-04, GSI-04, PZC3A-111910	4	5	0.15	2.3	N	N	Y	N
Carbon disulfide	1	21	22	5%	0.35	0.35	0.52	0.52	J	GSI-09	600	NA	100	560	N	--	N	N
Chloroethane	1	21	22	5%	0.76	0.76	2.8	2.8		PZ01A-111810	7	NA	2100	2800	N	--	N	N
Chloroform	1	21	22	5%	0.72	0.72	2	2		GSI-03	70	80	0.19	0.71	N	N	Y	Y
cis-1,2-Dichloroethene	11	11	22	50%	0.66	0.66	0.85	14.1		GSI-04	70	70	7.3	210	N	N	Y	N
Tetrachloroethene	8	14	22	36%	0.39	0.39	1.1	8.1		PZB3A-111810	0.6	5	0.11	0.55	Y	Y	Y	Y
Trichloroethene	13	9	22	59%	0.49	0.49	1	109		GSI-04	30	5	2	2.9	Y	Y	Y	Y
Vinyl chloride	3	19	22	14%	0.86	0.86	1.1	2.8		PZC3A-111910	0.2	2	0.016	0.15	Y	Y	Y	Y
1,4-Dioxane (SIM)	19	3	22	86%	0.39	0.39	0.97	178		BN-GW-MW-313	30	NA	0.67	NC	Y	--	Y	--
Tetrachloroethene (SIM)	8	5	13	62%	0.1	0.1	0.13	7.7	E	PZB3A-111810	0.6	5	0.11	0.55	Y	Y	Y	Y
Vinyl chloride (SIM)	8	5	13	62%	0.1	0.1	0.13	3.2		PZC3A-111910	0.2	2	0.016	0.15	Y	Y	Y	Y

Notes:

Concentrations are reported in units of ug/L.

NA - not available

NC - Constituent is not sufficiently volatile to be a constituent of potential concern for the vapor intrusion pathway

SIM - chemical was analyzed using SW846 8260B BY SIM method.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1) Maine CDC Maximum Exposure Guidelines (MEG) for drinking water (2010).

2) Federal Maximum Contaminant Levels (MCL).

3) EPA Regional Screening Levels for Tapwater (11/2010) based on an excess lifetime cancer risk of  $1 \times 10^{-6}$  and hazard quotient of 0.1.

4) Draft guidance for evaluating the vapor intrusion to indoor air pathway from groundwater and soils (subsurface vapor intrusion guidance) (EPA, 2002).

The groundwater screening levels for protection of indoor air (IA GWSL) are based on an excess lifetime cancer risk of  $1 \times 10^{-6}$  and hazard quotient of 1.

Risk-based IA GWSLs were calculated for the chemicals whose screening levels are defaulted to MCL in the EPA's document (Attachment I).

**TABLE 4-3**

Detected Constituents and Comparison to Ecological Screening Levels - Pore Water  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)	North of Confluence (Merriconeag Stream)										
		GSI-01			GSI-02		GSI-03			GSI-04		
		Shallow <sup>1</sup>	Intermediate <sup>2</sup>		Shallow	Intermediate	Shallow		Intermediate	Shallow	Intermediate	
		11/19/2010	11/19/2010	duplicate	11/19/2010	11/19/2010	11/19/2010	duplicate	11/19/2010	11/20/2010	11/20/2010	
Chloroethane	NC	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	36.1
Chloroform	1.8	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
1,1-Dichloroethane	47	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
cis-1,2-Dichloroethene	590	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Vinyl chloride	930	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
1,4-Dioxane	NC	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	2.7	83.5	

Notes:

NC - No criteria/no ecological screening available for the constituent.

Concentrations are reported in units of ug/L.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - "Shallow" indicates a sampling interval from 2 to 8 inches

2 - "Intermediate" indicates a sampling interval from 8 to 14 inches

3 - "Deep" indicates a sampling interval from 14 to 26 inches

TABLE 4-3

Detected Constituents and Comparison to Ecological Screening Levels - Pore Water  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)	Confluence (Mere Brook & Merriconeag Stream)										
		GSI-05				GSI-06			GSI-07			
		Shallow	Intermediate		Deep <sup>3</sup>	Shallow	Intermediate	Deep	Shallow	Intermediate (Well-Point)	Intermediate (PushPoint)	Deep
		11/20/2010	11/20/2010	duplicate	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010
Chloroethane	NC	0.76 U	0.76 U	0.76 U	3.4	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	2	0.76 U
Chloroform	1.8	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
1,1-Dichloroethane	47	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
cis-1,2-Dichloroethene	590	0.66 U	0.66 U	0.66 U	1.6	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Vinyl chloride	930	0.86 U	0.86 U	0.86 U	1.2	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
1,4-Dioxane	NC	0.39 U	3.6	4.2	12.6	2	8.6	9.7	6.6	6.7	14.3	7

Notes:

NC - No criteria/no ecological screening available for the constituent.

Concentrations are reported in units of ug/L.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - "Shallow" indicates a sampling interval from 2 to 8 inches

2 - "Intermediate" indicates a sampling interval from 8 to 14 inches

3 - "Deep" indicates a sampling interval from 14 to 26 inches

TABLE 4-3

Detected Constituents and Comparison to Ecological Screening Levels - Pore Water  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)	Confluence (Mere Brook & Merriconeag Stream)											
		GSI-08				GSI-09				GSI-10			
		Shallow	Intermediate (Well-Point)	Intermediate (PushPoint)	Deep	Shallow	Intermediate	Deep		Shallow	Intermediate	Deep	
		11/20/2010	11/20/2010		11/20/2010	11/21/2010	11/21/2010	11/21/2010	duplicate	11/21/2010	11/21/2010	11/21/2010	
Chloroethane	NC	0.76 U	0.76 U	0.76 U	2.2	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Chloroform	1.8	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
1,1-Dichloroethane	47	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
cis-1,2-Dichloroethene	590	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Vinyl chloride	930	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
1,4-Dioxane	NC	4.5	13.1	22.3	26.3	5.6 J	6.5	6.7	17.7	2.5	3.5	12.2	

Notes:

NC - No criteria/no ecological screening available for the constituent.

Concentrations are reported in units of ug/L.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - "Shallow" indicates a sampling interval from 2 to 8 inches

2 - "Intermediate" indicates a sampling interval from 8 to 14 inches

3 - "Deep" indicates a sampling interval from 14 to 26 inches

TABLE 4-3

Detected Constituents and Comparison to Ecological Screening Levels - Pore Water  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

VOC	Ecological Screening Value (ug/L)	East of Confluence (Mere Brook)						South of Confluence (Mere Brook)					
		GSI-11		GSI-12		GSI-13		GSI-14		GSI-15		GSI-16	
		Shallow	Intermediate	Shallow	Intermediate	Shallow	Intermediate	Shallow	Intermediate	Shallow	Intermediate	Shallow	Intermediate
		11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/20/2010	11/21/2010	11/21/2010	11/20/2010	11/20/2010
Chloroethane	NC	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Chloroform	1.8	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
1,1-Dichloroethane	47	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	1.4	0.63 U	0.63 U	0.63 U	0.63 U
cis-1,2-Dichloroethene	590	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Vinyl chloride	930	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U
1,4-Dioxane	NC	0.39 U	-	0.39 U	0.39 U	0.39 U	0.39 U	8.2	11.8	3.1	47	0.39 U	0.39 U

Notes:

NC - No criteria/no ecological screening available for the constituent.

Concentrations are reported in units of ug/L.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1 - "Shallow" indicates a sampling interval from 2 to 8 inches

2 - "Intermediate" indicates a sampling interval from 8 to 14 inches

3 - "Deep" indicates a sampling interval from 14 to 26 inches

**TABLE 4-4**

Detected Constituents - Sediment

*Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation**Naval Air Station Brunswick, Brunswick, Maine*

VOC	North of Confluence (Merriconeag Stream)	Confluence (Mere Brook & Merriconeag Stream)			East of Confluence (Mere Brook)	South of Confluence (Mere Brook)
	GSI-03	GSI-07		GSI-08	GSI-12	GSI-14
	11/18/2010	11/18/2010	duplicate	11/18/2010	11/18/2010	11/18/2010
Acetone	7.2 U	5.4 U	6.5 U	8.1 U	5.0 U	7.9
Carbon disulfide	0.27 U	1.3 J	0.24 U	0.30 UJ	0.18 U	0.23 U
Chloroform	0.23 U	0.17 U	0.21 U	0.26 U	0.16 U	0.24

## Notes:

Concentrations are reported in units of ug/kg.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

UJ - Not detected; estimated quantitation limit.

Shaded concentrations indicate detections

**TABLE 4-5**

Comparison to Ecological and Human Health Screening Levels - Sediment  
*Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation*  
*Naval Air Station Brunswick, Brunswick, Maine*

Analyte	No. of Detection	No. of Non-detects	No. of Analysis	Frequency of Detection	Non-Detected Results		Detected Results				Human Health	
					Min	Max	Min	Max (MaxDet)	MaxDet Qualifier	MaxDet Sample ID	Residential Soil RSL <sup>1</sup>	MaxDet Exceeds RSL?
					Acetone	1	5	6	17%	5	8.1	7.9
Carbon disulfide	1	5	6	17%	0.18	0.3	1.3	1.3	J	GSI-07	82000	N
Chloroform	1	5	6	17%	0.16	0.26	0.24	0.24		GSI-14	290	N

Notes:

Concentrations are reported in units of ug/kg.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

1) USEPA Regional Screening Levels for Residential Soil (11/2010) based on an excess lifetime cancer risk of  $1 \times 10^{-6}$  and hazard quotient of 0.1.

**TABLE 4-6**

Detected Constituents - Surface Water

*Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation*

*Naval Air Station Brunswick, Brunswick, Maine*

VOC	North of Confluence (Merriconeag Stream)		Confluence (Mere Brook & Merriconeag Stream)		East of Confluence (Mere Brook)		South of Confluence (Mere Brook)
	GSI-03	SW-17	GSI-07	GSI-08	GSI-12	SW-18	GSI-14
	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010	11/16/2010
1,4-Dioxane	0.51 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.92 J

Notes:

Concentrations are reported in units of ug/L.

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

**TABLE 4-7**

Comparison to Human Health and Ecological Screening Levels - Surface Water  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Analyte	No. of Detection	No. of Non-detects	No. of Analysis	Frequency of Detection	Non-Detected Results		Detected Results			NRWQC <sup>1</sup>	Tapwater RSL <sup>2</sup>	MaxDet Exceeds NRWQC?	MaxDet Exceeds RSL?	
					Min	Max	Min	Max (MaxDet)	MaxDet Qualifier					MaxDet Sample ID
1,4-Dioxane (SIM)	2	6	8	25%	0.39	0.39	0.51	0.92	J	GSI-14	NA	0.67	--	Y

Notes:

Concentrations are reported in units of ug/L.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

NA - Not available

SIM - chemical was analyzed using SW846 8260B BY SIM method.

1) National Recommended Water Quality Criteria (NRWQC) consumption of water and organisms (USEPA, 2009).

2) USEPA Regional Screening Levels for Tapwater (11/2010) based on an excess lifetime cancer risk of  $1 \times 10^{-6}$  and hazard quotient of 0.1.

**TABLE 4-8**

Groundwater MNA Parameters Compared Against PILs  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	Units	Project Indicator Limits	BN-PZ-GSI-01-10 11/18/2010 5-10	BN-PZ-GSI-02-10 11/18/2010 3.8-8.8	BN-PZ-GSI-03-10 11/18/2010 4.2-9.2	BN-PZ-GSI-04-10 11/18/2010 3.6-8.6	BN-GW-MW-EP-360 11/19/2010 40-50	PZB3A-111810 11/18/2010 7-12	PZC3A-111910 11/19/2010 7-12	PZ01A-111810 11/18/2010 7-12	PZB4A-111910 11/19/2010 7-12	BN-PZ-GSI-09-10 11/21/2010 7.8-12.8	PZB7A-1112010 11/21/2010 7-12							
<b>GC Volatiles (SW846 8015)</b>																				
Methane	ug/L	>500/<500	147	1670	0.066	U	0.066	U	0.59	1.14	50.8	48.3	466	J	903	40.5				
Ethane	ug/L	>10	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.47	U	0.056	J	0.056	U		
Ethene	ug/L	>100	0.075	U	0.075	U	0.075	U	0.075	U	0.29	1.3	0.13	U	0.075	U	0.075	U		
<b>Metals Analysis</b>																				
Iron	ug/L	>1,000	1140	U	5090	109	100	U	9480	100	U	100	U	3280	2970	743	1770			
Manganese	ug/L	present	99.6	U	562	54.6	15	U	207	78.5	86.7	497	218	106	U	123				
<b>General Chemistry</b>																				
Nitrogen, Nitrate	mg/L	<1	0.11	U	0.11	U	0.11	U	0.68	0.33	0.16	0.11	U	0.11	U	0.11	U	0.11	U	
Nitrogen, Nitrate + Nitrite	mg/L	<1	0.10	U	0.10	U	0.10	U	0.69	0.34	0.17	0.10	U	0.10	U	0.10	U	0.10	U	
Nitrogen, Nitrite	mg/L	<1	0.010	U	0.011	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U	0.010	U
Sulfate	mg/L	<20	19.4	U	5.0	U	6.8	U	9.1	13.9	11.4	U	5.0	U	8.4	U	5.0	U	5.0	U
Total Organic Carbon	mg/L	>20	1.7	U	3.3	U	1.0	U	1.0	U	1.0	U	1	U	2.4	U	4.6	U	2	U

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

B - Detected; potential blank contamination

JB - Concentration is below the detection limit; potential blank contamination.

**TABLE 4-8**

Groundwater MNA Parameters Compared Against PILs  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	Units	Project Indicator Limits	BN-MW-MB-06-A 11/21/2010 5-15	BN-MW-MB-06-C 11/19/2010 40-50	BN-MW-MB-06-C-D 11/19/2010 40-50	BN-PZ-GSI-11-10 11/19/2010 6.8-11.8	BN-PZ-GSI-12-10 11/21/2010 6.7-11.7	BN-PZ-GSI-13-10 11/21/2010 6.8-11.8	BN-PZ-GSI-14-10 11/21/2010 4.8-9.8	BN-PZ-GSI-15-10 11/21/2010 4.5-9.5	BN-PZ-GSI-16-10 11/21/2010 4.3-9.3	BN-GW-MW-313 11/19/2010 27-37							
<b>GC Volatiles (SW846 8015)</b>																			
Methane	ug/L	>500/<500	0.067	JB	21.1	26.1	0.19	J	67.4	0.11	JB	15.6	180	2400	42.1				
Ethane	ug/L	>10	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U			
Ethene	ug/L	>100	0.075	U	0.075	U	0.075	U	0.075	U	0.075	U	0.075	U	0.075	U			
<b>Metals Analysis</b>																			
Iron	ug/L	>1,000	23.4	B	919	16.5	B	6.4	B	6670	4.3	B	140	-	19500	1470			
Manganese	ug/L	present	37.7		201	102		1.1	B	1090	5.4	B	226	-	1800	136			
<b>General Chemistry</b>																			
Nitrogen, Nitrate	mg/L	<1	0.11	U	0.13	U	-	0.30		0.11	U	0.51	0.11	U	0.32	0.3	0.11	U	
Nitrogen, Nitrate + Nitrite	mg/L	<1	0.10	U	0.14	U	-	0.30		0.10	U	0.52	0.10	U	0.33	0.31	0.10	U	
Nitrogen, Nitrite	mg/L	<1	0.010	U	0.010	U	-	0.010	U	0.011		0.010	U	0.010	U	0.015	0.010	U	
Sulfate	mg/L	<20	5.0	U	13.5		-	5.0		6.8		9.5	5.0	U	5.6	5.0	U	5.0	U
Total Organic Carbon	mg/L	>20	2		1.0	U	-	1	U	1.2		1.0	U	1.0	U	2.5	3.9	1	U

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

B - Detected; potential blank contamination

JB - Concentration is below the detection limit; potential blank contamination.

**TABLE 4-9**

Pore Water MNA Parameters Compared Against PILs  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (inches):	Units	Project Indicator Limits (PILs)	BN-PW-GSI-01-02 11/19/2010 2-8	BN-PW-GSI-02-02 11/19/2010 2-8	BN-PW-GSI-03-02 11/19/2010 2-8	BN-PW-GSI-04-02 11/20/2010 2-8	BN-PW-GSI-05-02 11/20/2010 2-8	BN-PW-GSI-06-02 11/20/2010 2-8	BN-PW-GSI-07-02 11/20/2010 2-8	BN-PW-GSI-08-02 11/20/2010 2-8	BN-PW-GSI-09-02 11/21/2010 2-8	BN-PW-GSI-10-02 11/21/2010 2-8
<b>GC Volatiles (SW846 8015)</b>												
Methane	ug/L	>500/<500	2.77	2190	3.24	41.5	23	235	2270	73.5	749	3910
Ethane	ug/L	>10	0.056 U	0.056 U	0.056 U	0.36	0.056 U	0.056 U	0.16	0.056 U	0.18	0.056 U
Ethene	ug/L	>100	0.075 U									
<b>Metals Analysis</b>												
Iron II	ug/L	>1,000	179	18700	466	410	279	1410	22300	660	8430	16300
Manganese	ug/L	present	81.2	4000	232	1070	130	420	2490	805	5360	22900
<b>General Chemistry</b>												
Nitrogen, Nitrate	mg/L	<1	0.15	0.32	0.14	0.2	0.81	0.14	0.39	0.62	0.11 U	0.36
Nitrogen, Nitrate + Nitrite	mg/L	<1	0.16	0.33	0.15	0.21	0.82	0.15	0.41	0.63	0.10 U	0.37
Nitrogen, Nitrite	mg/L	<1	0.011	0.015	0.010	0.010 U	0.010 U	0.010 U	0.023	0.010 U	0.010 U	0.013
Sulfate	mg/L	<20	6.2	5.0 U	6.3	8.8	13.3	7.3	5.0 U	12.8	5.0 U	5.0 U
Total Organic Carbon	mg/L	>20	3.6	4	4.1	3.8		6.2	7.1	3.1	6.6	8.3

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

**TABLE 4-9**

Pore Water MNA Parameters Compared Against PILs  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (inches):	Units	Project Indicator Limits (PILs)	BN-PW-GSI-11-02 11/20/2010 2-8	BN-PW-GSI-12-02 11/20/2010 2-8	BN-PW-GSI-13-02 11/20/2010 2-8	BN-PW-GSI-14-02 11/20/2010 2-8	BN-PW-GSI-15-02 11/21/2010 2-8	BN-PW-GSI-16- 11/20/2010 2-8
<b>GC Volatiles (SW846 8015)</b>								
Methane	ug/L	>500/<500	2.95	4250	4.49	799	2100	3620
Ethane	ug/L	>10	0.056 U	0.058 J	0.056 U	0.056 U	0.056 U	0.056 U
Ethene	ug/L	>100	0.075 U	0.075 U				
<b>Metals Analysis</b>								
Iron II	ug/L	>1,000	156	12500	358	6070	3500	6640
Manganese	ug/L	present	61.4	962	163	1640	1260	6630
<b>General Chemistry</b>								
Nitrogen, Nitrate	mg/L	<1	0.77	0.11 U	0.63	0.16	0.18	0.11
Nitrogen, Nitrate + Nitrite	mg/L	<1	0.78	0.10 U	0.64	0.17	0.19	0.12
Nitrogen, Nitrite	mg/L	<1	0.010 U	0.010 U				
Sulfate	mg/L	<20	12.3	7.4	16.2	5.0 U	5.0 U	5.0 U
Total Organic Carbon	mg/L	>20	1.0 U	8.1	6.5	4.2	2.7	6

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

Shaded concentrations indicate detections.

U - Result not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.

J - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.

TABLE 4-10

Groundwater MNA Preliminary Screening for Individual Wells  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (ft):	Units	Project Indicator Limits (PILs)	BN-PZ-GSI-01-10 11/18/2010 5-10	BN-PZ-GSI-02-10 11/18/2010 3.8-8.8	BN-PZ-GSI-03-10 11/18/2010 4.2-9.2	BN-PZ-GSI-04-10 11/18/2010 3.6-8.6	BN-GW-MW-EP-360 11/19/2010 40-50	PZB3A-111810 11/18/2010 7-12	PZC3A-111910 11/19/2010 7-12	PZ01A-111810 11/18/2010 7-12	PZB4A-111910 11/19/2010 7-12	BN-PZ-GSI-09-10 11/21/2010 7.8-12.8	PZB7A-1112010 11/21/2010 7-12											
Dissolved Oxygen (mg/L)	mg/L	<0.5 mg/L	1.23	0	0.4	3	3.52	0	0.55	3	2.98	0	0.71	3	1.96	0	0.28	3	0.59	3	0.58	3	0.24	3
pH		5<pH<9	6.63	0	5.64	0	5.92	0	7.01	0	8.08	0	6.28	0	7.29	0	6.17	0	5.89	0	7.11	0	6.1	0
ORP	mV	<50/<-100mV	-167	2	-191	2	-150.4	2	100.8	0	-55.1	1	83.7	0	-179.8	2	-24.6	1	-150.1	2	-98.1	1	-194	2
Temperature	Deg C	>20 C	9.71	0	9.93	0	10.29	0	10.47	0	8.15	0	8.63	0	8.97	0	8.28	0	8.42	0	8.9	0	8.15	0
<b>GC Volatiles (SW846 8015)</b>																								
Methane	ug/L	>500/<500	147	0	1670	3	0.066	0	0.066	0	0.59	0	1.14	0	50.8	0	48.3	0	466	0	903	3	40.5	0
Ethane	ug/L	>10	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.47	0	0.056	0	0.081	0	0.056	0
Ethene	ug/L	>100	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.29	0	1.3	0	0.13	0	0.075	0	0.075	0
<b>Metals Analysis</b>																								
Iron	ug/L	>1,000	1140	3	5090	3	109	0	100	0	9480	3	100	0	100	0	3280	3	2970	3	743	0	1770	3
<b>General Chemistry</b>																								
Nitrogen, Nitrate	mg/L	<1	0.11	2	0.11	2	0.11	2	0.68	2	0.33	2	0.16	2	0.11	2	0.11	2	0.11	2	0.11	2	0.11	2
Sulfate	mg/L	<20	19.4	2	5.0	2	6.8	2	9.1	2	13.9	2	11.4	2	5.0	2	8.4	2	5.0	2	5.0	2	5.0	2
Total Organic Carbon	mg/L	>20	1.7	0	3.3	0	1.0	0	1.0	0	1.0	0	1.0	0	1	0	2.4	0	4.6	0	2	0	3	0
Chloroethane	ug/L	Present	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	2.8	0	0.76	0	0.76	0	0.76	0
1,1-Dichloroethane	ug/L	Present	0.63	0	0.63	0	0.63	0	30.2	2	20.4	2	11.9	2	52	2	15.2	2	8.1	0	0.98	2	8.6	2
1,2-Dichloroethane	ug/L	Present	0.74	0	0.74	0	0.74	0	1.4	0	0.74	0	0.74	0	1.4	0	0.74	0	0.74	0	0.74	0	0.74	0
1,1-Dichloroethene	ug/L	Present	0.70	0	0.70	0	0.70	0	65.6	0	19.2	0	20	0	42.9	0	3.1	0	4.8	0	0.70	0	7.9	2
cis-1,2-Dichloroethene	ug/L	Present	0.66	0	0.66	0	0.66	0	13.6	2	3.6	2	8.8	2	4.5	2	3.2	2	2	2	0.66	0	0.66	0
Tetrachloroethene	ug/L	Present	0.39	0	0.39	0	0.39	0	6.7	0	1.1	0	8.1	0	0.39	0	0.39	0	0.39	0	0.39	0	0.39	0
1,1,1-Trichloroethane	ug/L	Present	0.35	0	0.35	0	0.35	0	118	0	5.7	0	25.2	0	0.35	0	1.8	0	0.35	0	0.35	0	0.35	0
Trichloroethene	ug/L	Present	0.49	0	0.49	0	0.49	0	109	2	46.5	2	51.8	2	20.1	2	5.7	2	2.4	2	0.49	0	0.49	0
Vinyl chloride	ug/L	Present	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	2.8	2	2.6	2	1.1	2	0.86	0	0.86	0
MNA Total Score				9		15		6		13		14		13		14		19		18		13		16

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

0 to 5 - inadequate evidence for anaerobic biodegradation

6 to 14 - limited evidence for anaerobic biodegradation

14 to 20 - adequate evidence for anaerobic biodegradation

>20 - strong evidence for anaerobic biodegradation

TABLE 4-10

Groundwater MNA Preliminary Screening for Individual Wells  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID:			BN-MW-MB-06-A	BN-MW-MB-06-C	BN-PZ-GSI-11-10	BN-PZ-GSI-12-10	BN-PZ-GSI-13-10	BN-PZ-GSI-14-10	BN-PZ-GSI-15-10	BN-PZ-GSI-16-10	BN-GW-MW-313									
Date Sampled:	Units	Project Indicator Limits (PILs)	11/21/2010	11/19/2010	11/19/2010	11/21/2010	11/21/2010	11/21/2010	11/21/2010	11/21/2010	11/19/2010									
Depth (ft):			5-15	40-50	6.8-11.8	6.7-11.7	6.8-11.8	4.8-9.8	4.5-9.5	4.3-9.3	27-37									
	mg/L	<0.5 mg/L	5.49	-3	0.31	3	8.02	-3	0.48	3	5.22	-3	0.22	3	2.22	0	0.21	3	0.22	3
		5<pH<9	6.22	0	7.47	0	5.88	0	6.5	0	7.09	0	7.67	0	7.23	0	5.89	0	7.88	0
	mV	<50/<-100mV	-118.5	2	-81.3	1	-97.3	2	-131	2	99	0	-211.3	2	-141.6	2	-178	2	-168.2	2
	Deg C	>20 C	8.07	0	8.5	0	7.89	0	8.42	0	8.5	0	10.2	0	7.73	0	10.08	0	8	0
<b>GC Volatiles (SW846 8015)</b>																				
Methane	ug/L	>500/<500	0.067	0	21.1	0	0.19	0	67.4	0	0.11	0	15.6	0	180	0	2400	3	42.1	0
Ethane	ug/L	>10	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	0	0.056	U
Ethene	ug/L	>100	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	U
<b>Metals Analysis</b>																				
Iron	ug/L	>1,000	23.4	0	919	2	6.4	0	6670	2	4.3	0	140	0	-	0	19500	2	1470	2
<b>General Chemistry</b>																				
Nitrogen, Nitrate	mg/L	<1	0.11	2	0.13	2	0.30	2	0.11	2	0.51	2	0.11	0	0.32	2	0.3	2	0.11	2
Sulfate	mg/L	<20	5.0	2	13.5	2	5.0	2	6.8	2	9.5	2	5.0	0	5.6	2	5.0	2	5.0	2
Total Organic Carbon	mg/L	>20	2	0	1.0	0	1	0	1.2	0	1.0	0	1.0	0	2.5	0	3.9	0	1	0
Chloroethane	ug/L	present	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0
1,1-Dichloroethane	ug/L	present	4.2	2	9.4	2	0.63	0	0.63	0	0.63	0	17.1	2	0.63	0	0.63	0	20.5	2
1,2-Dichloroethane	ug/L	present	0.74	0	0.74	0	0.74	0	0.74	0	0.74	0	0.74	0	0.74	0	0.74	0	0.74	0
1,1-Dichloroethene	ug/L	present	7.5	0	11.8	0	0.70	0	0.70	0	0.70	0	6.9	0	0.70	0	0.70	0	25.8	2
cis-1,2-Dichloroethene	ug/L	present	0.85	2	2.4	2	0.66	0	1.1	2	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0
Tetrachloroethene	ug/L	present	0.39	0	2.8	0	0.39	0	1.2	0	2	0	0.39	0	0.39	0	0.39	0	0.39	0
1,1,1-Trichloroethane	ug/L	present	10.7	0	1.6	0	0.35	0	0.35	0	0.92	0	0.35	0	0.35	0	0.35	0	0.35	0
Trichloroethene	ug/L	present	13.7	2	20.7	2	0.49	0	1	2	2.3	2	0.49	0	0.49	0	0.49	0	2.6	2
Vinyl chloride	ug/L	present	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0
				9		16		3		15		3		7		6		14		17

Notes:

- ug/L - micrograms per liter
- mg/L - milligrams per liter
- 0 to 5 - inadequate evidence for anaerobic biodegradation
- 6 to 14 - limited evidence for anaerobic biodegradation
- 14 to 20 - adequate evidence for anaerobic biodegradation
- >20 - strong evidence for anaerobic biodegradation

**TABLE 4-11**

Pore Water MNA Preliminary Screening for Individual Wells  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (inches):	Units	Project Indicator Limits (PILs)	BN-PW-GSI-01-02 11/19/2010 2-8	BN-PW-GSI-02-02 11/19/2010 2-8	BN-PW-GSI-03-02 11/19/2010 2-8	BN-PW-GSI-04-02 11/20/2010 2-8	BN-PW-GSI-05-02 11/20/2010 2-8	BN-PW-GSI-06-02 11/20/2010 2-8	BN-PW-GSI-07-02 11/20/2010 2-8	BN-PW-GSI-08-02 11/20/2010 2-8	BN-PW-GSI-09-02 11/21/2010 2-8	BN-PW-GSI-10-02 11/21/2010 2-8										
Dissolved Oxygen (mg/L)	mg/L	<0.5 mg/L	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0								
pH		5<pH<9	7.2	0	6.46	0	6.84	0	7.09	0	6.87	0	6.48	0	6.08	0	6.69	0	6.36	0	6.64	0
ORP	mV	<50/<-100mV	157.0	0	104	0	240	0	24	1	135	0	-114	2	-121	2	86	0	26	1	-22	1
Temperature	Deg C	>20 C	4.2	0	6.30	0	7.40	0	4.70	0	5.80	0	5.91	0	6.40	0	6.90	0	5.00	0	3.70	0
<b>GC Volatiles (SW846 8015)</b>																						
Methane	ug/L	>500/<500	2.77	0	2190	3	3.24	0	41.5	0	23	0	235	0	2270	3	73.5	0	749	3	3910	3
Ethane	ug/L	>10	0.056	0	0.056	0	0.056	0	0.36	0	0.056	0	0.056	0	0.16	0	0.056	0	0.18	0	0.056	0
Ethene	ug/L	>100	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0
<b>Metals Analysis</b>																						
Iron II	ug/L	>1,000	179	0	18700	3	466	0	410	0	279	0	1410	3	22300	3	660	0	8430	3	16300	3
<b>General Chemistry</b>																						
Nitrogen, Nitrate	mg/L	<1	0.15	2	0.32	2	0.14	2	0.2	2	0.81	2	0.14	2	0.39	2	0.62	2	0.11	2	0.36	
Sulfate	mg/L	<20	6.2	2	5.0	2	6.3	2	8.8	2	13.3	2	7.3	2	5.0	2	12.8	2	5.0	2	5.0	U
Total Organic Carbon	mg/L	>20	3.6	0	4	0	4.1	0	3.8	0	NA	0	6.2	0	7.1	0	3.1	0	6.6	0	8.3	0
Chloroethane	ug/L	Present	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0
Chloroform	ug/L	Present	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0
1,1-Dichloroethane	ug/L	Present	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0
cis-1,2-Dichloroethene	ug/L	Present	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0
Vinyl chloride	ug/L	Present	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0
Total MNA Score				4		10		4		5		4		9		12		4		11		7

Notes:  
 ug/L - micrograms per liter  
 mg/L - milligrams per liter  
 0 to 5 - inadequate evidence for anaerobic biodegradation  
 6 to 14 - limited evidence for anaerobic biodegradation  
 14 to 20 - adequate evidence for anaerobic biodegradation  
 >20 - strong evidence for anaerobic biodegradation

**TABLE 4-11**

Pore Water MNA Preliminary Screening for Individual Wells  
 Mere Brook and Merriconeag Stream Groundwater-Surface Water Interface Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Sample ID: Date Sampled: Depth (inches):	Units	Project Indicator Limits (PILs)	BN-PW-GSI-11-02 11/20/2010 2-8	BN-PW-GSI-12-02 11/20/2010 2-8	BN-PW-GSI-13-02 11/20/2010 2-8	BN-PW-GSI-14-02 11/20/2010 2-8	BN-PW-GSI-15-02 11/21/2010 2-8	BN-PW-GSI-16-02 11/20/2010 2-8						
Dissolved Oxygen (mg/L)	mg/L	<0.5 mg/L	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0
pH		5<pH<9	6.74	0	6.23	0	6.79	0	6.43	0	6.44	0	6.31	0
ORP	mV	<50/<-100mV	-117	2	-110	2	-124	2	-34	1	17	1	-122	2
Temperature	Deg C	>20 C	7.44	0	6.39	0	6.91	0	6.10	0	3.40	0	5.78	0
<b>GC Volatiles (SW846 8015)</b>														
Methane	ug/L	>500/<500	2.95	0	4250	3	4.49	0	799	3	2100	3	3620	3
Ethane	ug/L	>10	0.056	0	0.058	0	0.056	0	0.056	0	0.056	0	0.056	0
Ethene	ug/L	>100	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0	0.075	0
<b>Metals Analysis</b>														
Iron II	ug/L	>1,000	156	0	12500	3	358	0	6070	3	3500	3	6640	3
<b>General Chemistry</b>														
Nitrogen, Nitrate	mg/L	<1	0.77	2	0.11	2	0.63	2	0.16	2	0.18	2	0.11	2
Sulfate	mg/L	<20	12.3	2	7.4	2	16.2	2	5.0	2	5.0	2	5.0	2
Total Organic Carbon	mg/L	>20	1.0	0	8.1	0	6.5	0	4.2	0	2.7	0	6	0
Chloroethane	ug/L	Present	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0
Chloroform	ug/L	Present	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0	0.72	0
1,1-Dichloroethane	ug/L	Present	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0	0.63	0
cis-1,2-Dichloroethene	ug/L	Present	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0
Vinyl chloride	ug/L	Present	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0	0.86	0
Total MNA Score				6		12		6		11		11		12

Notes:

ug/L - micrograms per liter

mg/L - milligrams per liter

0 to 5 - inadequate evidence for anaerobic biodegradation

6 to 14 - limited evidence for anaerobic biodegradation

14 to 20 - adequate evidence for anaerobic biodegradation

>20 - strong evidence for anaerobic biodegradation

**Attachment B**  
**Rainfall Data**

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TABLE B-1  
 2011 Daily Rainfall  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Month	2011 Daily Rainfall (inches)		
	Day	Weather.com <sup>1</sup>	Wunderground.com <sup>2</sup>
JULY	TOTAL	--	2.00
AUGUST	2-Aug	0.41	0.66
	4-Aug	0.06	0.27
	5-Aug	0	0.01
	6-Aug	0.13	0
	7-Aug	0.14	0.36
	8-Aug	0	0.01
	9-Aug	0.36	0
	10-Aug	0	0.38
	11-Aug	0	0.01
	13-Aug	0	0.01
	14-Aug	0	0.01
	15-Aug	0.43	1.02
	16-Aug	0.77	0.41
	17-Aug	0	0.01
	19-Aug	0	0.01
	21-Aug	1.19	0.63
	22-Aug	0	0.56
	23-Aug	0	0.01
	25-Aug	0.53	0
	26-Aug	0	0.01
27-Aug	0.66	0.7	
28-Aug	0.56	0.88	
31-Aug	0	0.01	
	<b>TOTAL</b>	<b>5.24</b>	<b>5.97</b>
SEPTEMBER	3-Sep	0	0
	4-Sep	0.18	0
	5-Sep	0.08	0.23
	6-Sep	0.04	0.08
	7-Sep	0.33	0.41
	8-Sep	0.01	0.06
	9-Sep	0	0.01
	10-Sep	0	0
	11-Sep	0	0.01
	12-Sep	0	0
	13-Sep	0	0
	14-Sep	0	0
	15-Sep	0.11	0.12
	16-Sep	0	0.01
	17-Sep	0	0

TABLE B-1  
 2011 Daily Rainfall  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Month	2011 Daily Rainfall (inches)		
	Day	Weather.com <sup>1</sup>	Wunderground.com <sup>2</sup>
	18-Sep	0	0
	19-Sep	0	0
	20-Sep	0.02	0.01
	21-Sep	0.15	0
	22-Sep	0.23	0.64
	23-Sep	0.51	0.01
	24-Sep	0	0.47
	25-Sep	0	0.01
	26-Sep	0	0.01
	27-Sep	0	0
	28-Sep	0	0.01
	29-Sep	0.23	0.06
	30-Sep	0.17	0
	<b>TOTAL</b>	2.06	2.15

} 2011  
 sampling  
 period

**Notes:**

- 1 <http://www.weather.com/weather/monthly/USME0056>
- 2 <http://www.wunderground.com/cgi-bin/findweather/getForecast?query=zmw:04011.1.99999>

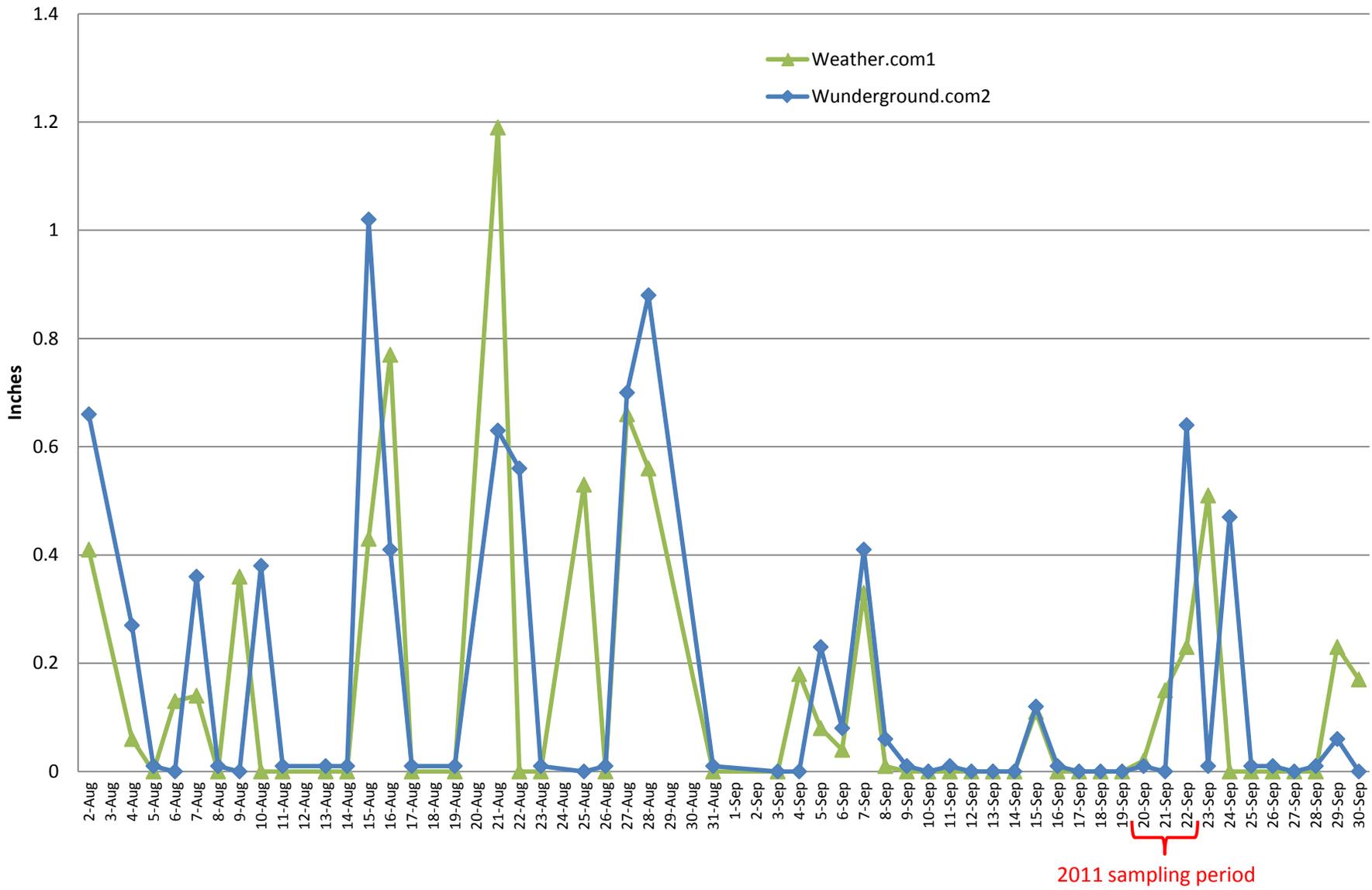
TABLE B-2  
 Historical Rainfall - 2008 to 2011  
*Supplemental GSI Investigation*  
*Naval Air Station Brunswick, Brunswick, Maine*

<b>Historical Rainfall<sup>1</sup> (inches)</b>				
<b>Month</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
JANUARY	3.15	2.87	2.93	2.56
FEBRUARY	6.92	3.29	4.28	3.41
MARCH	5.67	3.42	5.81	5.73
APRIL	2.32	5.40	0.63	5.88
MAY	1.91	4.76	0.86	4.07
JUNE	2.68	7.48	6.62	3.46
JULY	3.56	8.13	6.16	2.00
AUGUST	4.73	5.17	2.22	5.97
SEPTEMBER	10.61	1.65	2.39	2.15
OCTOBER	2.74	5.70	6.91	
NOVEMBER	7.07	5.50	5.01	
DECEMBER	4.12	6.05	3.98	

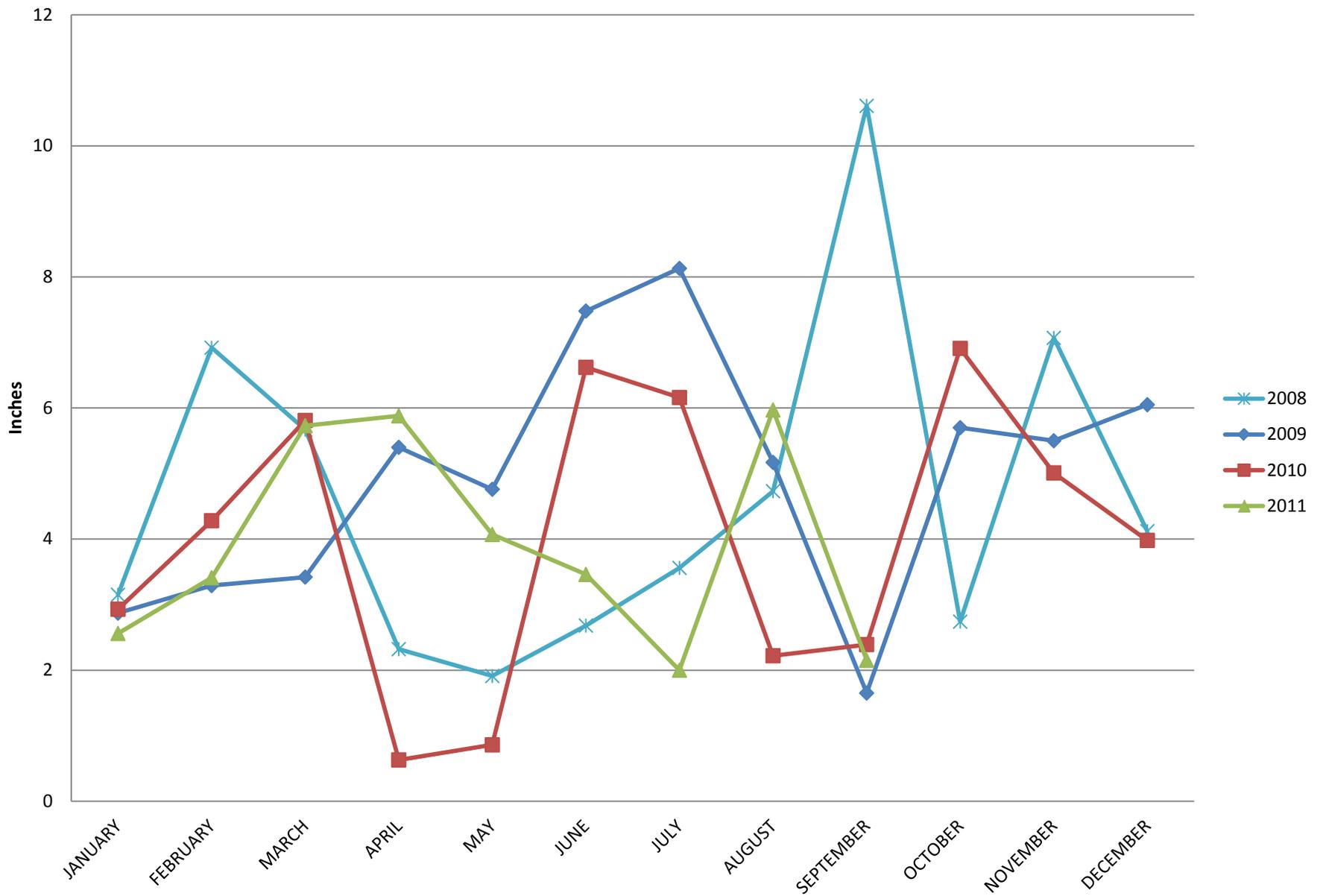
**Notes:**

- 1 <http://www.wunderground.com/cgi-bin/findweather/getForecast?query=zmw:04011.1.99999>

### Fig B-1: Rainfall for Brunswick, ME ~ August - September 2011



**Figure B-2: Historical Rainfall for Wiscasset, ME (via wunderground.com)**



**Attachment C**  
**Photographs**

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*Photograph 1: Well Point station at GSI-03; Merriconeag Stream, north of the confluence area*



*Photograph 2: Well Point station at GSI-04; Merriconeag Stream, north of the confluence area*



*Photograph 3: Well Point station at GSI-05; Mere Brook side of the confluence area*



*Photograph 4: Well Point station at GSI-05; view of width of Mere Brook.*



*Photograph 5: Well Point station at GSI-06; Mere Brook side of the confluence area*



*Photograph 6: Well Point station at GSI-07; Mere Brook side of the confluence area*



*Photograph 6:* Well Point station at GSI-08; Mere Brook side of the confluence area



*Photograph 7: Well Point station at GSI-12; Mere Brook, west of the confluence*



*Photograph 8: Well Point station at GSI-14; Mere Brook, south of the confluence*

SITE PHOTOGRAPHS – SEPTEMBER 2011 SUPPLEMENTAL GSI INVESTIGATION  
MERE BROOK AND MERRICONEAG STREAM GROUNDWATER-SURFACE WATER INTERFACE INVESTIGATION  
NAVAL AIR STATION BRUNSWICK, BRUNSWICK, MAINE



*Photograph 10: Well Point station at GSI-14; view across Mere Brook*



*Photograph 11: Well Point station at GSI-14; view north in Mere Brook*



*Photograph 12: On-site rain gauge measurement*

**Attachment D**  
**Raw Analytical Data**

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TABLE D-1  
Raw Analytical Data - Groundwater  
Supplemental GSI Investigation  
Naval Air Station Brunswick, Brunswick, Maine

Location	BN-B4A		BN-PZ01A	BN-PZB3A	BN-PZC3A	BN-GSI-03	BN-GSI-04	BN-GSI-12	BN-GSI-14
Sample ID	BN-B4A-0911	BN-B4A-D-0911	PZ01A-0911	PZB3A-0911	PZC3A-0911	BN-PZ-GSI-03-10-0911	BN-PZ-GSI-04-10-0911	BN-PZ-GSI-12-10-0911	BN-PZ-GSI-14-10-0911
Sample Depth (feet)	7-12	7-12	7-12	7-12	7-12	4.2-9.2	3.6-8.6	6.7-11.7	4.8-9.8
Sample Date	9/22/2011	9/22/2011	9/21/2011	9/21/2011	9/21/2011	9/20/2011	9/22/2011	9/20/2011	9/20/2011
<b>Volatile Organic Compounds (UG/L)</b>									
1,1,1-Trichloroethane	0.55 U	0.55 U	<b>2.8</b>	<b>17.6</b>	0.55 U	0.55 U	<b>78.4</b>	0.55 U	0.55 U
1,1,2,2-Tetrachloroethane	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
1,1,2-Trichloroethane	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U
1,1-Dichloroethane	<b>16.5</b>	<b>18.2</b>	<b>18.7</b>	<b>8.8</b>	<b>49.6</b>	0.33 U	<b>25.3</b>	0.33 U	<b>18.5</b>
1,1-Dichloroethene	<b>8.7</b>	<b>9.1</b>	<b>5.6</b>	<b>17.9</b>	<b>39.5</b>	0.8 U	<b>51.4</b>	0.8 U	<b>7.8</b>
1,2-Dichloroethane	0.44 U	0.44 U	0.44 U	0.44 U	<b>1.4</b>	0.44 U	<b>1.2</b>	0.44 U	<b>0.83</b> J
1,2-Dichloropropane	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
1,4-Dioxane	<b>75.7</b>	<b>70.4</b>	<b>35.2</b>	<b>21</b>	<b>63.4</b>	0.19 U	<b>51.7</b>	<b>0.53</b> J	<b>95.1</b>
2-Butanone (MEK)	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
2-Hexanone	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Methyl-2-pentanone (MIBK)	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
Acetone	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
Benzene	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Bromodichloromethane	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Bromoform	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Bromomethane	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Carbon disulfide	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Carbon tetrachloride	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Chlorobenzene	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Chloroethane	0.32 U	0.32 U	<b>0.86</b> J	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	<b>1.7</b>	0.58 U	0.58 U	0.58 U
Chloromethane	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
cis-1,2-Dichloroethene	<b>4.6</b>	<b>4.7</b>	<b>4.4</b>	<b>6.1</b>	<b>6.1</b>	0.69 U	<b>11.6</b>	<b>1.5</b>	0.69 U
cis-1,3-Dichloropropene	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Dibromochloromethane	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U
Ethylbenzene	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Methylene chloride	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U
Styrene	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
Tetrachloroethene	0.36 U	0.36 U	0.36 U	<b>8.8</b>	0.36 U	0.36 U	<b>5.9</b>	<b>0.77</b> J	0.36 U
Toluene	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
trans-1,2-Dichloroethene	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
trans-1,3-Dichloropropene	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Trichloroethene	<b>4.3</b>	<b>4.1</b>	<b>12.2</b>	<b>43</b>	<b>19.4</b>	0.75 U	<b>85.1</b>	0.75 U	0.75 U
Vinyl chloride	<b>2.5</b>	<b>2.8</b>	<b>3.5</b>	0.82 U	<b>3.2</b>	0.82 U	<b>0.093</b>	0.82 U	0.82 U
Xylene (total)	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
<b>Dissolved (Filtered) Inorganics (UG/L)</b>									
Iron	<b>1530</b>	NA	<b>2640</b>	<b>44.8</b> J	<b>51.1</b> J	<b>187</b>	14 U	<b>10600</b>	<b>78.4</b> J
Manganese	<b>212</b>	NA	<b>409</b>	<b>61.3</b>	<b>78</b>	<b>59.8</b>	0.43 U	<b>571</b>	<b>198</b>
<b>Other Parameters</b>									
Sulfate (MG/L)	5 U	NA	5 U	<b>13.3</b>	5 U	<b>8.3</b>	<b>10.4</b>	5 U	5 U
Total Organic Carbon (MG/L)	<b>3.7</b>	NA	<b>2.2</b>	1 U	1 U	1 U	1 U	<b>1.1</b>	1 U
Nitrogen, Nitrate (MG/L)	0.11 U	NA	<b>0.25</b>	<b>0.41</b>	<b>0.17</b>	0.11 U	<b>0.69</b>	<b>0.54</b>	0.11 U
Nitrogen, Nitrate + Nitrite (MG/L)	0.1 U	NA	<b>0.25</b>	<b>0.42</b>	<b>0.17</b>	0.1 U	<b>0.69</b>	<b>0.54</b>	0.1 U
Nitrogen, Nitrite (MG/L)	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Ethane (UG/L)	0.056 U	NA	<b>0.69</b>	0.056 U	0.056 U	0.056 U	0.056 U	0.056 U	<b>0.056</b> J
Ethene (UG/L)	<b>0.65</b>	NA	<b>1.3</b>	0.075 U	<b>0.35</b>	0.075 U	0.075 U	0.075 U	0.075 U
Methane (UG/L)	<b>822</b>	NA	<b>1010</b>	<b>35.5</b>	<b>83</b>	<b>0.62</b> J	<b>0.64</b> J	<b>349</b>	<b>22.8</b>

**Notes:**  
J The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.  
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.  
UJ The analyte was below the reported sample quantitation limit. However, the reported value is approximate.  
mg/l Milligrams per Liter  
ug/l Micrograms per Liter  
**Bold indicates the analyte was detected**

TABLE D-2  
Raw Analytical Data - Pore Water  
Supplemental GSI Investigation  
Naval Air Station Brunswick, Brunswick, Maine

Location	BN-GSI-03		BN-GSI-04		BN-GSI-05			
	BN-PW-GSI-03-02-0911	BN-PW-GSI-03-08-0911	BN-PW-GSI-04-02-0911	BN-PW-GSI-04-08-0911	BN-PW-GSI-05-02-0911	BN-PW-GSI-05-08-0911	BN-PW-GSI-05-08-D-0911	BN-PW-GSI-05-14-0911
Sample ID	2-8	8-14	2-8	8-14	2-8	8-14	8-14	14-24
Sample Depth (inches)	2-8	8-14	2-8	8-14	2-8	8-14	8-14	14-24
Sample Date	9/20/2011	9/20/2011	9/22/2011	9/22/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011
<b>Volatile Organic Compounds (UG/L)</b>								
1,1,1-Trichloroethane	0.55 U	0.55 U						
1,1,2,2-Tetrachloroethane	0.79 U	0.79 U						
1,1,2-Trichloroethane	0.74 U	0.74 U						
1,1-Dichloroethane	0.33 U	<b>0.82 J</b>	<b>0.63 J</b>	0.33 U				
1,1-Dichloroethene	0.8 U	0.8 U						
1,2-Dichloroethane	0.44 U	0.44 U	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U
1,2-Dichloropropane	0.71 U	0.71 U						
1,4-Dioxane	<b>0.76 J</b>	<b>0.72 J</b>	<b>10</b>	<b>66.3</b>	<b>2.6</b>	<b>5.8</b>	<b>6.9</b>	<b>9.3</b>
2-Butanone (MEK)	2.7 U	2.7 U						
2-Hexanone	1.3 U	1.3 U						
4-Methyl-2-pentanone (MIBK)	0.76 U	0.76 U						
Acetone	4.1 U	4.1 U						
Benzene	0.46 U	0.46 U						
Bromodichloromethane	0.49 U	0.49 U						
Bromoform	0.71 U	0.71 U						
Bromomethane	1.3 U	1.3 U						
Carbon disulfide	0.62 U	0.62 U						
Carbon tetrachloride	0.58 U	0.58 U						
Chlorobenzene	0.44 U	0.44 U						
Chloroethane	0.32 U	0.32 U	<b>9</b>	<b>48.4</b>	0.32 U	0.32 U	0.32 U	1.3 J
Chloroform	0.58 U	0.58 U						
Chloromethane	0.71 U	0.71 U						
cis-1,2-Dichloroethene	0.69 U	0.69 U	0.69 U	0.69 U	<b>0.99 J</b>	<b>2.7</b>	<b>2.7</b>	<b>1.5</b>
cis-1,3-Dichloropropene	0.41 U	0.41 U						
Dibromochloromethane	0.89 U	0.89 U						
Ethylbenzene	0.8 U	0.8 U						
Methylene chloride	0.99 U	0.99 U						
Styrene	0.97 U	0.97 U						
Tetrachloroethene	0.36 U	0.36 U						
Toluene	0.59 U	0.59 U						
trans-1,2-Dichloroethene	0.64 U	0.64 U						
trans-1,3-Dichloropropene	0.49 U	0.49 U						
Trichloroethene	0.75 U	0.75 U						
Vinyl chloride	0.82 U	1.1 U	0.82 U	0.82 U				
Xylene (total)	0.32 U	0.32 U						
<b>Dissolved (Filtered) Inorganics (UG/L)</b>								
Iron	319	NA	8290	NA	1950	NA	NA	NA
Manganese	272	NA	2280	NA	1020	NA	NA	NA
<b>Other Parameters</b>								
Total Organic Carbon (MG/L)	2.3	NA	3.2	NA	2.9	NA	NA	NA
Sulfate (MG/L)	8.6	NA	8.1	NA	8.3	NA	NA	NA
Nitrogen, Nitrate (MG/L)	0.68	NA	0.74	NA	0.62	NA	NA	NA
Nitrogen, Nitrate + Nitrite (MG/L)	0.69	NA	0.75	NA	0.63	NA	NA	NA
Nitrogen, Nitrite (MG/L)	0.01 U	NA	0.01 U	NA	0.01 U	NA	NA	NA
Ethane (UG/L)	0.056 U	NA	3.91	NA	0.056 U	NA	NA	NA
Ethene (UG/L)	0.075 U	NA	0.075 U	NA	0.075 U	NA	NA	NA
Methane (UG/L)	7.3	NA	1170	NA	372	NA	NA	NA

Notes:  
NA Not analyzed  
J The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.  
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.  
UJ The analyte was below the reported sample quantitation limit. However, the reported value is approximate.  
mg/l Milligrams per Liter  
ug/l Micrograms per Liter  
**Bold indicates the analyte was detected**

TABLE D-2  
 Raw Analytical Data - Pore Water  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Location	BN-GSI-06								BN-GSI-07			BN-GSI-08	
	BN-PW-GSI-06-02-0911	BN-PW-GSI-06-02-D-0911	BN-PW-GSI-06-08-0911	BN-PW-GSI-06-14-0911	BN-PW-GSI-07-02-0911	BN-PW-GSI-07-08-0911	BN-PW-GSI-07-14-0911	BN-PW-GSI-08-02-0911	BN-PW-GSI-08-08-0911				
Sample ID	2-8	2-8	8-14	14-24	2-8	8-14	14-24	2-8	8-14				
Sample Depth (inches)	2-8	2-8	8-14	14-24	2-8	8-14	14-24	2-8	8-14				
Sample Date	9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011	9/21/2011				
<b>Volatile Organic Compounds (UG/L)</b>													
1,1,1-Trichloroethane	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55
1,1,2,2-Tetrachloroethane	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79
1,1,2-Trichloroethane	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74
1,1-Dichloroethane	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33
1,1-Dichloroethene	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8
1,2-Dichloroethane	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44
1,2-Dichloropropane	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71
1,4-Dioxane	<b>0.88</b> J	0.19 U	<b>3.3</b>	<b>2.7</b>	<b>3.3</b>	<b>8</b>	<b>10</b>	<b>6.6</b>	<b>15.1</b>				
2-Butanone (MEK)	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7
2-Hexanone	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3
4-Methyl-2-pentanone (MIBK)	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76
Acetone	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1
Benzene	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46
Bromodichloromethane	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49
Bromoform	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71
Bromomethane	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3
Carbon disulfide	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62
Carbon tetrachloride	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58
Chlorobenzene	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44
Chloroethane	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32
Chloroform	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58
Chloromethane	0.71 U	1.9 J	0.71 U	0.71 U	0.71 U	0.71 U	0.71						
cis-1,2-Dichloroethene	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69
cis-1,3-Dichloropropene	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41
Dibromochloromethane	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.89
Ethylbenzene	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8
Methylene chloride	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99
Styrene	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97
Tetrachloroethene	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36
Toluene	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59
trans-1,2-Dichloroethene	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64
trans-1,3-Dichloropropene	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49
Trichloroethene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75
Vinyl chloride	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82
Xylene (total)	0.32 U	0.32 U	<b>0.64</b> J	<b>0.52</b> J	0.32 U	0.32 U	0.32 U	0.32 U	0.32				
<b>Dissolved (Filtered) Inorganics (UG/L)</b>													
Iron	790	NA	NA	NA	8490	NA	NA	10000	NA				NA
Manganese	3380	NA	NA	NA	1920	NA	NA	5740	NA				NA
<b>Other Parameters</b>													
Total Organic Carbon (MG/L)	3.4	NA	NA	NA	7.1	NA	NA	7.9	NA				NA
Sulfate (MG/L)	10.6	NA	NA	NA	11.9	NA	NA	9.3	NA				NA
Nitrogen, Nitrate (MG/L)	0.3	NA	NA	NA	0.4	NA	NA	2.5	NA				NA
Nitrogen, Nitrate + Nitrite (MG/L)	0.3	NA	NA	NA	0.41	NA	NA	2.5	NA				NA
Nitrogen, Nitrite (MG/L)	0.01 U	NA	NA	NA	0.01	NA	NA	0.01 U	NA				NA
Ethane (UG/L)	0.056 U	NA	NA	NA	0.13	NA	NA	0.079 J	NA				NA
Ethene (UG/L)	0.075 U	NA	NA	NA	0.075	NA	NA	0.075 U	NA				NA
Methane (UG/L)	531	NA	NA	NA	1420	NA	NA	2880	NA				NA

Notes:  
 NA Not analyzed  
 J The analyte was positively identified: the associ  
 U The analyte was analyzed for, but was not dete  
 UJ The analyte was below the reported sample q  
 mg/l Milligrams per Liter  
 ug/l Micrograms per Liter  
**Bold indicates the analyte was detected**

TABLE D-2  
Raw Analytical Data - Pore Water  
Supplemental GSI Investigation  
Naval Air Station Brunswick, Brunswick, Maine

Location	BN-PW-GSI-08-14-0911		BN-GSI-12			BN-GSI-14		
Sample ID	BN-PW-GSI-08-14-0911		BN-PW-GSI-12-02-0911	BN-PW-GSI-12-08-0911		BN-PW-GSI-14-02-0911	BN-PW-GSI-14-08-0911	
Sample Depth (inches)	14-24		2-8	8-14		2-8	8-14	
Sample Date	9/21/2011		9/20/2011	9/20/2011		9/20/2011	9/20/2011	
<b>Volatile Organic Compounds (UG/L)</b>								
1,1,1-Trichloroethane	U	0.55	U	0.55	U	0.55	U	0.55
1,1,2,2-Tetrachloroethane	U	0.79	U	0.79	U	0.79	U	0.79
1,1,2-Trichloroethane	U	0.74	U	0.74	U	0.74	U	0.74
1,1-Dichloroethane	U	0.33	U	0.33	U	0.33	U	0.33
1,1-Dichloroethene	U	0.8	U	0.8	U	0.8	U	2.2
1,2-Dichloroethane	U	0.44	U	0.44	U	0.44	U	0.44
1,2-Dichloropropane	U	0.71	U	0.71	U	0.71	U	0.71
1,4-Dioxane		<b>48</b>		0.19	U	<b>0.59</b>	J	<b>8.8</b>
2-Butanone (MEK)	U	2.7	U	2.7	U	2.7	U	2.7
2-Hexanone	U	1.3	U	1.3	U	1.3	U	1.3
4-Methyl-2-pentanone (MIBK)	U	0.76	U	0.76	U	0.76	U	0.76
Acetone	U	4.1	U	4.1	U	4.1	U	4.1
Benzene	U	0.46	U	0.46	U	0.46	U	0.46
Bromodichloromethane	U	0.49	U	0.49	U	0.49	U	0.49
Bromoform	U	0.71	U	0.71	U	0.71	U	0.71
Bromomethane	U	1.3	U	1.3	U	1.3	U	1.3
Carbon disulfide	U	0.62	U	0.62	U	0.62	U	0.62
Carbon tetrachloride	U	0.58	U	0.58	U	0.58	U	0.58
Chlorobenzene	U	0.44	U	0.44	U	0.44	U	0.44
Chloroethane	U	7.4	U	0.32	U	0.32	U	5.6
Chloroform	U	0.58	U	0.58	U	0.58	U	0.58
Chloromethane	U	0.71	U	0.71	U	0.71	U	0.71
cis-1,2-Dichloroethene	U	0.69	U	0.69	U	0.69	U	0.69
cis-1,3-Dichloropropene	U	0.41	U	0.41	U	0.41	U	0.41
Dibromochloromethane	U	0.89	U	0.89	U	0.89	U	0.89
Ethylbenzene	U	0.8	U	0.8	U	0.8	U	0.8
Methylene chloride	U	0.99	U	0.99	U	0.99	U	0.99
Styrene	U	0.97	U	0.97	U	0.97	U	0.97
Tetrachloroethene	U	0.36	U	0.36	U	0.36	U	0.36
Toluene	U	0.59	U	0.59	U	0.59	U	0.59
trans-1,2-Dichloroethene	U	0.64	U	0.64	U	0.64	U	0.64
trans-1,3-Dichloropropene	U	0.49	U	0.49	U	0.49	U	0.49
Trichloroethene	U	0.75	U	0.75	U	0.75	U	0.75
Vinyl chloride	U	0.82	U	0.82	U	0.82	U	0.82
Xylene (total)	U	<b>0.61</b>	J	0.32	U	0.32	U	0.32
<b>Dissolved (Filtered) Inorganics (UG/L)</b>								
Iron		NA		76.5	J	NA		13300
Manganese		NA		181		NA		4670
<b>Other Parameters</b>								
Total Organic Carbon (MG/L)		NA		1.5		NA		4.5
Sulfate (MG/L)		NA		12.4		NA		8.2
Nitrogen, Nitrate (MG/L)		NA		0.79		NA		0.51
Nitrogen, Nitrate + Nitrite (MG/L)		NA		0.8		NA		0.52
Nitrogen, Nitrite (MG/L)		NA		0.01	U	NA		0.01
Ethane (UG/L)		NA		0.056	U	NA		0.056
Ethene (UG/L)		NA		0.075	U	NA		0.075
Methane (UG/L)		NA		37.7		NA		1110

Notes:  
NA Not analyzed  
J The analyte was positively identified: the associ  
U The analyte was analyzed for, but was not dete  
UJ The analyte was below the reported sample q  
mg/l Milligrams per Liter  
ug/l Micrograms per Liter  
**Bold indicates the analyte was detected**

TABLE D-3

Raw Analytical Data - Surface Water

Supplemental GSI Investigation

Naval Air Station Brunswick, Brunswick, Maine

Location	BN-SW-17		BN-SW-18		PW-GSI-03		SW-GSI-06		SW-GSI-07	
Sample ID	BN-SW-17-00-0911		BN-SW-18-00-0911		BN-SW-GSI-03-00-0911		BN-SW-GSI-06-00-0911		BN-SW-GSI-07-00-0911	
Sample Depth (inches above sediment surface)	<1		<1		<1		<1		<1	
Sample Date	9/20/2011		9/21/2011		9/20/2011		9/21/2011		9/21/2011	
<b>Volatile Organic Compounds (UG/L)</b>										
1,1,1-Trichloroethane	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U
1,1,2,2-Tetrachloroethane	0.79	U	0.79	U	0.79	U	0.79	U	0.79	U
1,1,2-Trichloroethane	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U
1,1-Dichloroethane	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U
1,1-Dichloroethene	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
1,2-Dichloroethane	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U
1,2-Dichloropropane	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
1,4-Dioxane	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
2-Butanone (MEK)	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U
2-Hexanone	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
4-Methyl-2-pentanone (MIBK)	0.76	U	0.76	U	0.76	U	0.76	U	0.76	U
Acetone	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Benzene	0.46	U	0.46	U	0.46	U	0.46	U	0.46	U
Bromodichloromethane	0.49	U	0.49	U	0.49	U	0.49	U	0.49	U
Bromoform	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
Bromomethane	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Carbon disulfide	0.62	U	0.62	U	0.62	U	0.62	U	0.62	U
Carbon tetrachloride	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U
Chlorobenzene	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U
Chloroethane	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U
Chloroform	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U
Chloromethane	0.71	U	0.71	U	0.71	U	0.71	U	0.71	U
cis-1,2-Dichloroethene	0.69	U	0.69	U	0.69	U	0.69	U	0.69	U
cis-1,3-Dichloropropene	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U
Dibromochloromethane	0.89	U	0.89	U	0.89	U	0.89	U	0.89	U
Ethylbenzene	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
Methylene chloride	0.99	U	0.99	U	0.99	U	0.99	U	0.99	U
Styrene	0.97	U	0.97	U	0.97	U	0.97	U	0.97	U
Tetrachloroethene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Toluene	0.59	U	0.59	U	0.59	U	0.59	U	0.59	U
trans-1,2-Dichloroethene	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
trans-1,3-Dichloropropene	0.49	U	0.49	U	0.49	U	0.49	U	0.49	U
Trichloroethene	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Vinyl chloride	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U
Xylene (total)	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U

**Notes:**

NA Not analyzed

J The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

mg/l Milligrams per Liter

ug/l Micrograms per Liter

**Bold indicates the analyte was detected**

TABLE D-3

Raw Analytical Data - Surface Water

Supplemental GSI Investigation

Naval Air Station Brunswick, Brunswick, Maine

Location	SW-GSI-08		SW-GSI-12		SW-GSI-14	
Sample ID	BN-SW-GSI-08-00-0911		BN-SW-GSI-12-00-0911		BN-SW-GSI-14-00-0911	
Sample Depth (inches above sediment surface)	<1		<1		<1	
Sample Date	9/21/2011		9/20/2011		9/20/2011	
<b>Volatile Organic Compounds (UG/L)</b>						
1,1,1-Trichloroethane	0.55	U	0.55	U	0.55	U
1,1,2,2-Tetrachloroethane	0.79	U	0.79	U	0.79	U
1,1,2-Trichloroethane	0.74	U	0.74	U	0.74	U
1,1-Dichloroethane	0.33	U	0.33	U	0.33	U
1,1-Dichloroethene	0.8	U	0.8	U	0.8	U
1,2-Dichloroethane	0.44	U	0.44	U	0.44	U
1,2-Dichloropropane	0.71	U	0.71	U	0.71	U
1,4-Dioxane	0.19	U	0.19	U	0.19	U
2-Butanone (MEK)	2.7	U	2.7	U	2.7	U
2-Hexanone	1.3	U	1.3	U	1.3	U
4-Methyl-2-pentanone (MIBK)	0.76	U	0.76	U	0.76	U
Acetone	4.1	U	4.1	U	4.1	U
Benzene	0.46	U	0.46	U	0.46	U
Bromodichloromethane	0.49	U	0.49	U	0.49	U
Bromoform	0.71	U	0.71	U	0.71	U
Bromomethane	1.3	U	1.3	U	1.3	U
Carbon disulfide	0.62	U	0.62	U	0.62	U
Carbon tetrachloride	0.58	U	0.58	U	0.58	U
Chlorobenzene	0.44	U	0.44	U	0.44	U
Chloroethane	0.32	U	0.32	U	0.32	U
Chloroform	0.58	U	0.58	U	0.58	U
Chloromethane	0.71	U	0.71	U	0.71	U
cis-1,2-Dichloroethene	0.69	U	0.69	U	0.69	U
cis-1,3-Dichloropropene	0.41	U	0.41	U	0.41	U
Dibromochloromethane	0.89	U	0.89	U	0.89	U
Ethylbenzene	0.8	U	0.8	U	0.8	U
Methylene chloride	0.99	U	0.99	U	0.99	U
Styrene	0.97	U	0.97	U	0.97	U
Tetrachloroethene	0.36	U	0.36	U	0.1	U
Toluene	0.59	U	0.59	U	0.59	U
trans-1,2-Dichloroethene	0.64	U	0.64	U	0.64	U
trans-1,3-Dichloropropene	0.49	U	0.49	U	0.49	U
Trichloroethene	0.75	U	0.75	U	0.75	U
Vinyl chloride	0.82	U	0.82	U	0.1	U
Xylene (total)	0.32	U	0.32	U	0.32	U

**Notes:**

NA Not analyzed

J The analyte was positively identified: the a:

U The analyte was analyzed for, but was not

UJ The analyte was below the reported sam

mg/l Milligrams per Liter

ug/l Micrograms per Liter

**Bold indicates the analyte was detected**

TABLE D-4  
 Raw Analytical Data - Sediment  
 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Location	SD-GSI-03		SD-GSI-06				SD-GSI-07		SD-GSI-08		SD-GSI-12		SD-GSI-14	
Sample ID	BN-SD-GSI-03-00-0911		BN-SD-GSI-06-00-0911		BN-SD-GSI-06-00-D-0911		BN-SD-GSI-07-00-0911		BN-SD-GSI-08-00-0911		BN-SD-GSI-12-00-0911		BN-SD-GSI-14-00-0911	
Sample Depth (inches)	1-6		1-6		1-6		1-6		1-6		1-6		1-6	
Sample Date	9/21/2011		9/21/2011		9/21/2011		9/21/2011		9/21/2011		9/21/2011		9/22/2011	
<b>Volatile Organic Compounds (UG/KG)</b>														
1,1,1-Trichloroethane	16	U	19	U	15	U	14	U	18	U	14	U	16	U
1,1,2,2-Tetrachloroethane	15	U	18	U	14	U	13	U	18	U	13	U	16	U
1,1,2-Trichloroethane	22	U	27	U	20	U	19	U	25	U	19	U	23	U
1,1-Dichloroethane	13	U	16	U	12	U	12	U	15	U	11	U	13	U
1,1-Dichloroethene	27	U	33	U	25	U	24	U	32	U	24	U	28	U
1,2-Dichloroethane	12	U	15	U	12	U	11	U	14	U	11	U	13	U
1,2-Dichloropropane	20	U	24	U	18	U	17	U	23	U	17	U	20	U
1,4-Dioxane	0.32	U	0.38	U	0.3	U	0.33	U	0.33	U	0.27	U	0.33	U
2-Butanone (MEK)	100	U	120	U	95	U	91	U	120	U	88	U	110	U
2-Hexanone	90	U	110	U	84	U	80	U	100	U	78	U	93	U
4-Methyl-2-pentanone (MIBK)	72	U	88	U	67	U	64	U	84	U	62	U	74	U
Acetone	99	U	120	U	92	U	89	U	120	U	86	U	100	U
Benzene	11	U	13	U	10	U	9.6	U	12	U	9.3	U	11	U
Bromodichloromethane	18	U	22	U	17	U	16	U	21	U	16	U	19	U
Bromoform	41	U	49	U	38	U	36	U	47	U	35	U	42	U
Bromomethane	58	U	71	U	54	U	52	U	67	U	50	U	60	U
Carbon disulfide	83	U	100	U	77	U	74	U	97	U	72	U	86	U
Carbon tetrachloride	19	U	24	U	18	U	17	U	22	U	17	U	20	U
Chlorobenzene	8	U	9.8	U	7.5	U	7.2	U	9.3	U	6.9	U	8.3	U
Chloroethane	22	U	27	U	21	U	20	U	26	U	19	U	23	U
Chloroform	13	U	16	U	12	U	11	U	15	U	11	U	13	U
Chloromethane	19	U	23	U	17	U	17	U	22	U	16	U	19	U
cis-1,2-Dichloroethene	23	U	28	U	22	U	21	U	27	U	20	U	24	U
cis-1,3-Dichloropropene	86	U	100	U	80	U	76	U	100	U	74	U	88	U
Dibromochloromethane	56	U	68	U	52	U	50	U	65	U	48	U	58	U
Ethylbenzene	11	U	14	U	10	U	9.9	U	13	U	9.6	U	11	U
Methylene chloride	31	U	38	U	29	U	28	U	36	U	27	U	32	U
Styrene	43	U	52	U	40	U	38	U	50	U	37	U	44	U
Tetrachloroethene	14	U	18	U	13	U	13	U	17	U	12	U	15	U
Toluene	15	U	19	U	14	U	14	U	18	U	13	U	16	U
trans-1,2-Dichloroethene	22	U	26	U	20	U	19	U	25	U	19	U	22	U
trans-1,3-Dichloropropene	59	U	72	U	55	U	52	U	68	U	51	U	61	U
Trichloroethene	17	U	21	U	16	U	15	U	19	U	14	U	17	U
Vinyl chloride	55	U	68	U	51	U	49	U	64	U	48	U	57	U
Xylene (total)	11	U	13	U	10	U	9.6	U	13	U	9.3	U	11	U
<b>Grain Size Fraction (%)</b>														
% Gravel	0.38		2.3		NA		0.31		0.04		0.32		0.33	
% Sand	87.2		89.2		NA		90.6		94.4		74.9		91.4	
% Silt, Clay, Colloids	12.4		8.4		NA		9.1		5.6		24.8		8.3	
0.0015 mm (Hydrometer)	1.1		1.1		NA		0		0		0		1.1	
0.005 mm (Hydrometer)	2.5		3		NA		0		0		4		1.1	
0.030 mm (Hydrometer)	6		5.9		NA		0.99		0		17.5		5.5	
0.375 Inch Sieve	99.8		98.8		NA		99.9		100		100		99.8	
0.75 Inch Sieve	100		100		NA		100		100		100		100	
1.5 Inch Sieve	100		100		NA		100		100		100		100	
3 Inch Sieve	100		100		NA		100		100		100		100	
No.10 Sieve (2.00 mm)	99.5		96.4		NA		99.4		99.4		98.5		99	
No.100 Sieve (0.15 mm)	29.3		15.4		NA		18		14.9		37.5		16.6	
No.16 Sieve (1.18 mm)	99.2		95.8		NA		98.8		98		98		97.7	
No.200 Sieve (0.075 mm)	12.4		8.4		NA		9.1		5.6		24.8		8.3	
No.30 Sieve (0.60 mm)	98.4		91.9		NA		89		84.6		94		86.8	
No.4 Sieve (4.75 mm)	99.6		97.7		NA		99.7		100		99.7		99.7	
No.50 Sieve (0.30 mm)	85.3		54.7		NA		46.5		44.3		70.2		44.7	
No.8 Sieve (2.36 mm)	99.5		96.5		NA		99.5		99.6		98.8		99.3	
<b>Other Parameters (MG/KG)</b>														
Total Organic Carbon	6340		9610		NA		2370		16700		3660		3290	

Notes:  
 NA Not analyzed  
 U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.  
 mg/kg Milligrams per Kilogram  
 ug/kg Micrograms per Kilogram  
**Bold indicates the analyte was detected**

**Attachment E**  
**Surface Water and Pore Water Sampling Field Forms**

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### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-03 Date 9/20/11

Weather Conditions overcast, few light showers

Condition good

Sample Team TB/RC

Surface Water											
	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes	
	1553	6.94	.127	15.89	32.6	7.06	3.99	NM	Clear		
<p><b>Sample Information</b>                      Sample ID: <u>BN-SW-GSI-03-00-0911</u>                      Date: <u>9/20/11</u> Analysis: <u>VOCs, 1,4-Dioxane,</u>                      Time: <u>1600</u></p>											
Pore Water											
	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-03-02	1612	6.10	.094	15.48	71.2	3.60	157	NM	light brown	Went dry
After Sample		1712	6.14	.091	16.22	48.2	4.23	16.7	NM	Clear	
* well went dry while collecting after sample water quality											
Before Sample	GSI-03-08	1635	5.73	.075	15.49	173.3	3.64	193	NM	light brown	
After Sample		1710	6.51	.041	16.35	158.5	9.42*	192	NM	1"	
* well went dry aft while collecting after sample water quality											
<p><b>Sample Information</b>                      Sample ID: <u>BN-SW-GSI-03-02-0911</u>                      Date: <u>9/20/11</u> Analysis: <u>VOCs, 1,4-Dioxane, MNA Parameters</u>                      Time: <u>1621</u> Sample Depth: <u>2"-8"</u></p>						<p><b>Sample Information</b>                      Sample ID: <u>BN-PW-GSI-03-08-0911</u>                      Date: <u>9/20/11</u> Analysis: <u>VOCs, 1,4-Dioxane</u>                      Time: <u>1707</u> Sample Depth: <u>8"-14"</u></p>					
Signature/Date											

### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-04 Date: 9/22/11

Weather Conditions Showers (sometimes heavy)

Condition good

Sample Team TB/KC

Surface Water									
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
0915	6.76	.126	15.94	26.3	6.59	10.5	—	Clear	

**Sample Information**  
NO SAMPLE

Pore Water											
	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-04-02	0920	6.46	.216	16.23	-8.7	3.36	average	—		ok brown silty
After Sample		0936	6.58	.172	15.94	-33.0	3.58	101	—	some fine sand	sand
Before Sample	GSI-04-08	0955	6.28	.192	16.78	37.6	3.06	165	—	Cloudy	
After Sample		1005	6.25	.191	16.47	13.3	1.94	63.8	—		

River level still at initial w.l. mark (see photos)

**Sample Information PW**  
 Sample ID: BN-SW-GSI-04-02-0911  
 Date: 9/22/11 Analysis: VOCs, 1,4-Dioxane, MNA Parameters  
 Time: 0931 Sample Depth: 2"-8"

**Sample Information**  
 Sample ID: BN-PW-GSI-04-08-0911  
 Date: 9/22/11 Analysis: VOCs, 1,4-Dioxane  
 Time: 1003 Sample Depth: 8"-14"

Signature/Date



### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-05 Date: 9/21/11

Weather Conditions Sunny, 65-70°C

Condition good

Sample Team RC, TB, DL

Surface Water											
	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes	
	0915	7.13	0.269	13.66	217.3	8.88	4.78	N/A	clear		
<p><b>Sample Information</b> NO SAMPLE</p> <p style="text-align: right;">V6A → GSI-05-02 goes dry after filling 4 containers (0935). Wait for tech.</p>											
Pore Water											
	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-05-02	0920	6.84	0.194	16.96	51.5	6.50	964	N/A	brown, turbid	- goes dry (0935) recharge
After Sample							8.0	tubing readjusted			
Before Sample	GSI-05-08	0946	6.22	0.171	17.37	27.7	2.83	>1000	N/A	brown, cloudy/turbid	
After Sample			1003	6.37	0.179	17.28	39.1	3.01	441	N/A	slightly cloudy, light brown tint
Before Sample	GSI-05-14	1015	6.44	0.144	17.68	51.4	7.68	182	N/A	sl. cloudy	
After Sample			1021	6.42	0.139	16.84	67.5	5.59	180	N/A	sl. cloudy
<p><b>Sample Information</b> <u>05</u> Sample ID: <u>BN-SW-GSI-05-02-0911</u> Date: <u>9/21/11</u> Analysis: VOCs, 1,4-Dioxane, MNA Parameters Time: <u>0935</u> Sample Depth: <u>2"-8"</u></p> <p><b>Sample Information</b> <u>05</u> Sample ID: <u>BN-PW-GSI-05-08-0911</u> Date: <u>9/21/11</u> Analysis: VOCs, 1,4-Dioxane Time: <u>0950</u> Sample Depth: <u>8"-14"</u> Duplicate: <u>BN-PW-GSI-05-08-D</u> Signature/Date: <u>(0935)</u></p> <p><b>Sample Information</b> Sample ID: <u>BN-PW-GSI-05-14-0911</u> Date: <u>9/21/11</u> Analysis: VOCs, 1,4-Dioxane Time: <u>1020</u> Sample Depth: <u>14"-26"</u></p> <p style="text-align: right;">CH2MHILL.</p>											

### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-06 Date: 9/21/11

Weather Conditions clear 60s

Condition good

Sample Team B/KC

#### Surface Water

Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
0930	7.03	.261	14.41	207.7	7.67	9.11	—	clear	

**Sample Information**

Sample ID: BN-SW-GSI-06-00-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane,

Time: 0935

Also DUP: GSI-06-SW-D

#### Pore Water

	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-06-02	1000	6.77	.171	11.84	233.4	4.53	120	—	cloudy	
After Sample		1110	6.67	.153	16.59	-33.2	4.20	27	—	less cloudy	
Before Sample	GSI-06-08	1200	6.52	.224	16.69	47.1	4.00	16.4	—	wh clear	
After Sample		1210	6.47	.227	16.02	33.2	2.63	78.6	—	white cloudy	
Before Sample	GSI-06-14	1150	6.43	.229	17.04	59.3	2.01	431	—	cloudy brown	
After Sample		1155	6.40	.226	16.75	22.3	1.73	344	—	same	

**Sample Information**

Sample ID: BN-SW-GSI-06-02-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane, MNA Parameters

Time: 1005 Sample Depth: 2"-8"

Also MS/MSD e 1105

**Sample Information**

Sample ID: BN-PW-GSI-06-08-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane

Time: 1152TB Sample Depth: 8"-14"

1203  
wally Bl 9-21-11

Signature/Date

**Sample Information**

Sample ID: BN-PW-GSI-06-14-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane

Time: 1152 Sample Depth: 14"-26"



### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-07 Date: 9/21/11

Weather Conditions clear Sunny, ~70°F

Condition good

Sample Team RC, TB, DL

1.88  
4.58

Surface Water											
	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes	
	1111	7.12	0.190	16.77	52.9	8.60	169	—	mostly clear	fract. sed.	
<b>Sample Information</b>											
Sample ID: <u>BN-SW-GSI-07-00-0911</u>											
Date: <u>9/21/11</u> Analysis: <u>VOCs, 1,4-Dioxane,</u>											
Time: <u>1120</u>											
Pore Water											
	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-07-02	1147	6.34	0.184	17.88	28.9	3.60	>1000	N/A	brown, very turbid	
After Sample		1155	6.30	0.189	16.84	31.5	3.35	763	N/A	lt turbid brown tint, somewhat cloudy	
Before Sample	GSI-07-08	1212	6.13	0.188	16.77	48.6	3.62	176	N/A	slightly cloudy	
After Sample		1218	6.10	0.187	15.27	46.1	2.2-60	213	N/A	" "	
Before Sample	GSI-07-14	1240	6.12	0.181	16.93	69.1	2.47	>1000	N/A	brown, v. cloudy	
After Sample		1250	5.73	0.182	14.96	54.6	1.90	121	N/A	lt tint, somewhat cloudy	
<b>Sample Information</b>											
Sample ID: <u>BN-SW-GSI-07-02-0911</u>				<b>Sample Information</b>				<b>Sample Information</b>			
Date: <u>9/21/11</u> Analysis: <u>VOCs, 1,4-Dioxane, MNA Parameters</u>				Sample ID: <u>BN-PW-GSI-07-08-0911</u>				Sample ID: <u>BN-PW-GSI-07-14-0911</u>			
Time: <u>1150</u> Sample Depth: <u>2"-8"</u>				Date: <u>9/21/11</u> Analysis: <u>VOCs, 1,4-Dioxane</u>				Date: <u>9/21/11</u> Analysis: <u>VOCs, 1,4-Dioxane</u>			
				Time: <u>1215</u> Sample Depth: <u>8"-14"</u>				Time: <u>1250</u> Sample Depth: <u>14"-26"</u>			
Signature/Date <u>DL DL 9/21/11</u>											

MS/MSD - BN-SW-GSI-07-00-MS and BN-SW-GSI-07-00-MSD collected for all parameters

### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-08 Date 9/21/11

Weather Conditions lt breeze, Sunny, ~65°F

Condition good

Sample Team RC, TB, DL

Surface Water									
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
153A	7.09	0.193	16.90	81.5	7.70	22.7	N/A	clear, trace sed.	

**Sample Information**

Sample ID: BN-SW-GSI-08-00-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane,

Time: 1540

Pore Water

	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-08-02	1600	6.37	0.210	16.65	26.5	3.40	204	N/A	lt brown tint, cloudy	
After Sample		1612	6.48	0.219	15.88	-33.9	2.29	80.6	N/A	clear, slight yellow tint	
Before Sample	GSI-08-08	0830	6.04	0.359	15.41	228.1	3.62	188	N/A	lt brown, cloudy	
After Sample		0846	6.31	0.166	15.77	-21.3	7.60	46.7	N/A	mostly clear	
Before Sample	GSI-08-14	1549	6.16	0.164	16.63	30.1	2.40	800	N/A	brownish, cloudy / turbid	
After Sample		1554	6.02	0.150	15.15	20.9	152	200	N/A	slightly cloudy, slight brown tint	

**Sample Information**

Sample ID: BN-SW-GSI-08-02-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane, MNA Parameters

Time: 1610 Sample Depth: 2"-8"

**Sample Information**

Sample ID: BN-PW-GSI-08-08-0911

Date: 9/22/11 Analysis: VOCs, 1,4-Dioxane

Time: 0835 Sample Depth: 8"-14"

**Sample Information**

Sample ID: BN-PW-GSI-08-14-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane

Time: 1555 Sample Depth: 14"-26"

Signature/Date

*[Handwritten signatures and dates]*  
 [Signature] on 9/21/11  
 [Signature] on 9/22/11



### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-12 Date: 9/20/11

Weather Conditions overcast few showers

Condition Good

Sample Team TR/RC

Surface Water										
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes	
1302	7.12	.214	14.21	204.9	9.45	7.17	NM	Clear		

**Sample Information**

Sample ID: BN-SW-GSI-12-00-0911

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane,

Time: 1305

#### Pore Water

	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-12-02	1314	7.02	.163	14.74	184.7	7.52	4.13	NM	Clear	Clear
After Sample		1334	6.79	.168	14.40	186.6	8.14	6.86	NM	Clear	clear
Before Sample	GSI-12-08	1349	6.32	0.153	13.81	54.8	3.83	48.5	NM	Clear	Clear
After Sample		1357/1405	6.28	0.161	14.67	21.2	4.92	36.8	NM	lt. Brown	lt. Brown

1357/1405 went dry near 2nd water quality sample had to resample

**Sample Information**

Sample ID: BN-SW-GSI-12-02-0911

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane, MNA Parameters

Time: 1350 to 1315 Sample Depth: 2"-8"

**Sample Information**

Sample ID: BN-PW-GSI-12-08-0911

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane

Time: 1350 Sample Depth: 8"-14"

Signature/Date



\* water cascading into brook adj to sample point

Piezometer  
DTW = 1.82 TOC

Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-14 Date: 9/20/11

Weather Conditions Cloudy

Condition \_\_\_\_\_

Sample Team R. Clennon, T. Baker

Surface Water									
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
0955	7.14	0.397	13.81	231.1	8.37	20.9	N/A	sl. cloudy	

Sample Information

Sample ID: BN-SW-GSI-14-00-0911

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane,

Time: 1000

Pore Water											
	Sample ID	Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
Before Sample	GSI-14-02	10:02	6.49	0.165	14.14	74.8	3.86	>1000	N/A	← brown, cloudy	
After Sample		1014	6.34	0.201	13.96	+14.4	2.61	48.8	N/A	slt. brown tint, mostly clear	
Before Sample	GSI-14-08	1019	6.23	6.149	14.02	46.1	4.16	124	N/A	lt brown, cloudy	
After Sample		1026	6.27	0.148	13.97	-1.6	2.14	39.7	N/A	slt brown hue, mostly clear	

Sample Information

Sample ID: BN-SW-GSI-14-02-0911

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane, MNA Parameters

Time: 1010 Sample Depth: 2"-8"

Sample Information

Sample ID: BN-PW-GSI-14-08-0911

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane

Time: 1022 Sample Depth: 8"-14"

Signature/Date

*Bill A 9/20/11*



### Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) SW-17 Date: 9/20/11

Weather Conditions cloudy/overcast (some rain)

Condition stream calm, steady flow; ~12" deep

Sample Team \_\_\_\_\_

Surface Water										
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes	
400p	6.78	0.109	15.16	62.5	8.35	2.80		clear		
				ORP					FMU	

**Sample Information**  
 Sample ID: BN-SW-17-00-0911  
 Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane,  
 Time: 400p

Signature/Date DAN LAVOIE 9/20/11

 CH2MHILL



## Field Data Sheets for Porewater Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) SW-18 Date: 9/21/11

Weather Conditions cloudy, warm

Condition calm, flowing stream conditions

Sample Team Don Lavore

Surface Water									
Time	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	D.O. (mg/L)	Turbidity (NTU)	TDS (g/L)	Appearance	Additional Notes
345p	6.77	0.157	14.96	69.1	9.68	4.9		clear	

**Sample Information**  
 Sample ID: BN-SW-18-00-0911  
 Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane,  
 Time: 345p

Signature/Date [Signature] 9/21/11

 CH2MHILL

**Attachment F**  
**PushPoint (MHE Products) Field Set-up**

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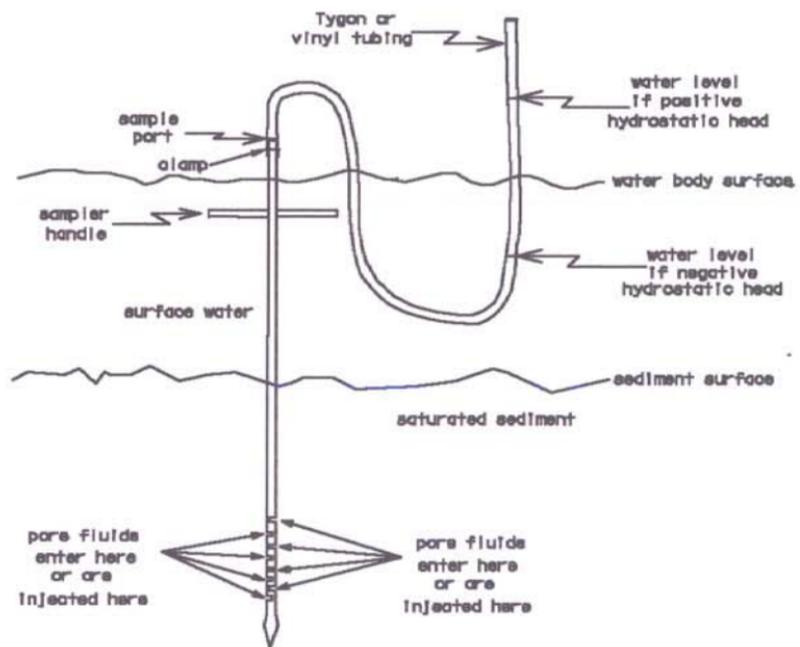


Figure 5





**Attachment G**  
**Low-Flow Groundwater Sampling Field Forms**

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## Field Data Sheets for Low Flow Ground Water Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870  
 Sample Source (Well No./Location) GSI-04 Date: 9/22/11  
 Weather Conditions # rain, ~60°C  
 PID \_\_\_\_\_ (ppm) Condition RC, TB  
 Sample Team \_\_\_\_\_

Well Depth 11.11 <sup>bhoc</sup> Datum PVC Well Stabilization Data Stick-up ht: 3.11 Ft  
 Static Water Level 3.89 Diameter \_\_\_\_\_  
 Purge Method: Low Flow, Peristaltic Pump and Dedicated Tubing  
 Time Purging begins (T<sub>0</sub>): 1041  
 Water Level at time T<sub>0</sub>: 4.75  
 Time Purging ends (T<sub>1</sub>): \_\_\_\_\_  
 Water Level at time T<sub>1</sub>: \_\_\_\_\_

Time	Volume Removed (L)	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	Water level (Ft)	D.O. (mg/L) (+/- 10%)		Turbidity (NTU)	Purge rate (Lpm)	Appearance
		+/- 0.1	+/- 3%	+/- 0.2	+/- 10 mV	< 0.3 ft	mg/L	Percent	+/- 10%	< 0.5LPM	
1045	< 2L	6.93	0.249	13.13	16.5	4.97	1.32	12.5	6.33		cloudy
1050	~ 3L	6.95	0.247	12.90	40.6	5.09	0.65	6.2	204	0.4	cloudy, brown tint
1055	5L	7.02	0.247	12.86	55.5	5.13	0.54	5.1	102	0.4	" "
1100	7L	7.03	0.247	12.90	58.4	5.14	0.52	4.9	25.7	0.4	" "
1105	9L	7.03	0.247	12.90	59.1	5.17	0.49	4.5	7.54	0.4	clear
1110	11L	7.03	0.257	12.87	62.4	5.21	0.45	4.2	5.53	0.4	" "
1115	13L	7.03	0.249	12.87	61.9	5.20	0.53	4.9	5.81	0.4	" "
Total Volume Purged											

Some what brown  
 Turbidity @ 1103: 12.8  
 Turb @ 1108: 5.06  
 Turb @ 1112: 5.53

SAMPLING

Date: 9/22/11 Analysis: VOCs, 1,4-Dioxane, and MNA parameters  
 Time: 1115 Sampling Depth: 11 ft bhoc  
 Sample ID: BN-PZ-GSI-04-10  
 Field Filtering Yes (metals only)  
 Sampling Methodology \_\_\_\_\_  
 Laboratory Accutest Method of Shipment FedEx  
 Remarks: \_\_\_\_\_

## Field Data Sheets for Low Flow Ground Water Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-05/PZ-MB-B3-A Date: 9/21/11

Weather Conditions clear 70s

PID \_\_\_\_\_ (ppm) Condition good

Sample Team R. Clemon, T. Baker, D. Lavoie

Well Depth 3.23' Datum Pvc (1") Well Stabilization Data  
 Static Water Level 5-116.39 Diameter 1" Depth: 9.29 TOC  
 Purge Method: Low Flow, Peristaltic Pump and Dedicated Tubing 6.29 BOS

Time Purging begins (T<sub>0</sub>): 10:22 1420  
 Water Level at time T<sub>0</sub>: 4.97 6.39  
 Time Purging ends (T<sub>1</sub>): 10:45  
 Water Level at time T<sub>1</sub>: 6.40

Time	Volume Removed (L)	pH +/- 0.1	SPCOND.(mS/cm) +/- 3%	TEMP.(C) +/- 0.2	Redox (mV) +/- 10 mV	Water level (Ft) < 0.3 ft	D.O. (mg/L) (+/- 10%)		Turbidity (NTU) +/- 10%	Purge rate (Lpm) < 0.5LPM	Appearance
							mg/L	Percent			
1035	< 1L	7.02	8.127	15.13	-62.0	N/A	5.76	51.7	> 1000		very cloudy / turbid
1037 Well/pipe goes dry wait for recharge											
1436	3.15AL	6.48	244	14.11	32.2		1.03	10.0	15.7	0.3	
1442		6.47	242	14.12	37.0		1.03	10.0	9.82	0.3	
1446		6.46	242	14.12	47.4	6.39	0.98	9.8	5.54	0.3	clear
1452		6.46	243	14.10	44.3	6.39	1.07	10.3	5.27	0.3	↓
1458	≈ 3.56L	6.46	243	14.10	46.1	6.42	1.01	9.8	19.2	0.3	little sediment
1503		6.46	243	14.04	24.5	6.42	0.97	9.4	14.5	0.3	"
1508		6.46	243	14.03	33.3	6.42	0.96	9.4	6.74	0.3	clear
1513		6.46	241	14.02	47.4	6.43	0.98	9.5	4.37	0.3	↓
1518		6.46	241	13.99	49.1	6.47	0.95	9.2	4.60	0.3	↓
1523		6.46	241	14.00	54.2	6.48	0.95	9.1	3.32	0.3	↓

**Total Volume Purged** \_\_\_\_\_

**SAMPLING**

Date: 9/21/11 Analysis: VOCs, 1,4-Dioxane, and MNA parameters

Time: 1521 Sampling Depth: 9 ft + 10 c

Sample ID: PZB3A-0911

Field Filtering: Yes (metals only)

Sampling Methodology: \_\_\_\_\_

Laboratory: Accutest Method of Shipment: FedEx

Remarks: \_\_\_\_\_





## Field Data Sheets for Low Flow Ground Water Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870  
 Sample Source (Well No./Location) GSI-08/PZ-MB-B4-A Date: 9/22/11  
 Weather Conditions Rain, ~65°F  
 PID \_\_\_\_\_ (ppm) Condition \_\_\_\_\_  
 Sample Team R. Clemens, T. Baker

**Well Stabilization Data**

Well Depth 9.40 Datum to P PVC Time Purging begins (T<sub>0</sub>): 05:00  
 Static Water Level 4.75 Diameter \_\_\_\_\_ Water Level at time T<sub>0</sub>: 4.96  
 Purge Method: Low Flow, Peristaltic Pump and Dedicated Tubing Time Purging ends (T<sub>1</sub>): 09:48  
 Water Level at time T<sub>1</sub>: 5.69

Time	Volume Removed (L)	pH	SPCOND.(mS/cm)	TEMP.(C)	Redox (mV)	Water level (Ft)	D.O. (mg/L) (+/- 10%)		Turbidity (NTU)	Purge rate (Lpm)	Appearance
		+/- 0.1	+/- 3%	+/- 0.2	+/- 10 mV	< 0.3 ft	mg/L	Percent	+/- 10%	< 0.5LPM	
0855	2.2	6.35	0.153	14.58	10.8	6.18	0.83	8.2	27.5	0.25 Lpm	Slight brown tint, mostly clear
0900	3.25	6.25	0.143	14.42	6.9	6.09	0.33	3.3	3.44	0.25	clear, no color
0905	4.5	6.22	0.136	14.38	5.8	6.24	0.32	3.2	2.12	0.25	clear, slight sulfur-like odor
0910	8.25	6.21	0.124	14.39	-0.8	6.34	0.38	3.7	1.42	0.25	" "
0915	9.5	6.19	0.122	14.42	0.9	6.41	0.35	3.9	0.94	0.25	clear, no color
0920	10.75	6.14	0.121	14.42	2.3	6.44	0.28	2.8	0.83	0.25	" "
0925											Some odor as before (B)
0930											
<b>Total Volume Purged</b>											

0920  
0925  
0930

tint, mostly clear  
 color, slight sulfur-like odor  
 " "  
 clear, no color  
 Some odor as before (B)

**SAMPLING**

Date: 9/22/11 Analysis: VOCs, 1,4-Dioxane, and MNA parameters  
 Time: 0930 - 0940 Sampling Depth: \_\_\_\_\_  
 Sample ID: PZB4A-0911 Sample PZB4A-0911-0  
 Field Filtering Y (metals only) also collected @ 0945  
 Sampling Methodology \_\_\_\_\_  
 Laboratory Accutest Method of Shipment FedEx  
 Remarks: \_\_\_\_\_

## Field Data Sheets for Low Flow Ground Water Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870

Sample Source (Well No./Location) GSI-12 Date: 9/20/11

Weather Conditions Clouds, H rain, ~65°F

PID \_\_\_\_\_ (ppm) Condition good - tubing stuck down hole

Sample Team R. Cleamon, T. Baker

Well Depth 14.50 Datum \_\_\_\_\_ Well Stabilization Data

Static Water Level 4.37 Diameter \_\_\_\_\_

Purge Method: Low Flow, Peristaltic Pump and Dedicated Tubing

Time Purging begins (T<sub>0</sub>): 1933

Water Level at time T<sub>0</sub>: 4.37

Time Purging ends (T<sub>1</sub>): 1953

Water Level at time T<sub>1</sub>: 1930

Time	Volume Removed (L)	pH +/- 0.1	SPCOND. (mS/cm) +/- 3%	TEMP. (C) +/- 0.2	Redox (mV) +/- 10 mV	Water level (Ft) < 0.3 ft	D.O. (mg/L) (+/- 10%)		Turbidity (NTU) +/- 10%	Purge rate (Lpm) < 0.5 LPM	Appearance
							mg/L	Percent			
1340	~1L	6.80	0.355	12.50	633	4.68	4.61	40.3	94.0	~0.35	
1345	2L	6.16	0.144	12.14	-26.2	4.79	0.57	5.3	47.4	0.35	milky/cloudy
1350	3L	6.23	0.126	12.10	-27.5	4.80	0.42	4.0	18.6	0.4	" "
1355	4L	6.36	0.129	12.11	-26.2	4.80	0.58	5.5	12.7	0.4	mostly clear
1400	5L	6.42	0.132	12.14	-25.7	4.80	0.65	6.8	9.97	0.4	" "
1405	6L	6.45	0.126	12.11	-30.1	4.80	0.54	4.9	5.90	0.4	" "
1410	7L	6.47	0.124	12.03	-32.6	4.80	0.67	6.8	5.06	0.4	" "
1415	8L	6.48	0.123	12.08	-28.3	4.80	0.60	5.7	4.15	0.4	" "
1420	9L	6.49	0.122	12.11	-24.9	4.80	0.31	2.9	7.57	0.4	" "
Total Volume Purged											

### SAMPLING

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane, and MNA parameters

Time: 1420 Sampling Depth: 12.5 ft bto c

Sample ID: BN-PZ-GSI-12-10

Field Filtering (metals only)

Sampling Methodology \_\_\_\_\_

Laboratory Accutest

Method of Shipment FedEx

Remarks: \_\_\_\_\_

## Field Data Sheets for Low Flow Ground Water Sampling

Project Name: NAS Brunswick, ME Merriconeag Stream Project Number: 398870  
 Sample Source (Well No./Location) GSI-14 Date: 9/20/11  
 Weather Conditions Cloudy, light breeze, ~65°F  
 PID NM (ppm) Condition good  
 Sample Team R. Clennon T. Baker

**Well Stabilization Data**

Well Depth 11.98 Datum PVC casing Time Purging begins (T<sub>0</sub>): 1045  
 Static Water Level 1.82 Diameter 1" pitometer Water Level at time T<sub>0</sub>: 1.82  
 Purge Method: Low Flow, Peristaltic Pump and Dedicated Tubing Time Purging ends (T<sub>1</sub>): 1145  
 Water Level at time T<sub>1</sub>: 1.82

Time	Volume Removed (L)	pH +/- 0.1	SPCOND.(mS/cm) +/- 3%	TEMP.(C) +/- 0.2	Redox (mV) +/- 10 mV	Water level (Ft) < 0.3 ft	D.O. (mg/L) (+/- 10%)		Turbidity (NTU) +/- 10%	Purge rate (Lpm) < 0.5LPM	Appearance
							mg/L	Percent			
1050	~1.8	7.36	0.123	12.02	-114.8	1.82	0.23	2.6	805	0.3 Lpm	cloudy, slt whit tint
1055	3.6	7.65	0.123	11.95	-110.6	1.82	0.27	2.8	805	0.4	cloudy
1100	5.6	7.82	0.123	11.96	-125.0	↓	0.26	2.4	123	0.4	slightly cloudy, no tint
1105	7.6	7.90	0.123	11.97	-126.3		0.23	2.1	94.9	0.4	" "
1110	9.6	7.96	0.123	11.97	-125.4		0.26	2.4	48.1	0.4	" "
1115	11.6	7.98	0.123	12.00	-125.0		0.25	2.3	35.7	0.4	mostly clear
1120	13.6	7.99	0.123	12.00	-126.2		0.24	2.3	23.5	0.4	" "
1125	15.6	8.00	0.123	12.03	-113.1		0.24	2.2	13.6	0.4	" "
1130	17.6	8.02	0.123	12.03	-109.4		0.21	2.0	10.3	0.4	" "
<b>Total Volume Purged</b>											

cloudy, slt whit tint  
 cloudy, no tint  
 Turbidity: 16.3 @ 1123  
 Turbidity: 10.8 @ 1127

**SAMPLING**

Date: 9/20/11 Analysis: VOCs, 1,4-Dioxane, and MNA parameters  
 Time: 1130 Sampling Depth: 11 ft bblc  
 Sample ID: BN-PZ-GSI-14-10  
 Field Filtering Y (metals only)  
 Sampling Methodology \_\_\_\_\_  
 Laboratory Accutest Method of Shipment FedEx  
 Remarks: \_\_\_\_\_

**Attachment H**  
**Groundwater Water Level Measurements (Watermark/ECC Data)**

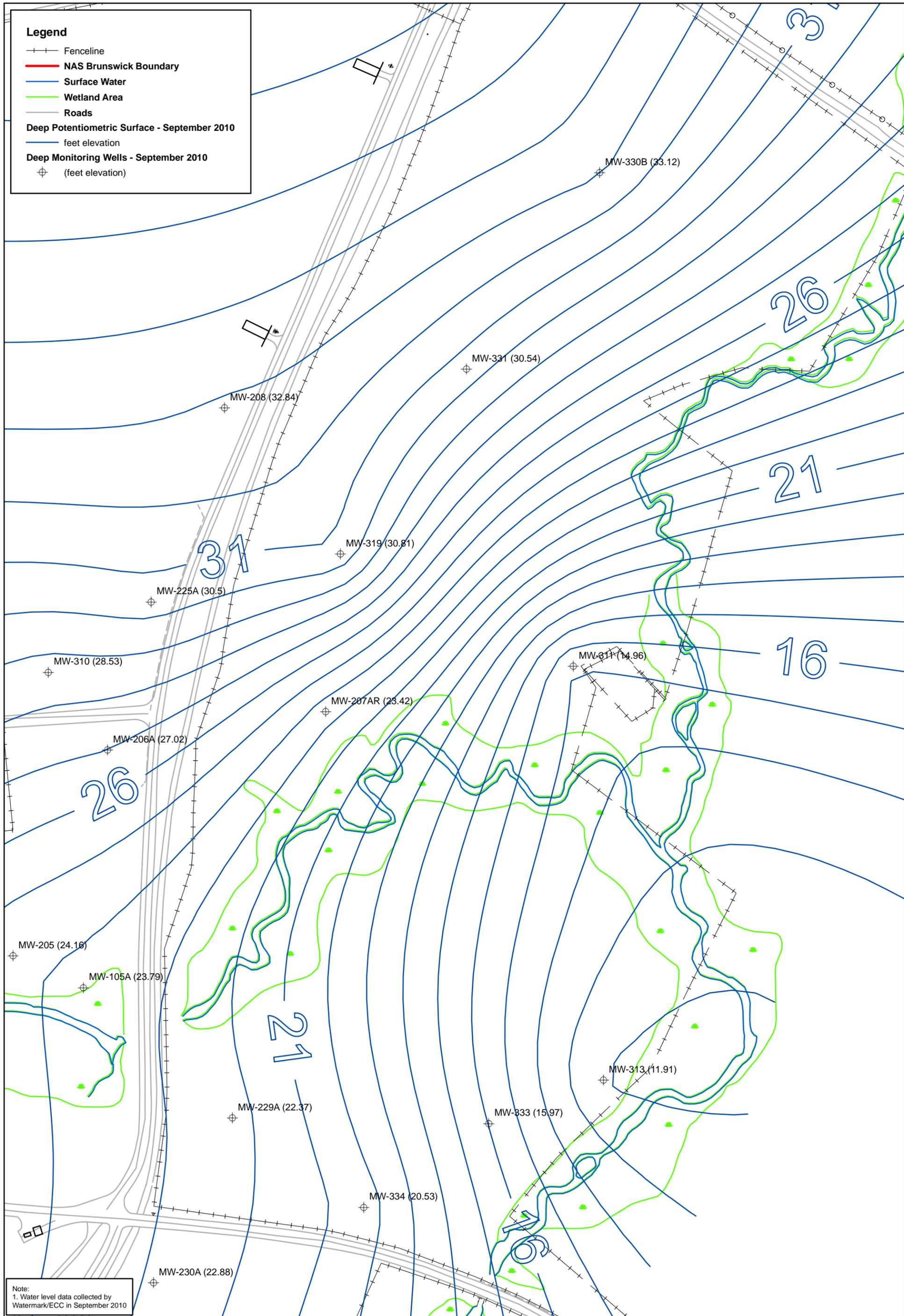
**TABLE H-1**

Groundwater Water Elevation  
 2011 Supplemental GSI Investigation  
 Naval Air Station Brunswick, Brunswick, Maine

Deep Eastern Plume Wells	Universal Transverse Mercator		Water Elevation (feet)		
	Easting (X)	Northing (Y)	September 2010	April 2011	September 2011
MW-105A	425501.99	4859056.95	23.69	24.19	23.79
MW-205	425459.86	4859076.69	23.99	24.43	24.16
MW-206A	425518.54	4859200.35	26.84	27.34	27.02
MW-207AR	425650.13	4859221.67	23.42	23.42	23.42
MW-208	425591.84	4859406.08	32.01	33.11	32.84
MW-225A	425546.04	4859289.43	30.04	30.86	30.50
MW-229A	425590.54	4858976.83	22.07	22.79	22.37
MW-230A	425541.64	4858878.01	22.67	23.04	22.88
MW-231A	425352.28	4858869.34	25.67	26.31	26.08
MW-303	426081.53	4860096.6	32.44	33.67	32.74
MW-305	426074.53	4859908.64	30.13	31.65	30.37
MW-306	425780.42	4859797.3	36.58	38.44	37.33
MW-310	425483.56	4859247.8	28.15	28.94	28.53
MW-311	425799.56	4859246.98	16.74	16.43	14.96
MW-313	425814.22	4858996.65	13.53	12.63	11.91
MW-315A	425539.41	4858747.63	21.91	22.26	22.06
MW-319	425660.33	4859316.8	30.40	31.18	30.81
MW-330B	425819.67	4859545.03	32.48	34.36	33.12
MW-331	425737.78	4859427.55	30.54	30.54	30.54
MW-333	425744.85	4858971.42	17.45	16.52	15.97
MW-334	425668.85	4858921.78	20.93	20.95	20.53
MW-NASB-212	425975.12	4860035.92	32.94	34.34	33.27

**Note:**

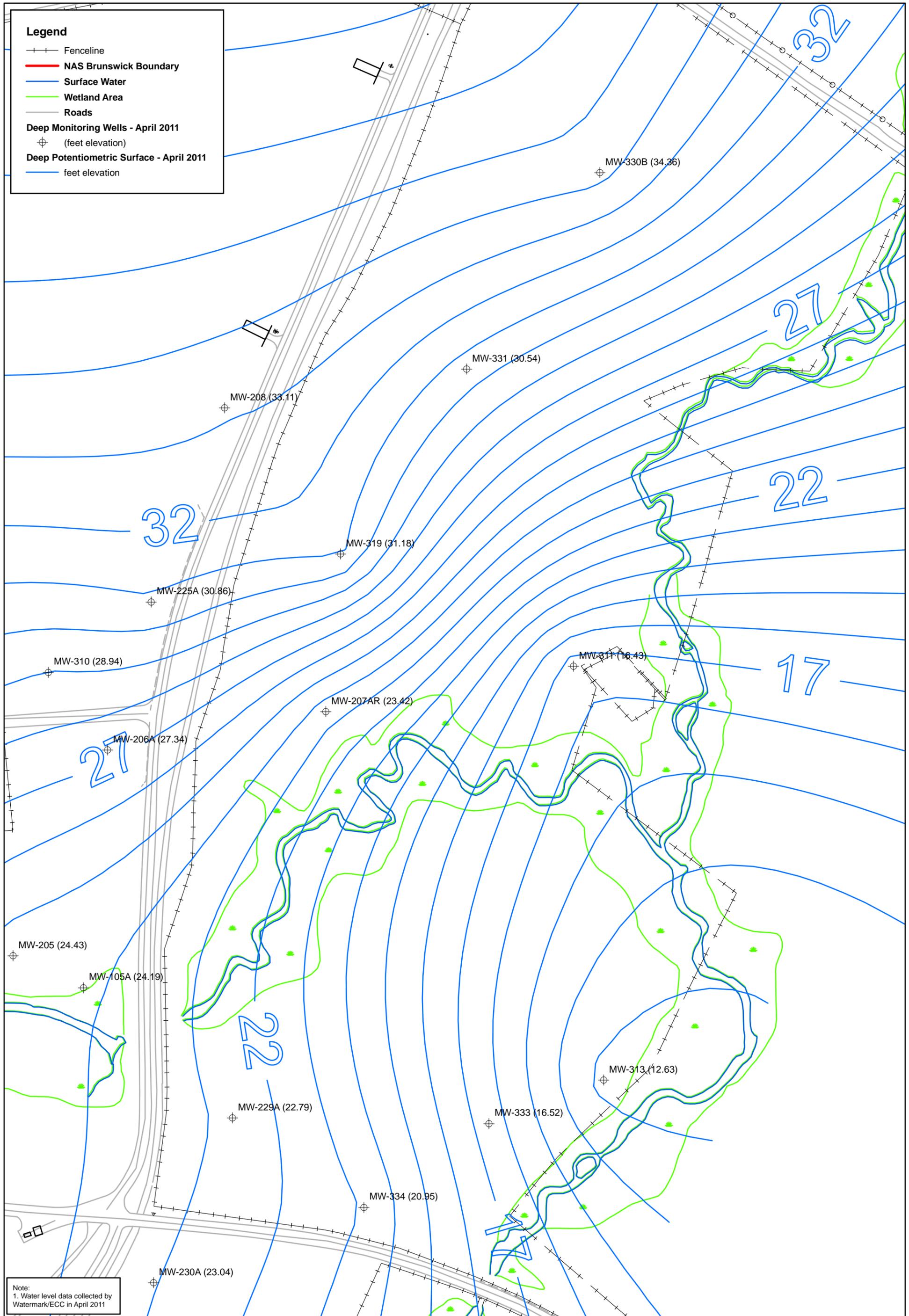
Data provided by Watermark/ECC



Note:  
1. Water level data collected by Watermark/ECC in September 2010



**Figure H-1**  
Potentiometric Map for the Eastern Plume September 2010  
Supplemental GSI Investigation  
Naval Air Station Brunswick  
Brunswick, Maine



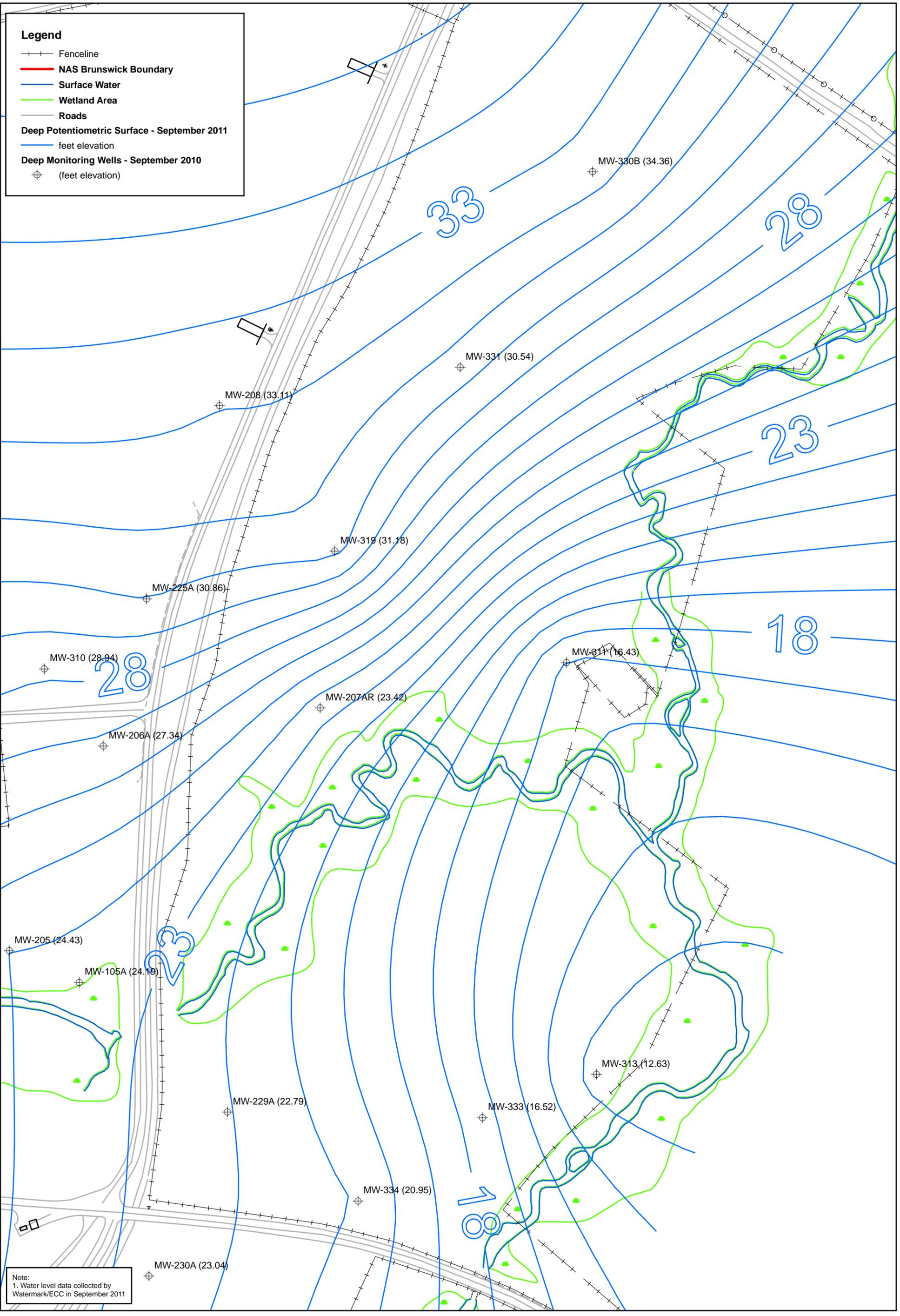
**Legend**

- Fenceline
- NAS Brunswick Boundary
- Surface Water
- Wetland Area
- Roads
- Deep Monitoring Wells - April 2011**
- ⊕ (feet elevation)
- Deep Potentiometric Surface - April 2011**
- feet elevation

Note:  
1. Water level data collected by Watermark/ECC in April 2011



**Figure H-2**  
Potentiometric Map for the Eastern Plume April 2011  
Supplemental GSI Investigation  
Naval Air Station Brunswick  
Brunswick, Maine



Note:  
1. Water level data collected by Watermark/ECC in September 2011



**Figure H-3**  
Potentiometric Map for the Eastern Plume September 2011  
Supplemental GSI Investigation  
Naval Air Station Brunswick  
Brunswick, Maine

**Attachment I**  
**Quality Assurance Review Memorandum**

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**PROJECT:** NAS Brunswick / Merriconeag Stream and Mere Brook  
Groundwater-Surface Water Interface Investigation / September  
2011

**REVIEWER:** Megan Morrison/ Project Chemist/ CH2M HILL

**COPIES:** Venky Venkatesh /Project Manager/ CH2M HILL

**DATE:** October 17, 2011

**SUBJECT:** Quality Assessment for Various Samples Collected in September  
2011

## **Introduction**

This quality assurance review memorandum is based upon a review of analytical data generated at the Naval Air Station in Brunswick, Maine. It contains a data validation summary and data quality evaluation for validated results.

The data validation summary in Section 1 of this memorandum presents the findings of the validation of ten percent of the analytical data. Quality control variances are detailed in this section along with subsequent qualification of the data.

The data quality evaluation in Section 2 assesses the effect of the overall analytical process on the availability of the analytical data for use by the project team. The qualifications of analytical results are reviewed to determine their impact on the project with regards to precision, accuracy, representativeness, completeness, and comparability.

## 1.0 Data Validation Report

Groundwater, surface water, pore water, and sediment samples were collected as a part of a groundwater- surface water interface investigation near the Merriconeag Stream and Mere Brook. Samples were submitted to Accutest of Marlborough, Massachusetts for analysis. Ten percent of the samples from each matrix were chosen to be validated. Table 1-1 presents a summary of the AGVIQ-CH2M HILL sample identification numbers, laboratory sample identification numbers, dates of collection, and the analyses performed for these validated samples.

Table 1  
Summary Sample Data  
NAS Brunswick

SDG	Field Sample ID	Lab Sample ID	Matrix	Sample Type	Analysis	Date Collected
MC3756	BN-SW-GSI-14-00-0911	MC3756-1	SW	N	1-3	9/20/11
MC3895	BN-SD-GSI-14-00-0911	MC3895-7	SD	N	1-2, 9-10	9/22/11
MC3815	BN-PW-GSI-08-02-0911	MC3815-18	PW	N	1-2, 4-8	9/21/11
MC3815	BN-PW-GSI-07-02-0911	MC3815-11	PW	N	1-2, 4-8	9/21/11
MC3867	BN-PZ-GSI-04-10-0911	MC3867-6	GW	N	1-3, 4-8	9/22/11

### Matrix Code:

GW- Groundwater sample

PW- Pore water sample

SD- Sediment sample

SW- Surface water sample

### Sample Type Code:

N- Native sample

### Analysis:

1. Select Volatile Organic Compounds (VOCs) by SW-846 8260B
2. 1,4-Dioxane by SW-846 8260B SIM
3. Vinyl Chloride (VC) and Tetrachloroethene (PCE) by SW-846 8260B SIM
4. Dissolved Iron and Manganese by SW-846 6010B
5. Nitrate by EPA 353.2
6. Sulfate by ASTM D 516-90-2
7. Total Organic Carbon (TOC) by SM 5310B
8. Methane, Ethane, Ethene by RSK-175
9. TOC by Lloyd Kahn
10. Grain Size by ASTM D422

The validated results and associated quality control samples have been compared to requirements in the Department of Defense (DoD) Quality Systems Manual (QSM), version 4.1, as presented in the project-specific UFP-SAP. If adherence to QA/QC criteria yielded deficiencies, data may have been qualified using the qualifiers in **Attachment A**. The data qualifiers that were used were those presented in National Functional Guidelines for Superfund Organic Methods (EPA, 2008) and National Functional Guidelines for Inorganic Data Review (EPA, 2004). National Functional Guidelines weren't used for data validation guidelines;

however, the specific qualifiers listed therein may have been applied to data if non-conformances against the QA/QC criteria were identified.

The findings of the data validation report in Section 1 of this report are based upon a comprehensive review of AGVIQ-CH2M HILL Level C (CLP-like data deliverables format) data package: chain of custody documentation, holding times, laboratory method and trip blank analyses, surrogate compound recoveries, matrix spike compound recoveries and reproducibility, post-digestion spike recoveries, serial dilutions, mass tuning results, initial and continuing calibration, laboratory control sample results, detection limits/sensitivity, and electronic data deliverables. Raw data wasn't reviewed by the validator and the results weren't re-calculated.

The analyses were performed acceptably; however, several qualifications were necessary. Any aspects of the data which are not discussed in this report should be considered qualitatively and quantitatively valid as reported, based on the deliverables reviewed. The validated and qualified results are presented in the data summary tables. **Attachment A** contains the validated sample results.

## 1.1 VOCS

The following sections detail quality control issues encountered during the validation of VOC data.

### 1.1.1 Initial Calibration

The initial calibrations for several analytes were outside control limits.

Table 1-2  
Calibration Results

Calibration Sample	Constituent	Difference (%)	Control Limit (%)	Associated Samples	Qualification
ICV 9/26/11 @ 10:47	Acetone	-48.7	≤ 20	BN-SW-GSI-14-00-0911	N/A; non-detect in associated sample
	2-Butanone	-48.5		BN-PW-GSI-08-02-0911	
	2-Hexanone	-41.0		BN-PW-GSI-07-02-0911 BN-PZ-GSI-04-10-0911	
ICV 9/15 @ 10:05	Vinyl acetate	21.6	≤ 20	BN-SD-GSI-14-00-0911	N/A; non-detect in associated samples
	2-Hexanone	-21.9			

### 1.1.2 Continuing Calibration

The continuing calibration verification (CCV) percent differences were acceptable except for the instances in Table 1-3, below.

Table 1-3  
Calibration Results

Calibration Sample	Constituent	Difference (%)	Control Limit (%)	Associated Samples	Qualification
CCV 9/26/11 @ 10:47	2-Hexanone	25.7	≤ 20	BN-PZ-GSI-04-10-0911	UJ, CCH

### 1.1.3 Laboratory Control Samples

The laboratory control samples (LCS) were outside control limits as shown in Table 1-4, below.

Table 1-4

*LCS Results*

Constituent	Recovery (LCS, LCSD) (%)	Control Limits (%)	Associated Samples	Qualification
1,1,1-Trichloroethane	142, OK	65-130	BN-SW-GSI-14-00-0911	N/A; non-detect in associated sample
Acetone	OK, 147	40-140	BN-PZ-GSI-04-10-0911	N/A; non-detect in associated sample

### 1.1.4 Surrogates

The surrogate recoveries were outside control limits as shown in Table 1-5, below.

Table 1-5

*Surrogate Results*

Constituent	Recovery (%)	Control Limits (%)	Associated Samples	Qualification
Dibromofluoromethane	121	85-115	BN-SW-GSI-14-00-0911	N/A; associated sample is non-detect
Dibromofluoromethane	118	85-115	BN-PZ-GSI-04-10-0911	N/A; associated sample is non-detect

## 1.3 Conclusion

A review of the analytical data submitted regarding groundwater, surface water, pore water, and sediment samples from NAS Brunswick, September 2011, by CH2M HILL has been completed. An overall evaluation of the data indicates that the sample handling, shipment, and analytical procedures have been adequately completed, and that the analytical results should be considered usable as qualified.

## 2.0 Data Quality Evaluation

### 2.1 Data Quality Assessment

This data quality evaluation assesses the effect of the overall analytical process on the “availability” of the analytical data. “Availability” refers to whether results can be used by the project team based on their analytical soundness. If a result is analytically sound, it is available for use for evaluating the potential releases, nature and extent of contamination, and estimating potentially associated human health and ecological risks. However, a particular result or group of results may not be “usable” for these purposes if other conditions apply. In order to avoid confusion of terms, this data quality evaluation differentiates the “availability” of results from “usability” of results. “Available” results are analytically sound and available for use by the project team to make decisions, even if they are not usable for a particular purpose.

The three major categories of data evaluation are laboratory performance, field collection performance (i.e. blank contamination and field duplicate reproducibility), and matrix interference. Evaluation of laboratory performance is a check for the laboratory’s compliance with the method requirements. Additionally, a data validator conducts a review of the laboratory data to assess whether the analytical methods were within required control limits. Evaluation of field collection performance, such as blank contamination and field duplicates, involves the review of field quality control (QC) samples and the determination of their effect on the sample results. Evaluation of potential matrix interferences involved the review of several areas of results, including surrogate spike recoveries and duplicate sample results.

The data evaluation and validation is a multi-tiered approach. The process begins with an internal laboratory review, continues with an independent review by a data validator, and ends with an overall review by the CH2M HILL project chemistry team. While only the data validator is allowed to apply qualifiers to the data, the process provides a medium for essential communication between the laboratory, validator, and project team, and allows for data quality to be thoroughly evaluated.

#### 2.1.1 Laboratory Internal Quality Control Review

Prior to releasing the analytical data, the laboratory reviewed both the sample and QC data to verify sample identity, instrument calibration, quantitation limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. To define a laboratory QC exceedance and the appropriate corrective action, the laboratory referred to its in-house SOPs and the limits agreed to in the *Naval Air Station (NAS) Brunswick Mere Brook and Merriconeag Stream Groundwater- Surface Water Interface Investigation Sampling and Analysis Plan* (AGVIQ-CH2M HILL, 2010). The SOPs were based on Department of Defense requirements, the analytical method, and accumulated laboratory experience. If a laboratory QC exceedance occurred, the situation was reviewed by the appropriate personnel to determine whether it was acceptable or it would require corrective action by the laboratory.

In addition, the QC data were tabulated and the results reviewed to determine whether they were within the contract-required limits for accuracy and precision. Any non-conforming data was discussed in the data package cover letter and case narrative.

### 2.1.2 Data Validation

An internal data validator reviewed all data packages using the validation criteria outlined in Section 1 of this memorandum.

The data validation process was focused on the effects of the laboratory's performance and the sample matrices' effects on the analytical results. Areas of review consisted of chain of custody documentation, holding times, laboratory method and trip blank analyses, surrogate compound recoveries, matrix spike compound recoveries and reproducibility, post-digestion spike recoveries, serial dilutions, mass tuning results, initial and continuing calibration, laboratory control sample results, detection limits/sensitivity, and electronic data deliverables. Raw data wasn't reviewed by the validator and none of the results were re-calculated.

When multiple analyses were performed, the analytical run with the lowest quantitation limits was selected by the validator if the QC criteria were met for that analysis. If a sample was analyzed more than once as a result of concentrations exceeding the calibration range, the data validator selected results from the appropriate dilution.

### 2.1.3 General Data Qualifiers and Usability

In general, the data validator examines each data point and determines any effects that QC exceedances may have had.

The J-qualification and U-qualification of results are common occurrences and have no adverse effect on the availability of that result to the project team for making decisions. J-qualified results are available, at the reported result, for use as detects as long as they are considered "estimated" by the project team. Human health risk assessment guidance suggests that these qualifiers "indicate uncertainty in the reported concentration of the chemical, but not in its assigned identity. Therefore, these data can be used just as positive data with no qualifiers or codes." In addition, one should use "J-qualified concentrations the same way as positive data that do not have this qualifier" (Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual. (Part A) EPA/540/1-89/002. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. 1989). U-qualified results are available, at the reported quantitation limit, for use as non-detects as long as they are considered "non-detect" as appropriate. A "UJ" qualification for a result means that the result was non-detect and the detection limit is estimated. UJ-qualified data are available for use as non-detects.

In certain cases, a result is R-qualified and deemed to be unreliable and unusable. "Unusable" in this instance is defined as a result that is not analytically sound and is not considered available for use by the project team. There are no R-qualified data points in this data set.

### 2.1.4 Project-Specific Data Qualifiers and Usability

The following sections examine the data validation qualifiers used on groundwater, surface water, pore water, and sediment sample data from the Mere Brook and Merriconeag Stream sites at NAS Brunswick.

#### 2.1.4.1 Primary Data Validation Qualifiers

The following data validation qualifiers were applied to one or more analytical results:

- **U** - Not detected. Sample was analyzed for this parameter, but it was not detected at a concentration greater than the reported quantitation limit.
- **J** - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample.
- **UJ** - Not detected; estimated quantitation limit.
- **[No qualifier present] or "NULL"** - Detected. Qualification was not warranted.

### 2.1.4.2 Secondary Data Validation Qualifiers

The following secondary data validation qualifiers were applied to one or more analytical results resulting in the following combinations:

Table 2-1

Validator Qualifier	Secondary Qualifier Code	Count	Percent	Available as Reported	Available as Qualified	Not Available	Impact on PARCC <sup>1</sup>	Explanation
CLEAR	CLEAR	116	39.73%	X			n/a	Constituent was analyzed for and detected. Further qualification was not necessary (no QA/QC exceedances). The result is usable as a detect as reported.
J	BRL	3	1.03%	X			n/a	Constituent was analyzed for and detected. The detection was less than the quantitation limit and J-qualified (as in "below reporting limit") by the laboratory. Further qualification was not necessary (no QA/QC exceedances) except to standardize the qualifier to a valid value. The result is usable as a detect as reported.
U	CLEAR	172	58.90%	X			n/a	Constituent was analyzed for but not detected. Further qualification was not necessary. The result is usable as a nondetect at the reported quantitation limit.
UJ	CCH	1	0.34%		X		n/a	Constituent was analyzed for but not detected. The result was UJ-qualified as "nondetect, estimated quantitation limit" due to high recovery in the continuing calibration verification. The QA/QC exceedance (potential high bias) was not severe enough to warrant rejection. The result is usable as a nondetect at the reported quantitation limit. Thus, there is no impact on the availability of data for use by the project team.
<b>TOTALS:</b>		<b>292</b>	<b>100.00%</b>	<b>99.66%</b>	<b>0.34%</b>	<b>0%</b>		
				<b>100% Data Completeness</b>				

<sup>1</sup> PARCC is "Precision, Accuracy, Representativeness, Completeness and Comparability". See Section 2.1.4.3 for more details.

### **2.1.4.3 Impacts on Precision, Accuracy, Representativeness, Completeness, Comparability (PARCC)**

#### **2.1.4.3.1 Precision**

Precision is defined as the agreement between duplicate results, and was characterized by comparing MS/MSD relative percent differences (RPDs), serial dilutions, laboratory replicates, and field duplicate sample results. Although results may have been qualified due to QC exceedances that may suggest an impact on precision, there is no actual significant negative impact on precision unless a data point is deemed unreliable due to precision exceedances.

#### **2.1.4.3.2 Accuracy/Bias**

Accuracy/bias is a measure of the agreement between an analytical determination and the true value of the parameter being measured. For organic analyses, each sample was spiked with surrogate compounds; and for organic and inorganic analyses, an MS/MSD and LCS were spiked with a known parameter concentration before preparation. Internal standards, surrogates and MS/MSDs provide a measure of the matrix effects on the analytical accuracy. The LCS demonstrates accuracy of the method and the laboratory's ability to meet the method criteria. Accuracy/bias is also assessed by calibration recoveries. Although results may have been qualified due to QC exceedances that may suggest an impact on accuracy/bias, there is no actual significant negative impact on accuracy unless a data point is deemed unusable (rejected) due to accuracy exceedances.

#### **2.1.4.3.3 Representativeness**

Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition (in this case, the nature and extent of contamination). Representativeness is a subjective parameter and is used to evaluate the efficacy of the sample planning design. In terms of data quality, representativeness was assured because the sampling team followed approved standard operating procedures (SOPs) for sample collection and handling, and the laboratory followed approved SOPs for sample handling, preparation, and analysis.

#### **2.1.4.3.4 Completeness**

Completeness will be calculated as the number of analytically-sound results that are available for use compared to the total number of measurements made. All results except those R-qualified as "unreliable" are available for use as analytically-sound results. The R-qualifier is the only qualifier that negatively affects a data point's availability. A completeness goal was not specified in the UFP-SAP; therefore, a general 95% completeness goal was applied. Overall, the entire data set was 100% complete and the goal was met.

#### **2.1.4.3.5 Comparability**

Comparability is a qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix, and analytical methods. In this case, because approved SOPs were used for sample collection and handling, common sample matrices were evaluated (surface and subsurface soil), and EPA methods were utilized, the data user

may express confidence in the fact that this data set is comparable to others of acceptable data quality. In addition, comparability is controlled by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Except in the case of rejected data, precision and accuracy were demonstrated to be acceptable, and the data user may be confident that this data set is comparable to others of high data quality.

## 2.2 Data Quality Evaluation

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects it found concerning the availability of the data for the investigation at NAS Brunswick.

### 2.2.1 Select VOCs Data

Select VOCs were analyzed by SW-846 method 8260B and 8260B Selective Ion Monitoring (SIM) in groundwater, surface water, pore water, and sediment samples. Excluding field quality control samples, 243 distinct data points were generated. The select VOCs data set is 100% complete and available for use. The validation process issued the following qualifiers for results in the select VOCs fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	79	32.51%
J	BRL	1	0.41%
U	CLEAR	162	66.67%
UJ	CCH	1	0.41%
<b>TOTAL:</b>		<b>243</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability.

### 2.2.2 Methane, Ethane, Ethene Data

Methane, ethane, and ethene were analyzed by RSK-175 for groundwater and select pore water samples. Excluding field quality control samples, nine distinct data points were generated. The methane, ethane, ethene data set is 100% complete; all results are available for use as reported. The validation process issued the following qualifiers for results in this fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	3	33.33%
J	BRL	2	22.22%
U	CLEAR	4	44.44%
<b>TOTAL:</b>		<b>9</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability.

### 2.2.3 Select Dissolved Metals Data

Select dissolved metals (iron and manganese) were analyzed by SW-846 method 6010B for groundwater and select pore water samples. Excluding field quality control samples, six distinct data points were generated. The select metals data set is 100% complete. The validation process issued the following qualifiers for results in the select dissolved metals fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	4	66.67%
U	CLEAR	2	33.33%
<b>TOTAL:</b>		<b>6</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability.

## 2.2.4 TOC Data

TOC was analyzed by Lloyd Kahn for sediment samples and SM 5310B for groundwater and select pore water samples. Excluding field quality control samples, four distinct data points were generated. The select metals data set is 100% complete; all results are available for use as reported. The validation process issued the following qualifiers for results in the TOC fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	3	75.00%
U	CLEAR	1	25.00%
<b>TOTAL:</b>		<b>4</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability.

## 2.2.5 Sulfate Data

Sulfate was analyzed by ASTM D516-90 in groundwater and select pore water samples. Excluding field quality control samples, three distinct data points were generated. The sulfate data set is 100% complete, which meets the overall completeness goal of 95%; all results are available for use as reported. The validation process issued the following qualifiers for results in the sulfate fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	3	100.00%
<b>TOTAL:</b>		<b>3</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability.

## 2.2.6 Nitrate Data

Nitrate was analyzed by EPA 353.2 for groundwater and select pore water samples. Excluding field quality control samples, nine distinct data points were generated. Note that the laboratory also reported the analytes "nitrate + nitrite" and "nitrite" in order to calculate the nitrate concentration. The nitrate data set is 100% complete, which meets the overall completeness goal of 95%; all results are available for use as reported or as qualified. The validation process issued the following qualifiers for results in the nitrate fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	6	66.67%
U	CLEAR	3	33.33%
<b>TOTAL:</b>		<b>9</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability

### 2.2.7 Grain Size Data

Grain size was analyzed by ASTM D422 for sediment samples. Eighteen distinct data points were generated. The data set is 100% complete, which meets the overall completeness goal of 95%; all results are available for use as reported or as qualified. The validation process issued the following qualifiers for results in the nitrate fraction:

Validator Qualifier	Secondary Qualifier Code	Count	Percent
CLEAR	CLEAR	18	100.00%
<b>TOTAL:</b>		<b>18</b>	<b>100.00%</b>

See the table in section 2.1.4.2 for an explanation of qualifications and their impact on data usability

## 2.3 Overall Assessment

The quality of the validated data reported for the groundwater, surface water, pore water, and sediment sampling at NAS Brunswick Merriconeag Stream and Mere Brook in September 2011 is of excellent quality. All of the validated data (100%) of the data in this data set is available for use either as reported or qualified. See Section 3 for an assessment of the unvalidated data.

**Attachment A**  
**Data Qualification Reference Information and Validated Data**

### VALID QUALIFIERS

Qualifier	Description
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit
J	The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
J-	Analyte present. Reported value may be biased low. Actual value is expected to be higher
J+	Analyte present. Reported value may be biased high. Actual value is expected to be lower
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R/UR	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.

Accutest Laboratories

## Report of Analysis

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Client Sample ID:	BN-SD-GSI-14-00-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3895-7	Date Received:	09/23/11
Matrix:	SO - Sediment	Percent Solids:	71.3
Method:	SW846 8260B		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K55165.D	1	10/03/11	GK	n/a	n/a	MSK1843
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	10.3 g	10.0 ml	100 ul
Run #2			

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	440	100	ug/kg	
71-43-2	Benzene	ND	44	11	ug/kg	
75-27-4	Bromodichloromethane	ND	180	19	ug/kg	
75-25-2	Bromoform	ND	180	42	ug/kg	
74-83-9	Bromomethane	ND	180	60	ug/kg	
78-93-3	2-Butanone (MEK)	ND	440	110	ug/kg	
75-15-0	Carbon disulfide	ND	440	86	ug/kg	
56-23-5	Carbon tetrachloride	ND	180	20	ug/kg	
108-90-7	Chlorobenzene	ND	180	8.3	ug/kg	
75-00-3	Chloroethane	ND	440	23	ug/kg	
67-66-3	Chloroform	ND	180	13	ug/kg	
74-87-3	Chloromethane	ND	440	19	ug/kg	
124-48-1	Dibromochloromethane	ND	180	58	ug/kg	
75-34-3	1,1-Dichloroethane	ND	180	13	ug/kg	
107-06-2	1,2-Dichloroethane	ND	180	13	ug/kg	
75-35-4	1,1-Dichloroethene	ND	180	28	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	180	24	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	180	22	ug/kg	
78-87-5	1,2-Dichloropropane	ND	180	20	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	180	88	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	180	61	ug/kg	
100-41-4	Ethylbenzene	ND	180	11	ug/kg	
591-78-6	2-Hexanone	ND	440	93	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	440	74	ug/kg	
75-09-2	Methylene chloride	ND	180	32	ug/kg	
100-42-5	Styrene	ND	440	44	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	180	16	ug/kg	
127-18-4	Tetrachloroethene	ND	180	15	ug/kg	
108-88-3	Toluene	ND	440	16	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	180	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	180	23	ug/kg	
79-01-6	Trichloroethene	ND	180	17	ug/kg	

MM  
10/17/11

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> BN-SD-GSI-14-00-0911	<b>Date Sampled:</b> 09/22/11
<b>Lab Sample ID:</b> MC3895-7	<b>Date Received:</b> 09/23/11
<b>Matrix:</b> SO - Sediment	<b>Percent Solids:</b> 71.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	180	57	ug/kg	
1330-20-7	Xylene (total)	ND	180	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		70-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	113%		70-130%

11/7/11  
MM

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

3.13  
3

Client Sample ID:	BN-SD-GSI-14-00-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3895-7	Date Received:	09/23/11
Matrix:	SO - Sediment	Percent Solids:	71.3
Project:	NAS Brunswick, Brunswick, ME		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve <sup>a</sup>	100		%	1	10/05/11	ANJ	ASTM D422-63
1.5 Inch Sieve <sup>a</sup>	100		%	1	10/05/11	ANJ	ASTM D422-63
0.75 Inch Sieve <sup>a</sup>	100		%	1	10/05/11	ANJ	ASTM D422-63
0.375 Inch Sieve <sup>a</sup>	99.8		%	1	10/05/11	ANJ	ASTM D422-63
No.4 Sieve (4.75 mm) <sup>a</sup>	99.7		%	1	10/05/11	ANJ	ASTM D422-63
No.8 Sieve (2.36 mm) <sup>a</sup>	99.3		%	1	10/05/11	ANJ	ASTM D422-63
No.10 Sieve (2.00 mm) <sup>a</sup>	99.0		%	1	10/05/11	ANJ	ASTM D422-63
No.16 Sieve (1.18 mm) <sup>a</sup>	97.7		%	1	10/05/11	ANJ	ASTM D422-63
No.30 Sieve (0.60 mm) <sup>a</sup>	86.8		%	1	10/05/11	ANJ	ASTM D422-63
No.50 Sieve (0.30 mm) <sup>a</sup>	44.7		%	1	10/05/11	ANJ	ASTM D422-63
No.100 Sieve (0.15 mm) <sup>a</sup>	16.6		%	1	10/05/11	ANJ	ASTM D422-63
No.200 Sieve (0.075 mm) <sup>a</sup>	8.3		%	1	10/05/11	ANJ	ASTM D422-63
0.030 mm (Hydrometer) <sup>a</sup>	5.5		%	1	10/05/11	ANJ	ASTM D422-63
0.005 mm (Hydrometer) <sup>a</sup>	1.1		%	1	10/05/11	ANJ	ASTM D422-63
0.0015 mm (Hydrometer) <sup>a</sup>	1.1		%	1	10/05/11	ANJ	ASTM D422-63
% Gravel <sup>a</sup>	0.33		%	1	10/05/11	ANJ	ASTM D422-63
% Sand <sup>a</sup>	91.4		%	1	10/05/11	ANJ	ASTM D422-63
% Silt, Clay, Colloids <sup>a</sup>	8.3		%	1	10/05/11	ANJ	ASTM D422-63
Solids, Percent	71.3		%	1	09/26/11	HS	SM21 2540 B MOD.
Total Organic Carbon	3290	280	mg/kg	1	10/04/11 17:47	CF	LLOYD KAHN 1988

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

MJM  
11/17/11

RL = Reporting Limit

Accutest Laboratories

### Report of Analysis

3.14  
3

Client Sample ID:	BN-SD-GSI-14-00-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3895-7A	Date Received:	09/23/11
Matrix:	SO - Sediment	Percent Solids:	71.3
Method:	SW846 8260B BY SIM		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	P55451.D	1	10/05/11	AMY	n/a	n/a	MSP1814
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.63 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	7.6	0.33	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	88%		60-140%		

*MM  
10/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

Accutest Laboratories

### Report of Analysis

3.15  
3

Client Sample ID:	BN-PZ-GSI-04-10-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3867-6	Date Received:	09/23/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G111294.D	1	10/05/11	AT	n/a	n/a	MSG4486
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	4.1	ug/l	
71-43-2	Benzene	ND	0.50	0.46	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.49	ug/l	
75-25-2	Bromoform	ND	1.0	0.71	ug/l	
74-83-9	Bromomethane	ND	2.0	1.3	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.7	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.62	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.58	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.44	ug/l	
75-00-3	Chloroethane	ND	2.0	0.32	ug/l	
67-66-3	Chloroform	ND	1.0	0.58	ug/l	
74-87-3	Chloromethane	ND	2.0	0.71	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.89	ug/l	
75-34-3	1,1-Dichloroethane	25.3	1.0	0.33	ug/l	
107-06-2	1,2-Dichloroethane	1.2	1.0	0.44	ug/l	
75-35-4	1,1-Dichloroethene	51.4	1.0	0.80	ug/l	
156-59-2	cis-1,2-Dichloroethene	11.6	1.0	0.69	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.71	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.41	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.49	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.80	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.3	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.76	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.99	ug/l	
100-42-5	Styrene	ND	5.0	0.97	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.79	ug/l	
127-18-4	Tetrachloroethene	5.9	1.0	0.36	ug/l	
108-88-3	Toluene	ND	1.0	0.59	ug/l	
71-55-6	1,1,1-Trichloroethane	78.4	1.0	0.55	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.74	ug/l	
79-01-6	Trichloroethene	85.1	1.0	0.75	ug/l	

MM  
10/17/11

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

### Report of Analysis

<b>Client Sample ID:</b> BN-PZ-GSI-04-10-0911	<b>Date Sampled:</b> 09/22/11
<b>Lab Sample ID:</b> MC3867-6	<b>Date Received:</b> 09/23/11
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.82	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.32	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	118%		70-130%
2037-26-5	Toluene-D8	114%		70-130%
460-00-4	4-Bromofluorobenzene	106%		70-130%

*WMM  
4/2/12*

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

### Report of Analysis

3.15  
**3**

Client Sample ID:	BN-PZ-GSI-04-10-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3867-6	Date Received:	09/23/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	VRSK 175		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GBA15575.D	1	09/28/11	AF	n/a	n/a	GBA969
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.64	1.0	0.066	ug/l	J
74-84-0	Ethane	ND	0.10	0.056	ug/l	
74-85-1	Ethene	ND	0.10	0.075	ug/l	

*MMW  
11/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

3.15  
3

Client Sample ID:	BN-PZ-GSI-04-10-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3867-6	Date Received:	09/23/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Project:	NAS Brunswick, Brunswick, ME		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	0.69	0.11	mg/l	1	09/28/11 17:26	CF	EPA 353.2
Nitrogen, Nitrate + Nitrite	0.69	0.10	mg/l	1	09/28/11 17:26	CF	EPA 353.2
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	09/23/11 18:10	CF	SM 21 4500 NO2 B
Sulfate	10.4	5.0	mg/l	1	09/29/11	SA	ASTM516-90.02
Total Organic Carbon	< 1.0	1.0	mg/l	1	09/30/11 15:47	MC	SM21 5310 B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

MM  
10/17/11

RL = Reporting Limit

Accutest Laboratories

### Report of Analysis

Client Sample ID:	BN-PZ-GSI-04-10-0911	Date Sampled:	09/22/11
Lab Sample ID:	MC3867-6A	Date Received:	09/23/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B BY SIM		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H55307.D	5	10/01/11	DFT	n/a	n/a	MSH1807
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	51.7	5.0	0.95	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	115%		60-140%		

MM  
10/17/11

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

### Report of Analysis

3.17  
3

<b>Client Sample ID:</b> BN-PZ-GSI-04-10-0911	<b>Date Sampled:</b> 09/22/11
<b>Lab Sample ID:</b> MC3867-6B	<b>Date Received:</b> 09/23/11
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B BY SIM	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E55889.D	1	10/01/11	DFT	n/a	n/a	MSE2263
Run #2	E55984.D	5	10/06/11	DFT	n/a	n/a	MSE2263

Run #	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
127-18-4	Tetrachloroethene	4.9 <sup>a</sup>	0.50	ug/l	
75-01-4	Vinyl chloride	0.093	0.10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	99%	83-127%
2037-26-5	Toluene-D8	100%	94%	89-112%

(a) Result is from Run# 2

mm  
4/9/12

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> BN-PZ-GSI-04-10-0911	<b>Date Sampled:</b> 09/22/11
<b>Lab Sample ID:</b> MC3867-6F	<b>Date Received:</b> 09/23/11
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Brunswick, Brunswick, ME	

### Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Iron	14 U	100	14	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	0.43 U	15	0.43	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA13431

(2) Prep QC Batch: MP17784

*MM  
10/17/11*

RL = Reporting Limit  
MDL = Method Detection Limit

U = Indicates a result < MDL  
B = Indicates a result >= MDL but < RL

Accutest Laboratories

## Report of Analysis

Page 1 of 2

3.28

3

Client Sample ID:	BN-PW-GSI-07-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-11	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G111106.D	1	09/30/11	AT	n/a	n/a	MSG4479
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	4.1	ug/l	
71-43-2	Benzene	ND	0.50	0.46	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.49	ug/l	
75-25-2	Bromoform	ND	1.0	0.71	ug/l	
74-83-9	Bromomethane	ND	2.0	1.3	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.7	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.62	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.58	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.44	ug/l	
75-00-3	Chloroethane	ND	2.0	0.32	ug/l	
67-66-3	Chloroform	ND	1.0	0.58	ug/l	
74-87-3	Chloromethane	ND	2.0	0.71	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.89	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.33	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.44	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.80	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.69	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.71	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.41	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.49	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.80	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.3	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.76	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.99	ug/l	
100-42-5	Styrene	ND	5.0	0.97	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.79	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.36	ug/l	
108-88-3	Toluene	ND	1.0	0.59	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.55	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.74	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.75	ug/l	

MUM  
10/17/11

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.28  
3

Client Sample ID:	BN-PW-GSI-07-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-11	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Brunswick, Brunswick, ME		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.82	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.32	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	113%		70-130%
2037-26-5	Toluene-D8	110%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

*MW  
10/17/11*

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

### Report of Analysis

Client Sample ID:	BN-PW-GSI-07-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-11	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	VRSK 175		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GBA15568.D	1	09/28/11	AF	n/a	n/a	GBA969
Run #2	GBA15569.D	10	09/28/11	AF	n/a	n/a	GBA969

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	1420 <sup>a</sup>	10	0.66	ug/l	
74-84-0	Ethane	0.13	0.10	0.056	ug/l	
74-85-1	Ethene	ND	0.10	0.075	ug/l	

(a) Result is from Run# 2

*MM  
10/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> BN-PW-GSI-07-02-0911	<b>Date Sampled:</b> 09/21/11
<b>Lab Sample ID:</b> MC3815-11	<b>Date Received:</b> 09/22/11
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Brunswick, Brunswick, ME	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	0.40	0.11	mg/l	1	09/22/11 18:39	CF	EPA 353.2
Nitrogen, Nitrate + Nitrite	0.41	0.10	mg/l	1	09/22/11 18:39	CF	EPA 353.2
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	09/22/11 16:08	CF	SM 21 4500 NO2 B
Sulfate	11.9	5.0	mg/l	1	09/27/11	BF	ASTM516-90,02
Total Organic Carbon	7.1	1.0	mg/l	1	09/30/11 14:29	MC	SM21 5310 B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

*MMM  
10/17/11*

RL = Reporting Limit

Accutest Laboratories

### Report of Analysis

3.29  
3

Client Sample ID:	BN-PW-GSI-07-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-11A	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B BY SIM		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H55227.D	1	09/26/11	JP	n/a	n/a	MSH1804
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	3.3	1.0	0.19	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	102%		60-140%		

*MCM  
10/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.30  
3

<b>Client Sample ID:</b> BN-PW-GSI-07-02-0911 <b>Lab Sample ID:</b> MC3815-11F <b>Matrix:</b> AQ - Groundwater Filtered <b>Project:</b> NAS Brunswick, Brunswick, ME	<b>Date Sampled:</b> 09/21/11 <b>Date Received:</b> 09/22/11 <b>Percent Solids:</b> n/a
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**Dissolved Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Iron	8490	100	14	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	1920	15	0.43	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA13431

(2) Prep QC Batch: MP17781

MMW  
11/7/11

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result >= MDL but < RL

Accutest Laboratories

## Report of Analysis

Page 1 of 2

3.50

3

Client Sample ID: BN-PW-GSI-08-02-0911

Lab Sample ID: MC3815-18

Date Sampled: 09/21/11

Matrix: AQ - Ground Water

Date Received: 09/22/11

Method: SW846 8260B

Percent Solids: n/a

Project: NAS Brunswick, Brunswick, ME

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G111112.D	1	09/30/11	AT	n/a	n/a	MSG4479
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	4.1	ug/l	
71-43-2	Benzene	ND	0.50	0.46	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.49	ug/l	
75-25-2	Bromoform	ND	1.0	0.71	ug/l	
74-83-9	Bromomethane	ND	2.0	1.3	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.7	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.62	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.58	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.44	ug/l	
75-00-3	Chloroethane	ND	2.0	0.32	ug/l	
67-66-3	Chloroform	ND	1.0	0.58	ug/l	
74-87-3	Chloromethane	ND	2.0	0.71	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.89	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.33	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.44	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.80	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.69	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.71	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.41	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.49	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.80	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.3	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.76	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.99	ug/l	
100-42-5	Styrene	ND	5.0	0.97	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.79	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.36	ug/l	
108-88-3	Toluene	ND	1.0	0.59	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.55	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.74	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.75	ug/l	

MM  
10/17/11

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

3.50  
3

<b>Client Sample ID:</b> BN-PW-GSI-08-02-0911 <b>Lab Sample ID:</b> MC3815-18 <b>Matrix:</b> AQ - Ground Water <b>Method:</b> SW846 8260B <b>Project:</b> NAS Brunswick, Brunswick, ME	<b>Date Sampled:</b> 09/21/11 <b>Date Received:</b> 09/22/11 <b>Percent Solids:</b> n/a
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**VOA TCL List**

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.82	ug/l	
1330-20-7	Xylene (total)	0.55	1.0	0.32	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	114%		70-130%
2037-26-5	Toluene-D8	111%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%

MM  
10/17/11

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

### Report of Analysis

Page 1 of 1

3.50  
3

<b>Client Sample ID:</b> BN-PW-GSI-08-02-0911	<b>Date Sampled:</b> 09/21/11
<b>Lab Sample ID:</b> MC3815-18	<b>Date Received:</b> 09/22/11
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> VRSK 175	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GBA15562.D	1	09/28/11	AF	n/a	n/a	GBA969
Run #2	GBA15563.D	10	09/28/11	AF	n/a	n/a	GBA969

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	2880 <sup>a</sup>	10	0.66	ug/l	
74-84-0	Ethane	0.079	0.10	0.056	ug/l	J
74-85-1	Ethene	ND	0.10	0.075	ug/l	

(a) Result is from Run# 2

*MUM*  
*10/17/11*

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ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

Client Sample ID:	BN-PW-GSI-08-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-18	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Project:	NAS Brunswick, Brunswick, ME		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	2.5	0.11	mg/l	1	09/22/11 18:42	CF	EPA 353.2
Nitrogen, Nitrate + Nitrite	2.5	0.10	mg/l	1	09/22/11 18:42	CF	EPA 353.2
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	09/22/11 16:11	CF	SM 21 4500 NO2 B
Sulfate	9.3	5.0	mg/l	1	09/29/11	SA	ASTM516-90,02
Total Organic Carbon	7.9	1.0	mg/l	1	09/30/11 14:57	MC	SM21 5310 B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

*MJM  
11/17/11*

RL = Reporting Limit

Accutest Laboratories

### Report of Analysis

3.51  
3

Client Sample ID:	BN-PW-GSI-08-02-0911	Date Sampled:	09/21/11
Lab Sample ID:	MC3815-18A	Date Received:	09/22/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B BY SIM		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H55233.D	1	09/27/11	JP	n/a	n/a	MSH1804
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	6.6	1.0	0.19	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	85%		60-140%		

*MJM  
10/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.52  
3

<b>Client Sample ID:</b> BN-PW-GSI-08-02-0911 <b>Lab Sample ID:</b> MC3815-18F <b>Matrix:</b> AQ - Groundwater Filtered <b>Project:</b> NAS Brunswick, Brunswick, ME	<b>Date Sampled:</b> 09/21/11 <b>Date Received:</b> 09/22/11 <b>Percent Solids:</b> n/a
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**Dissolved Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Iron	10000	100	14	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	5740	15	0.43	ug/l	1	09/24/11	09/27/11 DA	SW846 6010C <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA13431

(2) Prep QC Batch: MP17781

MM  
11/17/11

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL

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## Report of Analysis

Page 1 of 2

<b>Client Sample ID:</b> BN-SW-GSI-14-00-0911	<b>Date Sampled:</b> 09/20/11
<b>Lab Sample ID:</b> MC3756-1	<b>Date Received:</b> 09/21/11
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G111246.D	1	10/03/11	AT	n/a	n/a	MSG4484
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	4.1	ug/l	
71-43-2	Benzene	ND	0.50	0.46	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.49	ug/l	
75-25-2	Bromoform	ND	1.0	0.71	ug/l	
74-83-9	Bromomethane	ND	2.0	1.3	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.7	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.62	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.58	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.44	ug/l	
75-00-3	Chloroethane	ND	2.0	0.32	ug/l	
67-66-3	Chloroform	ND	1.0	0.58	ug/l	
74-87-3	Chloromethane	ND	2.0	0.71	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.89	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.33	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.44	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.80	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.69	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.71	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.41	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.49	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.80	ug/l	
591-78-6	2-Hexanone	ND	5.0	1.3	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.76	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.99	ug/l	
100-42-5	Styrene	ND	5.0	0.97	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.79	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.36	ug/l	
108-88-3	Toluene	ND	1.0	0.59	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.55	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.74	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.75	ug/l	

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

<b>Client Sample ID:</b> BN-SW-GSI-14-00-0911 <b>Lab Sample ID:</b> MC3756-1 <b>Matrix:</b> AQ - Surface Water <b>Method:</b> SW846 8260B <b>Project:</b> NAS Brunswick, Brunswick, ME	<b>Date Sampled:</b> 09/20/11 <b>Date Received:</b> 09/21/11 <b>Percent Solids:</b> n/a
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**VOA TCL List**

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.82	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.32	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	121%		70-130%
2037-26-5	Toluene-D8	113%		70-130%
460-00-4	4-Bromofluorobenzene	104%		70-130%

MM  
4/9/12

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ND = Not detected	MDL - Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Accutest Laboratories

### Report of Analysis

3.2  
3

Client Sample ID:	BN-SW-GSI-14-00-0911	Date Sampled:	09/20/11
Lab Sample ID:	MC3756-1A	Date Received:	09/21/11
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846 8260B BY SIM		
Project:	NAS Brunswick, Brunswick, ME		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H55195.D	1	09/23/11	JP	n/a	n/a	MSH1803
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	1.0	0.19	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	90%		60-140%		

*MMW  
10/17/11*

ND = Not detected      MDL - Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

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## Report of Analysis

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<b>Client Sample ID:</b> BN-SW-GSI-14-00-0911	<b>Date Sampled:</b> 09/20/11
<b>Lab Sample ID:</b> MC3756-1B	<b>Date Received:</b> 09/21/11
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B BY SIM	
<b>Project:</b> NAS Brunswick, Brunswick, ME	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E55866.D	1	09/30/11	DFT	n/a	n/a	MSE2262
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
127-18-4	Tetrachloroethene	ND	0.10	0.10	ug/l	
75-01-4	Vinyl chloride	ND	0.10	0.10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-127%
2037-26-5	Toluene-D8	100%		89-112%

MM  
4/9/12

ND = Not detected    MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound