



Semiannual Report

July through December 2018

Penta Wood Products Superfund Site

WDNR BRRTS Activity #02-07-000532

Wisconsin Department of
Natural Resources

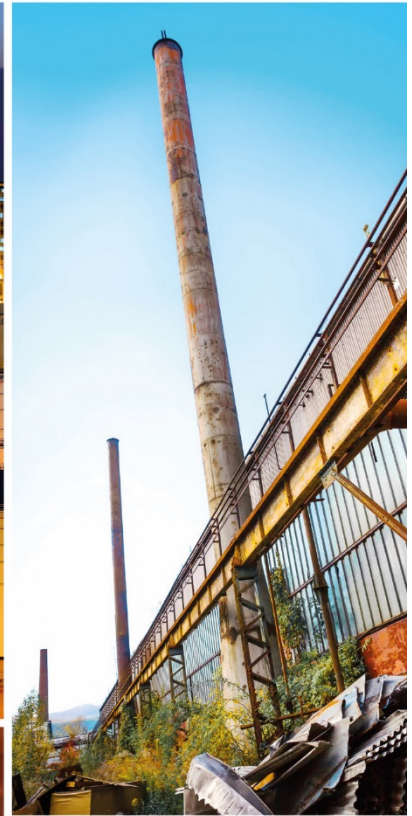
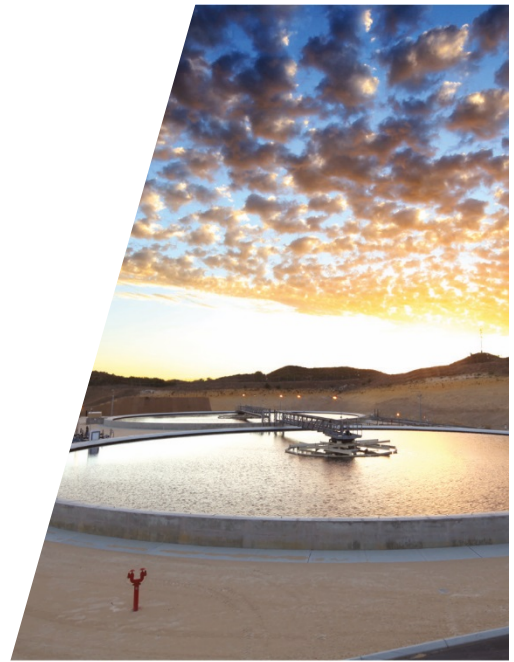




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1. Introduction

GHD Services Inc. (GHD) prepared this Semiannual Report (Report) for the Penta Wood Products Superfund Site (Site) in Siren, Wisconsin on behalf of Wisconsin Department of Natural Resources (WDNR). The Site location is shown on Figure 1.1, and the Site plan is shown on Figure 1.2. This Report presents the results of the activities conducted at the Site during July through December 2018 including:

- Groundwater monitoring and sampling (Section 2)
- Residential well and onsite supply well sampling (Section 3)
- Waste management and disposal (Section 4)
- Continuing obligations and inspections (Section 5)
- Conclusions and recommendations (Section 6)
- Certification (Section 7)

2. Groundwater Monitoring and Sampling

Groundwater monitoring was conducted at the Site in July and October 2018 and sampling was conducted at the Site in October 2018 based on the modified scope of work provided in a GHD letter to EPA dated June 30, 2016. Wells MW4 and MW14 were subsequently added to the sampling scope to assess semi-confined aquifer (lower portion) groundwater quality southeast of the LNAPL source area. Wells MW2 and MW5 were also added to the sampling scope to assess the groundwater quality in the vicinity of well MW30. The groundwater monitoring and sampling plan is summarized in Table 2.1. Sampling was completed in general accordance with the Field Sampling Plan (FSP) (CH2M HILL, November 1999 and November 2010) and Quality Assurance Project Plan (QAPP) (CH2M HILL, February 2005) with subsequent addendums (most recent is Addendum No. 6 dated July 2014). The objectives of the groundwater monitoring at the Site included:

- To monitor flow direction and hydraulic gradient through the measurement and assessment of groundwater levels
- To monitor the natural attenuation of the plume through collection and chemical analysis of groundwater samples from monitoring wells
- To monitor long term improvement in groundwater quality through the collection and chemical analysis of groundwater samples from monitoring wells
- To monitor compliance with groundwater cleanup standards for the Site (State of Wisconsin ch. NR 140 Enforcement Standards)
- To monitor potential impact to residential wells through collection and chemical analysis of water samples from targeted residential wells



2.1 Groundwater and LNAPL Level Monitoring

Groundwater and Light Non-Aqueous Phase Liquid (LNAPL) levels were measured in thirty-three (33) monitoring wells and twenty-two (22) extraction well casings at the Site on July 11, 2018 and on October 15, 2018. The groundwater and LNAPL elevation data along with well survey data are summarized in Table 2.2. Historical LNAPL thickness data are included in Appendix A.

Groundwater elevation contours were inferred from the July and October 2018 measurement data. Unconfined aquifer (upper portion) contours are shown on Figures 2.1 and 2.4. Semiconfined aquifer (lower portion) groundwater contours are shown on Figure 2.2 and 2.5. The contours indicate that the groundwater gradient is relatively flat at less than 0.0005 ft/ft (as calculated between wells MW2 and MW26) and represent non-pumping conditions following shutdown of the remediation system and groundwater extraction pumps (November 2015).

During the July 2018 and October 2018 events, LNAPL was present in monitoring wells MW18, MW19, MW20, and MW29 at measurable thicknesses, and LNAPL was not present in well MW10S. LNAPL was present in seven extraction wells (EW03S, EW05S, EW06S, EW07S, EW10S, EW12S, and EW14S) with casings screened in the unconfined (upper) aquifer during the July 2018 and October 2018 monitoring events, which is generally consistent with recent monitoring. During October 2018, LNAPL was present in extraction well EW03S (unconfined upper aquifer) for the first time since monitoring began at this well during the pilot study. However, well EW03S is located within 10 feet of monitoring well MW10S, which has previously contained LNAPL. LNAPL was not observed in any monitoring wells with casings screened in the semiconfined (lower) aquifer during July or October 2018. LNAPL thickness measurements are shown on Figures 2.3 and 2.6.

2.1.1 Vertical Gradients

Vertical hydraulic gradients were calculated between the semiconfined and unconfined aquifers to evaluate vertical flow between the two aquifers. The vertical gradient was calculated at monitoring wells MW10/MW10S, MW12/MW16, and MW23/MW9 (see Figures 2.1, 2.2, 2.4 and 2.5). The vertical gradient was determined by taking the difference in groundwater elevations divided by the difference in mid screen elevations of the wells listed above.

Groundwater at the Site flows from the unconfined aquifer downward to the semiconfined aquifer. The vertical gradients at the site range from 0.005 ft/ft (MW10/MW10S) to 0.017 ft/ft (MW12/MW16). These values are consistent with recent monitoring events and represent non-pumping conditions.

2.2 Groundwater Sampling

This groundwater sampling event was conducted from October 15 through October 19, 2018 and consisted of collecting groundwater samples from twenty (20) monitoring wells (MW1, MW2, MW3, MW4, MW5, MW6S, MW10, MW10S, MW12, MW13, MW14, MW16, MW17, MW21, MW22, MW23, MW25, MW28, MW30, and MW31) and three (3) extraction wells (EW11D, EW11S, and EW13S). Wells MW20 and MW29 were not sampled due to the presence of LNAPL in the wells. Groundwater samples were collected using low flow purge and sample protocol. As part of the well stabilization process, the groundwater was measured in the field for the following parameters: pH, temperature, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), iron, and sulfide.



The parameters DO, ORP, iron and sulfide are used to help evaluate the groundwater geochemical conditions at the well. The groundwater purging and sampling data are summarized in Table 2.3.

The groundwater samples were collected and analyzed for the following compounds: pentachlorophenol (PCP); naphthalene; benzene, toluene, ethylbenzene, and xylene (BTEX); natural attenuation parameters; and select dissolved metals. The natural attenuation parameters included alkalinity, chloride, hardness, nitrate, sulfate, total organic carbon, and methane. The results of the natural attenuation parameters were evaluated to confirm the groundwater reduction-oxidation conditions at the Site and if the groundwater conditions are favorable for biodegradation. The select dissolved metals included arsenic, copper, iron, manganese, and zinc. The metals samples were filtered in the field through a 0.54 micron filter. The groundwater sample analytical data are summarized in Table 2.4.

All groundwater samples were shipped via commercial courier under standard chain of custody procedures to TestAmerica Laboratories (TestAmerica) in University Park, Illinois for analysis. Copies of laboratory reports are included in Appendix B.

The following sections present a discussion of the groundwater sample analytical data and the Wisconsin Chapter NR140 preventative action limits (PAL) and enforcement standards (ES). Historical data are included in Appendix A.

2.2.1 Naphthalene and BTEX Analytical Data

The October 2018 naphthalene and BTEX analytical data are summarized in Table 2.4. Naphthalene was detected in three (3) wells (MW5, MW10, EW13S) at concentrations that exceeded the PAL of 10 micrograms per liter ($\mu\text{g/L}$) (Table 2.4). Naphthalene concentrations did not exceed the ES of 100 $\mu\text{g/L}$.

BTEX was not detected at concentrations that exceeded the ESs or PALs.

2.2.2 PCP Analytical Data

The October 2018 PCP analytical data are summarized in Table 2.4. PCP was detected in nine (9) wells (MW2, MW3, MW5, MW10, MW10S, MW12, MW13, MW30, and EW13S) at concentrations exceeding the PAL of 0.1 $\mu\text{g/L}$. Of those nine wells, the PCP concentrations in six (6) wells (MW5, MW10, MW10S, MW12, MW30, and EW13S) exceeded the ES of 1.0 $\mu\text{g/L}$. Figure 2.7 shows the PCP concentrations in the unconfined (upper) aquifer wells. Figure 2.8 shows the PCP concentrations in the semiconfined (lower) aquifer wells.

During October 2018, PCP was detected in well MW5 at a concentration of 5,600 $\mu\text{g/L}$, which is greater than the concentration (17 $\mu\text{g/L}$) during the April 2016 pilot study baseline sampling event.

PCP was detected in well MW2 at a concentration of 0.21 $\mu\text{g/L}$ during October 2018. PCP was detected at an estimated concentration of 0.080 $\mu\text{g/L}$ in well MW2 during the April 2016 pilot study baseline sampling event.

Although PCP concentrations were higher in some wells during October 2018 compared to previous sampling events, the elevated PCP concentrations (i.e., greater than 1,000 $\mu\text{g/L}$) are limited to the immediate vicinity of the LNAPL area in the unconfined and semiconfined aquifers, which is consistent with baseline sampling in April 2016 and recent sampling events.



2.2.3 Dissolved Arsenic Analytical Data

The October 2018 dissolved arsenic analytical data are summarized in Table 2.4. Arsenic was detected in four (4) wells (MW4, MW10, MW14, and EW13S) at concentrations exceeding the PAL (1 µg/L). Of those four wells, the arsenic concentrations in one well (EW13S) exceeded the ES (10 µg/L). Figure 2.9 shows the arsenic concentrations in the unconfined (upper) aquifer wells. Figure 2.10 shows the arsenic concentrations in the semiconfined (lower) aquifer wells.

2.2.4 Other Dissolved Metals Analytical Data

The October 2018 dissolved metals analytical data are summarized in Table 2.4. Zinc and copper were not detected above the PALs or ESs in any of the twenty (20) monitoring wells and three (3) extraction wells.

Iron was detected in five (5) wells at concentrations exceeding the PAL (150 µg/L) and four (4) wells at concentrations exceeding the ES (300 µg/L). Manganese was detected in eight (8) wells at concentrations exceeding the PAL (25 µg/L) and six (6) wells at concentrations exceeding the ES (50 µg/L). The ES for iron and manganese are considered secondary health based standards that are based on aesthetics (i.e., odor and taste).

2.2.5 Natural Attenuation Parameters Analytical Data

The natural attenuation results are provided in Table 2.4. The results generally show elevated levels of nitrate and sulfate and low concentrations of TOC and methane. These results in combination with the field stabilization parameters of DO, ORP, iron, and sulfide (Table 2.3) show that the groundwater beneath the Site is aerobic to slightly anaerobic because DO values are greater than 1 mg/L and ORP values are positive at the majority of wells outside the immediate vicinity of the LNAPL area in both the unconfined and semiconfined aquifers.

2.3 Proposed New Monitoring Well

Based on the PCP concentrations in wells MW5 and MW30, PCP is not delineated to the east. Hence, a new well MW32 is proposed near the east property boundary to further delineate PCP in the unconfined (upper) aquifer. The proposed well location is shown on Figures 1.2 and 2.7. Drilling and well installation work will be conducted during the spring of 2019. Groundwater sampling at this well will be included in the April and October 2019 semiannual events.

2.3.1 Drilling Protocol

A driller, licensed by the State of Wisconsin, would utilize a sonic drilling rig to advance the borehole for the new monitoring well (MW32). The borehole would be approximately 6 inches in diameter and advanced to approximately 10 feet below the groundwater table. The total drilling depth is estimated to be approximately 42 feet. The drilling equipment would be decontaminated prior to use at the borehole location. Drilling and well installation work would be conducted in general accordance with State of Wisconsin Administrative Code (WAC) ch. NR 141 requirements.



2.3.2 Well Installation

A monitoring well would be installed in borehole MW32. The well would consist of 2-inch diameter, Schedule 80, polyvinyl chloride (PVC) casing. The PVC screen interval would consist of casing with 0.010-inch slots installed between approximately 975 and 995 feet above mean sea level (ft msl) (10 feet above and below the groundwater table). Solid casing will extend from the top of the screened interval to approximately 2 feet above ground surface.

The annular space around the screened interval would be backfilled with a silica sand filter pack. The sand would extend from the bottom of the borehole to approximately 2 feet above the top of the screen. A 2-foot thick fine sand filter pack seal would be placed above the top of the filter pack. A neat cement grout would be installed, via a tremie pipe, in the annular space immediately above the filter pack seal to ground surface. A lockable steel protective casing (6-inch diameter, steel) would be installed around the above ground well casing and set in concrete.

Following installation, the well would be developed by surging and purging groundwater until the turbidity of the water is reduced.

2.3.3 Soil Cuttings and Water Management and Disposal

Soil cuttings removed from the borehole for monitoring well MW32 above an elevation of approximately 1,001 ft amsl, which is approximately 15 feet above the current groundwater table would be segregated placed into a stockpile. Soil cuttings removed below this elevation would be placed in a separate stockpile. The stockpiles would be located on the CAMU at the Site.

Each stockpile would be lined and covered with plastic sheeting. A composite soil sample would be collected from each stockpile for laboratory analysis of PCP, BTEX, and naphthalene and other parameters if required for profiling and offsite disposal.

If the soil sample results meet the State of Wisconsin standards, the drill cuttings would be thinspread at the Site. If the results exceed the standards, a waste profile will be developed for authorized disposal at an offsite facility. Disposal would be completed within 90 days of generating the soil cuttings.

Development/decontamination water would be discharged to the ground surface within the CAMU limits at the Site, and the quantity will be documented. Any LNAPL recovered during the drilling or well development activities would be stored in a drum at the Site and subsequently profiled and disposed at an authorized offsite facility.

3. Residential Well and Onsite Supply Well Sampling

On October 15 and 16, 2018, water samples were collected from seven residential wells located near the Site and the onsite water supply well (DW01) in general accordance with the FSP and QAPP. The six residential wells included:

- 8713 Daniels 70 (RW1)
- 8627 Daniels 70 (RW2)



- 8454 Daniels 70 (RW3)
- 8526 Daniels 70 (RW4)
- 8783 Daniels 70 (RW5)
- 8542 West Doctor Lake Road (RW6 and RW6 Shop)

The onsite water supply well serves the remediation equipment building. The water was previously used for sanitary facilities in the building and maintaining the remediation equipment but is not ingested by workers. During January 2018, the building heater malfunctioned, and the water supply pipes were damaged due to freezing. The water supply piping was subsequently disconnected at the building. The onsite water supply well no longer provides a water supply to the building.

The residential well and onsite water supply well locations are shown on Figure 3.1. The samples were analyzed for PCP, BTEX, and naphthalene.

3.1 Residential Well and Onsite Supply Well Sample Analytical Data

BTEX and naphthalene were not detected at concentrations in the residential wells or onsite water supply well that exceed the respective PALs (Table 3.1). With the exception of well RW5, PCP was not detected in the residential wells. PCP was detected in well RW5 at a concentration above the PAL (0.1 µg/L) and below the ES (1 µg/L). Semiannual sampling will continue at all residential wells to identify and track potential PCP concentration trends. The residential well and onsite supply well sample analytical data are summarized in Table 3.1. Copies of the laboratory reports are included in Appendix B, and the data validation memorandum is included in Appendix C. Historical residential and onsite water supply well PCP data are included in Appendix A.

4. Waste Management and Disposal

No waste was disposed during July through December 2018. GHD continues to collect and containerize PPE and other waste produced during sampling events onsite. Historical hazardous waste disposal is summarized in Appendix A.

5. Continuing Obligations and Inspections

The WDNR has implemented Institutional Controls (ICs) at the Site in the form of Continuing Obligations (COs). COs are legal requirements designed to protect public health and the environment in regard to contamination that remains on a property, and COs still apply after a property is sold. The Long-Term Response Action Operation and Maintenance Plan (O&M Plan) – Addendum No. 1 (GHD; November 9, 2015) effectively serves as an Institutional Control Implementation and Assurance Plan (ICIAP). This section documents the COs in addition to inspections required by the O&M Plan (GHD; July 22, 2015).



5.1 Continuing Obligations

On July 6, 2015 the WDNR provided a letter approving the Remedial Actions with Continuing Obligations (WDNR BRRTS Activity #02-07-000532, FID #: 807050310). That letter approved the remedies which have been implemented at the Site and specified the condition with which any current or future owner of the property must comply to ensure that the Site does not pose a threat. These conditions or COs meet the intent of the ICs required by the Record of Decision for the Site.

CO maintenance consists of periodic monitoring and reporting to confirm that Site security is in place and providing protection as intended and that use of the land is restricted to maintain the integrity and functional effectiveness of the Site remedy.

Maintenance activities consist of periodic review of the property and COs by WDNR, notifications to new land owners or lessees, and continuing education for land owners and property users through annual updates and information.

To facilitate monitoring of the COs, roles and responsibilities, schedules, corrective actions, and reporting requirements were performed as follows:

1. Periodic monitoring was conducted whenever WDNR or its contractors or other representatives were present at the Site.
2. Prohibition of use of the Site real estate is evaluated and updated on an annual basis (minimum frequency). This evaluation determined:
 - The selected remedy (i.e. remediation system shutdown pilot study and associated monitoring) remains in place and remains effective
 - Site security remains effective and real estate use meets the stated objectives and performance goals and provides protection required by the response
3. Evidence was not observed of the following improper uses:
 - Removal of the existing barrier or cover
 - Replacement with another barrier or cover
 - Excavating or grading of the land surface
 - Filling on covered or paved areas
 - Plowing for agricultural cultivation
 - Construction or placement of a building or other structure
 - Changing the use or occupancy of the property to a residential exposure setting, which may include certain uses, such as single or multiple family residences, a school, day care, senior center, hospital, or similar residential exposure setting

An inspection of continuing obligations items was completed on October 19, 2018 and a copy of the continuing obligations inspection form is included in Appendix D.



5.2 Inspections

Additional inspections required by the O&M Plan (GHD; July 22, 2015) were conducted during this monitoring period. The results of the inspections are as follows:

- The CAMU area fence is in satisfactory condition and does not require repairs; the CAMU fence gates remain closed and locked when GHD and/or WDNR are not at the Site
- The CAMU area surface soils/vegetation were in good condition during this monitoring period and did not require repairs; erosion, subsidence, and ponding water were not observed on the CAMU

A site well inspection was completed on October 19, 2018 and a copy of the well inspection form is included in Appendix D.

6. Conclusions and Recommendations

Based on the pilot study data obtained since April 2016, the following conclusions are made:

- LNAPL is stable and not migrating
- The dissolved PCP plume is stable and not migrating significantly outside of the LNAPL area; however, PCP concentrations east of the LNAPL area will be further evaluated during future monitoring and sampling events to confirm that the PCP plume remains stable and not migrating
- Dissolved PCP concentrations greater than 1,000 µg/L are limited to the immediate vicinity of the LNAPL area
- Dissolved PCP degrades naturally in the aerobic zone outside of the LNAPL area, which helps stabilize the plume and prevent migration
- Dissolved PCP degrades in the anaerobic zone (LNAPL source area) at a slow rate
- The current monitoring well network is mostly sufficient to monitor plume conditions; however, a new monitoring well (MW32) is proposed near the east property boundary to further delineate the PCP plume in the unconfined (upper) aquifer

The following actions are recommended for the Site during the next reporting period:

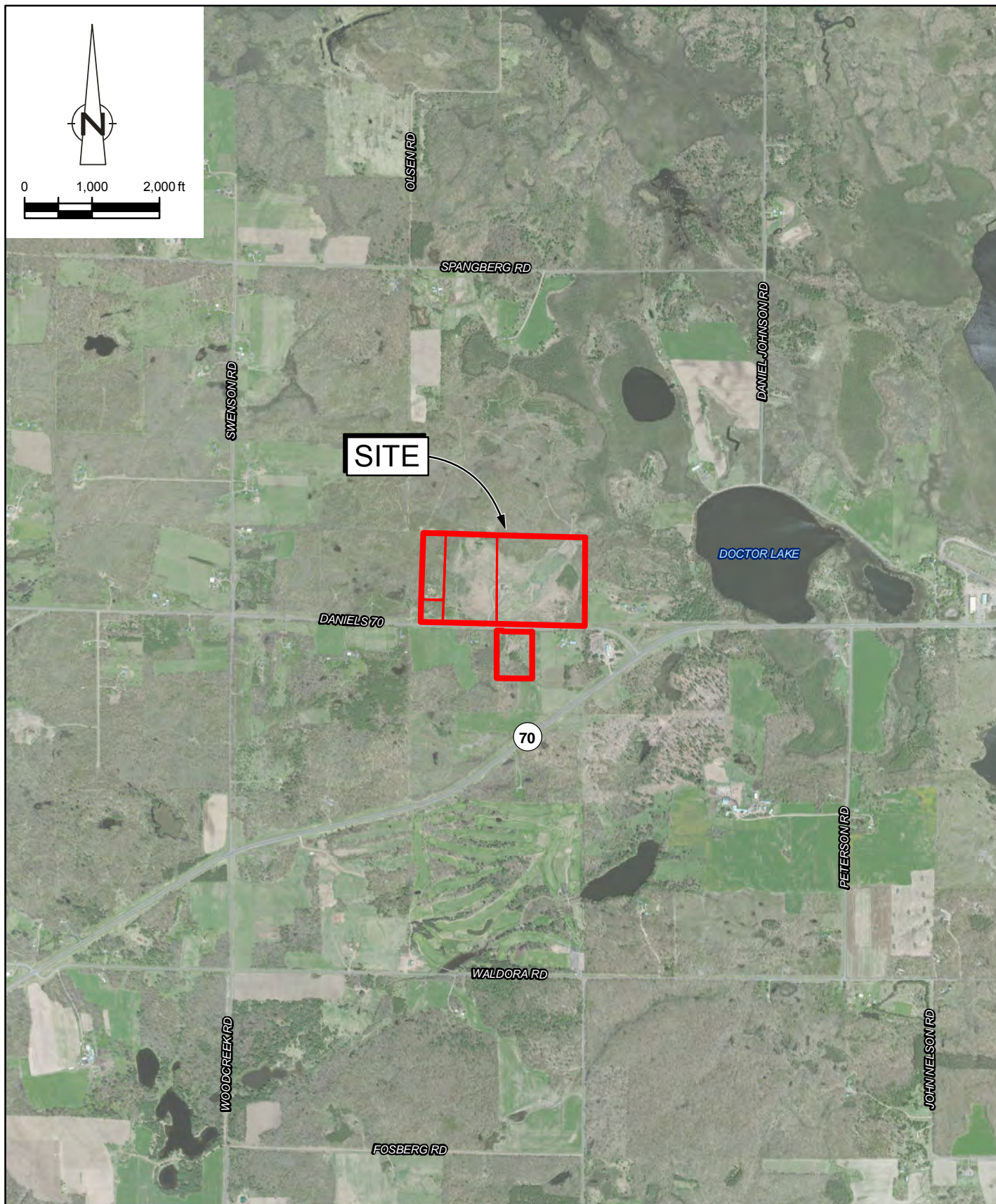
- Keep the remediation system shut down and continue the pilot study monitoring and sampling at the Site based on the USEPA approved scope and schedule
- Conduct quarterly groundwater and LNAPL level monitoring during January and April 2019
- Conduct semiannual groundwater monitoring and sampling during April 2019
- Conduct groundwater sampling at a new well (MW32), located near the east property boundary, to further evaluate the PCP plume and confirm that the plume remains stable and not migrating and/or determine whether additional wells are necessary
- Conduct semiannual residential well sampling during April 2019



- Assess future pilot study data to determine whether a change in the monitoring and sampling scope and schedule is appropriate and/or whether additional wells are needed to delineate the extent of PCP concentrations exceeding the ES
- Prepare and submit required monthly and semiannual reports; the next semiannual report will document Site work during January through June 2019 and will be submitted in July 2019.
- Conduct a groundwater statistical evaluation using USEPA and ITRC guidance after collecting groundwater data through 2019

7. Certification

The current actions at the Site remain protective of human health and the environment based on an evaluation of the current data. Implementation of the pilot study contingency plan outlined in the Remediation System Pilot Study Work Plan (GHD; November 13, 2015) is not necessary at this time.



Source: DigitalGlobe 2011

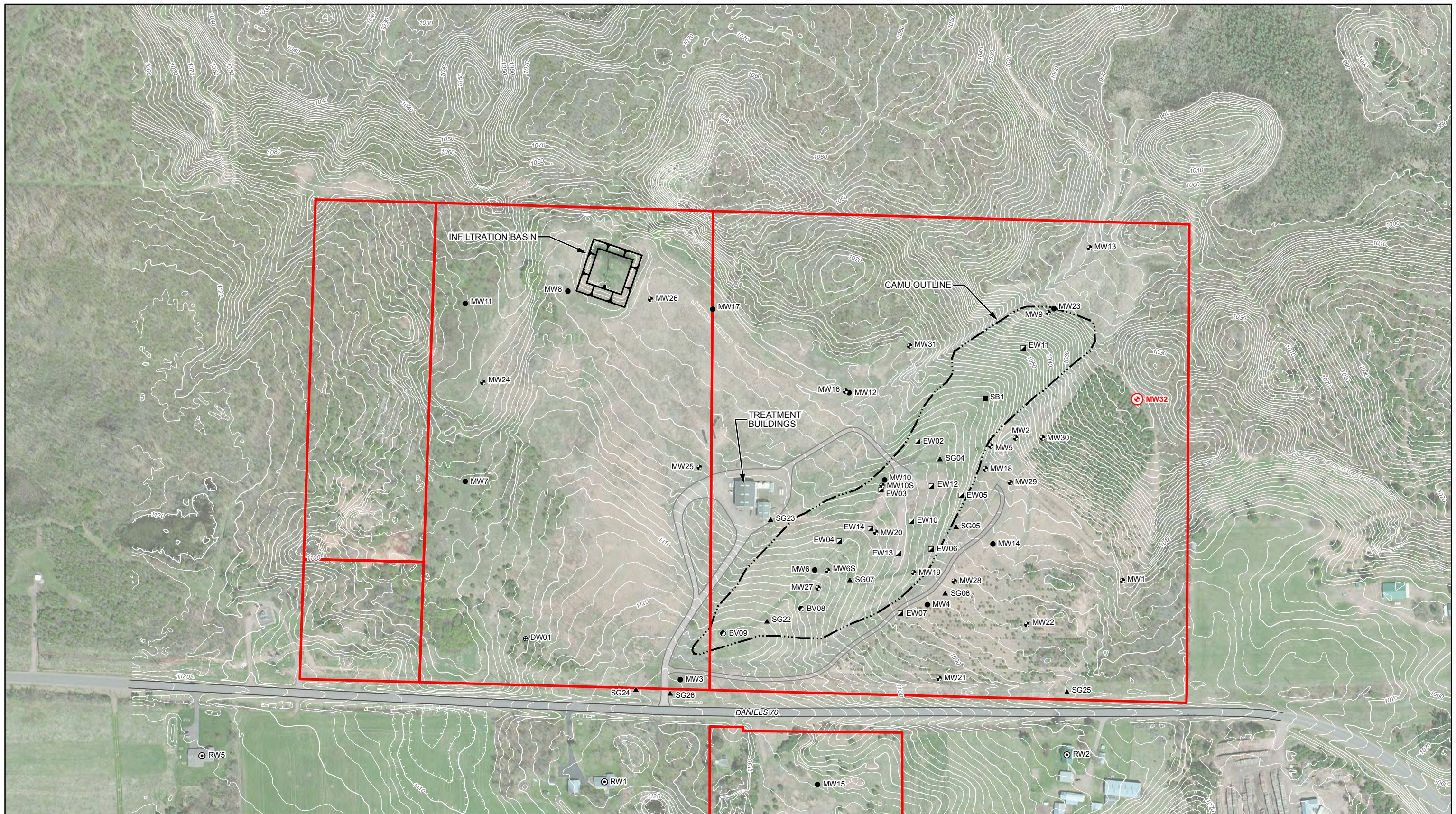


PENTA WOOD PRODUCTS SUPERFUND SITE
 SIREN, WISCONSIN
 SEMI-ANNUAL REPORT

086165-05-06
 Nov 19, 2018

SITE LOCATION

FIGURE 1.1



Source: Microsoft Corporation; Burnett County



LEGEND

- | | | | |
|---|-------------------------------------|-----|------------------------|
| ⊕ | PROPOSED UNCONFINED MONITORING WELL | ▲ | SOIL GAS WELL NEST |
| ⚡ | EXTRACTION WELL NEST | ⊕ | WATER SUPPLY WELL |
| ⊕ | UNCONFINED MONITORING WELL | ⊙ | RESIDENTIAL WELL |
| ● | SEMICONFINED MONITORING WELL | --- | APPROXIMATE CAMU LIMIT |
| ⊙ | BIOVENTING WELL | --- | SITE PARCEL BOUNDARY |



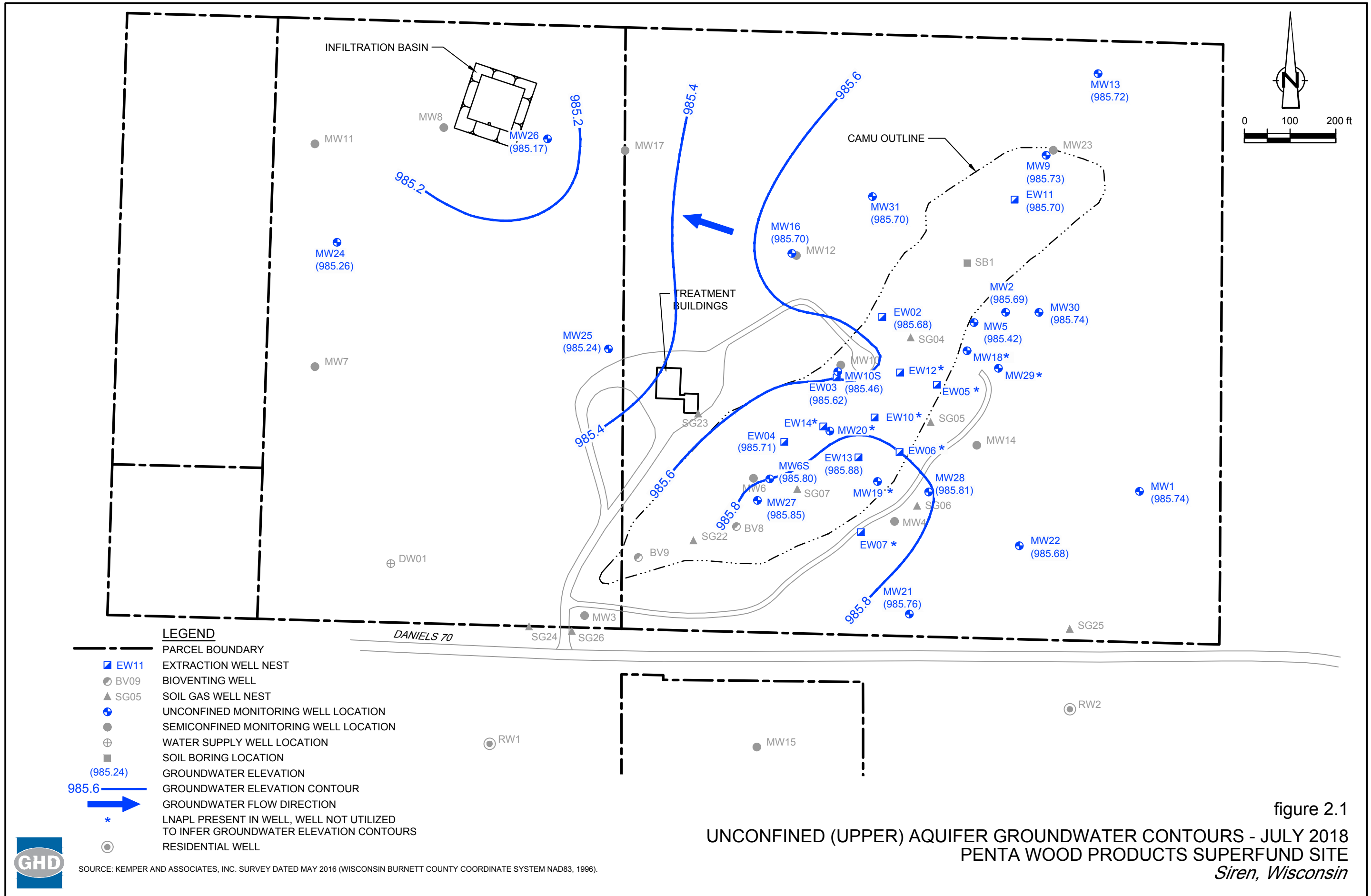
PENTA WOOD PRODUCTS SUPERFUND SITE
SIREN, WISCONSIN
SEMIANNUAL REPORT

SITE PLAN

086165-06-11

Jan 28, 2019

FIGURE 1.2

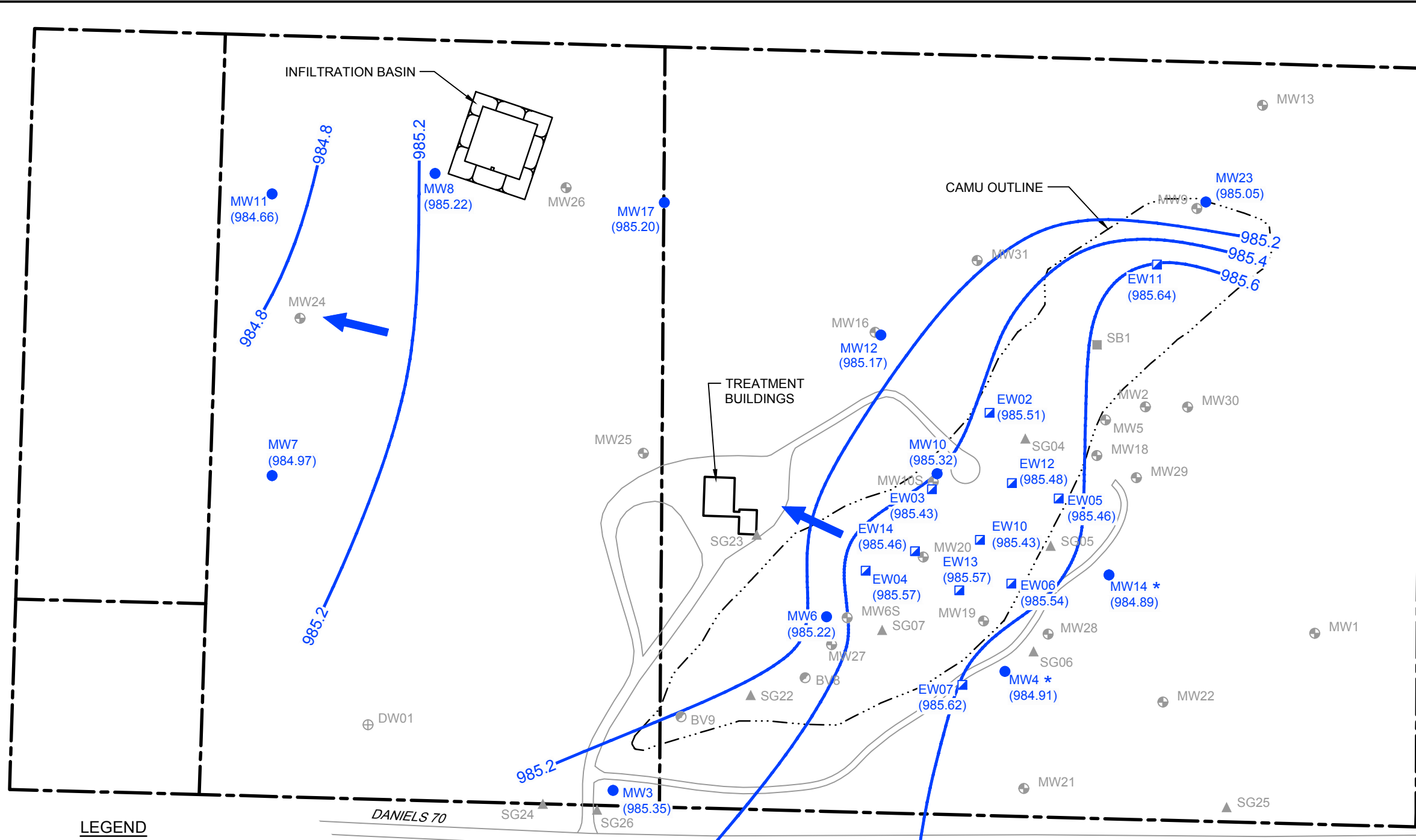


LEGEND

- PARCEL BOUNDARY
- EW11 EXTRACTION WELL NEST
- BV09 BIOVENTING WELL
- SG05 SOIL GAS WELL NEST
- UNCONFINED MONITORING WELL LOCATION
- SEMICONFINED MONITORING WELL LOCATION
- ⊕ WATER SUPPLY WELL LOCATION
- SOIL BORING LOCATION
- (985.24) GROUNDWATER ELEVATION
- 985.6 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- * LNAPL PRESENT IN WELL, WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS
- RESIDENTIAL WELL

SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

figure 2.1
UNCONFINED (UPPER) AQUIFER GROUNDWATER CONTOURS - JULY 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

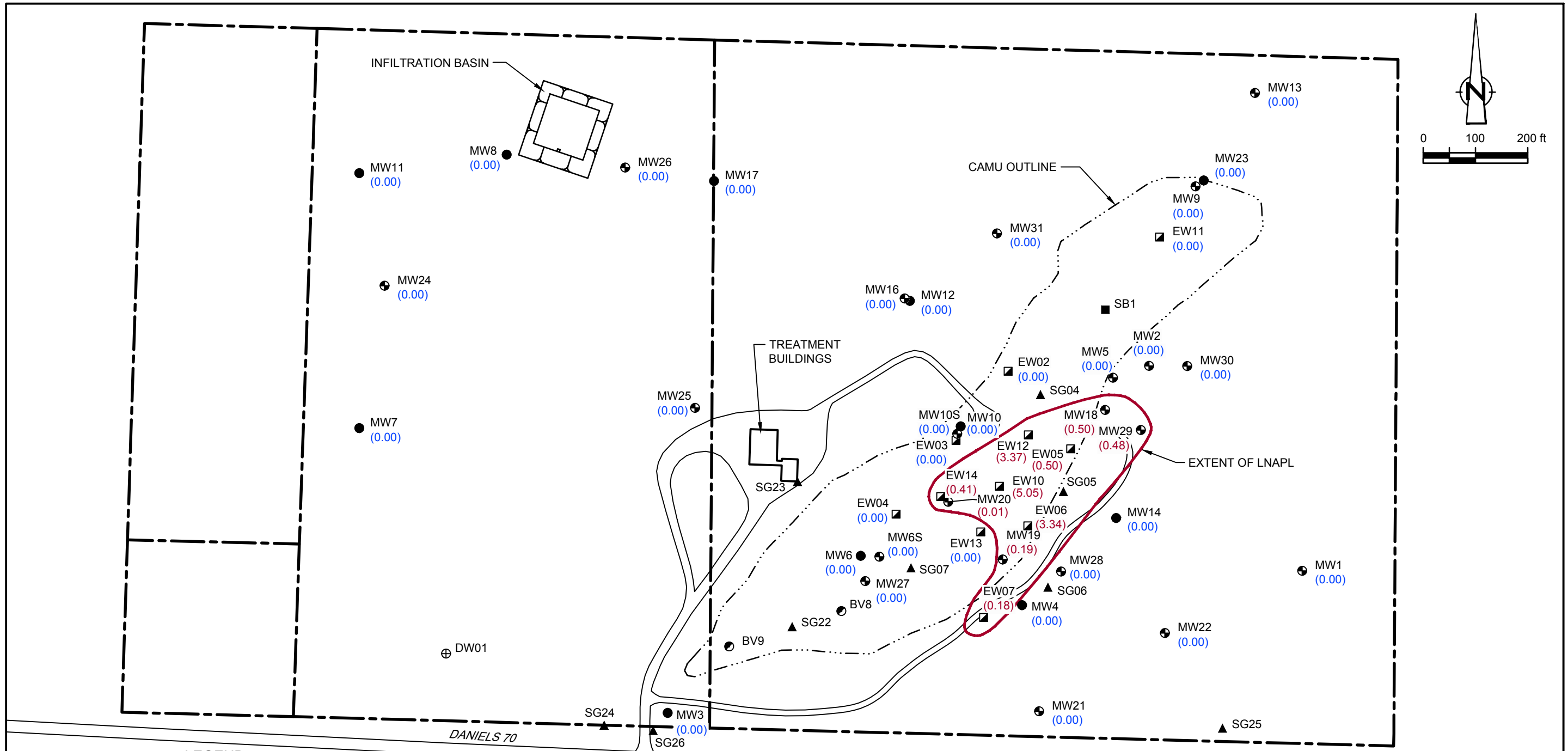


- LEGEND**
- PARCEL BOUNDARY
 - EW11 EXTRACTION WELL NEST
 - BV09 BIOVENTING WELL
 - ▲ SG05 SOIL GAS WELL NEST
 - ⊕ UNCONFINED MONITORING WELL LOCATION
 - SEMICONFINED MONITORING WELL LOCATION
 - ⊕ WATER SUPPLY WELL LOCATION
 - SOIL BORING LOCATION
 - (985.35) GROUNDWATER ELEVATION
 - 986.4 — GROUNDWATER ELEVATION CONTOUR
 - GROUNDWATER FLOW DIRECTION
 - RESIDENTIAL WELL
 - * WELL NOT USED TO INFER GROUNDWATER ELEVATION CONTOURS

figure 2.2
SEMICONFINED (LOWER) AQUIFER GROUNDWATER CONTOURS - JULY 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



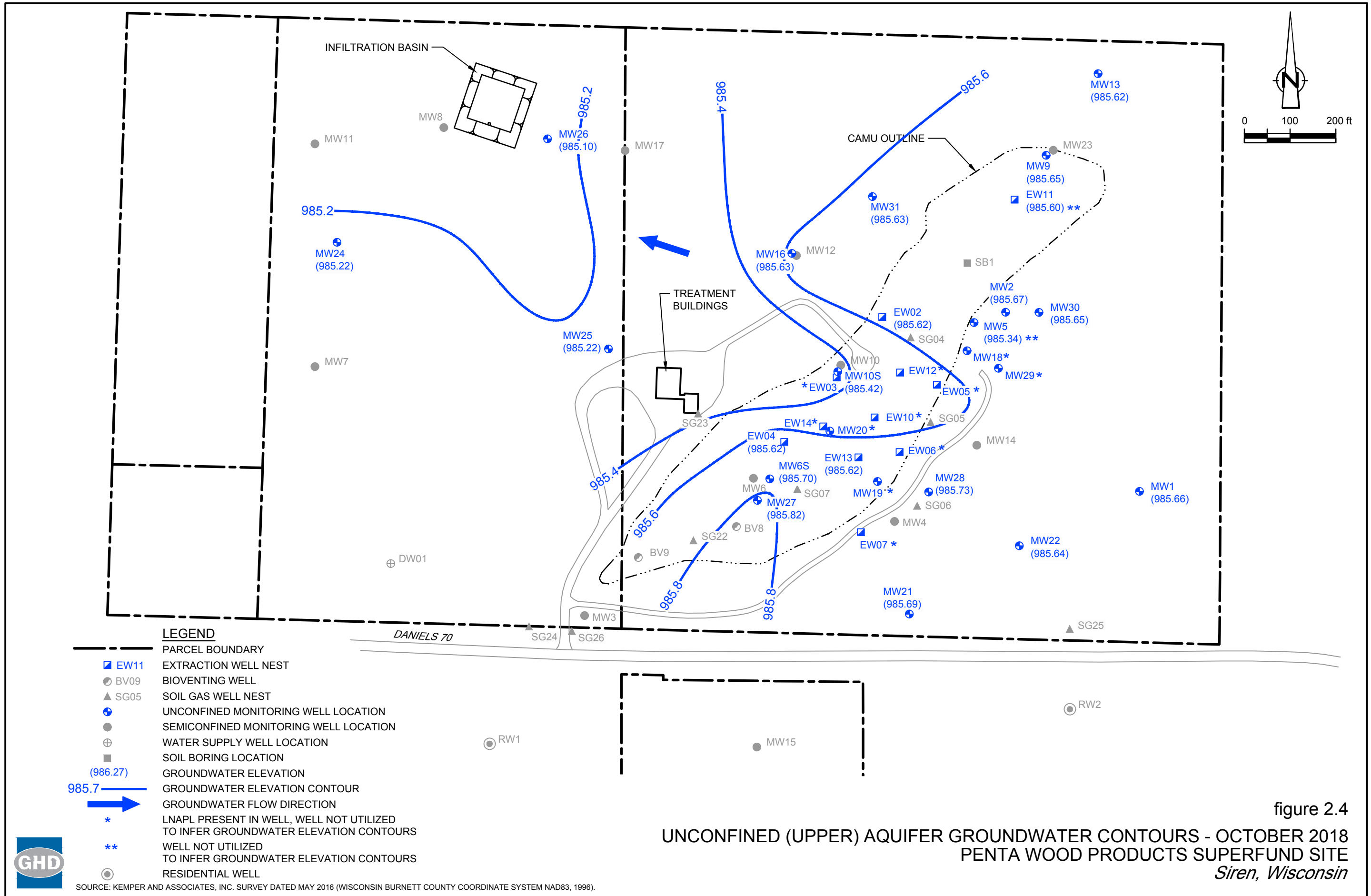
LEGEND

---	PARCEL BOUNDARY
■ EW11	EXTRACTION WELL NEST
● BV09	BIOVENTING WELL
▲ SG05	SOIL GAS WELL NEST
⊕	UNCONFINED MONITORING WELL LOCATION
●	SEMICONFINED MONITORING WELL LOCATION
⊕	WATER SUPPLY WELL LOCATION
■	SOIL BORING LOCATION
(0.00)	LNAPL NOT PRESENT
(0.26)	LNAPL THICKNESS (FEET)
---	EXTENT OF LNAPL
(NM)	LNAPL THICKNESS NOT MEASURED, BUT PRESENCE CONFIRMED
⊙	RESIDENTIAL WELL

figure 2.3
 LNAPL THICKNESS - JULY 2018
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

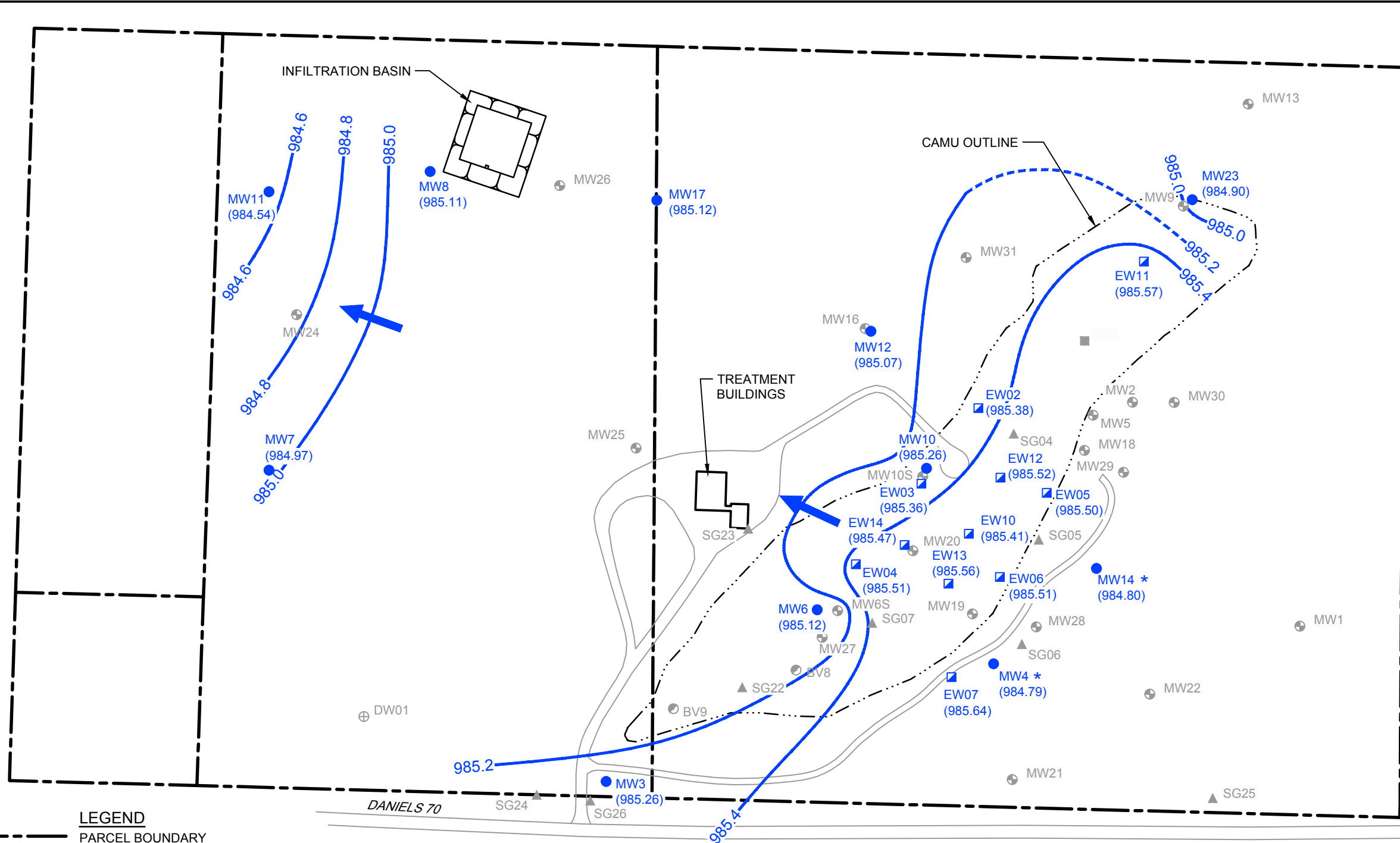


LEGEND

- PARCEL BOUNDARY
- EW11 EXTRACTION WELL NEST
- BV09 BIOVENTING WELL
- ▲ SG05 SOIL GAS WELL NEST
- ⊕ UNCONFINED MONITORING WELL LOCATION
- SEMICONFINED MONITORING WELL LOCATION
- ⊕ WATER SUPPLY WELL LOCATION
- SOIL BORING LOCATION
- (986.27) GROUNDWATER ELEVATION
- 985.7 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- * LNAPL PRESENT IN WELL, WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS
- ** WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS
- RESIDENTIAL WELL

SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

figure 2.4
UNCONFINED (UPPER) AQUIFER GROUNDWATER CONTOURS - OCTOBER 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

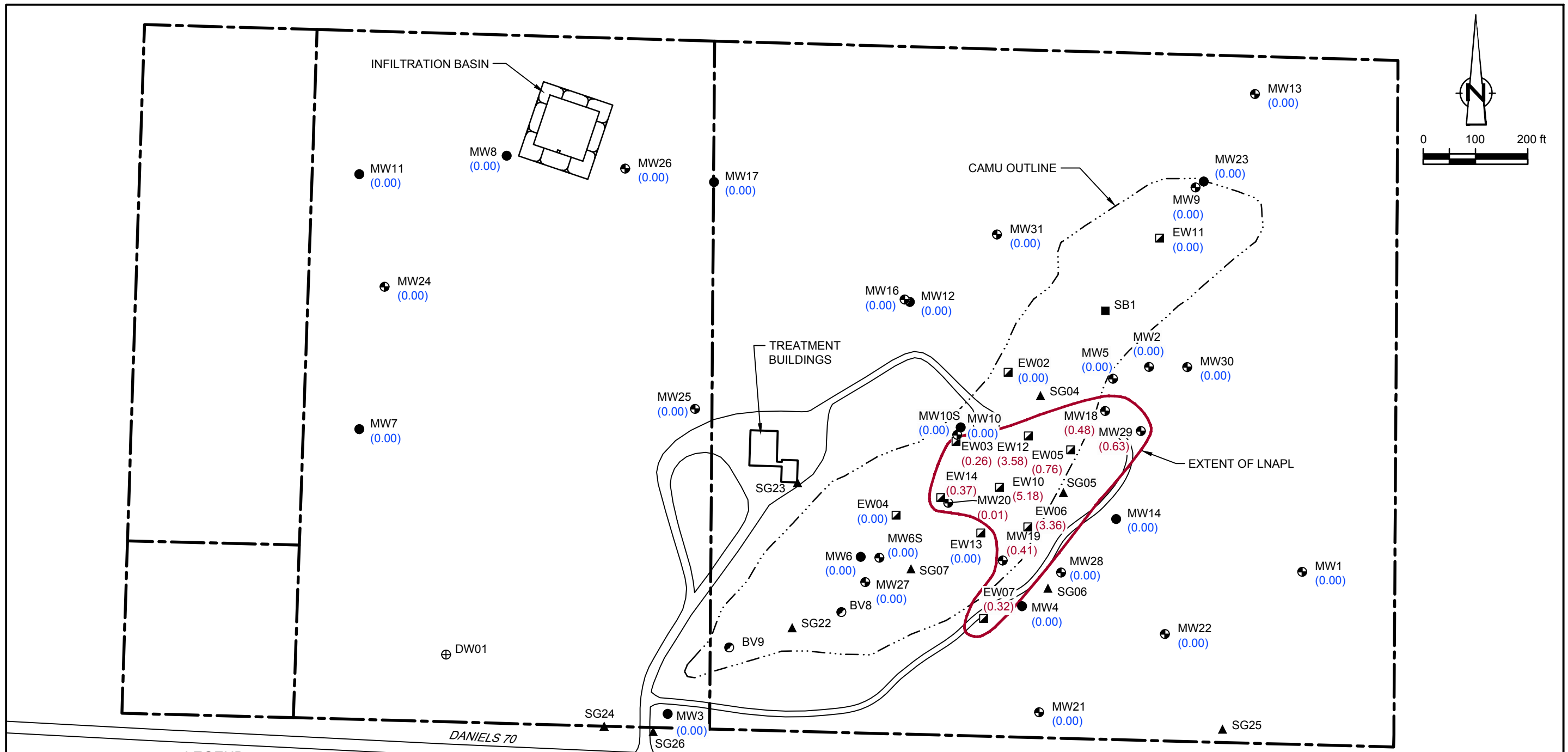


- LEGEND**
- PARCEL BOUNDARY
 - EW11 EXTRACTION WELL NEST
 - BV09 BIOVENTING WELL
 - ▲ SG05 SOIL GAS WELL NEST
 - ⊕ UNCONFINED MONITORING WELL LOCATION
 - SEMICONFINED MONITORING WELL LOCATION
 - ⊕ WATER SUPPLY WELL LOCATION
 - SOIL BORING LOCATION
 - (985.35) GROUNDWATER ELEVATION
 - 986.10 GROUNDWATER ELEVATION CONTOUR
 - GROUNDWATER FLOW DIRECTION
 - RESIDENTIAL WELL
 - * WELL NOT USED TO INFER GROUNDWATER ELEVATION CONTOURS

figure 2.5
 SEMICONFINED (LOWER) AQUIFER GROUNDWATER CONTOURS - OCTOBER 2018
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



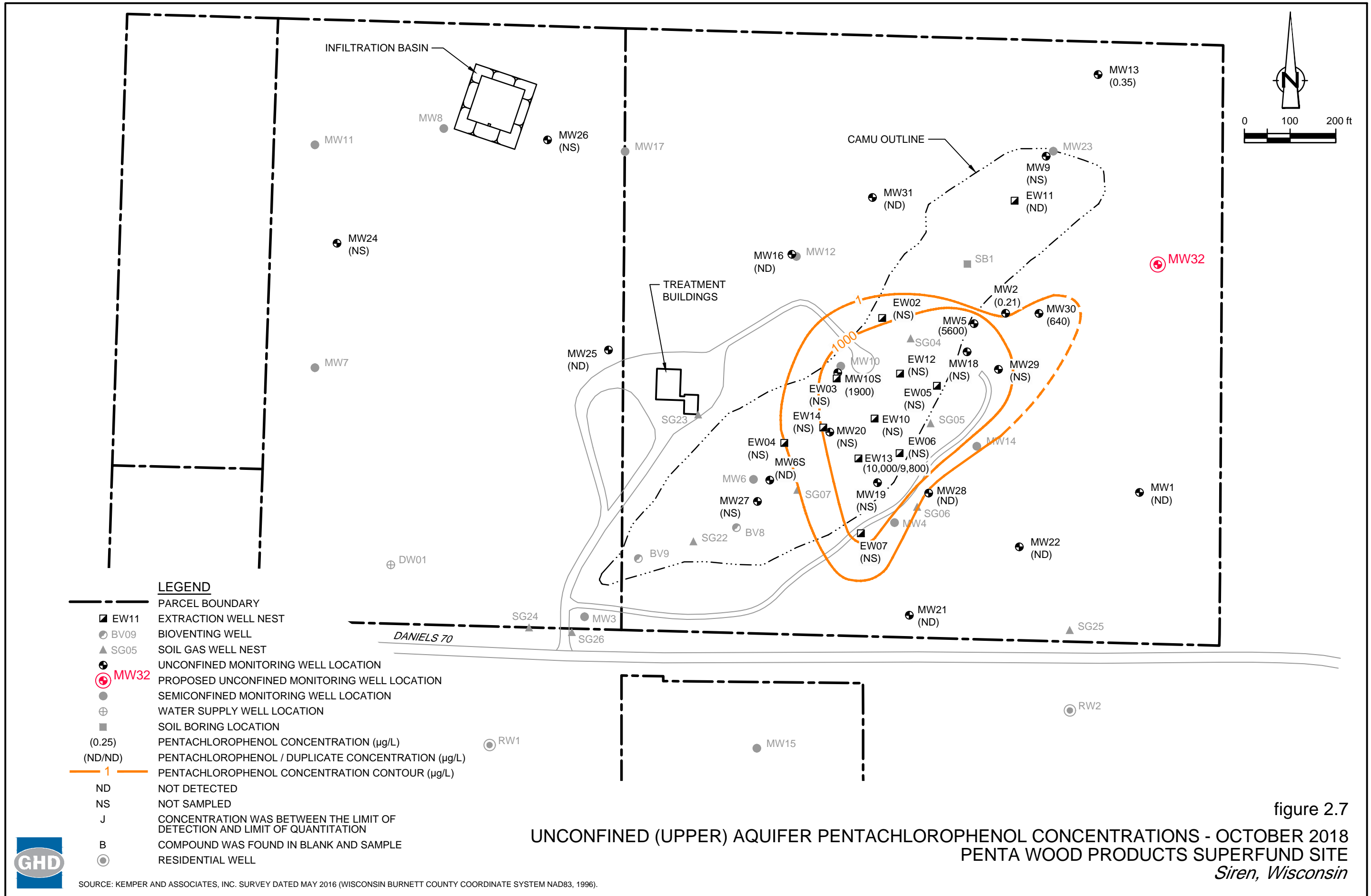
LEGEND

---	PARCEL BOUNDARY
■ EW11	EXTRACTION WELL NEST
● BV09	BIOVENTING WELL
▲ SG05	SOIL GAS WELL NEST
⊕	UNCONFINED MONITORING WELL LOCATION
●	SEMICONFINED MONITORING WELL LOCATION
⊕	WATER SUPPLY WELL LOCATION
■	SOIL BORING LOCATION
(0.00)	LNAPL NOT PRESENT
(0.26)	LNAPL THICKNESS (FEET)
---	EXTENT OF LNAPL
(NM)	LNAPL THICKNESS NOT MEASURED, BUT PRESENCE CONFIRMED
⊕	RESIDENTIAL WELL

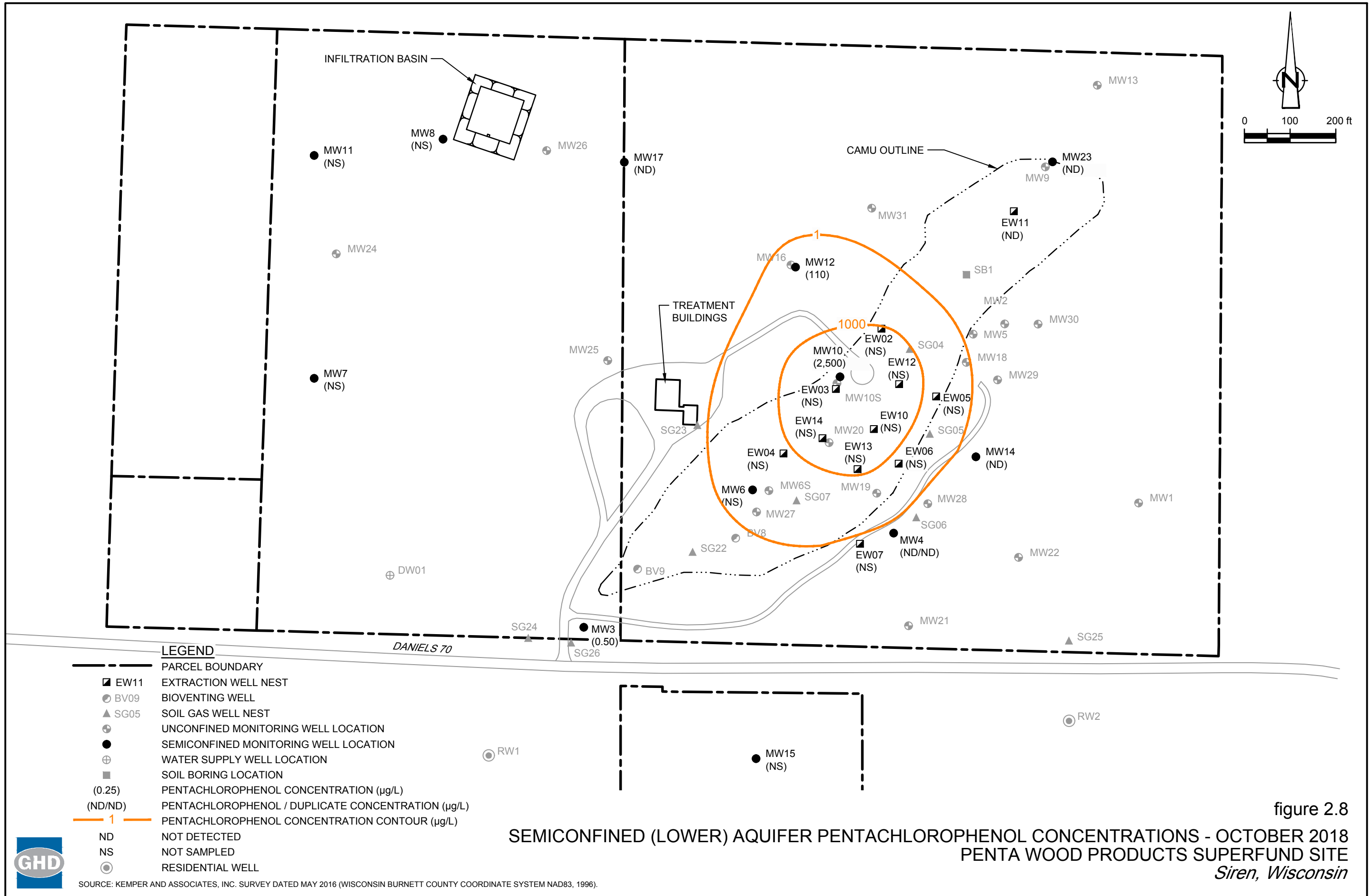


SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

figure 2.6
 LNAPL THICKNESS - OCTOBER 2018
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

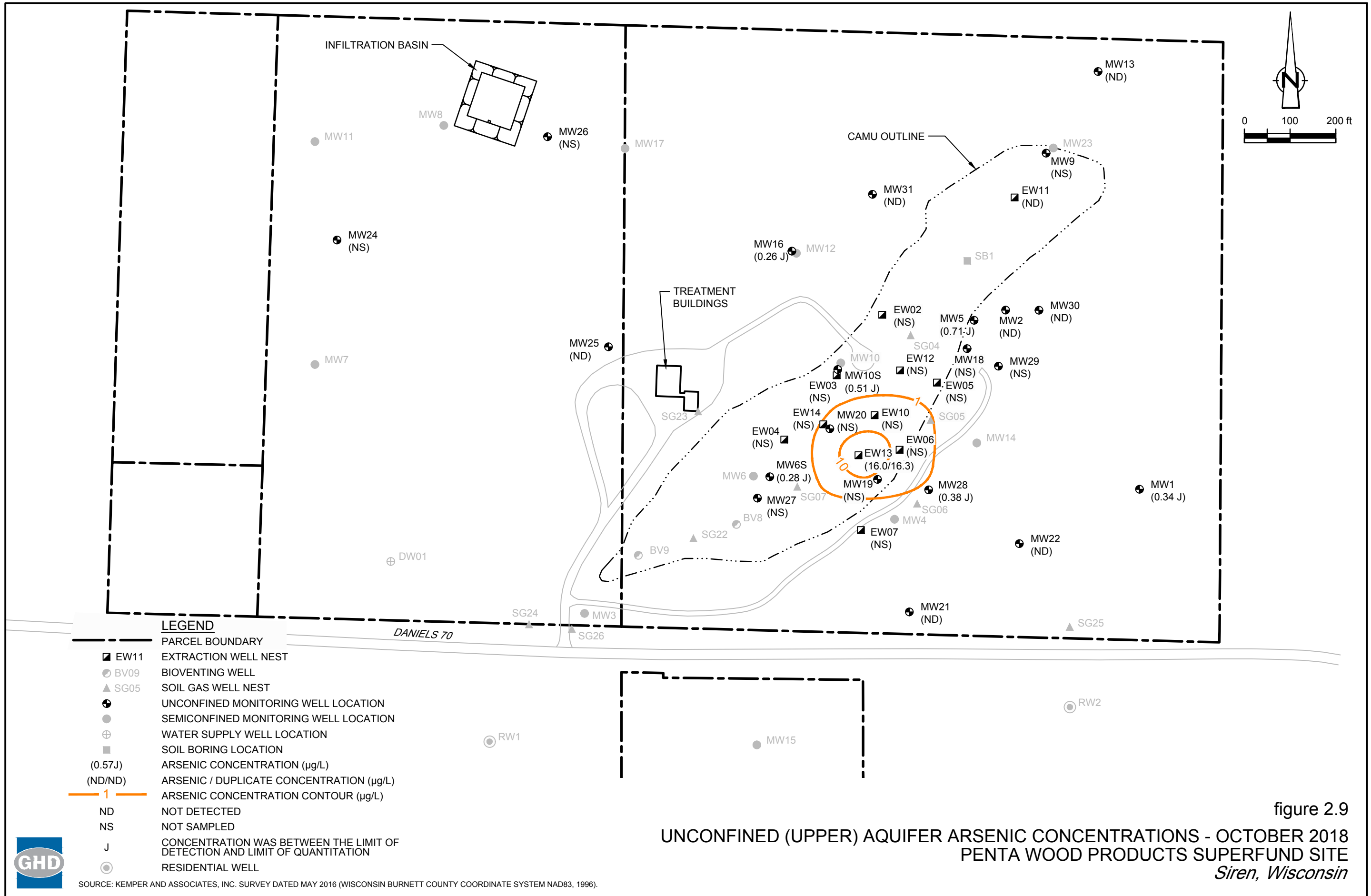
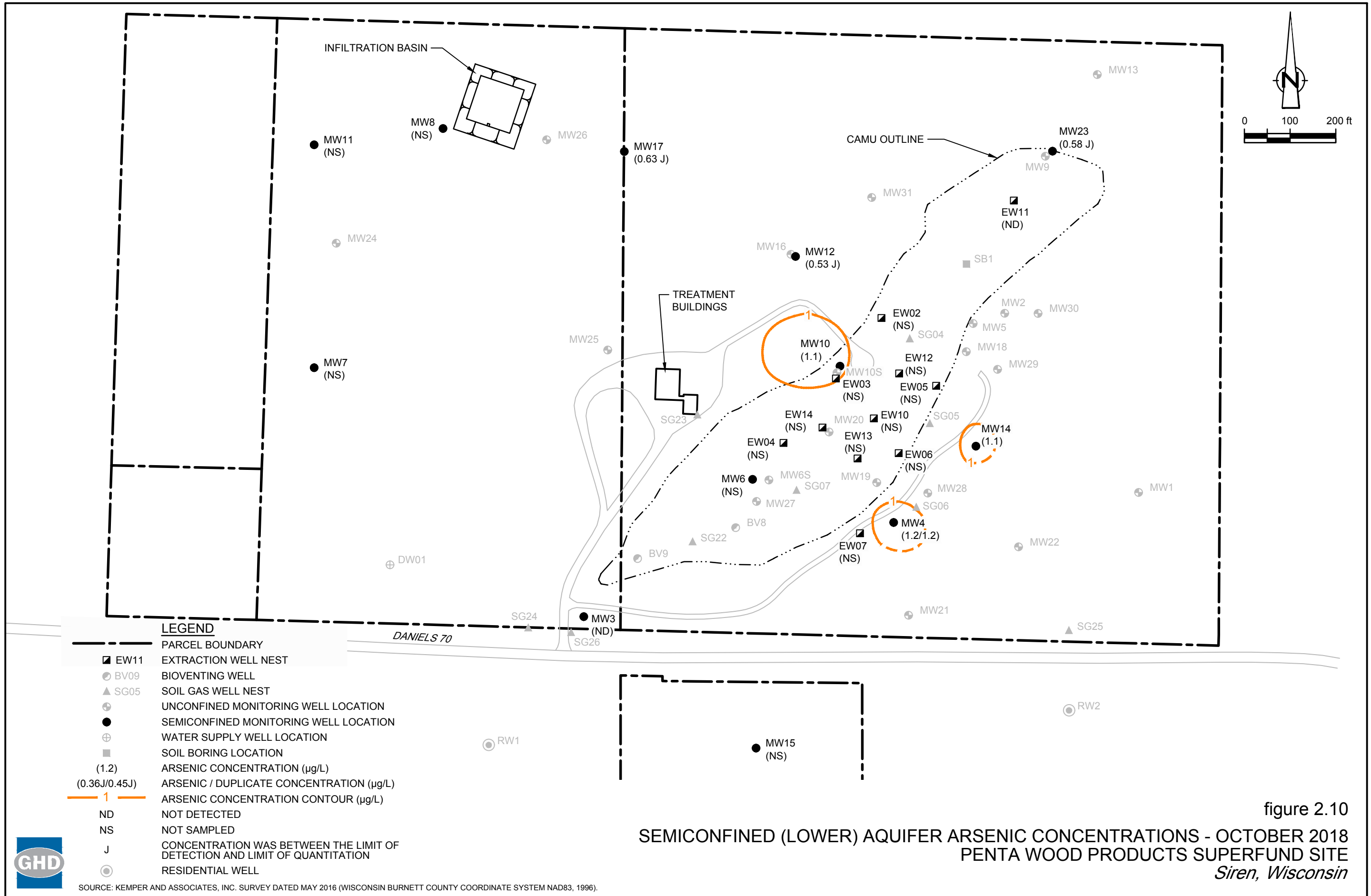
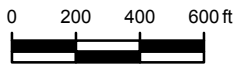
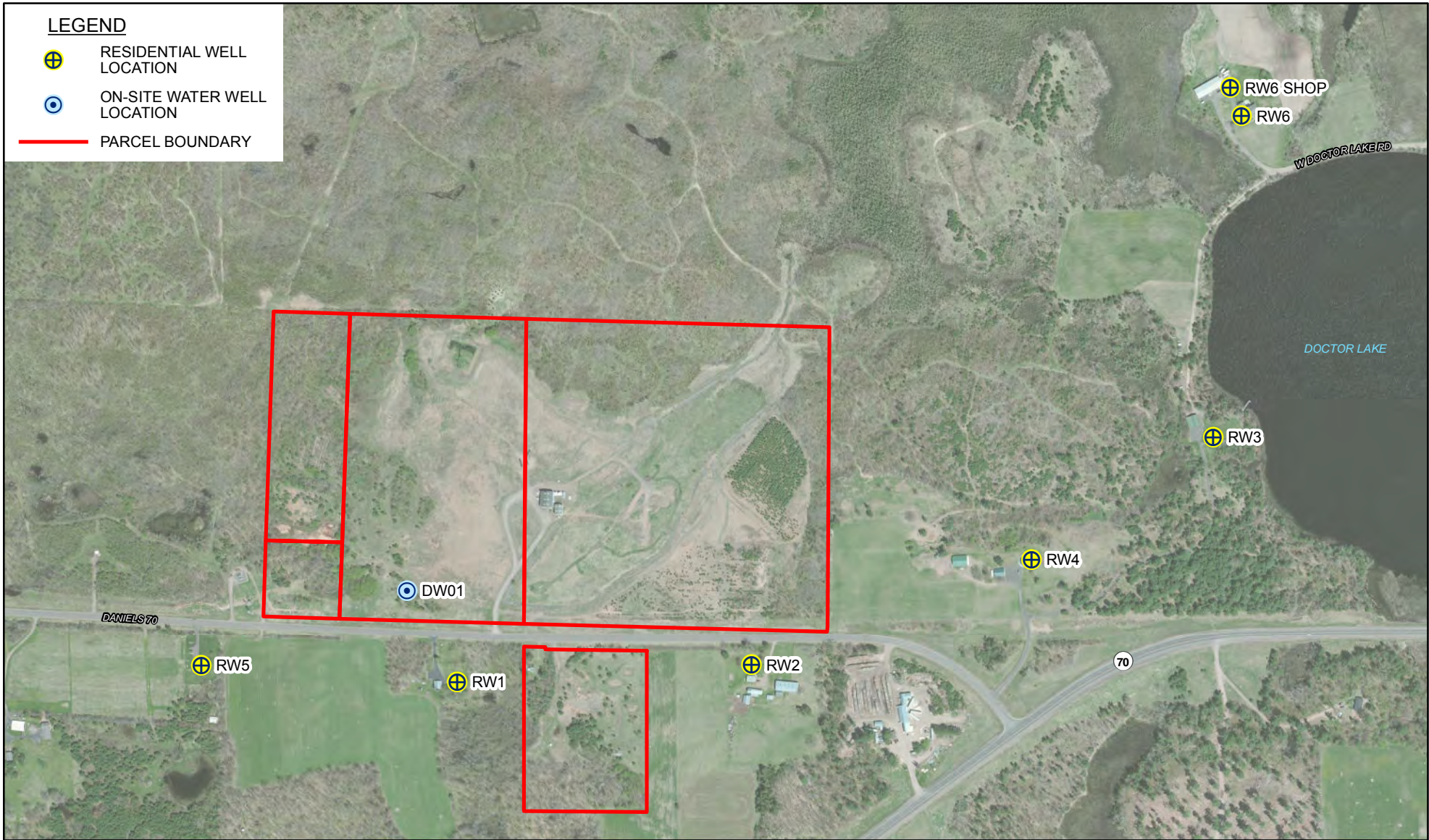


figure 2.9
 UNCONFINED (UPPER) AQUIFER ARSENIC CONCENTRATIONS - OCTOBER 2018
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin





PENTA WOOD PRODUCTS SUPERFUND SITE
SIREN, WISCONSIN
SEMIANNUAL REPORT

RESIDENTIAL WELL LOCATIONS

086165-05-06
Nov 19, 2018

FIGURE 3.1

**Groundwater Monitoring and Sampling Plan
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Quarterly Groundwater/LNAPL Level Monitoring ¹	Semiannual Groundwater Sampling ^{2, 3, 4}
Unconfined (Upper) Aquifer		
MW1	X	X
MW2	X	X
MW5	X	X
MW6S	X	X
MW9	X	
MW10S	X	X
MW13	X	X
MW16	X	X
MW18	X	
MW19	X	
MW20	X	X
MW21	X	X
MW22	X	X
MW24	X	
MW25	X	X
MW26	X	
MW27	X	
MW28	X	X
MW29	X	X
MW30	X	X
MW31	X	X
EW02S	X	
EW03S	X	
EW04S	X	
EW05S	X	
EW06S	X	
EW07S	X	
EW10S	X	
EW11S	X	X
EW12S	X	
EW13S	X	X
EW14S	X	

**Groundwater Monitoring and Sampling Plan
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Quarterly Groundwater/LNAPL Level Monitoring ¹	Semiannual Groundwater Sampling ^{2, 3, 4}
Semiconfined (Lower) Aquifer		
MW3	X	X
MW4	X	X
MW6	X	
MW7	X	
MW8	X	
MW10	X	X
MW11	X	
MW12	X	X
MW14	X	X
MW15	X	
MW17	X	X
MW23	X	X
EW02D	X	
EW03D	X	
EW04D	X	
EW05D	X	
EW06D	X	
EW07D	X	
EW10D	X	
EW11D	X	X
EW12D	X	
EW13D	X	
EW14D	X	

Notes:

- 1 Groundwater/LNAPL level monitoring conducted on a quarterly basis in January, April, July, and October
- 2 Groundwater sampling conducted on a semiannual basis in April and October
- 3 Groundwater sample laboratory analyses include the following parameters: Pentachlorophenol (PCP); naphthalene; benzene, toluene, ethylbenzene, and xylenes (BTEX); natural attenuation parameters (alkalinity, chloride, hardness, nitrate, sulfate, total organic carbon, and methane); and select dissolved metals (arsenic, copper, iron, manganese, and zinc). Field parameter measurements include the following parameters: pH, temperature, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), iron, and sulfide.
- 4 Groundwater samples will not be collected if LNAPL is present in the well casing.

Table 2.2

**Groundwater and LNAPL Level Monitoring Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet btoc)	Depth to LNAPL (feet btoc)	Groundwater Elevation (feet AMSL)	LNAPL Elevation (feet AMSL)	LNAPL Thickness (feet)
Semiconfined Aquifer (Lower)							
MW3	7/11/2018	1129.44	144.09	ND	985.35	NA	0
MW3	10/15/2018	1129.44	144.18	ND	985.26	NA	0
MW4	7/11/2018	1087.74	102.83	ND	984.91	NA	0
MW4	10/15/2018	1087.74	102.95	ND	984.79	NA	0
MW6	7/11/2018	1109.11	123.89	ND	985.22	NA	0
MW6	10/15/2018	1109.11	123.99	ND	985.12	NA	0
MW7	7/11/2018	1096.25	111.28	ND	984.97	NA	0
MW7	10/15/2018	1096.25	111.28	ND	984.97	NA	0
MW8	7/11/2018	1091.13	105.91	ND	985.22	NA	0
MW8	10/15/2018	1091.13	106.02	ND	985.11	NA	0
MW10	7/11/2018	1089.01	103.69	ND	985.32	NA	0
MW10	10/15/2018	1089.01	103.75	ND	985.26	NA	0
MW11	7/11/2018	1085.48	100.82	ND	984.66	NA	0
MW11	10/15/2018	1085.48	100.94	ND	984.54	NA	0
MW12	7/11/2018	1080.91	95.74	ND	985.17	NA	0
MW12	10/15/2018	1080.91	95.84	ND	985.07	NA	0
MW14	7/11/2018	1078.28	93.39	ND	984.89	NA	0
MW14	10/15/2018	1078.28	93.48	ND	984.80	NA	0
MW15	7/11/2018	1127.09	141.61	ND	985.48	NA	0
MW15	10/15/2018	1127.09	141.66	ND	985.43	NA	0
MW17	7/11/2018	1084.43	99.23	ND	985.20	NA	0
MW17	10/15/2018	1084.43	99.31	ND	985.12	NA	0
MW23	7/11/2018	1017.45	32.4	ND	985.05	NA	0
MW23	10/15/2018	1017.45	32.55	ND	984.90	NA	0
EW02D	7/11/2018	1083	97.49	ND	985.51	NA	0
EW02D	10/15/2018	1083	97.62	ND	985.38	NA	0
EW03D	7/11/2018	1089.48	104.05	ND	985.43	NA	0
EW03D	10/15/2018	1089.48	104.12	ND	985.36	NA	0
EW04D	7/11/2018	1101.09	115.52	ND	985.57	NA	0
EW04D	10/15/2018	1101.09	115.58	ND	985.51	NA	0
EW05D	7/11/2018	1076.99	91.53	ND	985.46	NA	0
EW05D	10/15/2018	1076.99	91.49	ND	985.50	NA	0
EW06D	7/11/2018	1083.39	97.85	ND	985.54	NA	0
EW06D	10/15/2018	1083.39	97.88	ND	985.51	NA	0
EW07D	7/11/2018	1087.52	101.9	ND	985.62	NA	0
EW07D	10/15/2018	1087.52	101.88	ND	985.64	NA	0
EW10D	7/11/2018	1088.55	103.12	ND	985.43	NA	0
EW10D	10/15/2018	1088.55	103.14	ND	985.41	NA	0
EW11D	7/11/2018	1048.19	62.55	ND	985.64	NA	0
EW11D	10/15/2018	1048.19	62.62	ND	985.57	NA	0
EW12D	7/11/2018	1086.41	100.93	ND	985.48	NA	0
EW12D	10/15/2018	1086.41	100.89	ND	985.52	NA	0
EW13D	7/11/2018	1092.88	107.31	ND	985.57	NA	0
EW13D	10/15/2018	1092.88	107.32	ND	985.56	NA	0
EW14D	7/11/2018	1098.28	112.82	ND	985.46	NA	0
EW14D	10/15/2018	1098.28	112.81	ND	985.47	NA	0

Table 2.2

**Groundwater and LNAPL Level Monitoring Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet btoc)	Depth to LNAPL (feet btoc)	Groundwater Elevation (feet AMSL)	LNAPL Elevation (feet AMSL)	LNAPL Thickness (feet)
Unconfined Aquifer (Upper) continued							
MW1	7/11/2018	1072.27	86.53	ND	985.74	NA	0
MW1	10/15/2018	1072.27	86.61	ND	985.66	NA	0
MW2	7/11/2018	1065.03	79.34	ND	985.69	NA	0
MW2	10/15/2018	1065.03	79.36	ND	985.67	NA	0
MW5	7/11/2018	1071.39	85.97	ND	985.42	NA	0
MW5	10/15/2018	1071.39	86.05	ND	985.34	NA	0
MW6S	7/11/2018	1108.35	122.55	ND	985.80	NA	0
MW6S	10/15/2018	1108.35	122.65	ND	985.70	NA	0
MW9	7/11/2018	1019.58	33.85	ND	985.73	NA	0
MW9	10/15/2018	1019.58	33.93	ND	985.65	NA	0
MW10S	7/11/2018	1090.12	104.66	ND	985.46	NA	0
MW10S	10/15/2018	1090.12	104.7	ND	985.42	NA	0
MW13	7/11/2018	1005.81	20.09	ND	985.72	NA	0
MW13	10/15/2018	1005.81	20.19	ND	985.62	NA	0
MW16	7/11/2018	1081.95	96.25	ND	985.70	NA	0
MW16	10/15/2018	1081.95	96.32	ND	985.63	NA	0
MW18	7/11/2018	1071.96	86.72	86.22	985.24	985.74	0.50
MW18	10/15/2018	1071.96	86.81	86.33	985.15	985.63	0.48
MW19	7/11/2018	1087.96	102.73	102.54	985.23	985.42	0.19
MW19	10/15/2018	1087.96	103.02	102.61	984.94	985.35	0.41
MW20	7/11/2018	1098.16	112.47	112.46	985.69	985.7	0.01
MW20	10/15/2018	1098.16	112.53	112.52	985.63	985.64	0.01
MW21	7/11/2018	1095.82	110.06	ND	985.76	NA	0
MW21	10/15/2018	1095.82	110.13	ND	985.69	NA	0
MW22	7/11/2018	1084.65	98.97	ND	985.68	NA	0
MW22	10/15/2018	1084.65	99.01	ND	985.64	NA	0
MW24	7/11/2018	1084.04	98.78	ND	985.26	NA	0
MW24	10/15/2018	1084.04	98.82	ND	985.22	NA	0
MW25	7/11/2018	1095.25	110.01	ND	985.24	NA	0
MW25	10/15/2018	1095.25	110.03	ND	985.22	NA	0
MW26	7/11/2018	1086.87	101.7	ND	985.17	NA	0
MW26	10/15/2018	1086.87	101.77	ND	985.10	NA	0
MW27	7/11/2018	1110.96	125.11	ND	985.85	NA	0
MW27	10/15/2018	1110.96	125.14	ND	985.82	NA	0
MW28	7/11/2018	1083.52	97.71	ND	985.81	NA	0
MW28	10/15/2018	1083.52	97.79	ND	985.73	NA	0
MW29	7/11/2018	1070.24	84.96	84.48	985.28	985.76	0.48
MW29	10/15/2018	1070.24	85.18	84.55	985.06	985.69	0.63
MW30	7/11/2018	1048.98	63.24	ND	985.74	NA	0
MW30	10/15/2018	1048.98	63.33	ND	985.65	NA	0
MW31	7/11/2018	1076.34	90.64	ND	985.70	NA	0
MW31	10/15/2018	1076.34	90.71	ND	985.63	NA	0
EW02S	7/11/2018	1082.25	96.57	ND	985.68	NA	0
EW02S	10/15/2018	1082.25	96.63	ND	985.62	NA	0
EW03S	7/11/2018	1088.66	103.04	ND	985.62	NA	0
EW03S	10/15/2018	1088.66	103.38	103.12	985.28	985.54	0.26

Table 2.2

**Groundwater and LNAPL Level Monitoring Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet btoc)	Depth to LNAPL (feet btoc)	Groundwater Elevation (feet AMSL)	LNAPL Elevation (feet AMSL)	LNAPL Thickness (feet)
Unconfined Aquifer (Upper) continued							
EW04S	7/11/2018	1101.01	115.3	ND	985.71	NA	0
EW04S	10/15/2018	1101.01	115.39	ND	985.62	NA	0
EW05S	7/11/2018	1077.04	91.86	91.36	985.18	985.68	0.50
EW05S	10/15/2018	1077.04	92.2	91.44	984.84	985.6	0.76
EW06S	7/11/2018	1083.61	101.3	97.96	982.31	985.65	3.34
EW06S	10/15/2018	1083.61	101.4	98.04	982.21	985.57	3.36
EW07S	7/11/2018	1087.49	102.05	101.87	985.44	985.62	0.18
EW07S	10/15/2018	1087.49	102.26	101.94	985.23	985.55	0.32
EW10S	7/11/2018	1088.72	108.08	103.03	980.64	985.69	5.05
EW10S	10/15/2018	1088.72	108.26	103.08	980.46	985.64	5.18
EW11S	7/11/2018	1047.23	61.53	ND	985.70	NA	0
EW11S	10/15/2018	1047.23	61.63	ND	985.60	NA	0
EW12S	7/11/2018	1086.31	104.05	100.68	982.26	985.63	3.37
EW12S	10/15/2018	1086.31	104.33	100.75	981.98	985.56	3.58
EW13S	7/11/2018	1092.88	107	ND	985.88	NA	0
EW13S	10/15/2018	1092.88	107.26	ND	985.62	NA	0
EW14S	7/11/2018	1098.32	113.25	112.84	985.07	985.48	0.41
EW14S	10/15/2018	1098.32	113.3	112.93	985.02	985.39	0.37

Notes:

- btoc - Feet below top of casing
 feet AMSL - Feet above mean sea level
 NA - Not applicable
 ND - LNAPL was not detected in a measurable quantity

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
RW4	10/15/2018	W-181015-MH-01 Sample time: 15:50	15:43	-	9.7	466.2	-	-	6.87	-	-	-
RW5	10/15/2018	W-181015-MH-02 Sample time: 16:29	16:19	-	10	339.8	-	-	7.92	-	-	-
RW1	10/15/2018	W-181015-MH-03 Sample time: 16:41	16:40	-	9.2	704.2	-	-	7.11	-	-	-
RW2	10/16/2018	W-181016-MH-04 Sample time: 9:08	9:00	-	9.1	296.7	-	-	7.46	-	-	-
RW2	10/16/2018	W-181016-MH-05 Sample time: 9:08	9:06	-	9.1	296.7	-	-	7.46	-	-	-
RW6 (shop)	10/16/2018	W-181016-MH-07 Sample time: 9:57	9:55	-	12.8	256.5	-	-	6.97	-	-	-
RW6 (residence)	10/16/2018	W-181016-MH-06 Sample time: 9:50	9:45	-	10.3	171.7	-	-	8.19	-	-	-
RW3	10/16/2018	W-181016-MH-09 Sample time: 10:28	10:26	-	9.6	198.5	-	-	8.05	-	-	-
RW3	10/16/2018	W-181016-MH-08 Sample time: 10:18	-	-	-	-	-	-	-	-	-	-
DW01	10/16/2018	W-181016-MH-10 Sample time: 10:58	10:53	-	9.6	586.6	-	-	7.7	-	-	-

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
MW12	10/16/2018	W-181016-MH-11 Sample time: 12:50	12:18	-	10.89	421	2.3	9.68	11.8	156	0	0
			12:23	-	11.52	431	2.1	7.92	11.12	144	-	-
			12:28	-	13.5	447	5.4	6.82	10.46	151	-	-
			12:33	1.3	14.37	465	5.6	5.41	9.87	163	-	-
			12:38	-	14.65	472	5.9	4.86	9.6	166	-	-
			12:43	-	14.65	472	5.9	4.86	9.6	166	-	-
MW16	10/16/2018	W-181016-MH-12 Sample time: 13:20	13:17	0	14.65	472	5.9	4.86	9.6	166	0.4	0
MW31	10/16/2018	W-181016-MH-13 Sample time: 14:14	14:02	0	10.58	372	0	27.14	5.92	237	0.6	0
			14:07	-	10.77	371	0	24.68	5.99	229	-	-
			14:12	-	10.79	370	0	23.7	6.07	224	-	-
MW13	10/16/2018	W-181016-MH-14 Sample time: 15:23	15:06	-	12.14	112	0	21.95	6.06	197	0.6	0
			15:11	-	11.74	120	0	18.03	5.56	232	-	-
			15:16	-	11.64	121	0	16.49	5.33	252	-	-
			15:19	-	11.64	122	0	15.85	5.25	259	-	-
			15:22	-	11.61	123	0	15.34	5.19	266	-	-
MW23	10/17/2018	W-181017-MH-15 Sample time: 8:58	8:35	0	9.04	560	0	6.66	7	240	0.4	0
			8:40	-	9.14	559	0	6.69	7.12	235	-	-
			8:49	-	9.37	557	0	6.69	7.43	217	-	-
			8:53	-	9.42	556	0	6.73	7.55	207	-	-
			8:56	-	9.43	556	0	6.7	7.59	201	-	-
MW17	10/17/2018	W-181017-MH-16 Sample time: 10:00	9:44	-	10.12	648	0.9	6.34	7.61	204	0.1	0
			9:49	-	11.55	661	1.3	6.67	7.59	179	-	-
			9:52	-	12.49	664	1.5	6.81	7.58	161	-	-
			9:55	-	12.85	666	1.5	6.89	7.58	151	-	-
			9:58	0.88	13.05	668	1.4	6.89	7.58	142	-	-

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
MW4	10/17/2018	W-181017-MH-17 Sample time: 12:49	12:30	0	9.78	371	0	0	8.29	173	0.1	0
			12:35	-	9.82	361	0	0	8.33	192	-	-
			12:40	-	9.83	355	0	0	8.35	200	-	-
			12:45	-	9.85	354	0	0	8.36	205	-	-
MW4	10/17/2018	W-181017-MH-18 Sample time: 12:49	-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
MW28	10/17/2018	W-181017-MH-19 Sample time: 13:34	13:16	-	9.89	323	0	9.79	8.04	110	0.2	0
			13:25	-	11.17	324	0	10.87	7.99	126	-	-
			13:28	0.67	11.61	326	2.2	10.85	7.96	130	-	-
			13:32	-	11.91	326	0.9	10.85	7.93	132	-	-
MW22	10/17/2018	W-181017-MH-20 Sample time: 14:02	13:56	0	10.56	158	16.3	8.18	7.94	159	1	0
			-	-	-	-	-	-	-	-	-	-
MW22	10/17/2018	W-181017-MH-21 Sample time: 14:35	-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
MW21	10/17/2018	W-181017-MH-22 Sample time: 15:18	15:07	0	10.18	350	0	11.48	7.29	189	0.8	0
			15:12	-	10.26	351	0	11.14	7.27	193	-	-
			15:15	-	10.3	352	0	11.03	7.24	195	-	-
MW14	10/17/2018	W-181017-MH-23 Sample time: 16:02	15:54	0	10.03	321	0	4.82	7.91	164	0	0
			15:58	-	10.12	329	0	5.04	7.92	162	-	-
			16:01	-	10.14	331	0	5.01	7.93	160	-	-
MW3	10/18/2018	W-181018-MH-24 Sample time: 9:40	9:25	0	10.36	559	12.7	6.28	6.25	159	2.2	0
			9:30	1.53	10.61	563	7.1	6.53	6.68	117	-	-
			9:33	-	10.67	564	4	6.76	6.81	105	-	-
			9:36	-	10.74	565	3.2	6.86	6.88	101	-	-
			9:39	-	10.75	566	2.5	7.17	6.92	100	-	-

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
MW1	10/18/2018	W-181018-MH-25 Sample time: 10:43	10:35	-	10.06	276	2.2	13.31	7.32	177	0.1	0
			10:38	0.75	10.12	270	0.5	13.26	7.28	180	-	-
			10:41	-	10.16	267	1.3	13.19	7.25	184	-	-
MW30	10/18/2018	W-181018-MH-26 Sample time: 11:33	11:14	-	9.86	206	7.8	0.7	6.98	169	0.2	0
			11:17	-	10.03	202	2.4	0.5	6.73	137	-	-
			11:20	-	10.03	199	0	0.76	6.58	141	-	-
			11:23	-	10.03	198	0	0.97	6.48	149	-	-
			11:26	-	10.06	197	0	1.14	6.41	158	-	-
			11:29	-	10.06	197	0	1.24	6.36	164	-	-
			11:32	-	10.06	196	0	1.32	6.31	170	-	-
EW13S	10/19/2018	W-181019-MH-29 Sample time: 11:25	11:56	0	11.15	728	0.6	8.67	6.21	-111	10	0
			11:59	1.49	11.49	696	0	7.43	6.32	-112	-	-
			12:02	-	11.78	689	0.8	6.68	6.36	-112	-	-
			12:05	-	12.12	655	32.6	6.01	6.37	-107	-	-
			12:08	-	12.32	630	40	5.61	6.36	-100	-	-
MW25	10/19/2018	W-181019-MH-31 Sample time: 9:49	9:35	-	11	356	2	11.51	6.91	131	0	0
			9:40	-	11.06	355	0	11.34	6.97	150	-	-
			9:45	-	11.13	356	0	11.24	7	157	-	-
			9:48	0.75	11.15	356	0	11.24	7.01	163	-	-
MW10D	10/19/2018	W-181019-MH-27 Sample time: 8:15	8:00	-	11.45	416	0	6.35	6.49	110	1.8	0
			8:03	-	12.45	424	0	0.99	6.85	-67	-	-
			8:06	0	12.8	417	0.4	0.96	7.1	-118	-	-
			8:09	0	12.79	413	0.2	0.92	7.12	-118	-	-
			8:12	-	12.79	415	0.3	0.9	7.14	-121	-	-

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
EW11D	10/19/2018	W-181019-MH-32 Sample time: 11:38	10:56	0	10.51	438	72	4.13	6.97	11	7.4	0
			10:59	-	10.42	436	24	3.79	6.98	-7	-	-
			11:02	-	10.34	432	29	3.72	6.99	-14	-	-
			11:05	-	10.35	432	10.8	3.66	7.01	-18	-	-
			11:09	-	10.25	432	160	3.66	7.01	-19	-	-
			11:12	-	10.15	436	14.9	3.69	7.02	-17	-	-
			11:15	-	10.15	439	75.3	3.65	7	-19	-	-
			11:20	1.19	-	-	12.8	-	-	-	-	-
			11:23	1.94	-	-	8.8	-	-	-	-	-
			11:26	-	-	-	7.5	-	-	-	-	-
			11:29	-	-	-	6.1	-	-	-	-	-
			11:32	-	-	-	4.7	-	-	-	-	-
			11:35	-	-	-	5.6	-	-	-	-	-
			MW10S	10/19/2018	W-181019-MH-28 Sample time: 8:55	8:35	0	12.51	795	1.9	10.44	6.6
8:38	0	13.35				804	1.6	8.54	6.38	25	-	-
8:41	-	13.58				802	1.8	7.97	6.34	23	-	-
8:44	-	13.63				802	1.2	7.11	6.31	22	-	-
8:47	0	13.77				800	0.7	5.87	6.28	22	-	-
8:50	-	13.77				800	1	5.47	6.28	21	-	-
8:53	-	13.77				800	1.1	5.37	6.28	21	-	-
EW11S	10/19/2018	W-181019-MH-33 Sample time: 12:33	12:17	0	10.61	369	0	4.82	7.15	125	1.4	0
			12:20	-	10.55	350	0	4.67	6.94	140	-	-
			12:23	-	10.48	341	0	4.65	6.81	149	-	-
			12:26	-	10.48	339	0	4.61	6.69	156	-	-
			12:29	-	10.52	335	0	4.59	6.6	160	-	-
			12:32	-	10.48	335	0	4.55	6.54	161	-	-
EW13S	10/19/2018	W-181019-MH-30 Sample time: N/A	-	-	-	-	-	-	-	-	-	

Table 2.3

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific Conductance (µS)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
MW6S	10/19/2018	W-181019-MH-34 Sample time: 12:35	-	-	-	-	-	-	-	-	-	-
MW6S	10/19/2018	W-181019-MH-35 Sample time: 12:54	13:01	0	12.98	592	133	5.27	6.61	163	2.2	0
MW5	10/29/2018	W-181029-MH-36 Sample time: 13:18	13:00 13:05 13:10	- - -	10.10 10.14 10.15	672 683 682	5.7 3.3 2.2	0.00 0.00 0.00	6.78 6.72 6.71	-64 -67 -69	10 - -	0 - -
MW2	10/29/2018	W-181029-MH-37 Sample time: 15:15	15:05	-	9.01	165	73	6.55	6.86	79	0	0

Notes:

- °C - Degrees Celcius
- µS - Micro-Siemens
- mg/L - Milligrams per liter
- MS/MSD - Matrix Spike Sample & Matrix Spike Duplicate Sample
- mV - Millivolts
- ND - Not Detected
- NM - Not Measured
- NTU - National Turbidity Units
- ORP - Oxidation Reduction Potential (ORP) reported in millivolts (mV)

Wells MW20 and MW29 were not sampled due to the presence of LNAPL

Table 2.4

Groundwater Analytical Data - Monitoring and Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin

Sample Location	Sample Identification	Sample Date	Alkalinity, total (as CaCO3) mg/L	Chloride ³ mg/L	Hardness, carbonate mg/L	Nitrate (as N) mg/L	Sulfate ³ mg/L	TOC averages mg/L	Methane (dissolved) ug/L	Arsenic (dissolved) ug/L	Copper (dissolved) ug/L	Iron (dissolved) ug/L	Manganese (dissolved) ug/L	Zinc (dissolved) ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	
	ES ¹		-	250	-	10	250	-	-	10	1300	300	50	5000	1	100	5	700	800	2000	
	PAL ²		-	125	-	2	125	-	-	1	130	150	25	2500	0.1	10	0.5	140	160	400	
Semiconfined Aquifer (Lower)																					
EW11D	W-1810198MH-32	10/19/2018	131	7.2	121	9.9	40.3	4.3	1.0 U	1.0 U	13.1	144	34.5	20.0 U	0.096 U	0.76 U	0.50 U	0.50 U	0.50 U	0.44 J	
MW3	W-181018-MH-24	10/18/2018	227	23.9	231	1.7	10.2	1.3	1.0 U	1.0 U	1.7 J	77.2 J	9.2	20.0 U	0.50	0.79 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW4	W-181017-MH-17	10/17/2018	86.5	40.9	138	0.20	13.0	0.72 J	5.9	1.2	2.0 U	100 U	33.8	20.0 U	0.097 U	0.55 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW4 (Duplicate)	W-181017-MH-18	10/17/2018	87.1	40.3	138	0.22	13.1	0.68 J	6.7	1.2	2.0 U	100 U	36.0	6.9 J	0.10 U	0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW10	W-181019-MH-27	10/19/2018	146	19.9	182	0.20 U	15.3	26.2	40	1.1	13.6	1310	907	20.0 U	2500	21	0.50 U	1.2	1.1	8.6	
MW12	W-181016-MH-11	10/16/2018	173	8.1	231	0.61	59.9	2.1	1.0 U	0.53 J	1.3 J	100 U	72.2	20.0 U	110	0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW14	W-181017-MH-23	10/17/2018	122	15.6	142	1.8	6.4	0.68 J	1.0 U	1.1	2.0 U	100 U	1.3 J	20.0 U	0.097 U	0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW17	W-181017-MH-16	10/17/2018	185	13.6	317	2.9	106	0.61 J	1.0 U	0.63 J	1.1 J	100 U	2.5 U	20.0 U	0.11 U	0.81 U	0.50 U	0.50 U	0.15 J	1.0 U	
MW23	W-181017-MH-15	10/17/2018	191	39.7	239	2.1	8.7	0.90 J	1.0 U	0.58 J	0.82 J	100 U	2.5 U	20.0 U	0.099 U	0.79 U	0.50 U	0.50 U	0.18 J	1.0 U	
Unconfined Aquifer (Upper)																					
EW11S	W-1810198MH-33	10/19/2018	56.4	7.4	182	11.9	29.2	2.7	1.0 U	1.0 U	9.6	213	63.5	12.8 J	0.099 U	0.81 U	0.50 U	0.50 U	0.50 U	0.23 J	
EW13S	W-1810198MH-29	10/19/2018	242	33.4	251	0.20 U	17.4	35.3	16	16.0	12.5	16400	2620	11.5 J	10000	34	0.23 J	1.2	1.2	21	
EW13S (Duplicate)	W-1810198MH-30	10/19/2018	241	32.6	255	0.20 U	17.0	34.7	17	16.3	17.3	16300	2610	20.0 U	9800	33	0.50 U	1.3	1.3	19	
MW1	W-181018-MH-25	10/18/2018	85.5	13.1	109	2.9	5.9	1.0	1.0 U	0.34 J	1.3 J	100 U	2.5 U	8.8 J	0.096 U	0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW2	W-181059-PS-37	10/29/2018	66.6	0.42	87.2	0.51	1.6	2.1	1.0 U	1.0 U	2.8	100 U	1.8 J	10.9 J	0.21	0.86 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW5	W-181059-PS-36	10/29/2018	249	28.5	292	0.084 J	28.5	39.6	15	0.71 J	1.5 J	7920	6730	20.0 U	5600	23	0.50 U	0.57	0.53	6.5	
MW6S	W-1810198MH-35	10/19/2018	249	13.1	306	5.1	8.0	3.2	1.0 U	0.28 J	15.7	100 U	5.2	12.4 J	0.097 U	0.76 U	0.50 U	0.50 U	0.50 U	0.24 J	
MW10S	W-1810198MH-28	10/19/2018	311	32.9	388	0.76	23.5	26.1	1.0 U	0.51 J	8.2	716	2030	20.0 U	1900	5.9 J	0.50 U	0.84	0.34 J	10	
MW13	W-181017-MH-14	10/16/2018	54.9	0.83	47.7	0.41	2.8	2.4	1.0 U	1.0 U	1.8 J	100 U	3.2	20.0 U	0.35	0.79 U	0.50 U	0.50 U	0.15 J	1.0 U	
MW16	W-181016-MH-12	10/16/2018	32.0	4.5	28.6	0.74	3.5	1.8	1.0 U	0.26 J	3.2	100 U	2.5 U	13.0 J	0.10 U	0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW21	W-181017-MH-22	10/17/2018	35.4	66.6	65.6	1.9	6.0	1.1	1.0 U	1.0 U	1.2 J	100 U	2.5 U	20.0 U	0.099 U	0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW22	W-181017-MH-20	10/17/2018	61.7	2.5	70.2	0.71	3.8	0.78 J	1.0 U	1.0 U	3.2	100 U	2.5 U	16.3 J	0.10 U	0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW25	W-1810198MH-31	10/19/2018	98.2	30.1	138	2.8	5.9	0.95 J	1.0 U	1.0 U	4.7	100 U	1.3 J	20.0 U	0.095 U	0.80 U	0.50 U	0.50 U	0.50 U	0.41 J	
MW28	W-181017-MH-19	10/17/2018	106	21.2	126	2.2	5.4	0.97 J	1.0 U	0.38 J	1.0 J	100 U	2.5 U	7.1 J	0.10 U	0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	
MW30	W-181018-MH-26	10/18/2018	77.5	1.7	82.9	2.2	3.7	2.6	1.0 U	1.0 U	0.94 J	100 U	15.4	7.9 J	640	1.3	0.50 U	0.50 U	0.50 U	1.0 U	
MW31	W-181016-MH-13	10/16/2018	187	0.67	181	0.55	1.5	0.70 J	1.0 U	1.0 U	0.63 J	100 U	1.0 J	20.0 U	0.097 U	0.79 U	0.50 U	0.50 U	0.50 U	0.46 J	

Notes:

- 1 - Enforcement Standard (ES) criteria adapted from Table 1 referred to and incorporated by NR 140.10 with except of Iron, Manganese, Zinc, Chloride, and Sulfate (see note 3 below)
 - 2 - Preventive Action Limit (PAL) criteria adapted from Table 1 referred to and incorporated by NR 140.10 with except of Iron, Manganese, Zinc, Chloride, and Sulfate (see note 3 below)
 - 3 - Enforcement Standard (ES) and Preventive Action Limit (PAL) criteria adapted from Table 2 referred to and incorporated by NR 140.12
 - mg/L - Concentrations listed with units of milligrams per liter
 - ug/L - Concentrations listed with units of micrograms per liter
 - J - Concentration was between the limit of detection and the limit of quantitation
 - U - Compound was not detected above the limit of detection
 - B - Compound was found in the blank and sample
 - F1 - MS and/or MSD recovery is outside acceptance limits
 - H - Analysis was performed beyond the specified holding time
 - NA - Not analyzed
 - Concentration exceeds the ES
 - Concentration exceeds the PAL
- Wells MW20 and MW29 were not sampled due to the presence of LNAPL

Table 3.1

**Groundwater Analytical Data - Residential Wells and Onsite Supply Well
Penta Wood Products Superfund Site
Siren, Wisconsin**

Sample Location	Sample Identification	Date	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
		ES ¹	1	100	5	700	800	2000
		PAL ²	0.1	10	0.5	140	160	400
DW01	W-181016-MH-10	10/16/2018	0.095 U	0.82 U	0.50 U	0.50 U	0.50 U	1.0 U
RW01	W-181015-MH-03	10/15/2018	0.10 U	0.79 U	0.50 U	0.50 U	0.50 U	1.0 U
RW02	W-181016-MH-04	10/16/2018	0.097 U	0.77 U	0.50 U	0.50 U	0.50 U	1.0 U
RW02 (DUP)	W-181016-MH-05	10/16/2018	0.099 U	0.80 U	0.50 U	0.50 U	0.50 U	1.0 U
RW03	W-181016-MH-09	10/16/2018	0.098 U	0.77 U	0.50 U	0.50 U	0.50 U	1.0 U
RW04	W-181015-MH-01	10/15/2018	0.11 U	0.90 U	0.50 U	0.50 U	0.50 U	1.0 U
RW05	W-181015-MH-02	10/15/2018	0.16	0.87 U	0.50 U	0.50 U	0.50 U	1.0 U
RW06	W-181016-MH-06	10/16/2018	0.099 U	0.78 U	0.50 U	0.50 U	0.50 U	1.0 U
RW06 SHOP	W-181016-MH-07	10/16/2018	0.095 U	0.75 U	0.50 U	0.50 U	1.7	1.0 U

Notes:

- ¹ - Enforcement Standard (ES) criteria adapted from Table 1 referred to and incorporated by NR 140.10
² - Preventive Action Limit (PAL) criteria adapted from Table 1 referred to and incorporated by NR 140.10

ug/L - Concentrations listed with units of micrograms per liter

J - Concentration was between the limit of detection and the limit of quantitation

U - Compound was not detected above the limit of detection

Dup - Duplicate sample

- Concentration exceeds the ES

- Concentration exceeds the PAL

Appendix A

Historical Site Data

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
DW01	9/24/03	N2	0.5 U		1 U	1 U	50 UJ		5 U	40														
DW01	9/24/03	N	0.5 U	0.05 J	1 U	2	50 UJ		5 UJ	30		1 U	0.25 U	2.5 U	2.5 U	2.5 U	250	66.9	110.8	1.48		2 U	1.5	
DW01	5/4/04	N2			0.280 J	49.5 R	29.2 R		58.0 R	2590 R														
DW01	5/4/04	N	10.0 U	0.102 UB	0.243 J	61.5 R	194 R	27300	108 R	2710 R		5.00 U	0.109 J	5.00 U	0.153 J	5.00 U	292	49 =	309	1.8 J		7.9 R	1.54 J	
DW01	9/22/04	N										5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
DW01	9/28/04	N		1.08 =																				
DW01	11/1/04	N		0.0962 U																				
DW01	5/11/05	N	2.0 U	0.033 J								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U			260 J					
DW01	9/27/05	N		0.040 J								0.93 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
DW01	5/31/06	N	2.0 U	0.039 J	1.0 UJ	140 J	50 UJ		4.0 UJ	1900 J		0.95 U	0.50 U	5.0 U	5.0 U	5.0 U	270 J	29 J	260 J	1.5 J		6.5	1.1 J	
DW01	9/26/06	N	2.0 UJ	0.11 U	1.0 UJ	100	50 UJ		15 J	1500 J		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	230 J	21 J	230 J	0.67 J		13 J	2.1	
DW01	5/10/07	N	2.0 UJ	0.074 J	1.0 UJ	100	100 UJ		10 UB	620 J		0.95 R	1.0 UJ	1.0 UJ	1.0 UJ	2.0 UJ	400 =	29	320	1.8		17 J	1.0 UB	
DW01	9/19/07	N	2.0 UJ	0.093 UJ	0.63 J	89	100 UJ		2.4 J	1100		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	250 J	27	330 J	1.5 J		14 J	0.92 J	
DW01	5/20/08	N		0.094 UJ								0.94 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								
DW01	10/23/08	N	2.0 UJ	0.1 U	2 UJ	205 J	642 J	33000 J	4.6 J	81.2 J		1 U	0.5 U	2.0 U	2.0 U	5.0 U	297 J	29.6	423 J	1.79 J		9.07	44.4	
DW01	6/3/09	N		0.1 U								1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U								
DW01	10/8/09	N		0.1 UJ								0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
DW01	5/19/10	N		0.1 U								1.0 U	0.4 U	5 U	5 U	5 U								
DW01	10/7/10	N		0.1 UJ								0.995 UJ	0.1 U	0.4 U	0.4 U	1 U								
DW01	6/30/11	N		0.1 U								0.999 U	0.1 U	0.4 U	0.4 U	1 U								
DW01	10/18/11	N		0.032 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	5/23/12	N		0.028 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	10/18/12	N		0.032 J								0.19 U H	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	5/21/13	N		0.029 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	10/8/13	N		0.027 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	5/13/14	N		0.057 J																				
DW01	9/25/14	N		0.54 J								0.19 UJ												
DW01	4/21/15	N		0.023 J								0.19 U												

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Type ³ Units	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
DW01	10/15/15	N		0.095 U								0.19 U												
DW01	10/15/15	FD		0.096 U								0.19 U												
DW01	4/5/16	N		0.095 U								0.14 J	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	4/5/16	FD		0.097 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	10/10/16	N		0.025 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	10/10/16	FD		0.024 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	4/18/17	N		0.020 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	4/18/17	FD		0.022 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
DW01	10/20/17	N		0.10 U								0.83 U	0.50 U	0.50 U	0.50 U	1.0 U								
DW01	10/20/17	FD		0.10 U								0.88 U	0.50 U	0.50 U	0.50 U	1.0 U								
DW01	6/5/18	N		0.095 U								0.77 U	0.50 U	0.50 U	0.50 U	1.0 U								
DW01	10/16/18	N		0.095 U								0.82 U	0.50 U	0.50 U	0.50 U	1.0 U								
EW02D	8/22/14	N		52							0.28											2.1 J		
EW02D	4/23/15	N		17																				
EW02D	4/14/16	N	0.15 J	370	0.49 J	3.8	299		384	46.7		1.7	0.50 U	1.0 U	1.0 U	2.0 U	55.0	12.1	70.6	0.70		8.7	4.8	
EW02S	4/14/16	N	0.094 J	690	5.0 U	1.4 J	50.2 J		39.3	20.0 U		2.5	0.50 U	1.0 U	1.0 U	2.0 U	30.0	10.5	41.2	1.0		7.0	2.7	
EW03D	8/22/14	N		260							0.87											1.6 J		
EW03D	4/18/16	N	1.3	3500	2.7 J	9.8	12500		1780	398		2.4	0.50 U	0.33 J	1.0 U	3.6	184	13.4	169	0.10 U		25.6	10	
EW03S	4/18/16	N	0.15 J	14000	0.53 J	10.8	1050		3530	20.0 U		12	1.0 U	2.0 U	2.0 U	5.2	88.0	73.8	220	0.29		39.1	59.1	
EW04D	8/22/14	N		150							0.65											4.8 U		
EW04D	2/3/15	N		200							0.71											4.9 U		
EW04D	4/23/15	N		430																				
EW04D	4/18/16	N	0.33 J	24	5.0 U	2.2	3060		316	172		0.16 J	0.50 U	1.0 U	1.0 U	2.0 U	129	16.5	131	1.9		6.0	5.3	
EW04S	4/18/16	N	0.12 J	210	5.0 U	2.4	567		385	20.0 U		0.25	0.50 U	1.0 U	1.0 U	2.0 U	81.0	9.9	98.0	0.92		8.1	7.2	
EW05D	8/22/14	N		4400							6.8											6.3		
EW05D	2/3/15	N		3100							11											2.0 J		
EW05D	4/20/16	N	0.44 J	7500	2.7 J	8.6	8430		1980	372		19	0.50 U	0.79 J	0.95 J	6.7	145	14.4	171	0.10 U		17.0	36.7	
EW06D	8/22/14	N		910							1.8											1.9 J		

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Type ³	Units	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
EW06D	2/3/15	N			4900							12										1.6 J		
EW06D	1/24/17	N	0.25 J		840	0.35	0.70 J	398		163	15.4 J		1.7	0.28	0.26	0.23	1.2 J	124	12.3	144	1.0		5.9	6.4
EW07D	8/22/14	N			280							0.68										1.3 J		
EW07D	2/3/15	N			170							0.28										4.9 U		
EW07D	4/23/15	N			2400																			
EW07D	4/12/16	N	0.59		0.31	5.0 U	1.1 J	122		210	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	127	23.7	174	6.6		8.4	1.2
EW10D	8/22/14	N			7000							11										11		
EW10D	2/3/15	N			2800							7.7										4.9 U		
EW10D	4/20/16	N	1.1		5000	6.5	10.3	3350		2200	81.0		19	0.50 U	1.4	1.8	12	135	25.7	180	0.057 J		21.8	41.8
EW10D	4/20/16	FD	1.3		4800	7.6	12.1	3720		2170	114		19	0.50 U	1.3	1.9	12	136	23.9	184	0.060 J		20.3	41.0
EW11D	4/14/16	N	0.50 U		3.4	5.0 U	1.1 J	657		22.6	46.4		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	187	12.7	282	2.0		155	1.0
EW11D	4/14/16	FD	0.080 J		2.5	5.0 U	2.0 U	825		27.4	55.9		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	190	12.8	276	2.0		198	1.2
EW11D	7/19/16	N	1.1		7.4	5.0 U	2.7	292		54.5	50.0		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	151	9.1	242	2.2		112	1.9
EW11D	10/10/16	N	3.2		8.4	5.0 U	0.67 J	793		23.6	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	190	13.6	272	2.7		159	1.0
EW11D	1/19/17	N	8.9		0.15	0.35	0.51 J	897		40.4	10.8 J		0.060	0.28	0.26	0.23	0.24	168	12.2	70.0	3.3		129	1.9
EW11D	4/19/17	N	35		0.13	5.0 U	0.58 J	2930		129	19.0 J		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	152	11.4	238	5.2		97.3	3.2
EW11D	10/4/17	N	14		0.18	0.31 J	1.4 J	1290		66.9	11.9 J		0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	159	11.5	220	7.7		79.4	2.5
EW11D	5/31/18	N	2.5		0.10 U	0.36 J	0.87 J	2600		124	10.2 J		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	137	9.0	202	13.0		49.5	3.4
EW11D	5/31/18	FD	2.4		0.12	0.35 J	1.2 J	2690		126	10.2 J		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	137	8.9	204	13.4		51.7	3.4
EW11D	10/19/18	N	1.0 U		0.096 U	1.0 U	13.1	144		34.5	20.0 U		0.76 U	0.50 U	0.50 U	0.50 U	0.44 J	131	7.2	121	9.9		40.3	4.3
EW11S	4/14/16	N	0.50 U		0.37	5.0 U	3.4	451		63.5	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	48.6	7.0	100	8.9		45.1	5.2
EW11S	7/19/16	N	0.50 U		1.2	5.0 U	2.3	84.2 J		37.3	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	65.7	7.9	106	6.0		36.5	2.7
EW11S	10/10/16	N	0.50 U		0.70	0.40 J	3.0	114		97.9	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	64.7	7.9	118	7.9		39.1	4.7
EW11S	1/19/17	N	0.20 J		0.96	0.40 J	2.2	211		157	6.2		0.060	0.28	0.26	0.23	0.24	50.5	9.8	108	7.7		36.3	4.3
EW11S	4/19/17	N	0.26 J		0.20	5.0 U	1.8 J	445		185	20.0 U		0.23 U	0.50 U	1.0 U	1.0 U	2.0 U	45.9	9.2	122	8.6		36.8	3.5
EW11S	10/4/17	N	0.22 J		0.25	0.31 J	2.9	164		65.0	7.9 J		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	65.2	9.4	129	8.0		39.1	3.9
EW11S	6/1/18	N	1.0 U		0.25	0.24 J	2.7	242		74.7	20.0 U		0.76 U	0.50 U	0.50 U	0.50 U	1.0 U	53.5	10.6	127	13.2		36.3	3.3
EW11S	10/19/18	N	1.0 U		0.099 U	1.0 U	9.6	213		63.5	12.8 J		0.81 U	0.50 U	0.50 U	0.50 U	0.23 J	56.4	7.4	182	11.9		29.2	2.7

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
EW12D	8/22/14	N		4600							5.7										5.1		
EW12D	2/3/15	N		880							4.1										4.9 U		
EW12D	4/20/16	N	4.0	2500	2.2 J	1.3 J	3820		1620	20.0 U		12	0.50 U	0.58 J	0.50 J	7.2	90.0	5.4	80.4	0.10 U		6.4	15.7
EW13D	8/22/14	N		780							1.2										1.5 J		
EW13D	2/3/15	N		660							1.6										4.7 U		
EW13D	4/23/15	N		18000																			
EW13D	4/19/16	N	1100	2100	1.6 J	2.0 U	7660		956	11.7 J		13	0.50 U	0.27 J	0.32 J	4.8	180	15.1	167	0.093 J		2.0	20.7
EW13S	4/19/16	N	4.9	770	23.2	37.7	14100		2340	13.8 J		2.0	0.50 U	0.26 J	1.0 U	4.2	370	20.7	229	0.10 U		9.6	36.6
EW13S	7/26/16	N	20	1900	58.9	133	45600		2580	52.2		4.0	0.50 U	0.31 J	0.35 J	4.4	312	21.2	292	0.10 U		7.8	32.6
EW13S	10/14/16	N	40	4200	18.5	30.6	15600		2360	8.4 J		6.8	0.50 U	0.53 J	0.54 J	7.1	296	25.1	236	0.10 U		11.8	34.7
EW13S	1/24/17	N	48	6400	11.4	3.2	8700		2220	6.2		11	0.28	0.70 J	0.62 J	9.3	297	28.0	304	4.8		12.1	35.8
EW13S	4/20/17	N	32	5100	13.7	2.2	10600		2260	20.0 U		20	0.50 U	0.96 J	0.90 J	13	240	29.1	294	0.10 U		16.1	37.2
EW13S	10/5/17	N	52	8700	12.4	0.93 J	10400		2010	20.0 U		16	0.50 U	1.0	1.0	14	276	34.5	276	0.075 J		13.6	34.9
EW13S	6/1/18	N	24	6000	14.9	3.6	13400		2540	20.0 U		19	0.50 U	0.93	1.0	13	271	34.2	253	0.085 J		13.6	33.8
EW13S	10/19/18	N	16	10000	16.0	12.5	16400		2620	11.5 J		34	0.23 J	1.2	1.2	21	242	33.4	251	0.20 U		17.4	35.3
EW13S	10/19/18	FD	17	9800	16.3	17.3	16300		2610	20.0 U		33	0.50 U	1.3	1.3	19	241	32.6	255	0.20 U		17.0	34.7
EW14D	8/22/14	N		290							0.99										1.4 J		
EW14D	2/3/15	N		660							1.5										4.9 U		
EW14D	4/23/15	N		2100																			
EW14D	4/19/16	N	4.2	2800	5.0 U	3.4	301		77.4	17.5 J		3.5	0.50 U	1.0 U	1.0 U	2.4	137	12.0	139	0.48		7.2	6.5
EW14D	4/19/16	FD	3.5	2700	5.0 U	2.0 U	292		77.8	17.2 J		3.1	0.50 U	1.0 U	1.0 U	2.4	136	11.9	145	0.48		7.1	6.3
MW1	10/9/97	N2		2	2 U	2 U				3			0.1 U	1 U	1 U	1 U							
MW1	10/9/97	N	10 U	2	2 U	61.6	20 U		1070	32.8			0.1 U	1 U	1 U	1 U	190	18		6.5		6.3	20
MW1	10/9/97	FD2			2 U	70.9				36													
MW1	10/9/97	FD	10 U	1	2.3	3.5 U	20 J		1180	3.8			0.1 U	1 U	1 U	1 U	190	16		4.5		5.8	43.5
MW1	4/24/01	N2	0.11 U		1 U	25 U	25 U		15 U	25 U										6.5			
MW1	4/24/01	N	0.11 U	0.1 U	2.4	33	9830		642	16		5.6 U	0.1 U	1 U	1 U	1 U	140	24	218	6.5 =		13	3.89
MW1	9/11/01	N2			1.3	25 U	4000		450	20													

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Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
MW1	9/11/01	N	10 U	0.5	0.7 J	4 J	35 U		0.79 J	3.7 U		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	130	10	170	2.6		8.2 U	3.9
MW1	5/14/02	N			1.4 U	1.6 J	11.2 U		0.48 J	5.4 J													
MW1	8/6/02	N4			1.4 U	0.3 U	11 U		2.2 J	2.9 J													
MW1	8/6/02	N3			1.8 J	9.5 J	2200		230	6.5 J													
MW1	8/6/02	N2	0.01 U	0.063	1.7 J	0.3 U	11 U		0.95 J	3.9 J		5 U	1 U	5 U	5 U	5 U	160	7.3	190	0.15 U		7.7	3.7
MW1	8/6/02	N	0.01 U	0.067	1.4 U	7.6 J	1700		180	5.8 J		5 U	1 U	5 U	5 U	5 U	170	7.4	190	0.15 U		7.9	2.6
MW1	4/29/03	N2	0.5 U		1 U	1 U	25 U		5 U	10 U													
MW1	4/29/03	N	0.5 U	0.1 U	1 U	14	3160		217	10 U		7.4 U	0.5 U	5 U	5 U	5 U	174	4.3	187	2.6		10	3.2
MW1	9/24/03	N2	0.5 U		1 U	1 J	100 J		36	10 U													
MW1	9/24/03	N	0.5 U	0.13	1 J	21	7000 J		416	20 J		1 U	0.25 U	2.5 U	2.5 U	2.5 U	157	3.3	68.25	2.61		2 U	8.4
MW1	5/4/04	N2			0.190 J	0.785 R	29.9 R		15.0 R	2.74 R													
MW1	5/4/04	N	0.863 J	1.06 J	0.346 J	5.73 R	790 R	13900	135 R	7.43 R		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	147	4.3 R	158	2.1 J		2.0 R	6.37 J
MW1	9/21/04	N2			0.218 J	0.605 J	18.0 J		2.60 J	4.06 J													
MW1	9/21/04	N	10.0 U	0.348	0.353 J	8.41 J	838		103	17.1 J		1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	130	2.7 =	776	1.8 J		5.2 J	6.75
MW1	9/21/04	FD2			0.227 J	0.707 J	21.0 J		3.07 J	3.31 J													
MW1	9/21/04	FD	10.0 U	0.442	0.470 J	13.6 J	1210		158	13.4 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	140	2.7 =	1960	1.8 J		4.5 J	7.98
MW1	5/10/05	N2			1.0 U	10 U	50 U		10 U	20 U													
MW1	5/10/05	N	2.0 U	0.12	1.0 U	18	3800		360	11 J		0.92 U	0.50 U	5.0 U	5.0 U	5.0 U	110 J	3.6 J	140 J	1.7 J		14 R	3.7 R
MW1	9/29/05	N2			1.0 UJ	10 UJ	50 UJ		3.8 J	20 UJ													
MW1	9/29/05	N	2.0 U	0.12	1.0 J	23 J	4800 J		400 J	14 J		1.0 U	0.50 U	5.0 U	5.0 U	5.0 U	110 J	6.2 J	160 J	1.9 J		16 R	2.4 J
MW1	5/31/06	N	2.0 U	0.049 J	1.0 UJ	10 UJ	50 UJ		10 UJ	20 UJ		1.0 U	0.50 U	5.0 U	5.0 U	5.0 U	110 J	2.3 J	100 J	1.6 J		17	1.7 J
MW1	5/8/07	N	2.0 UJ	0.11 J	1.0 UJ	10 UJ	100 UJ		6.3 J	20 UJ		1.0 R	1.0 U	1.0 U	1.0 U	2.0 U	190 =	2.2 J	130	1.9		15 J	1.9
MW1	9/18/07	N	2.0 UJ	0.093 UJ	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	110 J	9.4	170 J	3.0 J		12 J	1.1 J
MW1	10/21/08	N	2.0 UJ	0.42 UJ	2 U	10 UJ	388	21200	10 U	8.60 J		1.00 U	0.50 U	2.0 U	2.0 U	5.0 U	109	3.91	223 J	1.62 J		6.19	3.38 J
MW1	4/12/16	N	0.50 U	0.15	5.0 U	2.0 U	19.9 J		1.4 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	79.9	5.1	102	0.53		5.2	0.73 J
MW1	7/20/16	N	0.50 U	1.1	5.0 U	2.0 U	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	82.4	5.6	30.0	0.53		5.2	0.83 J
MW1	10/12/16	N	0.16 J	0.12	0.46 J	0.67 J	100 U		0.96 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	86.2	7.5	92.0	0.45		5.2	0.59 J
MW1	1/19/17	N	0.080	0.19	0.77 J	0.76 J	8.1 J		0.25	6.2		0.063	0.28	0.26	0.23	0.24	71.9	6.7	88.0	0.54		4.7	0.65 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW1	1/19/17	FD	0.080	0.30	0.51 J	0.73 J	5.7 J		0.25	6.2		0.061	0.28	0.26	0.23	0.24	71.9	6.8	88.0	0.54		4.8	0.73 J
MW1	4/18/17	N	0.50 U	0.12	0.37 J	2.0 U	100 U		5.0 U	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	64.4	3.9	84.0	0.39		5.5	0.91 J
MW1	10/4/17	N	0.15 J	0.17	1.0 U	1.1 J	100 U		2.5 U	20.0 U		0.77 U	0.50 U	0.50 U	0.50 U	1.0 U	78.5	8.1	81.3	1.1		5.5	0.63 J
MW1	10/18/18	N	1.0 U	0.096 U	0.34 J	1.3 J	100 U		2.5 U	8.8 J		0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	85.5	13.1	109	2.9		5.9	1.0
MW2	10/9/97	N2		1 U	2 U	11.4 J				10.7			0.1 U	1 U	1 U	1 U							
MW2	10/9/97	N	10 U	1 U	2 U	10.2 J	20 J		50.6	10			0.1 U	1 U	1 U	1 U	300	3.5		1.1		17	2.6
MW2	4/5/00	N		0.5 U								10 U											
MW2	6/18/01	N2	0.14		6.7	109	39900		1230	64										38			
MW2	6/18/01	N	0.14	0.1 U	0.37 J	25 U	24 U		8.3	25 U		5 U	0.1 U	1 U	1 U	1 U	36	5.73	66	38 =		105	5.57
MW2	9/12/01	N2			0.29 U	2.2 U	35 U		57	5.2 J													
MW2	9/12/01	N	10 U	0.51	3.9	110	29000		1200	69		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	49	6.2	140	2.3		10	4.2
MW2	8/6/02	N2			1.4 U	0.3 U	48		18	9.1 J													
MW2	8/6/02	N	0.01 U	0.12	6.4	30	10000		420	26 J		5 U	1 U	5 U	5 U	5 U	66	3	98	0.15 U		10	3.2
MW2	9/24/03	N2	0.5 U		1 U	16	3030 J		443	20 J													
MW2	9/24/03	N	0.5 U	0.28	8	100	41300 J		1180	80		0.99 U	0.25 U	2.5 U	2.5 U	2.5 U	80	1 J	106.2	2.02		3 J	2.3
MW2	9/21/04	N2			0.237 J	3.10 J	662		22.2 J	7.73 J													
MW2	9/21/04	N	10.0 UJ	1.26	4.03 J	87.2 J	25800 J		972 J	64.2 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	110 J	12 J	921 J	1.4 J		4.0 R	5.23 R
MW2	9/28/05	N2			1.0 UJ	2.5 J	65 J		9.3 J	20 UJ													
MW2	9/28/05	N	2.0 U	2.2 =	6.7	140 J	40000 J		1300 J	82 J		0.98 U	0.50 U	5.0 U	5.0 U	5.0 U	150 J	5.6 J	270 J	0.10 UJ		27 R	2.5 J
MW2	9/26/06	N	2.0 UJ	2.3	1.0 U	10 UJ	50 U		2.6 UB	20 UJ		1.7 U	0.50 U	5.0 U	5.0 U	5.0 U	160 J	1.6 J	220	0.12 J		20 J	3.1
MW2	9/19/07	N	2.0 UJ	3.7 J	0.62 J	10 UJ	100 UJ		6.5 J	20 UJ		0.97 R	1.0 U	1.0 U	1.0 U	2.0 U	160 J	3.6	200 J	0.22 J		16 J	2.1 J
MW2	10/21/08	N	2.0 UJ	1.60 J	2 U	10 UJ	424 J	27900	5.20 J	20 U		1.00 U	0.5 U	2.0 U	2.0 U	5.0 U	138	3.17	276 J	1.10 J		12.90	2.59 J
MW2	10/6/09	N	0.83 UJ	2.21 J	2 UJ	10 UJ	129 J	19000 J	10 UJ	20 UJ		0.996 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	122 J	1.97 J	190.6 J	0.81 J		11.6 J	5.33 J
MW2	10/6/10	N	1.3 U	0.1 U	2 U	8 U	43 J	4680	9.4 J	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	62	0.6 J	52.5	1.01 J		4.2 J	24
MW2	10/19/11	N	0.50 U	0.097 U	2.0 U	2.2 J+	47 J	9400 B	3.7 J	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	63	7.7	93.60	0.50 J		33	1.0 U
MW2	10/16/12	N	0.50 U	0.33	0.82 J	6.2 J	810	8800 =	25	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	54	4.1	91.2	0.90 J		32 J	6.7
MW2	10/9/13	N2																		2.9 J			
MW2	10/9/13	N	0.50 U	0.94 J	2.0 UJ	10.0 UJ	50 UJ	6900 J	10 UJ	20 UJ		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U *	39 J	2.8		2.9 J		28	4.5 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW2	9/24/14	N	0.50 U	0.32	5.0 U	2.0 U	100 U		1.4 J	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	62	0.69 J	68	0.73		2.4	1.0 U
MW2	10/14/15	N	0.50 U	0.13	5.0 U	0.75 J	56.7 J		2.9 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	50.7	0.55 J	60.3	0.63		2.1	1.3
MW2	4/14/16	N	0.50 U	0.080 J	1.3 J	20.1	6580		171	19.7 J		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	34.4	0.51 J	49.0	0.38		1.8	3.6
MW2	10/29/18	N	1.0 U	0.21	1.0 U	2.8	100 U		1.8 J	10.9 J		0.86 U	0.50 U	0.50 U	0.50 U	1.0 U	66.6	0.42	87.2	0.51		1.6	2.1
MW3	10/8/97	N2		1 U									0.1 U	1 U	1 U	1 U							
MW3	10/8/97	N	10 U	1 U	2 U	2 U	257		10.9	2 U			0.1 U	1 U	1 U	1 U	370	42 J		4.4 J		16	1.2
MW3	4/4/00	N		0.6 U								12 U											
MW3	4/25/01	N2			1 U	25 U	142		7.9	25 U		6.1 U								4.42 =			
MW3	4/25/01	N		0.11 U	1 U	25 U	147		7.3	25 U		6.1 U	0.1 U	1 U	0.46	1 U	442	47	544	4.42		11	1 U
MW3	9/13/01	N2			0.35 J	2.2 U	2400		31	3.7 U													
MW3	9/13/01	N	10 U	0.092 J	0.29 U	2.2 U	930		31	3.7 U		0.26 U	0.44 U	0.5 U	0.4 U	1.2 U	440	58	480	4		14	1.1
MW3	8/7/02	N2			1.9 J	0.58 J	160		12 J	4.8 J													
MW3	8/7/02	N	0.01 U	0.11	1.7 J	2.3 J	480		15 J	1.4 J		5 U	1 U	5 U	5 U	5 U	420	69	540	0.15 U		16	1.4
MW3	9/23/03	N2	2.5																				
MW3	9/23/03	N	2.5	0.31	1 U	1 J	150		5 U	10 U		1.1 U	0.25 U	2.5 U	2.5 U	2.5 U	357	52.4	160	4.43		2 U	1.6
MW3	9/24/03	N			1 U	1 U	1 U		8 J	10 U													
MW3	9/21/04	N2			0.119 J	1.91 J	137 J		4.99 J	4.61 J													
MW3	9/21/04	N	5.71 J	0.367	0.189 J	356 J	278 J		6.45 J	273 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	430 J	62 J	3250 J	3.5 J		8.9 R	2.16 R
MW3	9/28/05	N2			1.0 U	3.0 J	120 J		6.7 J	20 UJ													
MW3	9/28/05	N	2.0 U	0.20 J	1.0 U	4.9 J	23000 J		93 J	20 UJ		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	370 J	62 J	490 J	3.3 J		24 R	1.4 J
MW3	9/28/05	FD											0.50 U	5.0 U	5.0 U	5.0 U							
MW3	10/21/08	N	4.90 J	0.10 UJ	2.00 U	10 UJ	2140	58700	15.20 J	20 U		3.13 U	0.50 U	2.0 U	2.0 U	5.0 U	513	60.50	836	2.73 J		15.20	18 J
MW3	10/7/09	N	21 J	0.1 UJ	2 UJ	10 UJ	722 J	46000 J	12.4 J	20 UJ		0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	482 J	53.8 J	581.46 J	2.55 J		11 J	3.42 J
MW3	10/5/10	N	1.6	0.1 U	2 U	10 U	805	69100	12 J	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	510	67.2	906	3.62		19.8 J	2.2 J
MW3	10/18/11	N	140	0.58	0.76 J	2 U	510	44000 B	41	10 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	510	64	531.00	3.3		16	2.9
MW3	10/16/12	N	13	0.46	0.59 J	10 U	260	41000 =	8.3 J	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	460	69	493	3.6 J		17 =	2.4
MW3	10/8/13	N	4.3	0.38	0.088 J	10.0 U	50 U	42000 B	8.3 J	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	390	70		3.5 J		16	1.6
MW3	9/25/14	N	15	0.35	5.0 U	2.0 U	160		7.6	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	290	72	360	2.1		12	0.91 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW3	10/15/15	N	5.1	0.15	5.0 U	0.93 J	58.2 J		7.4	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	258	52.5	322	1.7		11.1	1.1	
MW3	10/15/15	FD	5.7	0.23	5.0 U	1.2 J	56.6 J		7.9	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	258	52.3	312	1.7		11.2	1.2	
MW3	4/5/16	N	4.4	0.46	5.0 U	1.4 J	716		20.4	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	224	48.2	299	1.4		10.1	0.98 J	
MW3	4/5/16	FD	4.2	0.40	5.0 U	0.99 J	514		18.6	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	221	48.6	283	1.4		10.0	0.94 J	
MW3	7/21/16	N	2.5	0.35	5.0 U	2.0 U	317		16.2	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	215	45.5	248	1.4		9.2	1.0	
MW3	10/11/16	N	1.5	0.45	5.0 U	1.7 J	171		14.8	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	233	46.8	268	1.8		12.7	1.1	
MW3	1/20/17	N	1.9	0.93	0.35	2.0	812		16.4	6.2		0.060	0.28	0.26	0.23	0.24	230	47.3	284	1.9		14.5	1.6	
MW3	4/20/17	N	1.3	0.47	5.0 U	1.7 J	83.6 J		23.0	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	232	45.5	358	1.8		15.0	1.4	
MW3	10/13/17	N	2.1	0.55	1.0 U	2.0	59.7 J		12.5	20.0 U		0.79 U	0.50 U	0.50 U	0.50 U	1.0 U	272	50.1	298	2.0		13.9	1.4	
MW3	6/1/18	N	1.0 U	0.25	0.29 J	1.7 J	50.6 J		9.4	20.0 U		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	698	31.5	246	1.9		10.8	1.2	
MW3	10/18/18	N	1.0 U	0.50	1.0 U	1.7 J	77.2 J		9.2	20.0 U		0.79 U	0.50 U	0.50 U	0.50 U	1.0 U	227	23.9	231	1.7		10.2	1.3	
MW4	10/9/97	N2		1 U	2 U	2.4 U				4.5			2	3	1	3								
MW4	10/9/97	N	139	1 U	2 J	2 U	35.9 J		55.9	2 U			2	3	1	3	94	7.3		0.1 U		6.3	12.3	
MW4	4/4/00	N		0.5 U								10 U												
MW4	1/20/17	N	0.92	3.0	1.5 J	0.36	124		37.9	6.2		0.063	0.28	0.26	0.23	0.24	87.9	22.7	132	0.23		11.6	0.53 J	
MW4	4/21/17	N	10	0.11	1.2 J	2.0 U	85.4 J		39.0	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	82.8	32.9	170	0.15		13.2	0.60 J	
MW4	10/3/17	N	7.2	0.097 U	1.2	1.2 J	501		41.8	20.0 U		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	93.7	37.0	134	0.26		30.0	1.0 U	
MW4	5/31/18	N	300	0.11 U	1.1	2.0 U	149		38.6	20.0 U		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	76.8	47.9	145	0.096 J		14.1	0.85 J	
MW4	10/17/18	N	5.9	0.097 U	1.2	2.0 U	100 U		33.8	20.0 U		0.55 U	0.50 U	0.50 U	0.50 U	1.0 U	86.5	40.9	138	0.20		13.0	0.72 J	
MW4	10/17/18	FD	6.7	0.10 U	1.2	2.0 U	100 U		36.0	6.9 J		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	87.1	40.3	138	0.22		13.1	0.68 J	
MW5	10/10/97	N2		28000 E	3.2	24 J				2 J			0.1 U	3	5	21								
MW5	10/10/97	N	10 U	28000 J	3.8	48.5 J	4860		12900	3.7			0.1 U	3	5	21	370	50		0.1 U		15	115	
MW5	10/10/97	FD2			4.6	4835 J				2.7														
MW5	10/10/97	FD	10 U	31000 J	4.3	26.2 J	5070		15500	2			0.1 U	2	4	18	370	50		0.1 U		16	160	
MW5	4/7/00	N		20600 =								76 U												
MW5	4/26/01	N2	0.4		3.9	25 U	7630		11300	25 U														
MW5	4/26/01	N	0.4	20600	5.6	74	20400		11200	25 U		38	0.22	0.84	1.8	8.1	352	42	349	0.13 U		28	43	
MW5	9/13/01	N2			8.2	100	26000		8500	4.2 J														

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
MW5	9/13/01	N	10 U	6300	3.7	5.1 J	4100		8500	6.2 J		23	0.44 U	0.54 J	0.78 J	4.3	270	29	240	0.17 J		22	27
MW5	8/7/02	N2			2 J	1.5 J	7900		7840	26.9 J													
MW5	8/7/02	N		510 J	4.1	28	34500		8130	104		3.2 J	1 U	5 U	5 U	5 U	220	26	4 U	0.15 U		21	25
MW5	9/25/03	N2	0.47 J		3	7	13400		8320	10 U													
MW5	9/25/03	N	0.47 J	1100	4	50	35100		9450	10 U		2.5	0.25 U	2.5 U	2.5 U	2.5 U	228	22.1	78.48	0.05 U		20	6.2
MW5	9/22/04	N2		214 E	0.612 J	1.44 J	7480 J		5650 J	5.91 J													
MW5	9/22/04	N	10.0 UJ	194	0.488 J	17.3 J	30500		7150	13.7 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	250 J	29 J	1490 J	0.01 R		24 R	18.8 R
MW5	9/28/05	N2			1.0 UJ	10 UJ	19000 J		7600 J	20 UJ													
MW5	9/28/05	N	2.3	1100 =	1.0 UJ	6.0 J	18000 J		7600 J	20 UJ		1.8	0.50 U	5.0 U	5.0 U	5.0 U	260 J	18 J	480 J	0.10 UJ		35 R	7.4 J
MW5	9/26/06	N	8.7 J	460 =	1.0 UJ	10 UJ	23000 J		8000 J	20 UJ		1.4 U	0.50 U	5.0 U	5.0 U	5.0 U	290 J	16 J	370	0.10 J		27 J	6.6
MW5	9/20/07	N	9.8	31 J	1.0 UJ	10 UJ	25000		7600	20 UJ		0.74 R	1.0 U	1.0 U	1.0 U	2.0 U	230 J	13	270 J	0.10 U		39 J	4.1 J
MW5	10/22/08	N	11 J	206	2 UJ	10 UJ	10500 J	31400 J	9700 J	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5.0 U	267 J	8.68	357 J	0.05 U		24.8	30.5
MW5	10/7/09	N	17 J	33.3 J	2 UJ	10 UJ	6000 J	33600 J	11800 J	20 UJ		0.998 UJ	0.1 UJ	0.4 UJ	0.4 UJ	0.14 J	256 J	8.59 J	344.62 J	0.05 UJ		55.1 J	3.5 J
MW5	10/6/10	N	4.1	39.8 J	3.36 J	8 U	3030	43600	12600	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	274	11.4 J	437	0.10 UJ		79.4	4.2
MW5	10/19/11	N	38 J	0.97	1.0 J	2 U	2600	40000 B	11000	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	260	15	397.00	0.10 U		150	2.6
MW5	10/17/12	N	17	0.59 J	0.57 J	10 U	2700	29000 =	7000	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	180	11	302	0.10 U H		130 =	1.8
MW5	10/10/13	N	19	0.60	0.39 J	10.0 UJ	2200 J	20000 J	4700 J	20 UJ		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	150 B	9.2 J		0.10 UJ		140 J	1.8
MW5	9/24/14	N	12	12	0.41 J	2.0 U	1200		2200	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	100	4.3	150	0.14		48	2.3
MW5	9/24/14	FD	10	12	0.42 J	2.0 U	1200		2200	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	97	4.3	150	0.12		48	1.0 U
MW5	10/14/15	N	1.8	64	5.0 U	2.0 U	954		2230	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	98.7	12.7	159	0.053 J		48.9	3.3
MW5	4/7/16	N	4.3	17	5.0 U	2.0 U	931		1990	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	72.0	12.7	113	0.97		38.0	4.6
MW5	4/7/16	FD	4.9	16	5.0 U	2.0 U	940		2070	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	71.3	12.5	113	0.96		37.6	4.5
MW5	10/29/18	N	15	5600	0.71 J	1.5 J	7920		6730	20.0 U		23	0.50 U	0.57	0.53	6.5	249	28.5	292	0.084 J		28.5	39.6
MW6	4/19/16	N	0.78	170	5.0 U	5.2	282		5.6	9.0 J		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	183	35.0	245	10.2		26.3	6.2
MW6	4/19/16	FD		0.050 J	5.0 U	2.0 U	100 U		3.2 J	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U							
MW6S	10/9/97	N2		1 U	2 U	2 U				2.2			0.1 U	1 U	1 U	1 U							
MW6S	10/9/97	N	10 U	1 U	5.1	473	20 U		4720	258			0.1 U	1 U	1 U	1 U	62	72 J		4.5		0.9	1.6
MW6S	4/26/01	N2	0.12 U		0.26	25 U	25 U		347	25 U													

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW6S	4/26/01	N	0.12 U	2.5	15	202	82800		1950	131		5.4 U	0.1 U	1 U	1 U	1 U	148	14	285	0.87		12	5.29	
MW6S	9/12/01	N2			0.58 J	3.1 J	35 U		800	5 J														
MW6S	9/12/01	N	10 U	1.1	7.4	190	42000		1900	110		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	160	12	290	1.1		16	6.3	
MW6S	8/7/02	N2			2.7	9.9 J	3330		1790	9.7 J														
MW6S	8/7/02	N	0.27	88 J	5.5	69.1	7570		2210	18.3 J		5 U	1 U	5 U	5 U	5 U	270	17	4 U	0.15 U		18	5.8	
MW6S	9/25/03	N2	130		1 J	9	1100		961	10 U														
MW6S	9/25/03	N	130	0.33	1 J	22	5900		1190	10 J		1 U	0.25 U	2.5 U	2.5 U	2.5 U	282	23.9	104	1.01		17	8.2	
MW6S	9/27/06	N	3.5 J	0.21	1.0 U	2.6 J	50 U		590	20 U		1.1 U	0.50 U	5.0 U	5.0 U	5.0 U	320 J	18	350	3.9 =		18	4.1	
MW6S	9/20/07	N	3.0	0.099 J	1.0 UJ	10 UJ	510		200	7.0 J		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	230 J	30	320 J	4.7		34 J	4.7 J	
MW6S	9/20/07	FD	2.7	0.14 J	1.0 UJ	10 UJ	390		190	7.0 J		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	230 J	29	330 J	4.7		36 J	5.2 J	
MW6S	10/23/08	N	2.0 UJ	2.65	2 UJ	4.4 J	438 J	6260 J	65.3 J	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5.0 U	4.98 J	28.3	90 J	7.11 J		11	8.3	
MW6S	10/7/10	N	1.3 U	0.1 UJ	2 U	5 J	531	4780	19.7 J	20 U		1.0 UJ	0.5 UJ	2 U	2 U	5 U	11 UB	21.3	56.9	6.94 J		11 J	6.8	
MW6S	10/19/11	N	0.50 U	0.10 U	2.0 U	3.7 J	50 U	4400 B	14	10 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	15	17	45.60	5.3		9.8	1.0 U	
MW6S	10/17/12	N	0.50 U	0.10 U	0.54 J	10 U	50 U	4600 =	3.9 J	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	18	16	51.4	5.5 H		11 J	3.2	
MW6S	10/9/13	N2																			8.9 J			
MW6S	10/9/13	N	0.50 U	0.52 J	2.0 UJ	10.0 UJ	1500 J	6000 J	32 J	20 UJ		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U *	5.0 UJ	29		9.0 J		9.5	8.0 J	
MW6S	9/24/14	N	0.082 J	0.27	1.3 J	27	6000		110	41		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	22	9.3	100	3.6		7.3	1.0 U	
MW6S	10/14/15	N	0.50 U	0.17	5.0 U	2.5	16.8 J		1.4 J	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	12.5	10.8	76.4	3.6		6.7	3.4	
MW6S	4/19/16	N	0.50 U	0.20	0.51 J	4.7	831		15.4	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	42.0	7.4	70.6	4.8		6.3	18.2	
MW6S	7/25/16	N	0.50 U	0.19	5.0 U	3.4	118		6.1	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	49.4	13.8	86.0	7.0		8.0	3.7	
MW6S	10/13/16	N	0.50 U	0.20	0.71 J	19.7	2290		52.7	11.7 J		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	126	14.5	152	6.9		8.1	4.2	
MW6S	1/23/17	N	0.080	0.059 J	0.35	2.8	5.3		6.0	6.2		0.063	0.28	0.26	0.23	0.24	188	6.6	212	3.1		6.0	3.8	
MW6S	4/24/17	N	0.089 J	0.13	5.0 U	3.3	8.3 J		7.4	20.0 U		0.23 U	0.50 U	1.0 U	1.0 U	2.0 U	198	6.5	268	3.8		8.1	2.3	
MW6S	10/5/17	N	0.50 U	0.32	1.0 U	5.5	100 U		4.0	7.2 J		0.86 U	0.50 U	0.50 U	0.50 U	1.0 U	225	18.2	283	6.6		8.0	1.8	
MW6S	6/1/18	N	1.0 U	0.11 U	0.37 J	3.1	58.6 J		4.7	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	250	14.1	320	11.6		11.9	2.3	
MW6S	10/19/18	N	1.0 U	0.097 U	0.28 J	15.7	100 U		5.2	12.4 J		0.76 U	0.50 U	0.50 U	0.50 U	0.24 J	249	13.1	306	5.1		8.0	3.2	
MW7	10/14/97	N2		1 U	2 U	2 U				3.5			0.1 U	1 U	1 U	1 U								
MW7	10/14/97	N	10 U	1 U	2 U	6.2	622		13.4	11.4			0.1 U	1 U	1 U	1 U	350	7.6		4.9		6	1.6	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW7	4/4/00	N		0.5 U								10 U												
MW7	4/4/00	FD		0.5 U								10 U												
MW7	4/25/01	N2	4.65		1 U	25 U	154		6.6	25 U		5.2 U								3.63 =				
MW7	4/25/01	N	4.65	0.1 U	1 U	25 U	352		5.4	25 U		5.2 U	0.1 U	1 U	1 U	1 U	352	8.36	388	3.63		6.54	2.8	
MW7	9/11/01	N4			0.29 U	2.2 U	230		4.6	3.9 J														
MW7	9/11/01	N3			0.47 J	2.2 U	560		5.7	4.8 J														
MW7	9/11/01	N2	10 U	0.13 J	0.29 U	2.2 U	230		4.4	5.2 J		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	350	24	400	3		10	1.8	
MW7	9/11/01	N	12	0.083 J	0.4 J	2.2 U	560		6.4	3.7 U		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	340	23	410	3		10	2	
MW7	8/7/02	N2			1.4 U	0.3 U	300		4 J	0.98 U														
MW7	8/7/02	N	0.01 U	0.03 J	1.5 J	0.3 U	730		6.5 J	2.8 J		5 U	1 U	5 U	5 U	5 U	390	21	450	0.15 U		10	1.5	
MW7	9/24/03	N2	4.9		1 U	1 U	90 J		5 U	10 UJ														
MW7	9/24/03	N	4.9	0.044 J	1 U	1 U	280 J		6 J	10 UJ		0.96 U	0.25 U	2.5 U	2.5 U	2.5 U	346	12.2	133.3	2.97		2 U	1.2	
MW7	9/22/04	N2		5.75	0.108 J	0.847 J	25.0 UJ		9.75 J	2.96 J														
MW7	9/22/04	N	10.0 UJ	9.18 E	1.00 UJ	1.09 J	1640 J		9.86 J	4.06 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	300 J	7.2 J	1560 J	3.4 J		6.8 R	1.98 R	
MW7	9/27/05	N2			1.0 U	10 U	880		16 J	20 U														
MW7	9/27/05	N	2.0 UJ	0.12 U	1.0 U	10 U	1300		18	20 U		0.91 UJ	0.50 U	5.0 U	5.0 U	5.0 U	260 J	18 J	450	1.8 J		130 J	0.96 J	
MW7	9/26/06	N	4.3 J	0.087 J	1.0 U	10 U	50 U		68 J	20 U		0.92 U	0.50 U	5.0 U	5.0 U	5.0 U	280 J	15	390	1.8 =		110 =	2.4	
MW7	9/20/07	N	3.7	0.093 U	1.0 UJ	10 UJ	260		22	5.9 J		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	270 J	16	370 J	1.5		170 J	1.1 J	
MW7	10/22/08	N2																						4.41
MW7	10/22/08	N	110 J	0.1 U	2 UJ	4 J	926 J	37700 J	41.6 J	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	277 J	14.1	535 J	1.54 J		98.9	4.16	
MW7	10/7/09	N	2.4 J	0.403 J	2 UJ	10 UJ	687 J	32600 J	109 J	20 UJ		0.999 UJ	0.1 UJ	0.4 UJ	0.4 UJ	0.14 J	245 J	12.2 J	396.43 J	1.91 J		152 J	14.5 J	
MW7	10/6/10	N	28	0.1 U	2 U	8 U	989	38900	63.2	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	226	13.8 J	482	2.24 J		168	10.4	
MW7	10/19/11	N	15	0.098 U	0.48 J	2 U	81	21000 B	21	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	230	12	249.00	1.9 J		92	1.5 J	
MW7	10/17/12	N	2.2	0.096 U	2.0 U	10 U	230	21000 =	22	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	210	11	254	1.5 H		120 =	0.97 J	
MW7	10/9/13	N2																			1.8 J			
MW7	10/9/13	N	2.2 B	0.094 U	0.34 J	10.0 UJ	10000 J	21000 J	74 J	20 UJ		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U *	200 J	12		1.8 J		120	0.75 J	
MW7	9/23/14	N	15	0.034 J	0.28 J	2.0 U	260		33	30		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	200	9.0	240	1.9		110	0.96 J	
MW7	10/12/15	N	6.5	0.094 U	0.88 J	1.6 J	100 U		423	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	228	8.3	229	1.5		46.2	0.85 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW7	4/6/16	N	13	0.098 U	5.0 U	1.9 J	5270		117	36.2		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	212	10.3	237	1.7		25.7	0.58 J	
MW8	10/14/97	N2		1 U	2 J	2 U				4.6			0.1 U	1 U	1 U	1 U								
MW8	10/14/97	N	36.5	1 U	2 U	2 U	148		17.8	7.4			0.1 U	1 U	1 U	1 U	170	4.2		1.4		4.5	2.3	
MW8	4/5/00	N		0.5 U								10 U												
MW8	4/25/01	N3			0.57	25 U	25 U		22	25 U														
MW8	4/25/01	N2	11.6		0.75	25 U	25 U		27	25 U														
MW8	4/25/01	N	11.6	0.2	0.99	25 U	829		32	25 U		5 U	0.1 U	1 U	1 U	1 U	154	3.25	181	1.52		7.47	1.46	
MW8	9/11/01	N2			1.2	2.2 U	350		19	3.7 U														
MW8	9/11/01	N	10 U	0.062 J	1	2.2 U	70 J		18	4.3 J		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	150	3.8	170	1.5		7.6 U	1 J	
MW8	8/8/02	N2			1.8 J	0.27 U	11 J		5.3 J	2.3 J														
MW8	8/8/02	N	0.01 U	0.04 U	1.4 U	0.3 U	98		6.4 J	12 J		5 U	1 U	5 U	5 U	5 U	180	4.2	310	0.15 U		6	1.1	
MW8	9/25/03	N4			1 U	1 U	50 U		6 J	10 U														
MW8	9/25/03	N3	9.2		1 U	1 U	240		8 J	10 U														
MW8	9/25/03	N2	9.2	0.11 U	1 U	1 U	50 U		8 J	10 U		1 U	0.25 U	2.5 U	2.5 U	2.5 U	184	11	69.44	2.6		2 U	2.3	
MW8	9/25/03	N	8.9	0.047 J	1 U	1 U	140		8 J	10 U		0.95 U	0.25 U	2.5 U	2.5 U	2.5 U	182	11	69.57	2.61		2 U	1.7	
MW8	9/23/04	N2			0.539 J	0.660 J	11.0 J		12.0 J	2.09 J														
MW8	9/23/04	N	3.75 J	1.94 =	0.127 J	0.465 J	256		15.1	2.25 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	200	15	1160	2.4 J		5.8 J	1.40	
MW8	9/28/05	N2			1.0 UJ	10 UJ	130 J		16 J	20 UJ														
MW8	9/28/05	N	2.6	0.031 J	1.0 UJ	3.8 J	4700 J		63 J	20 UJ		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	160 J	20 J	240 J	2.0 J		19 R	1.2 J	
MW8	9/28/05	FD2			1.0 UJ	10 UJ	120 J		13 J	20 UJ														
MW8	9/28/05	FD	2.0 U	0.12 U	1.0 UJ	2.3 J	4500 J		56 J	20 UJ		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	160 J	19 J	200 J	2.0 J		19 R	1.0 J	
MW8	9/20/07	N	2.0 UJ	0.093 U	0.61 J	10 UJ	210		13 J	20 UJ		0.93 U	1.0 U	1.0 U	1.0 U	2.0 U	180	21	260 J	1.5		76 J	1.1 J	
MW8	10/22/08	N	0.78 J	0.1 U	2 UJ	10 UJ	707 J	40400 J	13.1 J	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	178 J	24.3	496 J	1.92 J		73.1	16.1	
MW8	4/11/16	N	1.5	0.016 J	0.60 J	2.0 U	197		10.9	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	174	18.0	421	1.3		201	0.26 J	
MW9	10/8/97	N2		1 U									0.1 U	1 U	1 U	1 U								
MW9	10/8/97	N	10 U	1 U	2 U	4.2 U	20 U		19.7	5.6			0.1 U	1 U	1 U	1 U	60	45		4.2		3.4	6.5	
MW9	4/5/00	N		0.6 =																				
MW9	4/23/01	N2	0.12 U																	2.46				

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW9	4/23/01	N	0.12 U	0.12	0.38	25 U	470		46	25 U		5.3 U	0.1 U	1 U	1 U	1 U	60	3.22	59	2.46 =		27	9.94	
MW9	4/24/01	N			0.28	25 U	25 U		34	25 U														
MW9	9/12/01	N2			0.34 J	2.2 U	110		16	6.6 J														
MW9	9/12/01	N	10 U	0.76	0.43 J	6.1 J	300		27	11 J		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	62	6.5	64	3.3		6.8 U	5.1	
MW9	8/6/02	N2			1.4 U	0.3 U	11 U		6.3 J	9.6 J														
MW9	8/6/02	N	0.01 U	0.54	1.4 U	1.6 J	200		14 J	6.4 J		5 U	1 U	5 U	5 U	5 U	64	11	95	0.15 U		22	8.4	
MW9	9/25/03	N2	0.5 U		1 U	1 U	240		16	10 U														
MW9	9/25/03	N	0.5 U	2.3	1 J	20	7400		229	20 J		1 U	0.25 U	2.5 U	2.5 U	2.5 U	59	4.4	32.83	2.36		24	6.5	
MW9	9/22/04	N2			0.265 J	2.88 J	125 U		8.51 J	14.9 J														
MW9	9/22/04	N	10.0 UJ	2.92	0.134 J	2.07 J	231 J		16.5 J	4.60 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	58 J	3.2 J	776 J	1.8 J		26 R	6.48 R	
MW9	9/27/05	N2			1.0 UJ	10 U	50 U		5.4 J	20 U														
MW9	9/27/05	N	2.0 UJ		1.0 UJ	10 U	50 U		6.3 J	20 U		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	55 J	2.6 J	70	1.9 J		20 J	2.0	
MW9	10/18/05	N		0.57																				
MW9	9/21/07	N	2.0 U	0.37 J	1.0 UJ	5.9 J	100 UJ		4.1 J	20 UJ		0.97 R	1.0 U	1.0 U	1.0 U	2.0 U	58 J	2.6	86 J	3.8		15 J	3.3 J	
MW9	10/22/08	N	2.0 UJ	0.1 U	2 UJ	6 J	166 J	11600 J	10 UJ	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	55 J	3.44	113 J	2.48 J		14.9	11.2	
MW9	5/18/10	N	1.3 U	0.073 J	2 UJ	10 UJ	120. UJ	6230. J	7.1 J	20 UJ		1.0 U	0.5 U	5 U	5 U	5 U	63 UB	2.63	67.9	2.42 J		11	25.7 UB	
MW9	10/6/10	N	1.3 U	0.1 U	2 U	8 U	109 J	8540	16.7 U	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	27	3.3 J	88.1	3.35		14 J	7.6	
MW9	10/19/11	N	0.50 U	0.098 U	2.0 U	3.5 J+	50 U	8400 B	2.9 J	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	69	1.0 U	82.00	3.1		8.9	1.0 U	
MW9	10/16/12	N	0.50 U	0.39	0.91 J	10 U	50 U	8400 =	10 U	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	63	2.8 J	82	5.9 J		10 J	3.8	
MW9	10/9/13	N2																						
MW9	10/9/13	N	0.50 U	0.41 J	2.0 UJ	10.0 UJ	50 UJ	6200 J	10 UJ	20 UJ		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U *	47 J	1.2		3.8 J		12	1.6 J	
MW9	9/24/14	N	0.50 U	1.6	5.0 U	2.0 U	100 U		5.0 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	14	1.1	41	2.4		10	2.5	
MW9	10/13/15	N	0.50 U	0.17	5.0 U	1.3 J	21.1 J		5.0 U	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	31.0	0.70 J	40.2	1.5		7.4	4.4	
MW9	4/13/16	N	0.50 U	0.28	5.0 U	1.4 J	33.6 J		1.5 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	26.6	0.99 J	37.2	1.4		7.3	30.2	
MW10	10/15/97	N2		8200 E	2 J	2.8 U				9.2			0.2	2	3	17								
MW10	10/15/97	N	13.5	8200 J	1.4	9.1	2190		2510 J	4.4			0.2	2	3	17	340	35		4.9		13	20	
MW10	4/6/00	N2		12900 =								5410 U												
MW10	4/6/00	N		9530 J								60 =												

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
MW10	4/26/01	N2	2.9		2.4	5.9	5650		2380	25 U													
MW10	4/26/01	N	2.9	22800	3.1	98	25200		2560	44		5.2 U	0.4	3.3	5.3	27	472	48	505	0.18		22	26
MW10	9/12/01	N2			4.5	40	20000		3300	13													
MW10	9/12/01	N	10 U	21000	3.9	3.9 J	2400		3200	9.5 J		130	0.44 U	6.3	10	55	540 J	61	630	0.13 J		23	64
MW10	8/7/02	N2			7.3	10.1 J	10700		2540	6.1 J													
MW10	8/7/02	N	0.011	22000 J	9.5	48.2	24400		2730	2.8 J		120	1 U	7	11	54	400	56	480	0.15 U		20	110
MW10	10/1/03	N2	0.62		2 J	8	2590		1850	10 U													
MW10	10/1/03	N	0.62	9000	2 J	30	5470		1960	10 J		18	0.25 U	2.5 U	2.5 U	13.5	287	22	93.58	0.05 U		3 J	25.3
MW10	9/23/04	N2			3.01	12.4 J	24.1 J		1810	4.23 J		160											
MW10	9/23/04	N	10.0 U	38000 =	2.66	28.3	3550		2550	5.58 J		173 E	0.296 J	5.58 J	8.09 J	47.1	390	38	1640	0.0018 J		18 =	54.1
MW10	9/27/06	N	2.0 UJ	23000 J	1.0 U	4.3 J	120		2600	20 U		50	0.50 U	2.0 J	1.7 J	16	450 J	14	440	0.10 U		24 =	21
MW10	9/21/07	N	2.4 J	1700 J	0.88 J	2.3 J	550		2700	20 UJ		12 J	1.0 U	1.3	1.0 U	7.2	380 J	20	420 J	0.68		25 J	12 J
MW10	10/23/08	N	6 J	1630	2 UJ	10 UJ	1110 J	40000 J	2210 J	20 UJ		0.92 J	0.5 U	2.0 U	2.0 U	5.0 U	305 J	12.4	432 J	0.05 U		28.1	39.2
MW10	10/23/08	FD	7 J	1720	2 UJ	10 UJ	1080	48600 J	2190 J	20 UJ		0.82 J	0.5 U	2.0 U	2.0 U	5.0 U	310 J	12.4	500 J	0.05 J		29.5	13.1
MW10	10/7/09	N	17 J	220 J	2 UJ	8.2 J	1210 J	38800 J	2230 J	20 UJ		0.998 UJ	0.1 UJ	0.072 J	0.073 J	0.41 J	280 J	9.82 J	369.28 J	0.05 UJ		58.7 J	4.68 J
MW10	10/7/09	FD	23 J	214 J	2 UJ	10 UJ	704 J	36900 J	2310 J	20 UJ		0.996 UJ	0.1 UJ	0.094 J	0.083 J	0.49 J	282 J	9.84 J	347.47 J	0.05 UJ		59 J	2.13 J
MW10	10/7/10	N	1.8	92.4 J	2 U	8 U	488	41600	1780	20 U		1.0 UJ	0.1 U	0.4 U	0.051 J	1 U	308	7.2 J	390	0.10 UJ		48.2 J	2.2
MW10	10/7/10	FD	2.3	77.1 J	2 U	8 U	396	37200	1820	20 U		1.0 UJ	0.1 U	0.4 U	0.074 J	1 U	272	7.3 J	346	0.10 UJ		47.7 J	1.8
MW10	10/20/11	N	8.8 J	21	2.0 U	2 U	180	33000 B	1700	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	260	8.4	303.00	0.21		53	2.1
MW10	10/20/11	FD	11 J	21	0.60 J	2 U	180	33000 B	1700	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	260	8.7	303.00	0.22		54	2.1
MW10	10/17/12	N	12	8.7	0.55 J	10 U	190	32000 =	1600	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	240	7.8	304	0.075 J		68 J	1.7
MW10	10/17/12	FD	12	14	0.50 J	10 U	180	31000 =	1600	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	230	8.0	292	0.067 J		69 J	1.7
MW10	10/10/13	N	27 J	17	0.19 J	10.0 UJ	260 J	32000 J	1700 J	20 UJ		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	220 B	7.8		0.41 J		93	1.4
MW10	10/10/13	FD	140 J	16	0.19 J	10.0 UJ	230 J	31000 J	1600 J	20 UJ		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	230 B	7.9		0.39 J		94	1.7
MW10	9/25/14	N	8.1	37	0.21 J	2.0 U	250		1300	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	180	6.1	270	0.10		77	1.0 U
MW10	10/15/15	N	8.2	150	5.0 U	1.0 J	188		861	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	178	6.5	244	0.10 U		71.8	1.8
MW10	4/7/16	N	290	1900	5.0 U	2.0 U	1350		719	20.0 U		4.8	0.50 U	0.46 J	0.53 J	2.9	162	9.8	189	0.10 U		46.1	8.6
MW10	7/25/16	N	8.6	1700	5.0 U	3.7	826		744	20.0 U		5.2	0.50 U	0.66 J	0.64 J	5.2	160	12.3	188	0.10 U		31.7	11.6

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW10	10/13/16	N	5.5	7300	0.46 J	1.7 J	434		777	20.0 U		6.2	0.50 U	0.79 J	0.79 J	5.7	156	14.6	186	0.10 U		24.3	11.1	
MW10	1/24/17	N	8.5	6200	0.46 J	1.9 J	539		831	6.2		10	0.28	0.96 J	0.91 J	8.1	158	17.4	220	0.035		24.0	19.4	
MW10	4/24/17	N	3.7	7600	0.76 J	5.9	756		897	20.0 U		20	0.50 U	1.6	1.8	14	142	19.1	234	0.10 U		25.0	27.9	
MW10	10/5/17	N	13	4800	0.53 J	3.0	626		903	20.0 U		20	0.50 U	1.2	1.5	9.4	157	26.2	184	0.083 J		20.2	30.8	
MW10	10/5/17	FD	15	5000	0.53 J	3.7	609		898	20.0 U		19	0.50 U	1.3	1.5	9.5	157	25.9	182	0.081 J		20.1	32.0	
MW10	6/1/18	N	23	2500	1.0	3.6	796		951	20.0 U		24	0.50 U	1.4	1.5	10	470	27.6	197	0.084 J		19.9	2.1	
MW10	10/19/18	N	40	2500	1.1	13.6	1310		907	20.0 U		21	0.50 U	1.2	1.1	8.6	146	19.9	182	0.20 U		15.3	26.2	
MW10S	10/15/97	N2		30000 J	2 J	10.9 J				8.4			0.4	0.9 J	1	8								
MW10S	10/15/97	N	10 U	30000 E	2 U	28.5 J	45.4 J		10700 J	11.6			0.4	0.9 J	1	8	260	38		0.1 U		23	49.7	
MW10S	4/7/00	N2		34800 =								393 F												
MW10S	4/7/00	N		56100 J								512 =												
MW10S	12/5/00	N2	0.57	3810 J	9.36	160	11000		7100	35		152							570					
MW10S	12/5/00	N	0.57	3810 B	0.74 J	13 J	610		6900	25 U		152	0.1 U	5.9	2.9	70	31	15	570	1		11	300	
MW10S	4/25/01	N2	0.55		2.3	46	11300		6030	45			10 U	100 U	100 U	100 U				1.49				
MW10S	4/25/01	N	0.55	49000	18	409	131000		7990	216		306	1 U	3.5	10 U	44	142	11	425	1.49 =		8.64	503	
MW10S	9/12/01	N2			0.29 U	3.2 J	48 J		7600	3.7 U														
MW10S	9/12/01	N	10 U	82000	5.1	170	35000		8600	100		75	0.44 U	0.94 J	0.41 J	15	270 J	10	260	4.7		13	19	
MW10S	8/7/02	N2			3.1	2.3 J	67.3		7070	0.98 U														
MW10S	8/7/02	N	0.01 U	390 J	3.9	53.3	9490		7560	22.4 J		5 U	1 U	1 J	5 U	10	170	10	4 U	0.11 J		14	10	
MW10S	9/25/03	N2	0.5 U		1 U	1 J	50 U		5900	10 U														
MW10S	9/25/03	N	0.5 U	2200	1 U	7	1760		5910	10 U		1 U	0.25 U	2.5 U	2.5 U	3.4 J	135	6.7	52.05	3.41		2 J	6.6	
MW10S	9/22/04	N2			0.190 J	1.79 J	22.7 J		3740 J	6.07 J														
MW10S	9/22/04	N	10.0 UJ	9490	1.49 J	73.1 J	14500 J		5460 J	49.7 J		51.9	5.00 U	50.0 U	50.0 U	5.42 J	120 J	24 J	1220 J	3.6 J		15 R	7.54 R	
MW10S	9/29/05	N2			1.0 UJ	10 UJ	50 UJ		3900 J	20 UJ														
MW10S	9/29/05	N	2.0 U	0.11 U	1.0 UJ	14 J	3600 J		4000 J	8.0 J		5.6	0.50 U	5.0 U	5.0 U	0.99 J	130 J	16 J	300 J	2.0 J		120 R	3.0 J	
MW10S	9/26/06	N	2.0 UJ	2700 J	1.0 U	2.2 J	50 U		2500	20 U		1.2	0.50 U	5.0 U	5.0 U	2.6 J	180 J	8.6	310	1.2		79 =	6.5	
MW10S	9/21/07	N	2.0 U	24 J	1.0 UJ	10 UJ	100 UJ		1300	20 UJ		2.4 R	1.0 U	1.0 U	1.0 U	2.0 U	170 J	8.7	240 J	1.3		69 J	2.9 J	
MW10S	10/24/08	N	2.0 UJ									3.36	0.5 U	2.0 U	2.0 U	5.0 U								

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW10S	4/18/16	N	0.50 U	3500	0.59 J	2.6	190		388	20.0 U		4.7	0.50 U	1.0 U	1.0 U	2.7	102	7.8	92.1	0.10 U		9.1	9.5	
MW10S	7/25/16	N	0.50 U	5200	0.68 J	9.2	183		315	20.0 U		13	0.50 U	0.39 J	1.0 U	5.6	107	7.7	124	0.10 U		11.8	15.6	
MW10S	10/13/16	N	0.12 J	6600	0.44 J	4.6	124		399	20.0 U		9.6	0.50 U	0.30 J	1.0 U	4.6	83.7	6.1	100	0.10 U		11.9	12.3	
MW10S	1/24/17	N	0.12 J	9800	0.80 J	2.5	254		624	6.2		10	0.28	0.40 J	0.23	5.7	164	12.3	220	0.035		17.3	23.4	
MW10S	4/24/17	N	0.35 J	4300	0.74 J	3.3	394		1340	20.0 U		11	0.50 U	0.40 J	1.0 U	5.9	195	25.6	332	0.10 U		23.1	33.0	
MW10S	4/24/17	FD	0.36 J	3300	0.65 J	3.3	406		1380	20.0 U		10	0.50 U	0.40 J	1.0 U	5.8	195	25.7	350	0.082 J		23.1	32.1	
MW10S	10/5/17	N	0.29 J	4400	0.50 J	2.9	770		1260	8.1 J		9.9	0.50 U	0.46 J	0.50 U	6.0	314	41.1	378	0.13 J		26.7	29.8	
MW10S	6/1/18	N	1.0 U	1500	0.91 J	5.2	1010		2880	20.0 U		11	0.50 U	0.42 J	0.22 J	5.2	322	69.8	456	0.083 J		39.7	5.5	
MW10S	10/19/18	N	1.0 U	1900	0.51 J	8.2	716		2030	20.0 U		5.9 J	0.50 U	0.84	0.34 J	10	311	32.9	388	0.76		23.5	26.1	
MW11	10/15/97	N2		1 U	2 J	4.2 U				10.3			0.3	1 J	0.2 J	0.5 J								
MW11	10/15/97	N	10 U	1 U	2 U	2 U	10 U		2 U	5.3			0.3	1 JB	0.2 J	0.5 J	190	7.5		5		12	1.3	
MW11	4/4/00	N		0.6 U								11 U												
MW11	4/24/01	N4			1.3	25 U	25 U		15 U	25 U		5.4 U								3.74				
MW11	4/24/01	N3	0.11 U		1.4	25 U	151		15 U	126		5.4 U								3.74 =				
MW11	4/24/01	N2	0.11 U	0.11 U	1.2	25 U	25 U		15 U	20		5.3 U	0.1 U	1 U	1 U	1 U	225	6.25	231	3.59		3.48	4.67	
MW11	4/24/01	N	0.1 U	0.1 U	1.4	25 U	58		15 U	25		5.3 U	0.1 U	1 U	1 U	1 U	185	6.16	231	3.59 =		4.57	7.9	
MW11	9/10/01	N2			1.1	2.2 U	35 U		0.45 J	3.7 U														
MW11	9/10/01	N	10 U	0.091 J	1.4	2.9 J	66 J		1.9	9.1 J		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	190	8	220	3.1		7.4 U	4.2	
MW11	8/6/02	N2	0.01 U		1.5 J	0.3 U	11.2 U		1.2 J	8.5 J														
MW11	8/6/02	N	0.01 U	0.04 U	4.7	0.83 J	46		2.3 J	6.4 J		5 U	1 U	5 U	5 U	5 U	210	7.8	230	0.15 U		7.6	18	
MW11	9/23/03	N2	0.5 U		1 U	1 U	50 U		5 U	10 U														
MW11	9/23/03	N	0.5 U	0.11 U	1 U	2	160		5 U	10 U		0.98 U	0.25 U	2.5 U	2.5 U	2.5 U	187	6.7	72.14	2.94		2 U	2.3	
MW11	9/21/04	N2			0.948 J	0.366 J	6.05 J		1.40 J	4.05 J														
MW11	9/21/04	N	10.0 U	0.0656 J	0.885 J	0.620 J	15.6 J		2.81 J	6.36 J		1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	210	9.0 =	1020	3.0 J		6.2 J	14.1	
MW11	9/29/05	N2			1.0 UJ	10 UJ	50 UJ		3.0 J	20 UJ														
MW11	9/29/05	N	2.0 U	740 =	1.0 UJ	10 UJ	50 UJ		1.6 J	20 UJ		0.95 U	0.50 U	5.0 U	5.0 U	5.0 U	200 J	14 J	280 J	2.4 J		9.7 R	1.2 J	
MW11	9/27/06	N	2.0 UJ	0.11 U	1.0 UJ	10 UJ	50 UJ		10 UJ	20 UJ		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	220 J	16 J	240	0.53 J		8.8 J	2.3	
MW11	9/20/07	N	2.0 UJ	0.093 U	1.2 J	10 UJ	100 UJ		10 UJ	20 UJ		0.93 U	1.0 U	1.0 U	1.0 U	2.0 U	220	20	260 J	2.4		19 J	1.2 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW11	10/22/08	N	2.0 UJ	0.27	2 UJ	10 UJ	533	33600 J	10 UJ	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	234 J	19.9	433 J	2.26 J		17.8	20.2	
MW11	4/11/16	N	0.50 U	0.10 U	0.75 J	2.0 U	32.1 J		1.9 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	229	18.0	470	1.6		200	0.32 J	
MW12	10/15/97	N2		13000 J	2 U	6.1 U				16.3			1	2	3	14								
MW12	10/15/97	N	10 U	13000 E	2 U	5	267		1660	10.6			1	2	3	14	490	50		0.1 U		15	21.7	
MW12	4/6/00	N2		10300 J								47 =												
MW12	4/6/00	N		15000 =								5210 U												
MW12	4/6/00	FD2		14100 =								5150 U												
MW12	4/6/00	FD		10600 J								45 =												
MW12	4/26/01	N2	0.99		0.91	25 U	131		1570	25 U														
MW12	4/26/01	N	0.99	1500	1	25 U	151		1540	25 U		44	0.34	2.5	4.1	22	564	48	556	0.43		16	23	
MW12	9/13/01	N2			0.95 U	6.8 J	740		1400	12														
MW12	9/13/01	N	10 U	18000	1.1	5 J	770		1300	9.3 J		40	0.44 U	2.3 U	3.2 U	20	490	47	470	0.53 U		16	25	
MW12	5/14/02	N3			1.4 U	4.9 J	11.2 U		1680	12 J														
MW12	5/14/02	N2		4300	1.5 J	5 J	11.2 U		1670	9.3 J									520					
MW12	5/14/02	N	10 U	4000	1.4 U	5.3 J	44.5		1670	7.4 J		33	1 U	2 J	2 J	14	490	39	520	0.68 H		16	31	
MW12	5/14/02	FD		4000																				
MW12	8/8/02	N2			1.4 U	2.9 J	105		1600	3.3 J														
MW12	8/8/02	N	0.01 U	6400 J	2.8	5.6 J	123		1620	7.7 J		28	1 U	2 J	2 J	15	460	37	4 U	0.46		15	28	
MW12	4/29/03	N2	0.5 U		1 U	4	25 U		1560	10 U														
MW12	4/29/03	N	0.5 U	3000	1 J	5	230		1640	10 U		17	0.5 U	1.3 J	1.3 J	11	470	31	442	0.8		20	19	
MW12	9/23/03	N4			1 U	3	50 U		1490	10 U														
MW12	9/23/03	N3	0.64		1 U	4	80 J		1490	10 U														
MW12	9/23/03	N2	0.49 J		1 U	3	50 U		1530	10 U			0.25 U	2.5 U	2.5 U	9.4	433	29.8	153.3	1.23		2 U	16	
MW12	9/23/03	N	0.49 J	10000	1 U	4	70 J		1420	10 U		14	0.25 U	2.5 U	2.5 U	8.6	443	30.8	151.4	1.17		2 U	15.5	
MW12	5/4/04	N2			0.600 J	3.95 R	33.6 R		1480 R	8.80 R														
MW12	5/4/04	N	1.34 J	11200 J	0.564 J	5.50 R	52.7 R	45900	1730 R	10.8 R		22.9	0.124 J	1.39 J	1.03 J	11.2	446	29 =	443	1.1 J		14 R	20.2 J	
MW12	9/22/04	N2		3730 E	0.672 J	3.91 J	22.7 J		1230 J	8.10 J														
MW12	9/22/04	N	10.0 UJ	9060 J	1.00 UJ	5.09 J	53.9 J		1540 J	9.53 J		28.2 J	0.113 J	1.22 J	0.866 J	9.83	440 J	26 J	1660 J	1.1 J		12 R	18.2 R	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW12	5/10/05	N2			1.0 U	4.8 J	50 U		1400	20 U														
MW12	5/10/05	N	2.0 U	8300 J	1.0 U	4.2 J	50 U		1500	8.9 J		6.1	0.50 U	0.93 J	5.0 U	5.6	390 J	23 J	360 J	1.3 J		16 R	9.9 R	
MW12	9/27/05	N2			1.0 UJ	3.9 J	50 U		1300	20 U														
MW12	9/27/05	N	2.0 UJ	8500 J	1.0 UJ	10 U	50 U		1200	7.8 J		3.3	0.50 U	0.85 J	5.0 U	4.9 J	370 J	20 J	410	1.1 J		26 J	9.2	
MW12	6/7/06	N	2.0 U	6100 J	1.0 UJ	2.3 J	50 R		1100 J	20 UJ		0.94 U	0.50 U	0.67 J	5.0 U	3.4 J	400 J	21 J	400 J	2.1 J		32 =	7.2 J	
MW12	9/26/06	N	2.0 UJ	3100 =	1.0 UJ	3.2 J	50 UJ		1200 J	16 J		1.5	0.50 U	5.0 U	5.0 U	2.9 J	390 J	14 J	380	1.9 J		15 J	10	
MW12	9/26/06	FD	2.0 UJ	2000 =	1.0 UJ	2.5 UJ	46 J		1200 J	20 UJ		1.4	0.50 U	5.0 U	5.0 U	1.7 J	390 J	15 J	370	2.0 J		15 J	10	
MW12	5/9/07	N	2.0 UJ	3000 J	1.0 UJ	2.1 J	100 UJ		1100	5.2 J		0.99 J	1.0 UJ	1.0 UJ	1.0 UJ	1.9 J	340 =	13	370	2.4		37 J	7.0 UB	
MW12	9/19/07	N	2.0 UJ	1100 J	0.97 J	10 UJ	100 R		820	20 UJ		0.71 J	1.0 U	1.0 U	1.0 U	2.0 U	340	14	330 J	2.8		29 J	5.6 J	
MW12	9/19/07	FD	2.0 UJ	1000 J	1.1 J	1.7 J	100 R		790	20 UJ		0.74 J	1.0 U	1.0 U	1.0 U	2.0 U	340	14	350 J	2.2		2.7 J	5.7 J	
MW12	5/20/08	N	2.0 UJ	2100 J	0.59 J	3.7	100 UJ		1000	4.6 J		0.96 U	1.0 UJ	1.0 U	1.0 U	1.5 J	360 =	12	350	2.0		25	4.7 J	
MW12	5/20/08	FD	2.0 UJ	2200 J	0.61 J	3.8	100 UJ		1000	4.2 J		0.95 U	1.0 UJ	1.0 U	1.0 U	1.6 J	360 =	12	380	2.1		25	4.5 J	
MW12	10/21/08	N	2.0 UJ	1670.00 J	2 U	4 J	927	50200	1140	11 J		1.00 U	0.5 U	2.0 U	2.0 U	5.0 U	323	13.10	519 J	2.96 J		31.80	11.70 J	
MW12	10/21/08	FD	2.0 UJ	1300.00 J	2.00 U	3.70 J	936	45000	1120	20 U		1.00 U	0.5 U	2.0 U	2.0 U	5.0 U	322	14.50	465 J	2.95 J		31.70	11.80 J	
MW12	6/2/09	N	0.8 UJ	521 J	2 U	10 UJ	310 =	34400 =	1040 =	20 U		1.0 UJ	0.5 U	0.28 J	2.0 U	0.88 J	294 J	12.3	363.3928	2.65 J		59.9	3.6 J	
MW12	6/2/09	FD	0.8 UJ	489 J	2 U	10 UJ	292 =	40600 =	1020 =	20 U		1.0 UJ	0.5 U	0.31 J	2.0 U	0.96 J	302 J	12.4	429.3758	2.64 J		62.2	1.7 J	
MW12	10/6/09	N	0.83 UJ	295 J	2 UJ	4 J	307 J	51600 J	987 J	20 UJ		0.995 UJ	0.1 UJ	0.073 J	0.4 UJ	0.28 J	297 J	13.7 J	509.63 J	1.84 J		85.4 J	3.83 J	
MW12	10/6/09	FD	0.83 UJ	289 J	2 UJ	4 J	294 J	47600 J	982 J	20 UJ		0.997 UJ	0.1 UJ	0.069 J	0.4 UJ	0.28 J	294 J	13.7 J	468.19 J	1.83 J		84.7 J	3.25 J	
MW12	5/19/10	N	1.3 U	70.3	1.9 J	3.5 J	228. J	47700. J	913. J	11. J		1.0 U	0.5 U	5 U	5 U	5 U	308	14.7	496	1.87 J		116	41.8 UB	
MW12	5/19/10	FD	1.3 U	81.9	2 UJ	3.8 J	225. J	41800. J	633. J	8.2 J		1.0 U	0.5 U	5 U	5 U	5 U	308	14.7	432	1.91 J		117	36.1 UB	
MW12	10/5/10	N	1.3 U	43.7	2 U	8 U	358	41500 R	834	20 U		1.0 U	0.1 U	0.4 U	0.044	1 U	320	14.4 J	548	1.73		119	53.9 J	
MW12	10/5/10	FD	1.3 U	42.9	2 U	8 U	332	47500 R	859	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	316	14.4 J	483	1.72		119	22.9 J	
MW12	6/29/11	N	0.9 U	37	1.8 J	10 U	314	62600	744	20 U		0.998 U	0.1 U	0.4 U	0.4 U	1 U	295	14.1 J	555.00	2.28		111	1.28 J+	
MW12	6/29/11	FD	0.9 U	35.1	2 UJ	10 U	291	56900	765	20 U		0.998 U	0.1 U	0.4 U	0.4 U	1 U	276	13.3 J	524.00	2.11 J		103 J	1.53 J+	
MW12	10/18/11	N	0.50 U	37	1.1 J	2.3 J+	50 U	42000 B	660	10 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	300	14	398.00	2.1		98	2.0	
MW12	10/18/11	FD	0.50 U	30	1.0 J	2.3 J+	50 U	42000 B	640	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	300	14	398.00	2.1		100	2.0	
MW12	5/22/12	N	0.50 U	21 J	2.0 U	10 U	50 U	44000 =	670	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	300	14 =	431.00	1.8		120	1.5	
MW12	5/22/12	FD	0.50 U	16 J	2.0 U	4.3 J	50 U	43000 =	630	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	310	14 =	419.00	1.8		120	1.6	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW12	10/16/12	N	0.50 U	26	0.98 J	10 U	50 U	42000 =	410	20 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	280	14	413	2.0 J		120 =	1.4	
MW12	10/16/12	FD	0.50 U	23	1.2 J	10 U	50 U	43000 =	420	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	290	13	424	2.0 J		130 =	1.3	
MW12	5/22/13	N	0.50 U	22	2.0 U	10 U	50 U	36000 B	460 B	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	280	12		2.0 J		150	1.6	
MW12	5/22/13	FD	0.50 U	24	2.0 U	10 U	50 UJ	39000 B	530 B	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	290	12		2.1 J		150	1.6	
MW12	10/8/13	N	0.50 U	28	0.37 J	10.0 U	50 U	41000 B	680 B	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	270	12		2.1 J		120	1.4	
MW12	10/8/13	FD	0.50 U	22	0.37 J	10.0 U	50 U	42000 B	710 B	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	260	12		2.1 J		120	1.3	
MW12	5/14/14	N		19																				
MW12	9/23/14	N	0.076 J	24	0.66 J	2.0 U	100 U		450	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	240	11	360	1.7		130	1.0 U	
MW12	4/20/15	N	0.50 U	16	1.1 J	1.4 J	100 U		530	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	220	11	410	1.7		140	0.95 J	
MW12	10/13/15	N	0.080 J	25	5.0 U	2.0 U	362		27.4	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	279	11.7	74.4	1.6		159	1.2	
MW12	4/6/16	N	0.12 J	5.2	0.77 J	1.4 J	60.1 J		148	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	236	10.6	358	1.6		135	0.67 J	
MW12	7/19/16	N	0.50 U	14	0.61 J	1.6 J	100 U		388	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	238	10.1	358	1.4		134	0.96 J	
MW12	10/12/16	N	0.092 J	14	0.50 J	1.6 J	10 J		439	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	239	10.8	340	1.2		124	0.71 J	
MW12	1/18/17	N	0.13 J	18	0.87 J	1.4 J	8.5 J		427	6.2		0.060	0.28	0.26	0.23	0.24	203	10.7	326	1.1		122	0.89 J	
MW12	4/19/17	N	0.13 J	14	0.46 J	1.2 J	10.8 J		362	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	201	10.1	346	1.0		112	1.0	
MW12	10/2/17	N	0.48 J	32	0.49 J	1.9 J	100 U		328	20.0 U		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	199	11.7	282	0.90		105	1.1	
MW12	10/16/18	N	1.0 U	110	0.53 J	1.3 J	100 U		72.2	20.0 U		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	173	8.1	231	0.61		59.9	2.1	
MW13	10/8/97	N2		0.7 J									0.1 U	1 U	1 U	1 U								
MW13	10/8/97	N	10 U	0.7 J	2 U	3.32 U	6.7 J		27.3	2.7			0.1 U	1 U	1 U	1 U	70	2.7		1.4		1.4	17.9	
MW13	4/5/00	N		0.8 =								10 U												
MW13	12/5/00	N2	0.58 U			92	26000		870	52		5.5 U	0.1 U	1 U	1 U	1 U			140					
MW13	12/5/00	N	0.58 U	114 J	1 U	25 U	230		66	25 U		5.5 U	0.1 U	1 U	1 U	1 U	72	4.2	140	0.45		8.2	7.9	
MW13	4/23/01	N2	0.12 U		0.24	25 U	25 U		110	25 U														
MW13	4/23/01	N	0.12 U	0.18	14	140	56300		1300	89		5.3 U	0.1 U	1 U	1 U	1 U	70	3.52	146	1.77		35	18	
MW13	6/19/01	N2	0.12 U		9.1	6.1 J	141		26	25 U										2.87				
MW13	6/19/01	N	0.12 U	0.11 U	1.1	68	32800		848	45		5.3 U	0.12	1 U	1 U	1 U	68	5.73	112	2.87 =		11	13	
MW13	9/10/01	N2			0.54 J	2.8 J	52 J		27	4.7 J														
MW13	9/10/01	N	10 U	0.69	3.9	49	14000		510	37		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	75	5.4	100	2.5		7.5 U	9.5	

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW13	8/5/02	N2			2.2 J	2.5 J	1300		45	9.1 J														
MW13	8/5/02	N	0.01 U	0.64	9.1	55.3	19000		580	39.5		5 U	1 U	5 U	5 U	5 U	86	6.8	110	0.15 U		8.4	6.3	
MW13	9/23/03	N2	0.5 U		1 U	8	960		182	10 U														
MW13	9/23/03	N	0.5 U	2.9	3	55	24600		687	50		1 U	0.25 U	2.5 U	2.5 U	2.5 U	78	5.1	35.04	1.86		7	6	
MW13	9/21/04	N2			0.259 J	1.96 J	125 UJ		3.67 J	5.28 J														
MW13	9/21/04	N	10.0 UJ	4.67	1.52	32.4	8770		357	24.3 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	68 J	6.5 J	667 J	2.4 J		6.4 R	6.30 R	
MW13	9/27/05	N2			1.0 UJ	2.5 J	50 U		7.1 J	20 U														
MW13	9/27/05	N	2.0 UJ	0.85	1.0 J	18	6200		200	18 J		0.97 U	0.50 U	5.0 U	5.0 U	5.0 U	67 J	3.1 J	68	0.60 J		19 J	4.3	
MW13	9/18/07	N	2.0 UJ	0.53 J	1.0 UJ	10 UJ	100 UJ		6.3 J	5.2 J		0.93 R	1.0 U	1.0 U	1.0 U	2.0 U	71 J	2.9	100 J	0.31 J		29 J	4.1 J	
MW13	10/21/08	N	2.0 UJ	0.31 UJ	2 U	10 UJ	207	10500 J	10 U	20 U		1.00 U	0.50 U	2.0 U	2.0 U	5.0 U	55	1.90	110 J	0.45 J		10.10	3.44 J	
MW13	10/7/09	N	0.83 UJ	0.16 J	2 UJ	3.2 J	50 UJ	4430 J	10 UJ	20 UJ		0.996 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	30 J	2.12 J	45.46 J	0.77 J		9.71 J	13.9 J	
MW13	4/13/16	N	0.50 U	0.34	5.0 U	3.2	449		13.4	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	51.0	1.4	54.9	0.70		3.4	4.2	
MW13	7/20/16	N	0.50 U	1.1	5.0 U	1.5 J	19.4 J		5.0 U	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	39.5	0.91 J	86.0	1.0		2.2	2.1	
MW13	10/10/16	N	0.50 U	0.37	0.87 J	2.3	23.2 J		0.94 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	49.3	0.98 J	56.0	0.58		3.1	1.9	
MW13	1/19/17	N	0.080	0.33	0.35 J	3.1	17.1 J		1.1 J	6.2		0.064	0.28	0.26	0.23	0.24	50.8	0.71 J	52.0	0.49		3.6	2.2	
MW13	4/19/17	N	0.50 U	0.24	5.0 U	1.1 J	100 U		0.28 J	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	53.7	0.76 J	60.0	0.50		4.4	2.2	
MW13	9/29/17	N	0.25 J	0.27 J	1.0 U	1.6 J	53.5 J		1.4 J	20.0 U		0.79 U	0.50 U	0.50 U	0.50 U	1.0 U	59.0	1.4	47.6	0.56		3.3	2.0	
MW13	10/16/18	N	1.0 U	0.35	1.0 U	1.8 J	100 U		3.2	20.0 U		0.79 U	0.50 U	0.50 U	0.15 J	1.0 U	54.9	0.83	47.7	0.41		2.8	2.4	
MW14	10/9/97	N2		1 U	2 U	2 U				2 U			0.1 U	1 U	1 U	1 U								
MW14	10/9/97	N	10 U	1 U	2 U	2 U	20 U		4 J	4			0.1 U	1 U	1 U	1 U	120	8		1.6		2.4	1 U	
MW14	4/6/00	N		0.5 U								11 U												
MW14	6/19/01	N2	0.11 U		2	25 U	25 U		4.4	25 U										2.06 =				
MW14	6/19/01	N	0.11 U	0.96	1.4	5.4 J	1070		57	25 U		239	0.1 U	1 U	1 U	1 U	104	12	124	2.06		3.48 J	6.41	
MW14	1/23/17	N	0.080	0.12	1.1 J	0.62 J	5.3		1.6 J	6.2		0.061	0.28	0.26	0.23	0.24	129	15.8	146	1.7		6.6	0.51 J	
MW14	10/3/17	N	0.087 J	0.098 U	0.95 J	0.72 J	100 U		1.1 J	20.0 U		0.76 U	0.50 U	0.50 U	0.50 U	1.0 U	129	16.1	166	1.9		6.9	0.47 J	
MW14	10/3/17	FD	0.11 J	0.099 U	1.0	0.74 J	100 U		0.93 J	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	128	17.1	148	1.9		6.7	1.0 U	
MW14	5/31/18	N	1.0 U	0.10 U	1.2	0.79 J	100 U		3.1	20.0 U		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	585	16.4	143	1.7		6.3	0.71 J	
MW14	10/17/18	N	1.0 U	0.097 U	1.1	2.0 U	100 U		1.3 J	20.0 U		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	122	15.6	142	1.8		6.4	0.68 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW15	10/16/97	N2		1 U	2 U	3.5 U				13.9			0.1 U	1 U	1 U	1 U								
MW15	10/16/97	N	10 U	1 U	2 U	2 U	8.2 J		62.2	2 U			0.1 U	1 U	1 U	1 U	190	6.5		4.1		6.3	1.2	
MW15	4/4/00	N		0.5 U								11 U												
MW15	4/25/01	N4			0.42	25 U	25 U		15 U	16										3.92 =				
MW15	4/25/01	N3	0.12 U		0.56	25 U	174		4.1	25 U		5.6 U								3.92				
MW15	4/25/01	N2	0.1 U	0.11 U	0.31	25 U	25 U		15 U	15		5.6 U	0.1 U	1 U	1 U	1 U	246	16	276	3.97 =		4.05	3.7	
MW15	4/25/01	N	0.1 U	0.11 U	0.5	25 U	58		4.8	50		5.3 U	0.1 U	1 U	1 U	1 U	240	15	276	3.97		2.61	5.24	
MW15	9/12/01	N2			0.95 U	5.7 J	63 J		2.7	36														
MW15	9/12/01	N	10 U	0.077 J	0.95 U	2.9 J	35 U		0.31 J	35		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	240	17	270	3.7		4.5 U	4.5	
MW15	8/6/02	N2			2.6	0.3 U	11 U		0.42 U	11 J														
MW15	8/6/02	N	0.01 U	0.04 U	3.7	1.6 J	130		2.8 J	17 J		5 U	1 U	5 U	5 U	5 U	230	16	250	0.15 U		4.7	53	
MW15	9/23/03	N2	0.5 U		1 U	1 U	50 U		5 U	10 U														
MW15	9/23/03	N	0.5 U	0.1 U	1 U	1 J	280		9 J	10 J		0.99 U	0.25 U	2.5 U	2.5 U	2.5 U	213	17.4	88.57	3.8		2 U	1.8	
MW15	9/21/04	N2			0.482 J	0.648 J	5.57 J		0.976 J	8.97 J														
MW15	9/21/04	N	10.0 U	0.279	0.468 J	1.74 J	36.7		3.15 J	20.8 J		1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	230	16 =	1020	3.2 J		3.9 J	12.7	
MW15	9/29/05	N2			1.0 UJ	10 UJ	50 UJ		1.6 J	20 UJ														
MW15	9/29/05	N	2.0 U	0.11 U	1.0 UJ	2.4 J	420 J		15 J	20 UJ		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	220 J	17 J	300 J	4.2 J		5.8 R	0.84 J	
MW15	9/27/06	N	2.0 UJ	0.11 U	1.0 UJ	3.5 J	50 UJ		2.0 UB	13 J		0.91 U	0.50 U	5.0 U	5.0 U	5.0 U	260 J	14 J	250	4.7 J		5.9 J	2.1	
MW15	9/19/07	N	2.0 UJ	0.10 U	0.68 J	10 UJ	100 UJ		10 UJ	20 UJ		1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	250	15	250 J	5.7		13 J	1.3 J	
MW15	5/20/08	N	2.0 UJ	0.18 J	0.40 J	1.0 J	100 UJ		0.52 J	20 U		0.93 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ	260 =	14	290	4.7		6.6	0.85 J	
MW15	10/21/08	N	2.0 UJ	0.10 UJ	2 U	10 UJ	854	45400	10 U	20 U		1.00 U	0.5 U	2.0 U	2.0 U	5.00 U	265	14.60	567 J	6.05 J		6.99	13.60 J	
MW15	6/2/09	N	0.8 UJ	0.1 UJ	2 U	10 UJ	301 =	30600 =	10 U	20 U		1.0 UJ	0.5 U	0.21 J	2.0 U	5.0 U	279 J	13.5	375.2114	5.33 J		6.42	1.7 UJ	
MW15	10/7/09	N	0.83 UJ	0.1 UJ	2 UJ	3 J	293 J	25500 J	10 UJ	5.4 J		0.999 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	260 J	12.9 J	294.28 J	4.74 J		6.52 J	1.49 J	
MW15	5/18/10	N	1.3 U	0.1 U	2 UJ	10 UJ	194. J	24400. J	10 UJ	20 UJ		1.0 U	0.5 U	5 U	5 U	5 U	300	10.7	342	4.57 J		6.3	26.7 UB	
MW15	10/7/10	N	1.3 U	2.32 J	2 U	8 U	311	38400	16.7 U	20 U		1.0 UJ	0.5 UJ	2 UJ	2 UJ	5 UJ	252	13.2 J	430	5.49 J		6.9 J	1.0 U	
MW15	6/28/11	N	0.9 U	0.1 U	2 UJ	10 U	205	23100	10 U	20 U		0.998 U	0.1 U	0.4 U	0.4 U	1 U	239	12.1 J	307.00	5.2 J		6.91	0.77 J	
MW15	10/18/11	N	0.50 U	0.10 U	0.70 J	2.7 J+	50 U	24000 B	1.7 J	10 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	240	12	261.00	4.8 J		5.3	1.0 J	
MW15	5/22/12	N	0.50 U	0.024 J	2.0 U	10 U	50 U	24000 =	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	260	11	266.00	4.6 J		5.1 J	1.2	

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW15	10/16/12	N	0.50 U	0.094 U	0.97 J	10 U	50 U	24000 =	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	250	12	271	5.3 J		5.0 U	0.69 J	
MW15	5/21/13	N	0.50 U	0.025 J	2.0 U	10 U	50 U	26000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	280	9.8		4.7 J		5.9	0.82 J	
MW15	10/8/13	N	0.50 U	0.095 U	0.36 J	10.0 U	50 U	23000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	220	11		5.2 J		6.5	0.50 J	
MW15	5/13/14	N		0.095 U																				
MW15	9/23/14	N	0.50 U	0.054 J	1.1 J	2.0 U	28 J		1.9 J	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	210	11	250	5.3		5.6	0.85 J	
MW15	4/20/15	N	0.50 U	0.094 U	0.78 J	2.0 U	100 U		1.1 J	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	190	11	270	5.6		5.7	0.44 J	
MW15	10/12/15	N	0.50 U	0.094 U	0.54 J	1.0 J	100 U		5.0 U	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	224	12.0	302	6.7		5.8	0.55 J	
MW15	4/5/16	N	0.50 U	0.078 J	0.70 J	1.7 J	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	207	12.5	312	0.45		6.3	0.49 J	
MW16	10/14/97	N2		1 U	2 U	2.7 U				1.9 J			0.1 U	1 U	1 U	1 U								
MW16	10/14/97	N	10 U	1 U	17.1	438	15.3 J		10300 J	210			0.1 U	1 U	1 U	1 U	170	6.1		2.6		8.1	3	
MW16	4/6/00	N		0.5 U								10 U												
MW16	4/23/01	N2	0.12 U		1 U	25 U	26		9.4	23										8.69				
MW16	4/23/01	N	0.12 U	0.11 U	6.5	62	22300		1460	136		5.6 U	0.1 U	1 U	1 U	1 U	90	3.57	164	8.69 =		29	4.4	
MW16	9/10/01	N2			0.29 U	2.2 U	35 U		0.82 J	4.5 J														
MW16	9/10/01	N	10 U	0.17	1.8	23 U	5500		520	19		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	79	1.8	120	5.8		11	0.34 U	
MW16	8/6/02	N2			1.4 U	0.3 U	78		9.1 J	13 J														
MW16	8/6/02	N	0.01 U	0.035 J	3.5	25 J	6800		14	760 J		5 U	1 U	5 U	5 U	5 U	130	2	120	0.15 U		13	1.3	
MW16	9/23/03	N2	0.5 U		1 U	1 U	50 U		5 U	10 U														
MW16	9/23/03	N	0.5 U	0.089 J	2 J	18	7470		532	10 J		1.1 U	0.25 U	2.5 U	2.5 U	2.5 U	82	6.2	37.96	3.49		3 J	2.3	
MW16	9/21/04	N2			0.135 J	0.509 J	25.0 U		0.617 J	2.79 J														
MW16	9/21/04	N	10.0 U	0.0962 J	0.277 J	4.07 J	570		74.7	8.71 J		1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	82	3.7 =	1220	2.1 J		5.5 J	4.28	
MW16	9/29/05	N2			1.0 UJ	2.9 J	50 UJ		2.1 J	20 UJ														
MW16	9/29/05	N	2.0 U	0.11 U	1.0 UJ	7.6 J	1000 J		130 J	8.1 J		1.0 U	0.50 U	5.0 U	5.0 U	5.0 U	82 J	11 J	190 J	1.5 J		71 R	0.83 J	
MW16	9/27/06	N	2.0 UJ	0.046 J	1.0 UJ	10 UJ	50 UJ		0.59 UB	20 UJ		0.92 U	0.50 U	5.0 U	5.0 U	5.0 U	83 J	4.1 J	100	1.2 J		32 J	1.3	
MW16	9/18/07	N	2.0 UJ	0.20 J	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.99 R	1.0 U	1.0 U	1.0 U	2.0 U	81 J	4.5	120 J	1.2 J		23 J	1.3 J	
MW16	10/22/08	N	2.0 UJ	0.08 J	2 UJ	10 UJ	318 J	19400 J	20 J	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	51 J	7.51	175 J	0.99 J		43.2	92.3	
MW16	10/6/09	N	0.83 UJ	0.1 UJ	2 UJ	6.6 J	458 J	8360 J	48.6 J	20 UJ		0.998 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	40 J	6.35 J	81.869 J	1.03 J		36.7 J	1 UJ	
MW16	10/5/10	N	1.3 U	0.1 U	2 U	8 U	50 U	2910 R	16.7 U	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	39	5.7 J	29.3	0.63 J		6.3 J	15.7	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW16	10/19/11	N	0.50 U	0.095 U	0.44 J	2.2 J+	130	3200 B	14	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	32	4.2	30.70	0.63 J		12	1.0 U	
MW16	10/16/12	N	0.50 U	0.099 U	0.66 J	10 U	180	3600 =	17	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	37	4.6	39.8	0.52 J		17 J	1.3	
MW16	10/8/13	N	0.50 U	0.029 J	0.61 J	10.0 U	1500 B	3300 B	100 B	59 J		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	34	6.2		0.57 J		6.3	1.1	
MW16	9/23/14	N	0.50 U	0.036 J	0.41 J	2.0 U	100 U		5.0 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	31	5.4	60	0.54		2.8	1.1	
MW16	10/13/15	N	0.50 U	0.098 U	5.0 U	1.0 J	45.2 J		2.1 J	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	48.4	4.3	84.4	0.61		5.9	0.70 J	
MW16	4/6/16	N	0.50 U	0.096 U	5.0 U	1.9 J	168		14.6	20.0 U		0.11 J	0.50 U	1.0 U	1.0 U	2.0 U	32.6	2.2	31.8	0.41		2.6	2.3	
MW16	7/19/16	N	0.50 U	0.094 U	5.0 U	2.2	114		11.5	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	32.4	2.2	34.0	0.42		2.6	5.8	
MW16	10/12/16	N	0.50 U	0.18	0.40 J	1.7 J	61.7 J		5.3	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	33.1	2.4	24.0	0.30		2.2	0.58 J	
MW16	1/18/17	N	0.080	0.015	0.47 J	1.3 J	11.5 J		1.2 J	6.2		0.060	0.28	0.26	0.23	0.24	31.3	3.2	46.0	0.46		3.6	1.1	
MW16	4/19/17	N	0.50 U	0.10 U	5.0 U	1.6 J	7.7 J		0.80 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	39.0	3.3	60.0	0.57		4.5	2.0	
MW16	10/2/17	N	0.11 J	0.096 U	1.0 U	2.5	100 U		2.0 J	8.8 J		0.90 U	0.50 U	0.50 U	0.50 U	1.0 U	43.7	4.0	45.7	0.73		6.6	0.82 J	
MW16	10/16/18	N	1.0 U	0.10 U	0.26 J	3.2	100 U		2.5 U	13.0 J		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	32.0	4.5	28.6	0.74		3.5	1.8	
MW17	10/15/97	N2		1 U	2 U	2.3 U				2.5			0.1 U	1 J	1 U	0.6 J								
MW17	10/15/97	N	10 U	1 U	2 U	2	10 U		2 U	17.6			0.1 U	1 JB	1 U	0.6 J	180	4.8		4.1		10	0.7 J	
MW17	10/28/97	N		5																				
MW17	4/6/00	N		0.5 U								11 U												
MW17	4/26/01	N2	0.12 U		0.69	25 U	25 U		15 U	25 U										4.98 =				
MW17	4/26/01	N	0.12 U	0.72	0.6	25 U	33		15 U	12		54	0.1 U	1 U	1 U	1 U	202	4.12	228	4.98		6.82	1.57	
MW17	9/11/01	N2			1	2.2 U	310		0.27 U	3.7 U														
MW17	9/11/01	N	10 U	0.059 U	0.94	2.2 U	330		0.27 U	3.7 U		0.29 U	0.44 U	0.5 U	0.4 U	1.2 U	180	4.8	210	4.4		9.3 U	1 J	
MW17	8/8/02	N2			1.9 J	0.3 U	11 U		0.42 U	15 J														
MW17	8/8/02	N	0.01 U	0.032 J	3	0.47 J	11 U		0.42 U	0.98 U		5 U	1 U	5 U	5 U	5 U	200	4.6	210	0.15 U		7.4	0.73	
MW17	9/25/03	N2	0.5 U		1 U	1 U	50 U		5 U	10 U														
MW17	9/25/03	N	0.5 U	0.46	1 U	1 U	50 U		18	10 U		0.96 U	0.25 U	2.5 U	2.5 U	2.5 U	184	4.4	71.56	5.1		2 U	2.1	
MW17	9/22/04	N2			0.782 J	0.847 J	13.9 J		45.0 J	2.09 J														
MW17	9/22/04	N	10.0 UJ	2.82	0.0787 J	0.774 J	11.5 UB		0.371 J	2.46 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	190 J	4.1 J	1100 J	4.8 J		8.6 R	1.67 R	
MW17	9/27/05	N2			1.0 UJ	10 U	50 U		10 U	20 U														
MW17	9/27/05	N	2.0 UJ	0.054 J	1.0 UJ	10 U	50 U		0.44 J	20 U		0.92 U	0.50 U	5.0 U	5.0 U	5.0 U	160 J	3.9 J	180	5.1 J		7.8 J	0.91 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW17	9/26/06	N	2.0 UJ	0.11 U	1.0 UJ	10 UJ	50 UJ		10 UJ	7.5 J		0.91 U	0.50 U	5.0 U	5.0 U	5.0 U	170 J	2.9 J	170	5.5 J		6.5 J	1.1	
MW17	9/19/07	N	2.0 UJ	0.099 U	1.0 J	10 UJ	100 UJ		10 UJ	20 UJ		0.94 U	1.0 U	1.0 U	1.0 U	2.0 U	160	4.7	160 J	5.6		14 J	1.2 J	
MW17	10/22/08	N	2.0 UJ	0.1	2 UJ	10 UJ	374 J	29200 J	10 UJ	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5 U	155 J	7.78	295 J	5.75 J		7.75	20.2	
MW17	10/6/09	N	0.83 UJ	0.1 UJ	2 UJ	10 UJ	160 J	26700 J	10 UJ	20 UJ		0.995 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	60 J	6.54 J	295.228 J	1.65 J		6.86 J	1 UJ	
MW17	10/5/10	N	1.3 U	0.1 U	2 U	10 U	163	20500	10 U	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	160	11.6 J	225	5.18		9.7 J	1.6	
MW17	10/18/11	N	0.50 U	0.095 U	1.1 J	2 U	50 U	17000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	140	16	180.00	3.9		24	0.89 J	
MW17	10/16/12	N	0.50 U	0.095 U	1.2 J	10 U	50 U	17000 =	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	150	16	187	4.7		23 J	0.59 J	
MW17	10/8/13	N	0.50 U	0.095 U	0.72 J	10.0 U	50 U	18000 B	10 U	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	140	16		4.5 J		36	0.40 J	
MW17	9/24/14	N	0.50 U	0.097 U	0.83 J	2.0 U	100 U		1.3 J	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	150	15	250	4.8		40	0.72 J	
MW17	10/13/15	N	0.50 U	0.095 U	1.1 J	2.0 U	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	184	14.8	265	4.2		45.3	0.59 J	
MW17	4/5/16	N	0.50 U	0.095 U	0.81 J	1.8 J	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	173	13.6	289	3.5		85.4	0.46 J	
MW17	7/19/16	N	0.50 U	0.095 U	0.84 J	1.4 J	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	195	14.7	336	2.8		142	0.52 J	
MW17	10/11/16	N	0.50 U	0.094 U	0.80 J	0.76 J	100 U		0.28 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	208	17.0	348	2.7		136	0.36 J	
MW17	1/23/17	N	0.13 J	0.099	0.73 J	1.4 J	5.3		0.25	6.2		0.060	0.28	0.26	0.23	0.24	202	17.4	390	2.1		167	0.81 J	
MW17	1/23/17	FD	0.080	0.015	0.76 J	0.66 J	5.3		0.25	6.2		0.060	0.28	0.26	0.23	0.24	213	17.4	380	2.1		167	0.50 J	
MW17	4/20/17	N	0.50 U	0.10 U	0.71 J	0.77 J	100 U		0.45 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	201	16.1	460	2.2		164	0.48 J	
MW17	4/20/17	FD	0.50 U	0.10 U	0.68 J	0.65 J	100 U		0.58 J	20.0 U		0.24 U	0.50 U	1.0 U	1.0 U	2.0 U	223	16.1	470	2.2		165	0.43 J	
MW17	10/3/17	N	0.096 J	0.099 U	0.74 J	1.8 J	100 U		2.5 U	20.0 U		0.85 U	0.50 U	0.50 U	0.50 U	1.0 U	212	17.2	390	3.5		125	1.0 U	
MW17	5/31/18	N	1.0 U	0.096 U	0.79 J	1.7 J	100 U		2.5 U	20.0 U		0.77 U	0.50 U	0.50 U	0.50 U	1.0 U	194	14.9	311	3.3		98.2	0.77 J	
MW17	10/17/18	N	1.0 U	0.11 U	0.63 J	1.1 J	100 U		2.5 U	20.0 U		0.81 U	0.50 U	0.50 U	0.15 J	1.0 U	185	13.6	317	2.9		106	0.61 J	
MW18	10/10/97	N2		27000 E	8.9	62.5				5.3			0.1 U	2	16	19								
MW18	10/10/97	N	10 U	27000 J	8.2	43.5 J	32000 J		10600	2.6			0.1 U	2	16	19	260	49		0.1 U		11	154	
MW18	6/19/01	N2	0.13 U		5	43	15200		6540	25 U														
MW18	6/19/01	N	0.13 U	27400	4.9	21 J	13700		6650	25 U		5 U	1.1	14	10 U	20	168	19	182	0.13 U		33 J	6.63	
MW19	10/16/97	N2		19000 E	2 U	3.4 U				2 U			0.2	1 U	1 U	0.2 J								
MW19	10/16/97	N	10 U	19000 J	2 U	38 J	10 U		2690 J	46			0.2	1 U	1 U	0.2 J	180	47		3.8		19	32.8	
MW19	4/7/00	N2		11000 J								22 =												
MW19	4/7/00	N		11800 =								5260 U												

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW19	4/26/01	N2	0.5		1 U	25 U	25 U		1790	25 U		325	10 U	100 U	100 U	100 U				3.37				
MW19	4/26/01	N	0.5	25600	2.2	38	10000		1840	27		325 =	1 U	10 U	10 U	10	236	39	323	3.37 =		47	33	
MW19	9/12/01	N2			1.7 J	44	5600		2100	53 J														
MW19	9/12/01	N	16	400000	0.29 U	6.4 J	71 J		1800	5.8 J		240	0.44 U	1.9 U	1.7 U	28	320 J	19	270	1.3		9.7 U	34	
MW19	5/13/02	N		14000	1.4 U	5.1 J	11.2 U		2070	9.4 J		190												
MW19	8/8/02	N2			1.4 U	7.1 J	218		3110	5.7 J														
MW19	8/8/02	N	0.01 U	11000 J	7	30.2	719		3100	290		210	1 U	2 J	1 J	29	130	22	4 U	0.16		16	65	
MW19	4/29/03	N2	2.4		1 U	5	25 U		3590	10 U														
MW19	4/29/03	N	2.4	4900	2 J	24	2030		3670	10 U		1200	500 U	5000 U	5000 U	5000 U	118	19.6	162	3		27	53	
MW19	9/25/03	N2	5.7		1 U	9	50 J		4470	10 U										2 J				
MW19	9/25/03	N	5.7	15000	1 U	27	950		2210	10 U		3200	1 U	10 U	10 U	46.6	160	17.5 J	71.57	2 J		90 J	129 J	
MW19	5/4/04	N2			0.169 J	5.77 R	31.4		3360 R	6.93 R														
MW19	5/4/04	N	1.13 J	70000 J	0.284 J	22.2 R	892 R	17600	4040 R	11.6 R		201	2.50 U	2.13 J	1.98 J	30.0	144	25 =	176	0.71 J		16 R	43.7 J	
MW19	9/22/04	N2			0.159 J	6.26 J	125 U		2650	16.0 J														
MW19	9/22/04	N	10.0 UJ	111000	1.00 UJ	13.5 J	402 J		3160 J	16.7 J		260	0.500 U	3.45 J	2.25 J	50.3	110 J	15 J	1120 J	1.5 J		23 R	31.3 R	
MW19	5/10/05	N2			1.0 U	15	630		2100	8.4 J														
MW19	5/10/05	N	2.0 U	45000 J	1.0 U	6.3 J	50 U		2300	9.8 J		2300 =	100 UJ	1000 UJ	1000 UJ	1000 UJ	97 J	18 J	140 J	0.76 J		29 R	35 R	
MW19	9/29/05	N2			1.0 UJ	5.0 J	50 UJ		2700 J	20 UJ														
MW19	9/29/05	N	2.0 U	13000 =	1.0 UJ	11 J	97 J		2600 J	20 UJ		78	0.50 U	1.2 J	1.1 J	18	140 J	19 J	5 UJ	0.75 J		40 R	32 J	
MW19	6/7/06	N	2.0 U	17000 J	1.0 UJ	4.4 J	50 UJ		2700 J	20 UJ		59	0.50 U	1.5 J	1.3 J	22	120 J	18 J	360 J	0.76 J		36 =	20 J	
MW19	9/27/06	N	2.0 UJ	8200 J	1.0 U	6.4 J	50 U		3100	20 U		69	0.50 U	1.4 J	1.2 J	19	160 J	14	190	0.66 J		30 =	35	
MW19	5/9/07	N	2.0 UJ	11000 J	1.0 UJ	3.7 J	100 UJ		2600	20 UJ		54 J	1.0 U	1.4	1.5	17	230 =	15	160	0.29		59 J	33 UB	
MW19	9/21/07	N		3500 J	1.0 UJ	4.0 J	100 UJ		3100	20 UJ		47 R	1.0 U	1.8	2.0	21	190 J	17	240 J	0.28		42 J	38 J	
MW19	5/20/08	N	2.0 U	23000 J	1.0 U	3.4	100 UJ		2900	2.3 J		140	1.0 UJ	5.0	4.8	54 J	220 =	16	260	0.44		42	18 J	
MW19	10/24/08	N	2.1 J	27900	2 UJ	5 J	510 J	28700 J	4850 J	20 UJ		120	0.5 U	5.11	5.08 =	50.3	221 J	15.9	373 J	0.04 J		46.2	29.8	
MW19	6/2/09	N	3.9 J	18600 J	2 U	10 UJ	222 =	29900 =	4050 =	20 U		110 J	0.5 U	7.93	6.66	74.6	249 J	12.8	317.6445	0.01 UB		44.7	13	
MW19	10/7/09	N	2 J	31800 J	2 UJ	3.8 J	237 J	27400 J	3190 J	7.2 J		137 J	0.1 UJ	7.62 J	5.77 J	60.7 J	228 J	14.3 J	271.39 J	0.05 UJ		42 J	20.4 J	
MW19	5/20/10	N	1.4	26000.	2 UJ	3.2 J	92.2 UJ	19900. J	1870. J	20 UJ		123.	0.5 U	7.95	5.65	64.3	136	21.5	199	0.05 UJ		32.4	50.4 UB	

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW19	10/7/10	N	1.3 U	4470 J	2 U	2.9 J	114	7130	942	20 U		102 J	0.5 UJ	3.21 J	1.7 J	44.7 J	84	13.6 J	77.8	0.10 UJ		18.7 J	17.4
MW19	6/29/11	N	0.9 U	8880	2 UJ	14.8 J	131	9550	1300	20 U		42.1	0.1 U	1.12	1.09	22.7	43	16.6 J	90.00	0.26		20.1	85.4
MW19	10/20/11	N	0.33 J	13000	2.0 U	12 B	52 J+	8600 B	1700	14 J+		2.8	0.84 U	1.1 J	1.0 J	23	57	19	85.40	0.30		17	92
MW19	5/22/12	N	0.71	5300	2.0 U	7.6 J	50 U	7600 =	1300	20 U		50	2.0 U	0.88 J	0.76 J	16	51	15	76.20	1.1		12	38
MW19	10/17/12	N	0.50 U	8100	2.0 U	6.9 J	50 U	5800 =	900	20 U		8.4	2.0 U	4.0 U	0.67 J	9.7	36	12	66.3	1.4		11 J	27
MW19	5/22/13	N	0.84 J	5800	2.0 U	7.3 J	50 U	8700 B	1100 B	20 U		29 J	0.50 U	0.99 J	1.5	19	54	14		1.1 J		11	45
MW19	10/10/13	N	0.50 U	7900	0.26 J	10.0 UJ	50 UJ	5800 J	990 J	20 UJ		3.0	2.5 U	5.0 U	1.1 J	15	36 B	12		1.1 J		11	31
MW19	5/14/14	N		18000																			
MW20	10/15/97	N	10 U	29000 J									0.1 U	1 U	1 U	0.1 U							
MW20	4/26/01	N2	2.73		1.1	14	841		2250	23		9970	10 U	100 U	100 U	71							
MW20	4/26/01	N	2.73	36600	8.2	196	33200		3120	126		9970 =	1 U	10 U	10 U	29	198	24	301	0.13 U		67	478
MW20	9/12/01	N2			1.5	15 U	35 U		2800	12 U													
MW20	9/12/01	N	10 U	83000	3.6	81	7900		3200	36		890	0.44 U	3.4 U	4.1 U	37	260 J	16	250	0.15 J		24	65
MW20	8/7/02	N2			2.6	5.8 J	206		3280	15.4 J													
MW20	8/7/02	N	0.01 U	30000 J	8.9	87.4	4910		3520	16.6 J		1400	1 U	12	9	120	220	22	4 U	0.15 U		25	71
MW20	9/25/03	N2	5.4		1 U	11	350		3250	10 J										1.25 U			
MW20	9/25/03	N	5.4	13000	2 J	58	7220		3310	20 J		830	1 U	10 U	10 U	60.9	233	19.4 J	86.67	1.25 U		80 J	150 J
MW20	9/22/04	N2			0.498 J	35.2 J	2070		2320	47.0 J													
MW20	9/22/04	N	10.0 UJ	133000	1.00 UJ	30.4 J	1320 J		2770 J	18.7 J		282	2.50 U	3.01 J	3.21 J	40.3	190 J	24 J	1320 J	0.29 J		23 R	46.3 R
MW20	10/25/05	N2			1.0 UJ	2.7 UJ	140 J		2400 J	20 UJ													
MW20	10/25/05	N	2.0 UJ	63000 =	1.0 U	16 J	780 J		2300 J	20 UJ			0.50 U	5.5	5.4	62	170 J	13 J	190 J	2.1 J		39 R	21 R
MW20	9/27/06	N	2.0 UJ	35000 J	1.0 U	3.8 J	48 J		4200	20 U		160 =	0.50 U	4.8 J	4.1 J	51	220 J	16	240	0.22		71 =	23
MW20	9/27/06	FD	2.0 UJ	44000 J	1.0 UJ	4.8 J	94 J		4200	20 U		180 =	0.50 U	5.1	4.1 J	53	230 J	16	380	0.19		65 =	22
MW20	9/21/07	N	2.0 U	9500 J	1.0 UJ	10 UJ	100 UJ		4800	20 UJ		71 R	1.0 U	6.4	4.4	62	230 J	18	300 J	0.10 U		98 J	13 J
MW20	10/23/08	N	2.0 UJ	41000	2 UJ	17.3 J	462	31700 J	3400 J	20 UJ		1150	0.5 U	2.99 =	2.94 =	38.7	127 J	15.7	332 J	0.13 J		28.9	121
MW20	4/20/17	N	0.50 U	0.10 U	1.0 J	0.37 J	100 U		0.33 J	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	131	14.8	186	3.5		7.0	0.47 J
MW20	4/20/17	FD	0.50 U	0.10 U	0.99 J	2.0 U	100 U		0.64 J	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	133	14.7	188	1.7		7.0	0.49 J
MW21	2/9/98	N2		1 U	2 U	9.5 U				32.6 U			0.1 U	1 U	1 U	1 U							

Appendix A.1

**Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW21	2/9/98	N	11	1 U	3	70.1	5.5 U		1210	113			0.1 U	1 U	1 U	1 U	176	70.6				9.1	0.47 U	
MW21	2/9/98	FD2			2 U	9.5 U				33.8														
MW21	2/9/98	FD	10	1	3.1	83.9	7.3 U		1380	98.9			0.1 U	1 U	1 U	1 U	196	67.3				8.9	0.47 U	
MW21	5/14/02	N			1.9 J	1.3 J	130		9.7 J	11 J														
MW21	8/6/02	N2			1.6 J	0.3 U	11 U		0.63 J	6.8 J														
MW21	8/6/02	N		0.035 J	4.4	50	10000		930	29		5 U	1 U	5 U	5 U	5 U	120	49	150	0.15 U		9.6	8.3	
MW21	4/29/03	N2	0.5 U		1 U	1 U	25 U		5 U	10 U														
MW21	4/29/03	N	0.5 U	0.15	1 U	12	3440		227	10 U		7.4 U	0.5 U	5 U	5 U	5 U	144	41	169	2.5		12	1.5	
MW21	9/24/03	N2	0.5 U		1 U	1 U	50 UJ		5 U	10 U														
MW21	9/24/03	N	0.5 U	0.063 J	1 U	260	68400		3750	150		1 U	0.25 U	2.5 U	2.5 U	2.5 U	165	48	81.46	2.62		2 U	3.6	
MW21	5/4/04	N2			0.122 J	1.28 R	28.6 R		0.718 R	4.48 R														
MW21	5/4/04	N	10.0 U	0.135 UB	2.31 J	72.5 R	14000 R	19300	1970 R	46.5 R		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	165	67 =	188	2.3 J		3.6 R	3.12 J	
MW21	9/21/04	N2			0.130 J	0.955 J	25.0 UJ		0.484 J	3.30 J														
MW21	9/21/04	N	10.0 UJ	0.474	1.80 J	48.2 J	10300 J		983 J	32.6 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	150 J	63 J	1030 J	2.4 J		4.8 R	2.76 R	
MW21	5/10/05	N2			1.0 U	25	6200		480	16 J														
MW21	5/10/05	N	2.0 U	0.33	1.0 U	10 U	50 U		0.47 J	20 U		0.98 U	0.50 U	5.0 U	5.0 U	5.0 U	130 J	49 J	170 J	2.8 J		12 R	2.2 R	
MW21	9/27/05	N2			1.0 UJ	2.6 J	36 J		9.8 J	20 U														
MW21	9/27/05	N	2.0 UJ	0.046 J	7.1	230	56000		3400	110		0.91 U	0.50 U	5.0 U	5.0 U	5.0 U	130 J	47 J	370	2.4 J		17 J	1.2	
MW21	6/1/06	N	2.0 U	0.023 J	1.0 UJ	10 UJ	47 J		17 J	20 UJ		0.99 U	0.50 U	5.0 U	5.0 U	5.0 U	140 J	65 J	140	2.7 J		20	1.5 J	
MW21	5/8/07	N	2.0 UJ	0.098 UJ	1.0 UJ	10 UJ	100 UJ		10 UJ	4.2 J		1.0 R	1.0 U	1.0 U	1.0 U	2.0 U	210 =	33 J	120	4.2		9.3 J	1.7	
MW21	9/18/07	N	2.0 UJ	0.13 J	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.98 R	1.0 U	1.0 U	1.0 U	2.0 U	110 J	29	120 J	3.7 J		12 J	1.2 J	
MW21	10/21/08	N	2.0 UJ	0.10 UJ	2 U	10 UJ	294 J	14900 J	10 U	20 U		1.00 U	0.50 U	2.00 U	2.0 U	5.00 U	66	68.80	149 J	2.69 J		7.27 U	2.38 J	
MW21	4/6/16	N	0.092 J	0.016 J	0.70 J	1.0 J	22.8 J		1.7 J	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	25.9	101	83.6	1.8		6.8	0.63 J	
MW21	7/20/16	N	0.11 J	8.5	5.0 U	1.3 J	29.4 J		5.0 U	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	29.4	84.5	84.0	1.7		6.8	0.93 J	
MW21	7/20/16	FD	0.50 U	5.5	5.0 U	0.86 J	23.5 J		5.0 U	20.0 U		0.24 U	0.50 U	1.0 U	1.0 U	2.0 U	29.9	84.9	78.0	1.7		6.6	0.90 J	
MW21	10/11/16	N	0.50 U	5.7	0.38 J	1.8 J	6.2 J		0.44 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	30.5	74.4	82.0	1.8		6.6	0.61 J	
MW21	1/18/17	N	0.080	2.9	0.39 J	2.2	6.8 J		0.25	6.2		0.060	0.28	0.26	0.23	0.24	25.4	86.8	88.0	1.8		7.4	0.75 J	
MW21	4/18/17	N	0.50 U	0.017 J	5.0 U	0.44 J	100 U		5.0 U	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	26.7	78.6	92.0	1.8		7.5	0.77 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW21	10/3/17	N	0.082 J	0.096 U	0.28 J	1.2 J	100 U		2.5 U	20.0 U		0.76 U	0.50 U	0.50 U	0.50 U	1.0 U	35.2	72.6	70.5	1.8		7.1	0.76 J
MW21	10/17/18	N	1.0 U	0.099 U	1.0 U	1.2 J	100 U		2.5 U	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	35.4	66.6	65.6	1.9		6.0	1.1
MW22	2/9/98	N2		1 U	2 U	9.5 U				12.6			0.1 U	1 U	1 U	1 U							
MW22	2/9/98	N	13	1 U	4	255	5.5 U		3700	121			0.1 U	1 U	1 U	1 U	186	56.3				17.9	0.47 U
MW22	5/14/02	N			1.4 U	0.3 U	22.9 J		3.5 J	2.7 J													
MW22	8/6/02	N2			1.4 U	0.3 U	25 J		0.42 U	4.9 J													
MW22	8/6/02	N	0.01 U	0.078	2.2 J	9.8 J	2500		170	7.3 J		5 U	1 U	5 U	5 U	5 U	150	7.2	170	0.15 U		12	1.3
MW22	9/24/03	N2	0.5 U		1 U	20	2770		542	20 J													
MW22	9/24/03	N	0.5 U	0.34	7	140	56900		2570	120 J		1 U	0.25 U	2.5 U	2.5 U	2.5 U	132	4.9	101.8	2.15		3 J	1.7
MW22	9/21/04	N2			0.164 J	0.473 J	25.0 UJ		15.0 UJ	2.31 J													
MW22	9/21/04	N	10.0 UJ	0.220	2.76 J	71.6 J	13600 J		963 J	48.4 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	130 J	11 J	885 J	2.2 J		6.7 R	3.86 R
MW22	9/28/05	N2			1.0 UJ	10 UJ	50 UJ		1.3 J	20 UJ													
MW22	9/28/05	N	2.0 U	0.16 J	1.0 UJ	9.8 J	2100 J		130 J	8.0 J		1.0 U	0.50 U	5.0 U	5.0 U	5.0 U	91 J	9.6 J	130 J	1.7 J		18 R	0.94 J
MW22	9/18/07	N	2.0 UJ	0.13 J	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.99 R	1.0 U	1.0 U	1.0 U	2.0 U	110 J	8.2	160 J	2.5 J		10 J	1.0 J
MW22	5/20/08	N	2.0 UJ	0.77 J	1.0 U	0.98 J	100 UJ		3.6	5.4 J		0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ	110 =	8.4	200	2.3		12	3.0 J
MW22	10/21/08	N	2.0 UJ	0.09 UJ	2.60 J	10 UJ	303 J	11100 J	0.01 U	20 U		1.00 U	0.5 U	2.0 U	2.0 U	5.0 U	90	4.69	111 J	1.48 J		6.95	21.10 J
MW22	6/2/09	N	0.8 UJ	0.1 UJ	2 U	10 UJ	83.1 =	10000 J	10 U	20 U		1.0 UJ	0.5 U	0.22 J	2.0 U	5.0 U	70 J	6.92	99.6098	1.97 J		6.73	1.7 UJ
MW22	10/6/09	N	0.83 UJ	0.1 UJ	2 UJ	13.1 J	1560 J	11500 J	168 J	6.7 J		0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	147 J	7 J	106.54 J	5.31 J		7.53 J	8.62 J
MW22	5/18/10	N	1.3 U	0.1 U									0.5 U	5 U	5 U	5 U	66 UB	9.21		1.9 J		6.9	58.8 UB
MW22	10/6/10	N	1.3 U	0.13 UB	2 U	4.1 J	74.2 J	3680	16.7 U	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	62	1.8 J	40.9	0.90 J		5.6 J	24.6
MW22	6/29/11	N	0.9 U	0.1 U	2 UJ	4.5 J	499	3700	27.6	20 U		0.999 U	0.1 U	0.4 U	0.4 U	1 U	32.	0.78 J+	34.10	0.46 J		3.9 J	11
MW22	10/18/11	N	0.50 U	0.098 U	0.45 J	2.1 J+	50 U	3600 B	2.7 J	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	43	1.0 U	37.30	0.50 J		3.5 J	1.0 U
MW22	5/22/12	N	0.50 U	0.084 J	2.0 U	2.3 J	160	5000 =	13	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	49	3.4	50.60	0.76 J		3.9 J	10
MW22	10/16/12	N	0.50 U	0.096 U	0.59 J	10 U	50 U	5000 =	5.7 J	20 U		0.19 U	2.5 UJ	5.0 UJ	5.0 UJ	10 UJ	48	4.1	53.1	0.48 J		5.0 U	36
MW22	5/22/13	N	0.50 U	0.11	2.0 U	10 U	50 U	4000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	41	3.7		1.0 J		3.9	15
MW22	10/8/13	N	0.50 U	0.14	0.24 J	10.0 U	50 U	5200 B	2.8 J	20 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	45	7.2		1.4 J		4.7	10
MW22	5/14/14	N		0.093 J																			
MW22	9/24/14	N	0.50 U	0.27	0.22 J	2.0 U	25 J		19	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	51	1.7	60	0.69		3.6	0.71 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW22	4/21/15	N	0.50 U	0.072 J	0.60 J	2.8	390		23	20 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	42	1.9	57	0.69		3.7	0.57 J	
MW22	10/13/15	N	0.50 U	0.041 J	5.0 U	1.2 J	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	46.3	1.7	52.3	0.65		2.8	0.74 J	
MW22	4/6/16	N	0.50 U	0.025 J	5.0 U	0.92 J	17.5 J		2.2 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	50.8	1.3	57.7	0.61		2.9	5.3	
MW22	7/20/16	N	0.50 U	0.030 J	5.0 U	3.4	235		10	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	58.6	1.2	64.0	0.60		3.1	1.7	
MW22	10/12/16	N	0.50 U	0.043 J	0.41 J	1.7 J	85.4 J		5.4	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	67.2	1.7	70.0	0.53		3.5	0.96 J	
MW22	1/18/17	N	0.080 J	0.058 J	0.44 J	3.4	186		10.6	6.2		0.060	0.28	0.26	0.23	0.24	58.4	2.1	94.0	0.65		3.8	1.1	
MW22	4/21/17	N	0.50 U	0.090 J	5.0 U	2.6	100 U		0.31 J	20.0 U		0.23 U	0.50 U	1.0 U	1.0 U	2.0 U	62.9	2.8	110	0.77		4.4	0.93 J	
MW22	10/4/17	N	0.39 J	0.049 J	1.0 U	2.6	198		11.9	8.5 J		0.89 U	0.50 U	0.50 U	0.50 U	1.0 U	74.1	2.7	77.9	0.71		3.7	0.90 J	
MW22	10/17/18	N	1.0 U	0.10 U	1.0 U	3.2	100 U		2.5 U	16.3 J		0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	61.7	2.5	70.2	0.71		3.8	0.78 J	
MW23	2/26/98	N2		1 U	2 U	14.2 U				6.6			2 =	1 U	77 =	2 =								
MW23	2/26/98	N	57	1 U	2 U	17.6 U	5.5 U		128	43.6			2	1 U	77	2	120	8.7				7.6	0.47 U	
MW23	9/11/01	N2			0.62 J	2.2 U	35 U		29	4.7 J														
MW23	9/11/01	N	10 U	0.49	1.2	6.3 J	630		140	37		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	110	10	140	0.13 U		8.2 U	5.6	
MW23	4/13/16	N	0.50 U	0.095 U	0.58 J	2.0 U	35.1 J		5.0 U	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	197	29.5	255	1.8		7.1	0.62 J	
MW23	7/20/16	N	0.50 U	0.31	0.70 J	2.0 U	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	195	30.6	230	1.8		7.2	0.66 J	
MW23	10/11/16	N	0.50 U	0.094 U	0.71 J	0.90 J	100 U		0.38 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	194	32.3	230	1.9		8.1	0.54 J	
MW23	1/19/17	N	0.080	0.015	0.75 J	0.64 J	5.3		0.25	6.2		0.061	0.28	0.26	0.23	0.24	177	35.1	238	1.8		8.2	0.81 J	
MW23	4/19/17	N	0.50 U	0.095 U	0.59 J	2.0 U	100 U		5.0 U	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	179	34.7	304	1.9		9.1	0.76 J	
MW23	10/2/17	N	0.50 U	0.098 U	0.66 J	1.5 J	100 U		2.5 U	20.0 U		0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	197	40.3	240	2.0		9.1	0.68 J	
MW23	6/1/18	N	1.0 U	0.10 U	0.74 J	0.90 J	100 U		2.5 U	20.0 U		0.77 U	0.50 U	0.50 U	0.50 U	1.0 U	194	42.3	256	2.0		8.8	0.81 J	
MW23	10/17/18	N	1.0 U	0.099 U	0.58 J	0.82 J	100 U		2.5 U	20.0 U		0.79 U	0.50 U	0.50 U	0.18 J	1.0 U	191	39.7	239	2.1		8.7	0.90 J	
MW24	2/8/98	N2		4 U	2 U	9.5 U				23			3 U	2 U	3 U	5 U								
MW24	2/8/98	N	10 U	4 U	4.3	53	5.5 U		1030	50.7			3 U	2 U	3 U	5 U	253	18.7				5.2	1.8	
MW24	12/6/00	N2	0.53 U		0.29	25 U	25 U		15 U	25 U		5.9 U	0.1 U	1 U	0.29	1 U								
MW24	12/6/00	N	0.53 U	123 J	1.6	27	6500		530	11		5.9 U	0.1 U	1 U	0.29	1 U	180	21	310	2.3		7.1	5.5	
MW24	4/24/01	N2	0.1 U		0.29	5.2	25 U		2.4	11		5.3 U								3.64				
MW24	4/24/01	N	0.1 U	0.11	2.4	30	7310		508	23		5.3 U	0.1 U	1 U	1 U	1 U	256	36	348	3.64 =		12	3.36	
MW24	4/7/16	N	0.11 J	0.044 J	5.0 U	3.0	420		28.4	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	168	9.1	135	1.9		17.4	0.79 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L	
MW25	2/9/98	N2		1 =	2 U	9.5 U				16.4			0.1 U	1 U	1 U	1 U								
MW25	2/9/98	N	17	1	6.6	462	30.2 U		4480	321			0.1 U	1 U	1 U	1 U	455	15.6				9.9	0.47 U	
MW25	4/11/16	N	0.50 U	0.024 J	1.1 J	17.6	6090		148	12.4 J		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	33.7	37.8	137	2.4		3.8	1.5	
MW25	7/26/16	N	0.50 U	0.30	5.0 U	1.3 J	28.8 J		1.0 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	40.3	49.1	108	3.2		5.0	0.70 J	
MW25	10/10/16	N	0.50 U	0.23	5.0 U	0.62 J	5.4 J		0.46 J	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	31.1	17.5	52.0	1.6		2.8	0.44 J	
MW25	10/10/16	FD	0.50 U	0.17	5.0 U	0.71 J	100 U		0.27 J	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	31.1	16.9	54.0	1.6		2.7	0.44 J	
MW25	1/18/17	N	0.080	4.9	0.35	1.2 J	28.2 J		0.70 J	6.2		0.063	0.28	0.26	0.23	0.24	46.0	45.2	112	2.8		4.9	0.78 J	
MW25	4/18/17	N	0.50 U	0.094 U	5.0 U	1.4 J	100 U		5.0 U	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	81.3	29.0	108	2.9		7.3	0.82 J	
MW25	10/13/17	N	1.0 U	0.051 J	1.0 U	1.3 J	100 U		2.5 U	20.0 U		0.78 U	0.50 U	0.50 U	0.50 U	1.0 U	79.5	36.1	125	3.2		7.0	0.84 J	
MW25	10/13/17	N	1.0 U	0.083 J	1.0 U	1.1 J	100 U		2.5 U	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	78.7	35.0	122	3.2		7.0	0.81 J	
MW25	5/31/18	N	1.0 U	0.096 U	0.28 J	1.3 J	100 U		2.5 U	20.0 U		0.84 U	0.50 U	0.50 U	0.50 U	1.0 U	112	12.5	123	2.4		6.0	1.1	
MW25	10/19/18	N	1.0 U	0.095 U	1.0 U	4.7	100 U		1.3 J	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	0.41 J	98.2	30.1	138	2.8		5.9	0.95 J	
MW26	12/6/00	N4			1.1	25	16000		290	33														
MW26	12/6/00	N3	0.7 U		4	25 U	25 U		89	25 U		5 U	0.1 U	1 U	1 U	1 U								
MW26	12/6/00	N2	0.65 U	115 J	2.8	27	16000		300	35		5 U	0.1 U	1 U	1 U	1 U	270	28	330	2.8		770	6.1	
MW26	12/6/00	N	0.65 U	118 J	1.1	21	25 U		94	17		5 U	0.1 U	1 U	1 U	1 U	230	29	350	2.8		540	8	
MW26	4/24/01	N2	0.1 U		0.24	25 U	36		15 U	19700										5				
MW26	4/24/01	N	0.1 U	0.1 U	3	13	6980		132	24		5.4 U	0.1 U	1 U	1 U	1 U	240	22	294	5 =		10	2.79	
MW26	6/18/01	N2	0.1 U		3.6	18	9140		232	28										30 =				
MW26	6/18/01	N	0.1 U	1	1.1	25 U	25 U		15 U	25 U		5 U	0.1 U	1 U	1 U	1 U	230	27	326	30		13	6.67	
MW26	9/10/01	N4			1.6	13	2500		96	24														
MW26	9/10/01	N3			0.75 J	2.9 J	55 J		1.5 U	3.7 U														
MW26	9/10/01	N2	10 U	0.16 J	0.8 J	4 J	100 J		4 U	3.8 J		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	260	29	310	3.2		12	2.7	
MW26	9/10/01	N	10 U	0.16 J	1.5	10 U	2300		94	24		0.24 U	0.44 U	0.5 U	0.4 U	1.2 U	260	30	300	3.2		12	0.34 U	
MW26	5/14/02	N2			1.4 U	1.2 J	11.2 U		0.73 J	9.3 J									300					
MW26	5/14/02	N		0.1	1.4 J	5 J	1530		57.2	9.7 J		5 U	1 U	5 U	5 U	5 U	260	27	300	3 H		15	5	
MW26	8/5/02	N4			3.2	0.3 U	11.2 U		0.42 U	7.4 J														
MW26	8/5/02	N3			2.7	3.9 J	728		26	18.7 J														

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW26	8/5/02	N2	0.01 U	0.035 J	1.4 U	0.3 U	11.2 U		0.56 J	13.7 J		5 U	1 U	5 U	5 U	5 U	280	19	310	0.15 U		11	24	
MW26	8/5/02	N	0.01 U	0.03 J	3	2.5 J	385		17.2	16.3 J		5 U	1 U	5 U	5 U	5 U	270	18	310	0.15 U		14	4.5	
MW26	4/29/03	N4			1 U	1 U	25 U		5 U	10 U														
MW26	4/29/03	N3	0.5 U		2 J	5	1690		48	20														
MW26	4/29/03	N2	0.5 U	0.11 U	1 U	2 J	25 U		5 U	10 U		7.1 U	0.5 U	5 U	5 U	5 U	250	18.7	257	3.6		14	12	
MW26	4/29/03	N	0.5 U	0.1 U	1 U	4	1290		46	10 U		7.1 U	0.5 U	5 U	5 U	5 U	248	18	262	3.5		14	7	
MW26	9/23/03	N2	0.5 U		1 U	1 U	50 U		5 U	10 U														
MW26	9/23/03	N	0.5 U	0.11 U	1 U	1 J	740		29	10 U		1 U	0.25 U	2.5 U	2.5 U	2.5 U	250	11	90.28	3.74		2 U	6.4	
MW26	5/4/04	N2			0.289 J	1.24 R	39.0 R		1.23 R	4.36 R														
MW26	5/4/04	N	10.0 U	0.242 UB	0.264 J	2.62 R	458 R	26700	17.8 R	10.5 R		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	242	17 =	284	3.9 J		42 R	3.75 J	
MW26	5/4/04	FD2			0.323 J	1.19 R	49.3 R		2.07 R	4.15 R														
MW26	5/4/04	FD	10.0 U	0.219 UB	0.295 J	2.37 R	399 R	27400	15.2 R	7.82 R		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	242	17 =	291	4.0 J		44 R	4.35 J	
MW26	9/23/04	N2			0.314 J	1.57 J	8.81 J		19.3	4.70 J														
MW26	9/23/04	N	10.0 U	0.393 =	1.00 U	3.73 J	620		24.8	7.86 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	280	28	1670	1.5 J		120 =	2.40	
MW26	9/23/04	FD2		4.11 =	0.354 J	2.01 J	6.48 J		4.00 J	3.80 J														
MW26	9/23/04	FD	10.0 U	5.97 BE	1.00 U	3.10 J	542		22.2	6.95 J		5.00 U	0.500 U	5.00 U	5.00 U	5.00 U	280	28	1770	1.5 J		170 =	1.95	
MW26	5/10/05	N2			1.0 U	2.4 J	680		18	7.5 J														
MW26	5/10/05	N	2.0 U	0.061 J	1.0 U	10 U	50 U		1.8 J	20 U		0.94 U	0.50 U	5.0 U	5.0 U	5.0 U	250 J	26 J	340 J	2.8 J		200 R	2.1 R	
MW26	5/10/05	FD2			1.0 U	2.2 J	510		14	17 J														
MW26	5/10/05	FD	2.0 U	0.11 U	1.0 U	10 U	50 U		0.59 J	20 U		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	240 J	26 J	370 J	2.2 J		180 R	1.1 R	
MW26	9/27/05	N2			1.0 UJ	2.2 J	50 U		10 U	20 U														
MW26	9/27/05	N	2.0 UJ	0.027 J	1.0 UJ	10 U	50 U		2.3 J	20 U		0.93 U	0.50 U	5.0 U	5.0 U	5.0 U	240 J	25 J	350	1.9 J		170 =	0.72 J	
MW26	9/27/05	FD2			1.0 UJ	2.6 J	50 UJ		10 U	20 U														
MW26	9/27/05	FD	2.0 UJ	0.024 J	1.0 UJ	10 U	50 U		1.7 J	20 U		0.92 U					250 J	25 J	380	2.0 J		160 J	0.68 J	
MW26	6/7/06	N	2.0 U	0.11 UJ	1.0 UJ	10 UJ	50 UJ		2.5 UJ	20 UJ		0.95 U	0.50 U	5.0 U	5.0 U	5.0 U	260 J	29 J	320 J	1.8 J		140 =	1.4 J	
MW26	6/7/06	FD	2.0 U	0.091 J	1.0 UJ	10 UJ	50 UJ		1.0 UJ	20 UJ		0.94 U	0.50 U	5.0 U	5.0 U	5.0 U	250 J	29 J	350 J	1.8 J		150 =	0.94 J	
MW26	9/26/06	N	2.0 UJ	0.11 U	1.0 UJ	10 UJ	50 UJ		10 UJ	20 UJ		0.91 U	0.50 U	5.0 U	5.0 U	5.0 U	270 J	23 J	350	1.5 J		87 J	2.0	
MW26	5/8/07	N	2.0 UJ	0.093 UJ	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.92 R	1.0 U	1.0 U	1.0 U	2.0 U	260 =	21 J	360	1.5		210 J	0.68 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW26	5/8/07	FD	2.0 UJ	0.095 UJ	1.0 UJ	10 UJ	100 UJ		10 UJ	20 UJ		0.92 R	1.0 U	1.0 U	1.0 U	2.0 U	270 =	21 J	360	1.6		250 J	0.76 J	
MW26	9/19/07	N	2.0 UJ	0.095 U	1.0 UJ	10 UJ	100 R		10 UJ	20 UJ		0.93 U	1.0 U	1.0 U	1.0 U	2.0 U	240	25	500 J	1.3		220 J	0.84 J	
MW26	5/20/08	N	2.0 UJ	0.096 UJ	0.34 J	0.47 J	100 UJ		2.5 U	20 U		0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ	240 =	22	430	1.8		230	0.65 J	
MW26	10/22/08	N	2.0 UJ	0.1 U	2 UJ	6.2 J	777 J	35100 J	10 UJ	20 UJ		1 U	0.5 U	2.0 U	2.0 U	5.0 U	256 J	21.7	432 J	2.36 J		235	18.6	
MW26	6/2/09	N	0.8 UJ	0.1 UJ	2 U	10 UJ	341 =	33400 =	10 U	20 U		1.0 UJ	0.5 UB	0.3 J	2.0 UB	5.0 U	229 J	203	414.7082	1.83 J		2360	1.7 UJ	
MW26	10/6/09	N	0.83 UJ	0.1 UJ	2 UJ	3.8 J	325 J	42900 J	10 UJ	20 UJ		0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ	227 J	20.7 J	491.28 J	1.7 J		212 J	1 UJ	
MW26	5/19/10	N	1.3 U	0.13 J	1.8 J	10 UJ	236. J	39800. J	10 UJ	15. J		1.0 U	0.5 U	5 U	5 U	5 U	230	20.4	486	2.41 J		279	20.1 J	
MW26	10/5/10	N	1.3 U	0.1 UJ	2 U	10 U	376	37900	10 U	20 U		1.0 U	0.1 U	0.4 U	0.4 U	1 U	236	20.0 J	478	1.77		232	0.6 J	
MW26	6/29/11	N	0.9 U	0.1 U	2 UJ	10 U	274	41600	10 U	20 U		0.992 U	0.1 U	0.4 U	0.4 U	1 U	202	18.3 J	463.00	1.83 J		230	1 U	
MW26	10/19/11	N	0.50 U	0.099 U	0.87 J	2 U	50 U	29000 B	10 U	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	230	19	329.00	1.6 J		200	0.88 J	
MW26	5/22/12	N	0.50 U	0.10 U	2.0 U	10 U	50 U	28000 =	10 U	20 U		0.19 UJ	0.50 U	1.0 U	1.0 U	2.0 U	200	19	325.00	1.7		210	0.43 J	
MW26	10/16/12	N	0.50 U	0.095 U	0.99 J	10 U	50 U	29000 =	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 UJ	2.0 U	190	19	344	1.8 J		200 =	0.30 J	
MW26	5/22/13	N	0.50 U	0.094 U	2.0 U	10 U	50 U	25000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	170	18		1.9 J		230	0.55 J	
MW26	10/8/13	N	0.50 U	0.095 U	0.37 J	10.0 U	50 U	26000 B	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	160	18		1.5 J		110 J	1.0 U	
MW26	5/14/14	N		0.095 U																				
MW26	9/24/14	N	0.50 U	0.095 U	0.43 J	2.0 U	100 U		5.0 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	150	17	290	1.2		160	1.0 U	
MW26	9/24/14	FD	0.50 U	0.095 U	0.32 J	2.0 U	100 U		5.0 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	150	17	280	1.2		160	1.0 U	
MW26	4/21/15	N	0.50 U	0.094 U	0.71 J	2.0 U	100 U		4.4 J	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	160	16	240	2.4		82	1.0 U	
MW26	4/21/15	FD		0.094 U	0.76 J	2.0 U	100 U		5.0 U	20 U		0.19 U												
MW26	10/13/15	N	0.50 U	0.096 U	0.76 J	2.0 U	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	198	15.3	229	1.9		74.6	0.32 J	
MW26	10/13/15	N	0.50 U	0.096 U	0.50 J	2.0 U	100 U		5.0 U	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	194	15.5	235	1.9		75.7	0.33 J	
MW26	4/5/16	N	0.15 J	0.095 U	0.57 J	1.5 J	21.4 J		58.7	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	154	9.4	183	1.4		36.1	0.26 J	
MW27	10/20/11	N	0.10 J	0.17	1.7 J	2.3 J+	50 U	2300 B	10 U	10 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	63	10	28.70	3.1		9.1	1.6	
MW27	4/7/16	N	0.092 J	0.15	0.59 J	1.9 J	21.1 J		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	137	20.0	113	6.5		14.2	1.9	
MW27	4/7/16	FD		0.094 U	5.0 U	2.0 U	29.9 J		2.3 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
MW28	10/20/11	N	0.19 J	690	0.55 J	2 U	50 U	12000 B	6.0 J	10 U		0.19 U	0.50 U	1.0 U	1.0 U	0.38 J	130	5.5	132.00	1.3		5.2	2.7	
MW28	10/17/12	N	0.50 U	0.095 U	0.48 J	10 U	50 U	12000 =	10 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	120	11	134	1.8		5.0 U	0.81 J	
MW28	10/9/13	N2																		2.2 J				

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW28	10/9/13	N	0.50 U	0.049 J	2.0 UJ	10.0 UJ	50 UJ	12000 J	10 UJ	20 UJ		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U *	120 J	21		2.2 J		6.5	0.49 J
MW28	9/25/14	N	0.50 U	0.099	0.31 J	2.0 U	100 U		5.0 U	20 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	120	18	150	1.3		5.1	0.85 J
MW28	10/14/15	N	0.50 U	0.32	5.0 U	2.0 U	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	126	15.5	155	2.0		5.4	0.69 J
MW28	4/6/16	N	0.20 J	47	5.0 U	0.76 J	29.7 J		2.7 J	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	122	9.4	125	1.2		4.8	1.6
MW28	7/21/16	N	0.10 J	100	0.49 J	2.0 U	25.9 J		10.8	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	127	11.4	138	1.9		5.4	1.9
MW28	10/13/16	N	0.28 J	1900	0.39 J	0.76 J	9.8 J		8.5	20.0 U		0.12 J	0.50 U	1.0 U	1.0 U	1.4 J	128	11.4	148	1.7		5.8	12.3
MW28	10/13/16	FD	0.36 J	1200	0.38 J	0.61 J	100 U		7.9	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	1.4 J	125	11.4	142	1.7		5.6	12.3
MW28	1/20/17	N	0.20 J	290	0.47 J	1.0 J	5.3		10.3	6.2		0.063	0.28	0.26	0.23	0.24	113	13.4	138	2.0		6.1	4.9
MW28	4/20/17	N	0.50 U	22	0.55 J	1.0 J	11.9 J		4.0 J	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	123	22.5	186	3.3		7.1	1.6
MW28	10/3/17	N	0.18 J	0.16	0.38 J	1.4 J	100 U		2.5 U	20.0 U		0.76 U	0.50 U	0.50 U	0.50 U	1.0 U	116	31.8	171	2.3		6.6	0.83 J
MW28	10/17/18	N	1.0 U	0.10 U	0.38 J	1.0 J	100 U		2.5 U	7.1 J		0.81 U	0.50 U	0.50 U	0.50 U	1.0 U	106	21.2	126	2.2		5.4	0.97 J
MW29	4/13/16	N	1.4	14000	5.0 U	6.7	1660		2270	20.0 U		34	0.50 U	0.58 J	0.90 J	7.2	87.0	4.5	120	0.10 U		6.4	70.2
MW29	7/21/16	N	0.67	11000	5.0 U	2.1	1290		2800	20.0 U		35	0.50 U	0.74 J	1.3	9.1	84.0	9.2	110	0.10 U		10.4	50.5
MW29	7/21/16	FD	0.69	9100	5.0 U	2.1	1250		2740	20.0 U		30	0.50 U	0.83 J	1.2	9.3	83.8	9.2	110	0.10 U		10.5	51.6
MW29	10/14/16	N	0.32 J	20000	0.35 J	2.6	1970		3220	20.0 U		32	0.50 U	0.98 J	1.6	11	83.0	15.9	124	0.10 U		16.3	56.9
MW29	1/24/17	N	0.40 J	56000	0.35	1.9 J	1400		3290	6.2		40	0.28	0.98 J	1.2	12	113	4.3	120	0.035		6.8	51.4
MW29	1/24/17	FD	0.37 J	67000	0.35	3.3	1380		3170	6.2		41	0.28	0.90 J	1.3	12	112	4.3	122	0.035		6.9	49.9
MW30	4/13/16	N	0.50 U	0.72	5.0 U	0.81 J	46.1 J		147	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	42.0	3.2	82.3	3.4		32.8	1.2
MW30	7/21/16	N	0.50 U	1.7	5.0 U	2.0 U	100 U		52.9	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	44.5	2.9	82.0	4.0		29.9	1.4
MW30	10/12/16	N	0.084 J	3.8	5.0 U	1.1 J	13.8 J		67.3	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	52.2	3.8	86.0	1.6		30.5	
MW30	1/20/17	N	0.080	5.5	0.35	1.0 J	9.4 J		52.8	6.2		0.060	0.28	0.26	0.23	0.24	45.9	2.4	60.0	0.80		9.9	1.4
MW30	4/21/17	N	0.50 U	3.6	5.0 U	0.95 J	8.1 J		37.7	20.0 U		0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	46.2	0.57 J	250	1.1		5.4	0.93 J
MW30	10/5/17	N	0.11 J	2.1	1.0 U	1.1 J	49.4 J		31.5	20.0 U		0.80 U	0.50 U	0.50 U	0.50 U	1.0 U	48.4	0.55	52.3	2.0		4.6	1.6
MW30	5/31/18	N	1.0 U	630	1.0 U	1.1 J	100 U		23.3	20.0 U		1.7	0.50 U	0.50 U	0.50 U	0.39 J	67.3	0.66	69.1	1.6		3.7	1.7
MW30	10/18/18	N	1.0 U	640	1.0 U	0.94 J	100 U		15.4	7.9 J		1.3	0.50 U	0.50 U	0.50 U	1.0 U	77.5	1.7	82.9	2.2		3.7	2.6
MW31	4/12/16	N	0.50 U	0.030 J	5.0 U	2.0 U	20.9 J		7.7	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	122	0.99 J	125	0.68		4.0	0.59 J
MW31	7/20/16	N	0.50 U	4.6	5.0 U	0.86 J	100 U		2.2 J	20.0 U		0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	105	0.76 J	100	0.49		1.9	0.68 J
MW31	10/13/16	N	0.11 J	3.7	5.0 U	0.76 J	100 U		5.0 U	20.0 U		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	110	0.63 J	104	0.46		1.5	0.29 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW31	1/17/17	N	0.20 J	0.69	0.59 J	1.4 J	10.5 J		0.52 J	6.2		0.061	0.28	0.26	0.23	0.24	113	0.53 J	118	0.51		1.7	0.74 J	
MW31	4/18/17	N	0.21 J	0.026 J	5.0 U	0.58 J	100 U		0.63 J	20.0 U		0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	111	0.68 J	136	0.73		2.8	0.72 J	
MW31	10/2/17	N	1.9	0.095 U	0.51 J	5.0	1630		34.5	9.7 J		0.82 U	0.50 U	0.50 U	0.50 U	1.0 U	104	1.4	93.9	0.54		1.3	0.50 J	
MW31	10/16/18	N	1.0 U	0.097 U	1.0 U	0.63 J	100 U		1.0 J	20.0 U		0.79 U	0.50 U	0.50 U	0.50 U	0.46 J	187	0.67	181	0.55		1.5	0.70 J	
RW01	10/9/97	N		1 U																				
RW01	4/23/01	N		0.1 U								5.3 U	0.5 U	5 U	5 U									
RW01	9/11/01	N		0.071 J								0.26 U	0.44 U	0.5 U	0.4 U	1.2 U								
RW01	9/28/01	N2		0.05 U																				
RW01	9/28/01	N		0.1 U																				
RW01	5/14/02	N		0.23								5 U	1 U	5 U	2 J	2 J								
RW01	8/6/02	N		0.04								5 U	1 U	5 U	5 U	5 U								
RW01	4/29/03	N		0.1 J								7.1 U	0.5 U	5 U	5 U	5 U								
RW01	9/23/03	N		0.28								0.97 U	0.25 U	2.5 U	2.5 U	2.5 U								
RW01	11/20/03	N		0.24																				
RW01	5/4/04	N		0.140 UB								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW01	5/4/04	FD		0.134 UB								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW01	9/22/04	N		0.201								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW01	9/22/04	FD		1.51								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW01	11/1/04	N		0.0952 U																				
RW01	5/10/05	N		0.068 J								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	5/10/05	FD		0.053 J								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	7/7/05	N		0.043 J								0.95 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	7/7/05	FD		0.035 J								0.96 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	9/27/05	N		0.050 J								0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	9/27/05	FD		0.049 J								0.93 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	5/31/06	N		0.048 J								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	5/31/06	FD		0.055 J								0.94 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	9/25/06	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								

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Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW01	9/25/06	FD		0.023 J								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW01	5/9/07	N		0.035 J								0.95 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW01	5/9/07	FD		0.048 J								0.95 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW01	9/18/07	N		0.093 UJ								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW01	9/18/07	FD		0.27 R								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW01	5/20/08	N		0.060 J								0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								
RW01	5/20/08	FD		0.066 J								0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								
RW01	10/23/08	N										1 U												
RW01	10/23/08	FD										1 U												
RW01	12/11/08	N		0.1 UJ									0.1 U	0.4 U	0.4 U	1.0 U								
RW01	12/11/08	FD		0.1 U									0.1 U	0.4 U	0.4 U	1.0 U								
RW01	6/2/09	N		0.1 UJ								1.0 UJ	0.5 UB	2.0 UB	2.0 UB	5.0 U								
RW01	6/2/09	FD		0.1 UJ								1.0 UJ	0.5 UB	2.0 UB	2.0 UB	5.0 UB								
RW01	7/6/09	N											0.5 U	2.0 U	2.0 U	5.0 U								
RW01	7/6/09	FD											0.5 U	2.0 U	2.0 U	5.0 U								
RW01	10/7/09	N		0.1 UJ								1 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW01	10/7/09	FD		0.1 UJ								0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW01	5/19/10	N		0.1 U								1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ								
RW01	5/19/10	FD		0.1 U								1.0 U	0.4 U	5 U	5 U	5 U								
RW01	10/5/10	N		0.1 U								1.0 U	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW01	10/5/10	FD		0.1 U								1.0 U	0.1 U	0.4 U	0.4 U	1 U								
RW01	11/30/10	N											0.1 U	0.4 U	0.4 U	1 U								
RW01	6/30/11	N		0.1 U								0.997 U	0.1 U	0.4 U	0.4 U	1 U								
RW01	6/30/11	FD		0.1 U								1 U	0.1 U	0.4 U	0.4 U	1 U								
RW01	10/20/11	N		0.040 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/20/11	FD		0.039 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	12/16/11	N		0.096 UJ																				
RW01	12/16/11	FD		0.031 R																				

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Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW01	5/23/12	N		0.019 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	5/23/12	FD		0.017 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	7/11/12	N		0.027 J																				
RW01	7/11/12	FD2		0.033 J																				
RW01	7/11/12	FD		0.035 J																				
RW01	10/17/12	N		0.045 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/17/12	FD		0.035 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	12/3/12	N2		0.095 U																				
RW01	12/3/12	N		0.094 UJ																				
RW01	12/3/12	FD2		0.095 U																				
RW01	12/3/12	FD		0.094 UJ																				
RW01	5/21/13	N		0.031 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	5/21/13	FD		0.029 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/8/13	N2		0.097 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/8/13	N		0.040 J								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	5/13/14	N		0.051 J																				
RW01	9/25/14	N		0.043 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	4/21/15	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/15/15	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	4/5/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/10/16	N		0.020 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	4/19/17	N		0.015 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW01	10/20/17	N		0.10 U								0.87 U	0.50 U	0.50 U	0.37 J	1.0 U								
RW01	6/5/18	N		0.095 U								0.75 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW01	10/15/18	N		0.10 U								0.79 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW02	10/9/97	N		0.9 J																				
RW02	10/9/97	FD		2																				
RW02	10/24/97	N		1 U																				

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Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW02	4/8/98	N		1 U																				
RW02	4/24/01	N		0.1 U								5.4 U	0.1 U	1 U	1 U	1 U								
RW02	9/11/01	N		9.5								0.25 U	0.44 U	0.5 U	0.4 U	1.2 U								
RW02	9/28/01	N4		0.05 U																				
RW02	9/28/01	N3		0.05 U																				
RW02	9/28/01	N2		0.1 U																				
RW02	9/28/01	N		0.1 U																				
RW02	5/14/02	N		0.1								5 U	1 U	5 U	5 U	5 U								
RW02	8/6/02	N2		0.04 U								5 U	1 U	5 U	5 U	5 U								
RW02	8/6/02	N		0.04 U								5 U	1 U	5 U	5 U	5 U								
RW02	4/29/03	N		0.11 U								6.8 U	0.5 U	5 U	5 U	5 U								
RW02	9/24/03	N2		0.11 U								0.96 U	0.25 U	2.5 U	2.5 U	2.5 U								
RW02	9/24/03	N		0.11 U								0.97 U	0.25 U	2.5 U	2.5 U	2.5 U								
RW02	5/4/04	N		0.0252 UB								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW02	9/22/04	N		0.398								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW02	11/1/04	N		0.0962 U																				
RW02	5/10/05	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW02	9/27/05	N		0.11 U								0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
RW02	5/31/06	N		0.11 UJ								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW02	9/25/06	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW02	5/9/07	N		0.092 UJ								0.97 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW02	9/18/07	N		0.093 UJ								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW02	5/20/08	N		0.095 UJ								0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								
RW02	10/23/08	N										1.33 U												
RW02	12/10/08	N		0.1 U									0.1 U	0.4 U	0.4 U	1.0 U								
RW02	6/2/09	N		0.1 UJ								1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U								
RW02	10/7/09	N		0.1 UJ								0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW02	5/19/10	N		0.1 U								1.0 U	0.4 U	5 U	5 U	5 U								

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Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW02	10/5/10	N		0.1 U								1.0 U	0.1 U	0.4 U	0.4 U	1 U								
RW02	6/30/11	N		0.1 U								0.999 U	0.1 U	0.4 U	0.4 U	1 U								
RW02	10/20/11	N		0.095 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	5/23/12	N		0.097 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	10/17/12	N3		0.094 UJ																				
RW02	10/17/12	N2		0.057 J																				
RW02	10/17/12	N		0.037 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	12/3/12	N2		0.094 UJ																				
RW02	12/3/12	N		0.095 U																				
RW02	5/21/13	N		0.097 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	10/8/13	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	5/13/14	N		0.095 U																				
RW02	9/25/14	N		0.096 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	4/21/15	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	10/15/15	N		0.096 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	4/5/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	10/10/16	N		0.097 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	4/17/17	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW02	10/20/17	N		0.10 U								0.75 U	0.50 U	0.50 U	0.33 J	1.0 U								
RW02	4/17/18	N		0.024 U								0.79 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW02	10/16/18	N		0.097 U								0.77 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW02	10/16/18	FD		0.099 U								0.80 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW03	10/9/97	N		1 U																				
RW03	9/11/01	N		0.1 J								0.28 U	0.44 U	0.5 U	0.4 U	1.2 U								
RW03	9/28/01	N2		0.05 U																				
RW03	9/28/01	N		0.1 U																				
RW03	5/14/02	N		0.094 J								5 U	1 U	5 U	5 U	5 U								
RW03	8/6/02	N		0.04 U								5 U	1 U	5 U	5 U	5 U								

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Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW03	4/29/03	N		0.11 U								6.8 U	0.5 U	5 U	5 U	5 U								
RW03	9/23/03	N		0.11 U								0.96 U	0.25 U	2.5 U	2.5 U	2.5 U								
RW03	5/4/04	N		0.0952 U								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW03	9/22/04	N		2.18								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW03	11/1/04	N		0.0962 U																				
RW03	5/10/05	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW03	9/27/05	N		0.11 U								0.93 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
RW03	5/31/06	N		0.11 UJ								0.94 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW03	9/25/06	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW03	5/9/07	N		0.092 UJ								0.95 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW03	9/18/07	N		0.093 UJ								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW03	5/20/08	N		0.097 UJ								0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								
RW03	10/23/08	N										1 U												
RW03	12/10/08	N		0.1 U									0.1 U	0.4 U	0.4 U	1.0 U								
RW03	6/2/09	N		0.1 UJ								1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U								
RW03	10/7/09	N		0.1 UJ								0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW03	5/19/10	N		0.1 U								1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ								
RW03	10/5/10	N		0.1 U								1.0 U	0.1 U	0.4 U	0.4 U	1 U								
RW03	6/30/11	N		0.1 U								0.994 U	0.1 U	0.4 U	0.4 U	1 U								
RW03	10/20/11	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	5/23/12	N		0.097 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	10/17/12	N		0.015 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	12/3/12	N2		0.095 UJ																				
RW03	12/3/12	N		0.095 U																				
RW03	5/21/13	N		0.053 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	10/8/13	N		0.096 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	5/13/14	N		0.095 U																				
RW03	9/25/14	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW03	9/25/14	FD		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	4/21/15	N		0.097 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	10/15/15	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	4/5/16	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	10/10/16	N		0.095 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	4/17/17	N		0.095 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW03	10/20/17	N		0.096 U								0.79 U	0.50 U	0.50 U	0.29 J	1.0 U								
RW03	4/17/18	N		0.025 U								0.84 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW03	10/16/18	N		0.098 U								0.77 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW04	10/9/97	N		1 U																				
RW04	4/23/01	N		0.1 U								5 U	0.5 U	5 U	5 U									
RW04	9/11/01	N		0.073 J								0.25 U	0.44 U	0.5 U	0.4 U	1.2 U								
RW04	9/28/01	N2		0.05 U																				
RW04	9/28/01	N		0.1 U																				
RW04	5/14/02	N		0.13								5 U	1 U	5 U	5 U	5 U								
RW04	8/6/02	N		0.04 U								5 U	1 U	5 U	5 U	5 U								
RW04	4/29/03	N		0.11 U								7.4 U	0.5 U	5 U	5 U	5 U								
RW04	9/23/03	N		0.11 U								0.99 U	0.25 U	2.5 U	2.5 U	2.5 U								
RW04	5/4/04	N		0.100 U								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW04	9/22/04	N		0.266								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW04	10/1/04	N		0.0962 R																				
RW04	5/10/05	N		0.11 U								0.94 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW04	9/27/05	N		0.11 U								0.91 UJ	0.50 U	5.0 U	5.0 U	5.0 U								
RW04	5/31/06	N		0.11 UJ								0.97 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW04	9/25/06	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U								
RW04	5/9/07	N		0.093 UJ								0.96 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW04	9/18/07	N		0.093 UJ								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U								
RW04	5/20/08	N		0.093 UJ								0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ								

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO3)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW04	10/23/08	N										1 U												
RW04	12/10/08	N		0.1 U									0.1 U	0.4 U	0.4 U	1.0 U								
RW04	6/2/09	N		0.1 UJ								1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U								
RW04	10/7/09	N		0.15 J								0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ								
RW04	10/20/09	N		0.1 UJ																				
RW04	5/19/10	N		0.1 U								1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ								
RW04	10/5/10	N		0.1 U								1.0 U	0.1 U	0.4 U	0.4 U	1 U								
RW04	6/30/11	N		0.1 U								0.992 U	0.1 U	0.4 U	0.4 U	1 U								
RW04	10/20/11	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	5/23/12	N		0.094 U								0.20 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	10/17/12	N		0.071 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	12/3/12	N2		0.094 UJ																				
RW04	12/3/12	N		0.095 U																				
RW04	5/21/13	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	10/8/13	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	5/13/14	N		0.023 J																				
RW04	9/25/14	N		0.096 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	4/21/15	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	10/15/15	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	4/5/16	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	10/10/16	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	4/17/17	N		0.094 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW04	10/20/17	N		0.096 U								0.81 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW04	4/17/18	N		0.024 U								0.92 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW04	10/15/18	N		0.11 U								0.90 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW05	5/4/04	N		0.0935 U								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW05	9/22/04	N		0.293								5.00 U	0.500 U	5.00 U	5.00 U	5.00 U								
RW05	11/1/04	N		0.0962 U																				

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Pentachlorophenol ug/L	Arsenic ug/L	Copper ug/L	Iron ug/L	Magnesium ug/L	Manganese ug/L	Zinc ug/L	Total Petroleum Hydrocarbons (C10-C28) DRO mg/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, total (as CaCO3) mg/L	Chloride mg/L	Hardness mg/L	Nitrate (as N) mg/L	Oil and grease (HEM), polar mg/L	Sulfate mg/L	Total organic carbon (TOC) mg/L
RW05	5/10/05	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U							
RW05	9/27/05	N		0.11 U								0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U							
RW05	5/31/06	N		0.11 UJ								0.94 U	0.50 U	5.0 U	5.0 U	5.0 U							
RW05	9/25/06	N		0.11 U								0.93 U	0.50 U	5.0 U	5.0 U	5.0 U							
RW05	5/9/07	N		0.092 UJ								0.93 R	1.0 U	1.0 U	1.0 U	2.0 U							
RW05	9/18/07	N		0.093 UJ								1.0 R	1.0 U	1.0 U	1.0 U	2.0 U							
RW05	5/20/08	N		0.095 UJ								0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ							
RW05	10/23/08	N										1 U											
RW05	12/10/08	N		0.1 U									0.1 U	0.4 U	0.4 U	1.0 U							
RW05	6/2/09	N		0.1 UJ								1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U							
RW05	10/7/09	N		0.1 UJ								0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ							
RW05	5/19/10	N		0.1 U								1.0 U	0.4 U	5 U	5 U	5 U							
RW05	10/5/10	N		0.1 U								1.0 U	0.1 U	0.4 U	0.4 U	1 U							
RW05	6/30/11	N		0.1 U								0.991 U	0.1 U	0.4 U	0.4 U	1 U							
RW05	10/20/11	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	5/23/12	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	10/17/12	N		0.030 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	12/4/12	N2		0.095 U																			
RW05	12/4/12	N		0.095 UJ																			
RW05	5/21/13	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	10/8/13	N		0.098 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	5/13/14	N		0.095 U																			
RW05	9/25/14	N		0.096 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	4/21/15	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	10/15/15	N		0.10 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	4/5/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	10/10/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							
RW05	4/17/17	N		0.097 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U							

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Pentachlorophenol	Arsenic	Copper	Iron	Magnesium	Manganese	Zinc	Total Petroleum Hydrocarbons (C10-C28) DRO	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, total (as CaCO ₃)	Chloride	Hardness	Nitrate (as N)	Oil and grease (HEM), polar	Sulfate	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
RW05	10/20/17	N		0.095 U								0.81 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW05	4/17/18	N		0.024 U								0.75 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW05	4/17/18	FD		0.024 U								0.75 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW05	10/15/18	N		0.16								0.87 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW06	9/25/14	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	4/21/15	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	10/15/15	N		0.018 J								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	4/5/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	10/10/16	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	4/18/17	N		0.095 U								0.19 U	0.50 U	1.0 U	1.0 U	2.0 U								
RW06	10/20/17	N		0.095 U								0.75 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW06	4/17/18	N		0.024 U								0.83 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW06	10/16/18	N		0.099 U								0.78 U	0.50 U	0.50 U	0.50 U	1.0 U								
RW06 SHOP	4/17/18	N		0.024 U								0.79 U	0.50 U	0.50 U	1.5	1.0 U								
RW06 SHOP	10/16/18	N		0.095 U								0.75 U	0.50 U	0.50 U	1.7	1.0 U								

Appendix A.1

**Historical Groundwater Sampling Results
Penta Wood Products Superfund Site
Siren, Wisconsin**

Notes:

- 1 Only compounds currently sampled are included on this table.
- 2 Samples collected before September 2014 were not collected by GHD. GHD has no ability to verify data or data qualifiers.
- 3 Sample type is listed for normal samples (N) and field duplicates (FD), numbers differentiate from multiple samples of similar sample type during the same sampling event.
- mg/L Concentrations listed with units of milligrams per liter.
- ug/L Concentrations listed with units of micrograms per liter.
- * LCS or LCSD exceeds the control limits.
- B Compound was detected in the method blank.
- F1 MS and/or MSD Recovery exceeds the control limits
- H Analysis was performed after holding time.
- J Concentration was estimated below the reporting limit.
- p The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
- U Compound was not detected above the reporting limit.
- UJ Compound was not detected above the estimated reporting limit.

Appendix A.2

**Historical LNAPL Thickness - Monitoring Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

**Monitoring Well
LNAPL Thickness (feet)**

Date	MW10S	MW18	MW19	MW20	MW29
Sep-01	0.01	0.27	0.51	0.11	NA
May-02	0.00	0.29	0.23	0.00	NA
Aug-02	0.00	0.33	0.22	0.00	NA
May-03	0.00	0.00	0.00	0.00	NA
Sep-03	0.00	0.32	0.24	0.04	NA
May-04	0.00	0.45	0.36	0.35	NA
Sep-04	0.21	0.54	0.67	0.52	NA
May-05	0.29	0.48	0.63	0.36	NA
Sep-05	0.87	0.06	0.83	1.15	NA
May-06	0.00	0.00	0.29	0.00	NA
Sep-06	0.00	0.05	0.80	0.69	NA
Apr-07	0.58	0.04	0.74	1.22	NA
May-07	0.58	0.03	0.54	1.20	NA
Sep-07	0.04	0.16	1.07	0.00	NA
May-08	0.40	1.19	0.90	1.71	NA
Oct-08	0.14	0.04	0.00	0.00	NA
Jun-09	0.54	1.58	1.60	1.45	NA
Oct-09	0.63	1.92	1.46	1.02	NA
May-10	0.51	2.01	1.10	0.85	NA
Oct-10	0.00	0.57	0.59	0.00	NA
Jun-11	0.00	0.42	0.79	0.00	NA
Oct-11	0.00	0.53	1.07	0.00	NA
May-12	0.69	0.79	0.80	2.17	NA
Aug-12	0.04	0.43	0.89	0.30	NA
Oct-12	0.00	0.45	0.91	0.88	NA
Dec-12	0.02	0.44	1.06	0.95	NA
May-13	0.17	0.53	0.94	1.08	NA
Oct-13	0.00	0.70	1.25	0.81	NA
May-14	0.00	0.79	0.22	0.22	NA
Sep-14	0.00	0.56	0.30	0.00	NA
2/13/15	0.00	0.56	0.24	0.00	NA
2/20/15	0.00	0.53	0.23	0.00	NA
3/24/15	0.00	0.34	0.52	0.00	NA
4/16/15	0.00	0.58	NM	0.00	NA
5/14/15	0.00	0.57	NM	0.00	NA
10/12/15	0.00	0.42	0.07	0.01	NA
4/4/16	0.00	0.66	0.25	0.01	0.00
7/18/16	0.00	0.52	0.00	0.00	0.00
10/7/16	0.00	0.67	0.01	0.01	0.00
1/11/17	0.00	NM	0.18	0.02	0.00

Appendix A.2

**Historical LNAPL Thickness - Monitoring Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

**Monitoring Well
LNAPL Thickness (feet)**

Date	MW10S	MW18	MW19	MW20	MW29
4/17/17	0.00	0.53	0.27	0.01	0.47
7/13/17	0.00	0.51	0.10	0.01	0.15
9/28/17	0.00	NM	NM	0.01	0.45
1/3/18	0.00	0.45	0.26	0.01	0.70
5/25/18*	0.00	0.53	0.62	0.01	0.88
7/11/18	0.00	0.50	0.19	0.01	0.48
10/15/18	0.00	0.48	0.41	0.01	0.63

Notes:

NM - Not Measured

NA - Not Applicable

* - MW10S measured on 6/1/18 and MW29 measured on 5/24/18

**Historical Groundwater Extraction Summary
Penta Wood Products Superfund Site
Siren, Wisconsin**

Operation Period	Volume of Groundwater Extracted (gallons)
09/27/00 to 12/18/00	11,712,960
02/02/01 to 02/08/01	691,200
03/16/01 to 06/10/01	9,288,000
06/15/01 to 09/27/01	6,822,720
02/27/04 to 12/31/04	18,548,154
01/01/05 to 12/31/05	21,374,796
01/01/06 to 12/31/06	14,759,392
01/01/07 to 12/31/07	16,551,336
01/01/08 to 12/31/08	18,118,696
01/01/09 to 12/31/09	18,533,648
01/01/10 to 12/31/10	18,561,632
01/01/11 to 12/31/11	17,796,668
01/01/12 to 12/31/12	23,051,892
01/01/13 to 12/31/13	29,793,563
01/01/14 to 12/31/14	18,415,098
01/01/15 to 06/30/15	6,282,127
07/01/15 to 11/23/15	5,125,729
Total Gallons Extracted	255,427,611

Appendix A.4

**Historical Influent Pentachlorophenol Concentrations
Penta Wood Products Superfund Site
Siren, Wisconsin**

Date	Influent PCP Concentration (ug/L)
02/27/2004 to 12/31/2004*	9,227
01/01/2005 to 12/31/2005*	7,300
01/01/2006 to 12/31/2006*	6,425
01/01/2007 to 12/31/2007*	3,557
01/01/2008 to 12/31/2008*	3,255
March 2009	3,560
July 2009	3,140
September 2009	2,800
December 2009	2,030
March 2010	2050 J
June 2010	1,970
September 2010	1,830
December 2010	1,940
March 2011	2,470
June 2011	2,170
August 2011	1,700
October 2011	1,600
February 2012	2,600
May 2012	2,200
July 2012	1,900
October 2012	1,800
February 2013	1,100
May 2013	1,100
July 2013	1,800
October 2013	1,400
February 2014	1,800
May 2014	1,600
August 2014	2,100
September 2014	2,400
October 2014	2,400
November 2014	2,100
December 2014	4,600
January 2015	1,800
February 2015	480
March 2015	390
April 2015*	1,767
May 2015*	355
June 2015	550
July 2015*	1,100
August 2015	370
September 2015	750
October 2015	600
November 2015	1,100

Note:

* Average PCP influent concentration for that time period.

Appendix A.5

**Historical Hazardous Waste Generation Summary
Penta Wood Products Superfund Site
Siren, Wisconsin**

Date	Filter Cake (lb)	Misc. Debris (lb)	Carbon (lb)	LNAPL (lb)	Liquids[‡] (gallons)	Yearly Total (lb)
2000	0	200	6,000	5,009*	0	11,209
2001	0	400	56,100	6,166*	0	62,666
2002	0	1,400	48,000	10,790*	27,756	87,946
2003	0	600	0	3,083*	1,376	5,059
2004	155,960	3,200	102,000	53,522*	0	314,682
2005	178,784	1,290	104,860	23,847*	0	308,924
2006	112,640	1,200	136,520	52,892*	0	303,252
2007	174,020	2,200	245,377	77,615*	0	517,387
2008	211,402	3,176	70,007	28,036	0	312,621
2009	233,840	1,116	49,757	35,659	0	320,372
2010	210,940	0	81,227	34,937	0	327,104
2011	292,903	0	74,247	0	0	367,150
2012	182,280	0	65,420	25,493	0	273,193
2013	156,760	0	46,571	27,252	0	230,582
2014	110,754	13,513	65,995	11,720	0	201,982
2015	0	0	22,248	0	0	22,248
2016	0	15,212 [†]	34,877	14,374	0	49,251
2017	0	0	0	0	2,759	2,759
2018	0	0	0	0	0	0

Note:

* - Volume shows the amount of waste disposed offsite and is estimated to be approximately 50 percent pure LNAPL and 50 percent mixture of water and emulsified LNAPL.

† - Miscellaneous debris includes sludge, filter cake, and drill cuttings from system decommissioning.

‡ - Prior to 2017, all liquids disposed were water. In 2017, liquids disposed were ferric sulfate water treatment chemicals.

lb - pounds

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW02	2/18/2015	97.51	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW02	2/20/2015	97.52	NP	0.00	NA	
EW02	2/24/2015	97.59	NP	0.00	NA	
EW02	3/10/2015	97.67	NP	0.00	NA	
EW02	3/24/2015	97.76	NP	0.00	NA	
EW02	4/10/2015	97.79	NP	0.00	NA	
EW02	4/16/2015	97.76	NP	0.00	NA	
EW02	5/8/2015	97.77	NP	0.00	NA	Groundwater extraction rate increased to 12 gpm on 4/30/2015
EW02	5/21/2015	97.89	NP	0.00	NA	
EW02	6/3/2015	97.92	NP	0.00	NA	
EW02	6/16/2015	97.99	NP	0.00	NA	
EW02	7/8/2015	98.12	NP	0.00	NA	
EW02	7/21/2015	98.11	NP	0.00	NA	
EW02	7/29/2015	98.11	NP	0.00	NA	Groundwater extraction rate increased to 13.5 gpm
EW02	8/5/2015	98.18	NP	0.00	NA	
EW02	8/19/2015	98.11	NP	0.00	NA	
EW02	9/4/2015	97.83	NP	0.00	NA	
EW02	9/21/2015	97.76	NP	0.00	NA	
EW02	10/8/2015	97.72	NP	0.00	NA	
EW02	10/22/2015	97.64	NP	0.00	NA	
EW02	11/2/2015	97.58	NP	0.00	NA	
EW02	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
Total LNAPL Recovered					0.0	

LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW04	11/4/2014	114.30	NP	0.00	NA	
EW04	12/11/2014	115.39	NP	0.00	NA	
EW04	12/23/2014	115.34	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW04	12/30/2014	115.26	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW04	1/8/2015	115.22	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW04	1/19/2015	115.23	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW04	1/22/2015	115.36	NP	0.00	NA	
EW04	1/30/2015	115.47	NP	0.00	NA	
EW04	2/3/2015	115.48	NP	0.00	NA	
EW04	2/13/2015	115.51	NP	0.00	NA	
EW04	2/17/2015	115.48	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW04	2/18/2015	115.51	NP	0.00	NA	
EW04	2/20/2015	115.43	NP	0.00	NA	
EW04	2/24/2015	115.53	NP	0.00	NA	
EW04	3/10/2015	115.58	NP	0.00	NA	
EW04	3/24/2015	115.67	NP	0.00	NA	
EW04	4/10/2015	115.69	NP	0.00	NA	
EW04	4/16/2015	115.69	NP	0.00	NA	
EW04	5/8/2015	115.69	NP	0.00	NA	Groundwater extraction rate increased to 12 gpm on 4/30/2015
EW04	5/21/2015	115.74	NP	0.00	NA	
EW04	6/3/2015	115.75	NP	0.00	NA	
EW04	6/16/2015	115.82	NP	0.00	NA	
EW04	7/8/2015	115.93	NP	0.00	NA	
EW04	7/21/2015	115.92	NP	0.00	NA	
EW04	7/29/2015	115.91	NP	0.00	NA	Groundwater extraction rate increased to 13.5 gpm
EW04	8/5/2015	115.97	NP	0.00	NA	
EW04	8/19/2015	115.95	NP	0.00	NA	
EW04	9/4/2015	115.78	NP	0.00	NA	
EW04	9/21/2015	115.61	NP	0.00	NA	
EW04	10/8/2015	115.58	NP	0.00	NA	
EW04	10/22/2015	115.58	NP	0.00	NA	
EW04	11/2/2015	115.45	NP	0.00	NA	
EW04	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
			Total LNAPL Recovered		0.0	

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW05	11/4/2014	83.35	83.25	0.10	NA	
EW05	11/6/2014	NM	NM	NM	<0.1	
EW05	11/7/2014	91.51	91.44	0.07	NA	
EW05	11/11/2014	91.75	91.56	0.19	NA	
EW05	11/12/2014	91.65	91.48	0.17	NA	Temporary system shutdown due to alarm condition
EW05	11/17/2014	91.64	91.51	0.13	NA	
EW05	12/1/2014	91.58	91.46	0.12	NA	
EW05	12/8/2014	91.55	91.51	0.04	NA	
EW05	12/11/2014	91.65	91.52	0.13	NA	
EW05	12/23/2014	91.40	91.39	0.01	NA	Groundwater extraction system shutdown pending carbon change-out
EW05	12/30/2014	91.37	91.36	0.01	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW05	1/8/2015	91.31	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW05	1/19/2015	91.32	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW05	1/22/2015	91.95	91.45	0.50	NA	
EW05	1/30/2015	92.00	91.49	0.51	0.1	Measurements recorded prior to LNAPL removal
EW05	2/3/2015	92.17	91.54	0.63	NA	
EW05	2/13/2015	92.14	91.54	0.60	NA	Groundwater extraction pump turned off
EW05	2/17/2015	91.72	91.49	0.23	NA	
EW05	2/20/2015	91.96	91.54	0.42	NA	
EW05	2/24/2015	91.91	91.56	0.35	NA	
EW05	2/27/2015	NM	NM	NM	0.3	Measurements recorded prior to LNAPL removal
EW05	3/10/2015	92.30	91.58	0.72	0.1	Measurements recorded prior to LNAPL removal
EW05	3/26/2015	92.42	91.62	0.80	NA	
EW05	3/31/2015	NM	NM	NM	0.5	
EW05	4/10/2015	92.50	91.71	0.79	NA	
EW05	4/16/2015	92.51	91.69	0.82	NA	
EW05	4/27/2015	NM	NM	NM	1.0	
EW05	5/8/2015	92.03	91.70	0.33	NA	
EW05	5/21/2015	92.34	91.76	0.58	1.0	
EW05	6/3/2015	92.29	91.79	0.50	0.4	
EW05	6/16/2015	92.40	91.86	0.54	0.3	
EW05	7/8/2015	92.34	91.95	0.39	NA	
EW05	7/10/2015	NM	NM	NM	0.5	
EW05	7/21/2015	92.58	91.93	0.65	NA	
EW05	7/23/2015	NM	NM	NM	0.5	
EW05	7/29/2015	92.69	91.96	0.73	NA	
EW05	8/5/2015	92.60	92.04	0.56	NA	
EW05	8/7/2015	NM	NM	NM	0.3	
EW05	8/19/2015	92.45	91.94	0.51	NA	
EW05	8/21/2015	NM	NM	NM	0.3	
EW05	9/4/2015	92.02	91.82	0.20	NA	
EW05	9/11/2015	NM	NM	NM	<0.1	
EW05	9/21/2015	91.67	91.66	0.01	NA	
EW05	10/8/2015	91.87	91.67	0.20	NA	
EW05	10/22/2015	91.66	91.65	0.01	NA	
EW05	11/2/2015	91.51	91.50	0.01	NA	
			Total LNAPL Recovered		5.5	

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW06	11/5/2014	111.22	98.06	13.16	12.0	
EW06	11/12/2014	107.80	98.30	9.50	NA	Temporary system shutdown due to alarm condition
EW06	11/17/2014	110.34	98.52	11.82	NA	
EW06	11/24/2014	111.05	98.45	12.60	10.0	
EW06	11/25/2014	105.63	98.55	7.08	NA	
EW06	12/1/2014	108.60	98.53	10.07	NA	
EW06	12/4/2014	109.35	98.48	10.87	NA	
EW06	12/8/2014	101.90	97.89	4.01	NA	
EW06	12/11/2014	111.91	98.01	13.90	NA	Measurements recorded prior to LNAPL removal
EW06	12/11/2014	100.35	98.40	1.95	12.0	Measurements recorded immediately after LNAPL removal
EW06	12/15/2014	108.40	98.01	10.39	NA	
EW06	12/23/2014	109.35	98.01	11.34	NA	Measurements recorded prior to LNAPL removal
EW06	12/23/2014	99.50	98.35	1.15	13.0	Measurements recorded immediately after LNAPL removal, groundwater extraction system shutdown pending carbon change-out
EW06	12/30/2014	98.59	97.83	0.76	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW06	1/8/2015	99.00	97.92	1.08	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW06	1/19/2015	99.54	97.80	1.74	NA	Groundwater extraction system restarted after carbon change-out
EW06	1/22/2015	111.10	98.18	12.92	NA	
EW06	1/23/2015	98.90	98.50	0.40	12.0	Measurements recorded immediately after LNAPL removal
EW06	1/30/2015	109.35	98.22	11.13	NA	
EW06	2/3/2015	112.61	98.22	14.39	12.0	Measurements recorded prior to LNAPL removal
EW06	2/13/2015	112.44	98.22	14.22	14.0	Groundwater extraction pump turned off
EW06	2/17/2015	101.95	98.12	3.83	NA	
EW06	2/20/2015	105.20	98.18	7.02	NA	
EW06	2/24/2015	105.37	98.02	7.35	8.0	Measurements recorded prior to LNAPL removal
EW06	3/10/2015	108.36	98.22	10.14	8.0	Measurements recorded prior to LNAPL removal
EW06	3/24/2015	NM	NM	NM	8.0	Not measured due to equipment breakdown
EW06	3/26/2015	105.87	98.21	7.66	NA	
EW06	4/10/2015	105.55	98.39	7.16	10.0	
EW06	4/16/2015	106.02	98.36	7.66	10.0	
EW06	4/30/2015	106.33	98.47	7.86	8.0	Groundwater extraction rate increased to 6 gpm
EW06	5/8/2015	100.72	98.32	2.40	4.0	
EW06	5/21/2015	106.84	98.27	8.57	10.0	
EW06	6/3/2015	106.55	98.41	8.14	NA	
EW06	6/4/2015	NM	NM	NM	10.0	
EW06	6/16/2015	105.85	98.49	7.36	7.0	
EW06	7/8/2015	107.10	98.42	8.68	20.0	
EW06	7/10/2015	107.10	98.60	8.50	17.0	
EW06	7/21/2015	107.90	98.54	9.36	17.0	
EW06	7/29/2015	105.87	98.59	7.28	NA	Groundwater extraction rate decreased to 3 gpm
EW06	8/5/2015	105.98	98.65	7.33	14.0	
EW06	8/7/2015	NM	NM	NM	14.0	
EW06	8/19/2015	103.95	98.51	5.44	10.0	
EW06	9/4/2015	105.31	98.31	7.00	10.0	
EW06	9/21/2015	104.49	98.28	6.21	10.0	
EW06	10/8/2015	100.38	98.25	2.13	5.0	
EW06	10/22/2015	105.54	98.23	7.31	8.0	
EW06	11/2/2015	105.15	98.05	7.10	NA	
EW06	11/5/2015	NM	NM	NM	8.0	
EW06	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
Total LNAPL Recovered					301.0	

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW10	11/4/2014	108.20	103.92	4.28	NA	
EW10	11/5/2014	108.77	104.70	4.07	4.0	
EW10	11/18/2014	107.60	104.35	3.25	NA	
EW10	11/24/2014	107.45	103.94	3.51	0.0	LNAPL pump inoperable, unable to recover LNAPL
EW10	11/25/2014	107.50	103.91	3.59	NA	
EW10	12/1/2014	107.30	104.14	3.16	NA	
EW10	12/4/2014	107.33	104.11	3.22	NA	Measurements recorded prior to LNAPL removal
EW10	12/4/2014	105.35	104.05	1.30	2.0	Measurements recorded immediately after LNAPL removal
EW10	12/8/2014	104.29	103.17	1.12	NA	
EW10	12/11/2014	106.95	104.05	2.90	NA	Measurements recorded prior to LNAPL removal
EW10	12/11/2014	105.46	104.12	1.34	2.0	Measurements recorded immediately after LNAPL removal
EW10	12/15/2014	106.68	104.00	2.68	NA	
EW10	12/23/2014	107.25	103.91	3.34	NA	Measurements recorded prior to LNAPL removal
EW10	12/23/2014	104.75	104.06	0.69	4.0	Measurements recorded immediately after LNAPL removal, groundwater extraction system shutdown pending carbon change-out
EW10	12/30/2014	104.59	103.00	1.59	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW10	1/8/2015	104.55	103.10	1.45	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW10	1/19/2015	104.70	103.00	1.70	NA	Groundwater extraction system restarted after carbon change-out
EW10	1/22/2015	106.38	104.31	2.07	NA	
EW10	1/23/2015	104.40	104.38	0.02	2.0	Measurements recorded immediately after LNAPL removal
EW10	1/30/2015	105.76	104.28	1.48	NA	
EW10	2/3/2015	106.00	104.27	1.73	2.0	Measurements recorded prior to LNAPL removal
EW10	2/13/2015	106.82	104.24	2.58	3.0	Groundwater extraction pump turned off
EW10	2/17/2015	105.80	103.65	2.15	NA	
EW10	2/20/2015	106.40	103.81	2.59	NA	
EW10	2/24/2015	106.85	103.79	3.06	2.0	Measurements recorded prior to LNAPL removal
EW10	3/10/2015	107.80	103.81	3.99	2.0	Measurements recorded prior to LNAPL removal
EW10	3/24/2015	108.21	103.84	4.37	2.0	Measurements recorded prior to LNAPL removal
EW10	4/10/2015	108.96	103.86	5.10	3.0	
EW10	4/16/2015	108.18	103.90	4.28	2.0	
EW10	4/30/2015	107.81	103.84	3.97	2.0	
EW10	5/8/2015	106.84	103.46	3.38	2.5	
EW10	5/21/2015	107.46	103.62	3.84	2.5	
EW10	6/3/2015	107.51	103.60	3.91	NA	
EW10	6/4/2015	NM	NM	NM	2.5	
EW10	6/16/2015	108.20	103.85	4.35	2.0	
EW10	7/8/2015	108.53	103.96	4.57	3.0	
EW10	7/10/2015	107.85	103.97	3.88	NA	
EW10	7/21/2015	108.48	103.96	4.52	3.0	
EW10	7/29/2015	108.10	104.00	4.10	NA	
EW10	8/5/2015	108.85	104.00	4.85	2.5	
EW10	8/19/2015	108.57	103.74	4.83	3.0	
EW10	9/4/2015	108.91	103.60	5.31	3.0	
EW10	9/21/2015	108.35	103.62	4.73	3.0	
EW10	10/8/2015	107.72	103.33	4.39	2.5	
EW10	10/22/2015	109.10	103.56	5.54	3.0	
EW10	11/2/2015	109.50	103.27	6.23	NA	
EW10	11/5/2015	NM	NM	NM	3.0	
Total LNAPL Recovered					67.5	

LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW12	11/4/2014	105.26	105.04	0.22	NA	
EW12	11/6/2014	NM	NM	NM	<0.1	
EW12	11/7/2014	108.26	108.15	0.11	NA	
EW12	11/11/2014	108.39	108.22	0.17	NA	
EW12	11/12/2014	101.16	101.14	0.02	NA	Temporary system shutdown due to alarm condition
EW12	11/17/2014	108.00	107.98	0.02	NA	
EW12	12/8/2014	100.99	NP	0.00	NA	
EW12	12/11/2014	108.98	108.97	0.01	NA	
EW12	12/23/2014	109.75	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW12	12/30/2014	101.10	100.88	0.22	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW12	1/8/2015	101.20	100.84	0.36	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW12	1/19/2015	101.35	100.85	0.50	NA	Groundwater extraction system restarted after carbon change-out
EW12	1/22/2015	108.16	108.15	0.01	NA	
EW12	1/30/2015	108.96	108.96	0.00	NA	
EW12	2/3/2015	109.13	109.13	0.00	NA	
EW12	2/13/2015	109.98	NP	0.00	NA	Groundwater extraction pump turned off
EW12	2/17/2015	101.56	101.08	0.48	NA	
EW12	2/20/2015	101.90	101.32	0.58	NA	
EW12	2/24/2015	102.01	101.31	0.70	NA	
EW12	2/27/2015	NM	NM	NM	0.1	Measurements recorded prior to LNAPL removal
EW12	3/10/2015	102.35	101.35	1.00	0.1	Measurements recorded prior to LNAPL removal
EW12	3/24/2015	102.45	101.33	1.12	NA	
EW12	3/31/2015	NM	NM	NM	1.0	
EW12	4/10/2015	102.22	101.36	0.86	NA	
EW12	4/16/2015	102.32	101.36	0.96	NA	
EW12	4/27/2015	NM	NM	NM	1.0	
EW12	5/8/2015	101.99	101.19	0.80	NA	
EW12	5/21/2015	102.39	101.40	0.99	1.0	
EW12	6/3/2015	102.34	101.45	0.89	0.4	
EW12	6/16/2015	102.27	101.50	0.77	0.3	
EW12	7/8/2015	102.26	101.54	0.72	NA	
EW12	7/10/2015	NM	NM	NM	0.5	
EW12	7/21/2015	102.10	101.61	0.49	NA	
EW12	7/23/2015	NM	NM	NM	0.5	
EW12	7/29/2015	102.11	101.65	0.46	NA	
EW12	8/5/2015	102.39	101.69	0.70	NA	
EW12	8/7/2015	NM	NM	NM	0.3	
EW12	8/19/2015	101.27	100.45	0.82	NA	
EW12	8/21/2015	NM	NM	NM	0.1	
EW12	9/4/2015	101.87	101.47	0.40	NA	
EW12	9/11/2015	NM	NM	NM	0.3	
EW12	9/21/2015	101.60	101.29	0.31	NA	
EW12	10/1/2015	NM	NM	NM	0.2	
EW12	10/8/2015	101.39	101.15	0.24	NA	
EW12	10/22/2015	101.52	101.23	0.29	NA	
EW12	11/2/2015	101.51	101.18	0.33	NA	
Total LNAPL Recovered					5.9	

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW13	11/4/2014	111.48	NP	0.00	NA	
EW13	12/11/2014	114.81	NP	0.00	NA	
EW13	12/23/2014	115.11	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW13	12/30/2014	107.34	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW13	1/8/2015	107.27	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW13	1/19/2015	107.33	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW13	1/22/2015	115.05	NP	0.00	NA	
EW13	1/30/2015	115.49	NP	0.00	NA	
EW13	2/3/2015	115.28	NP	0.00	NA	
EW13	2/13/2015	115.74	NP	0.00	NA	
EW13	2/17/2015	117.05	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW13	2/18/2015	119.19	NP	0.00	NA	
EW13	2/20/2015	119.37	NP	0.00	NA	
EW13	2/24/2015	119.50	NP	0.00	NA	
EW13	3/10/2015	120.13	NP	0.00	NA	
EW13	3/24/2015	116.72	NP	0.00	NA	
EW13	4/10/2015	118.55	NP	0.00	NA	
EW13	4/16/2015	120.92	NP	0.00	NA	
EW13	5/8/2015	107.18	NP	0.00	NA	Groundwater extraction pump turned off on 4/30/2015
EW13	5/21/2015	104.94	NP	0.00	NA	
EW13	6/3/2015	105.88	NP	0.00	NA	
EW13	6/16/2015	106.44	NP	0.00	NA	
EW13	7/8/2015	107.42	NP	0.00	NA	
EW13	7/21/2015	107.70	NP	0.00	NA	
EW13	7/29/2015	107.91	NP	0.00	NA	
EW13	8/5/2015	107.89	NP	0.00	NA	
EW13	8/19/2015	107.80	NP	0.00	NA	
EW13	9/4/2015	107.63	NP	0.00	NA	
EW13	9/21/2015	107.63	NP	0.00	NA	
EW13	10/8/2015	107.49	NP	0.00	NA	
EW13	10/22/2015	107.72	NP	0.00	NA	
EW13	11/2/2015	107.48	NP	0.00	NA	
			Total LNAPL Recovered		0.0	

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW14	11/4/2014	112.55	112.45	0.10	NA	
EW14	11/6/2014	NM	NM	NM	<0.1	
EW14	11/7/2014	112.54	112.49	0.05	NA	
EW14	11/11/2014	112.68	112.60	0.08	NA	
EW14	11/12/2014	112.91	112.87	0.04	NA	Temporary system shutdown due to alarm condition
EW14	11/17/2014	111.82	111.55	0.27	NA	
EW14	12/8/2014	112.89	112.85	0.04	NA	
EW14	12/11/2014	113.83	113.75	0.08	NA	
EW14	12/23/2014	113.74	113.65	0.09	NA	Groundwater extraction system shutdown pending carbon change-out
EW14	12/30/2014	112.85	112.76	0.09	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW14	1/8/2015	112.77	112.71	0.06	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW14	1/19/2015	112.92	112.78	0.14	NA	Groundwater extraction system restarted after carbon change-out
EW14	1/22/2015	113.80	113.72	0.08	NA	
EW14	1/30/2015	113.79	113.66	0.13	<0.1	
EW14	2/3/2015	113.74	113.65	0.09	NA	
EW14	2/13/2015	113.90	113.68	0.22	NA	
EW14	2/17/2015	113.85	113.79	0.06	NA	Groundwater extraction rate increased to 10 gpm
EW14	2/18/2015	114.29	114.21	0.08	NA	
EW14	2/20/2015	114.26	114.18	0.08	NA	
EW14	2/24/2015	114.25	114.21	0.04	NA	
EW14	3/10/2015	114.36	114.30	0.06	NA	
EW14	3/24/2015	114.41	114.36	0.05	NA	
EW14	3/31/2015	NM	NM	NM	<0.1	
EW14	4/10/2015	114.43	114.42	0.01	NA	
EW14	4/16/2015	114.47	114.44	0.03	NA	
EW14	5/8/2015	113.30	113.14	0.16	NA	Groundwater extraction pump turned off on 4/30/2015
EW14	5/21/2015	113.71	113.49	0.22	NA	
EW14	6/3/2015	113.72	113.50	0.22	0.2	
EW14	6/16/2015	113.71	113.58	0.13	0.1	
EW14	7/8/2015	113.71	113.62	0.09	NA	
EW14	7/21/2015	113.78	113.68	0.10	NA	
EW14	7/29/2015	113.83	113.72	0.11	NA	
EW14	8/5/2015	113.84	113.72	0.12	NA	
EW14	8/7/2015	NM	NM	NM	<0.1	
EW14	8/19/2015	113.80	113.70	0.10	NA	
EW14	9/4/2015	113.68	113.59	0.09	NA	
EW14	9/11/2015	NM	NM	NM	<0.1	
EW14	9/21/2015	113.43	113.38	0.05	NA	
EW14	10/8/2015	113.12	113.06	0.06	NA	
EW14	10/22/2015	113.48	113.39	0.09	NA	
EW14	11/2/2015	113.44	113.32	0.12	NA	
Total LNAPL Recovered					0.8	
Total LNAPL Recovered (all wells)					380.7	Since system modification in October 2014; system shutdown and LNAPL recovery terminated in November 2015

Notes:

¹ Depth to water and depth to LNAPL measurements before December 2014 were not consistently recorded from the same benchmark location/elevation. Measurements were consistently recorded from the same benchmark location at the top of the well vault starting in December 2014.

NM - Not measured
 NP - LNAPL was not present in a measurable quantity
 NA - Not applicable

Appendix B

Groundwater Sample Laboratory Reports – Monitoring, Extraction, Residential, and Onsite Supply Wells

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

TestAmerica Job ID: 500-153349-1
Client Project/Site: Penta Wood 086165

For:
GHD Services Inc.
1801 Old Highway 8 NW
Suite 114
St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:
11/1/2018 12:42:35 PM

Richard Wright, Senior Project Manager
(708)534-5200
richard.wright@testamericainc.com

LINKS

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www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Job ID: 500-153349-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative 500-153349-1

Receipt

The samples were received on 10/18/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 8 coolers at receipt time were 1.3° C, 1.8° C, 2.1° C, 2.6° C, 3.1° C, 3.3° C, 3.9° C and 4.1° C.

GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D: The following samples contained one base surrogate outside acceptance limits: W-181016-MH-10 (500-153349-10[MS]), W-181016-MH-10 (500-153349-10[MSD]) and W-181017-MH-14 (500-153349-14). The laboratory's SOP allows one base surrogate to be outside acceptance limits; therefore, re-extraction was not performed. These results have been reported and qualified.

Method(s) 8270D: The continuing calibration verification (CCVIS) associated with batch 500-456532 recovered above the upper control limit for Nitrobenzene-d5 (Surr).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA

Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 240-351927.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

Method(s) 8151A: The following sample required a dilution due to the nature of the sample matrix: W-181016-MH-11 (500-153349-11). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181015-MH-01

Lab Sample ID: 500-153349-1

No Detections.

Client Sample ID: W-181015-MH-02

Lab Sample ID: 500-153349-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.16		0.096	0.086	ug/L	1		8151A	Total/NA

Client Sample ID: W-181015-MH-03

Lab Sample ID: 500-153349-3

No Detections.

Client Sample ID: W-181016-MH-04

Lab Sample ID: 500-153349-4

No Detections.

Client Sample ID: W-181016-MH-05

Lab Sample ID: 500-153349-5

No Detections.

Client Sample ID: W-181016-MH-06

Lab Sample ID: 500-153349-6

No Detections.

Client Sample ID: W-181016-MH-07

Lab Sample ID: 500-153349-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.7		0.50	0.15	ug/L	1		8260B	Total/NA

Client Sample ID: W-181016-MH-08

Lab Sample ID: 500-153349-8

No Detections.

Client Sample ID: W-181016-MH-09

Lab Sample ID: 500-153349-9

No Detections.

Client Sample ID: W-181016-MH-10

Lab Sample ID: 500-153349-10

No Detections.

Client Sample ID: W-181016-MH-11

Lab Sample ID: 500-153349-11

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	110		4.9	4.4	ug/L	50		8151A	Total/NA
Arsenic	0.53	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.3	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	72.2		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	231		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	8.1		0.40	0.34	mg/L	2		300.0	Total/NA
Nitrate as N	0.61		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	59.9		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	2.1		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	173		5.0	3.7	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-12

Lab Sample ID: 500-153349-12

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.26	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	3.2		2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	13.0	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	28.6		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	4.5		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.74		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	3.5		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	1.8		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	32.0		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181016-MH-13

Lab Sample ID: 500-153349-13

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.46	J	1.0	0.22	ug/L	1		8260B	Total/NA
Copper	0.63	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	1.0	J	2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	181		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	0.67		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.55		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	1.5		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.70	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	187		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-14

Lab Sample ID: 500-153349-14

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.15	J	0.50	0.15	ug/L	1		8260B	Total/NA
Pentachlorophenol	0.35		0.096	0.086	ug/L	1		8151A	Total/NA
Copper	1.8	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	3.2		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	47.7		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	0.83		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.41		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	2.8		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	2.4		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	54.9		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-15

Lab Sample ID: 500-153349-15

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.18	J	0.50	0.15	ug/L	1		8260B	Total/NA
Arsenic	0.58	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	0.82	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	239		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	39.7		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.1		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	8.7		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.90	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	191		5.0	3.7	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-16

Lab Sample ID: 500-153349-16

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.15	J	0.50	0.15	ug/L	1		8260B	Total/NA
Arsenic	0.63	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.1	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	317		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	13.6		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.9		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	106		4.0	1.9	mg/L	20		300.0	Total/NA
Total Organic Carbon - Duplicates	0.61	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	185		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank

Lab Sample ID: 500-153349-17

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL CHI
6020A	Metals (ICP/MS)	SW846	TAL CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL CHI
300.0	Anions, Ion Chromatography	MCAWW	TAL CHI
9060A	Organic Carbon, Total (TOC)	SW846	TAL CHI
SM 2320B	Alkalinity	SM	TAL CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CHI
3010A	Preparation, Total Metals	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CHI
5030B	Purge and Trap	SW846	TAL CHI
8151A	Extraction (Herbicides)	SW846	TAL CHI

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-153349-1	W-181015-MH-01	Water	10/15/18 15:50	10/18/18 09:00
500-153349-2	W-181015-MH-02	Water	10/15/18 16:29	10/18/18 09:00
500-153349-3	W-181015-MH-03	Water	10/15/18 16:41	10/18/18 09:00
500-153349-4	W-181016-MH-04	Water	10/16/18 09:08	10/18/18 09:00
500-153349-5	W-181016-MH-05	Water	10/16/18 09:15	10/18/18 09:00
500-153349-6	W-181016-MH-06	Water	10/16/18 09:50	10/18/18 09:00
500-153349-7	W-181016-MH-07	Water	10/16/18 09:57	10/18/18 09:00
500-153349-8	W-181016-MH-08	Water	10/16/18 10:18	10/18/18 09:00
500-153349-9	W-181016-MH-09	Water	10/16/18 10:28	10/18/18 09:00
500-153349-10	W-181016-MH-10	Water	10/16/18 10:58	10/18/18 09:00
500-153349-11	W-181016-MH-11	Water	10/16/18 12:50	10/18/18 09:00
500-153349-12	W-181016-MH-12	Water	10/16/18 13:20	10/18/18 09:00
500-153349-13	W-181016-MH-13	Water	10/16/18 14:14	10/18/18 09:00
500-153349-14	W-181017-MH-14	Water	10/16/18 15:23	10/18/18 09:00
500-153349-15	W-181017-MH-15	Water	10/17/18 08:58	10/18/18 09:00
500-153349-16	W-181017-MH-16	Water	10/17/18 10:00	10/18/18 09:00
500-153349-17	Trip Blank	Water	10/17/18 11:00	10/18/18 09:00

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181015-MH-01

Lab Sample ID: 500-153349-1

Date Collected: 10/15/18 15:50

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 13:15	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 13:15	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 13:15	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 13:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		75 - 126		10/24/18 13:15	1
Toluene-d8 (Surr)	98		75 - 120		10/24/18 13:15	1
4-Bromofluorobenzene (Surr)	96		72 - 124		10/24/18 13:15	1
Dibromofluoromethane	77		75 - 120		10/24/18 13:15	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.28		0.90	0.28	ug/L		10/22/18 07:49	10/22/18 14:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	93		36 - 120	10/22/18 07:49	10/22/18 14:46	1
2-Fluorobiphenyl (Surr)	98		34 - 110	10/22/18 07:49	10/22/18 14:46	1
Terphenyl-d14 (Surr)	121		40 - 145	10/22/18 07:49	10/22/18 14:46	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.095		0.11	0.095	ug/L		10/22/18 10:37	10/23/18 00:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	78		25 - 130	10/22/18 10:37	10/23/18 00:06	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181015-MH-02

Lab Sample ID: 500-153349-2

Date Collected: 10/15/18 16:29

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 13:40	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 13:40	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 13:40	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 13:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		75 - 126		10/24/18 13:40	1
Toluene-d8 (Surr)	98		75 - 120		10/24/18 13:40	1
4-Bromofluorobenzene (Surr)	97		72 - 124		10/24/18 13:40	1
Dibromofluoromethane	75		75 - 120		10/24/18 13:40	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.27		0.87	0.27	ug/L		10/22/18 07:49	10/22/18 16:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	93		36 - 120	10/22/18 07:49	10/22/18 16:18	1
2-Fluorobiphenyl (Surr)	99		34 - 110	10/22/18 07:49	10/22/18 16:18	1
Terphenyl-d14 (Surr)	121		40 - 145	10/22/18 07:49	10/22/18 16:18	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.16		0.096	0.086	ug/L		10/22/18 10:37	10/23/18 00:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	77		25 - 130	10/22/18 10:37	10/23/18 00:31	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181015-MH-03

Lab Sample ID: 500-153349-3

Date Collected: 10/15/18 16:41

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 14:05	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 14:05	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 14:05	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 14:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		75 - 126		10/24/18 14:05	1
Toluene-d8 (Surr)	99		75 - 120		10/24/18 14:05	1
4-Bromofluorobenzene (Surr)	96		72 - 124		10/24/18 14:05	1
Dibromofluoromethane	77		75 - 120		10/24/18 14:05	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.79	0.24	ug/L		10/22/18 07:49	10/22/18 16:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	85		36 - 120	10/22/18 07:49	10/22/18 16:49	1
2-Fluorobiphenyl (Surr)	92		34 - 110	10/22/18 07:49	10/22/18 16:49	1
Terphenyl-d14 (Surr)	110		40 - 145	10/22/18 07:49	10/22/18 16:49	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.10	0.089	ug/L		10/22/18 10:37	10/23/18 00:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	75		25 - 130	10/22/18 10:37	10/23/18 00:55	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-04

Lab Sample ID: 500-153349-4

Date Collected: 10/16/18 09:08

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 14:56	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 14:56	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 14:56	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 14:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 126		10/24/18 14:56	1
Toluene-d8 (Surr)	97		75 - 120		10/24/18 14:56	1
4-Bromofluorobenzene (Surr)	97		72 - 124		10/24/18 14:56	1
Dibromofluoromethane	78		75 - 120		10/24/18 14:56	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.77	0.24	ug/L		10/22/18 07:49	10/22/18 17:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	85		36 - 120	10/22/18 07:49	10/22/18 17:20	1
2-Fluorobiphenyl (Surr)	90		34 - 110	10/22/18 07:49	10/22/18 17:20	1
Terphenyl-d14 (Surr)	111		40 - 145	10/22/18 07:49	10/22/18 17:20	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/22/18 10:37	10/23/18 01:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	75		25 - 130	10/22/18 10:37	10/23/18 01:19	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-05

Lab Sample ID: 500-153349-5

Date Collected: 10/16/18 09:15

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 15:21	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 15:21	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 15:21	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 15:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/24/18 15:21	1
Toluene-d8 (Surr)	95		75 - 120		10/24/18 15:21	1
4-Bromofluorobenzene (Surr)	99		72 - 124		10/24/18 15:21	1
Dibromofluoromethane	79		75 - 120		10/24/18 15:21	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/22/18 07:49	10/22/18 19:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	99		36 - 120	10/22/18 07:49	10/22/18 19:53	1
2-Fluorobiphenyl (Surr)	103		34 - 110	10/22/18 07:49	10/22/18 19:53	1
Terphenyl-d14 (Surr)	131		40 - 145	10/22/18 07:49	10/22/18 19:53	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.099	0.089	ug/L		10/22/18 10:37	10/23/18 01:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	73		25 - 130	10/22/18 10:37	10/23/18 01:43	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-06

Lab Sample ID: 500-153349-6

Date Collected: 10/16/18 09:50

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 15:47	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 15:47	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 15:47	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 15:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		75 - 126		10/24/18 15:47	1
Toluene-d8 (Surr)	96		75 - 120		10/24/18 15:47	1
4-Bromofluorobenzene (Surr)	98		72 - 124		10/24/18 15:47	1
Dibromofluoromethane	78		75 - 120		10/24/18 15:47	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.78	0.24	ug/L		10/22/18 07:49	10/22/18 20:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	97		36 - 120	10/22/18 07:49	10/22/18 20:24	1
2-Fluorobiphenyl (Surr)	101		34 - 110	10/22/18 07:49	10/22/18 20:24	1
Terphenyl-d14 (Surr)	130		40 - 145	10/22/18 07:49	10/22/18 20:24	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.099	0.089	ug/L		10/22/18 10:37	10/23/18 02:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	74		25 - 130	10/22/18 10:37	10/23/18 02:08	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-07

Lab Sample ID: 500-153349-7

Date Collected: 10/16/18 09:57

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 16:12	1
Toluene	1.7		0.50	0.15	ug/L			10/24/18 16:12	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 16:12	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 16:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		75 - 126		10/24/18 16:12	1
Toluene-d8 (Surr)	94		75 - 120		10/24/18 16:12	1
4-Bromofluorobenzene (Surr)	99		72 - 124		10/24/18 16:12	1
Dibromofluoromethane	80		75 - 120		10/24/18 16:12	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.23		0.75	0.23	ug/L		10/22/18 07:49	10/22/18 20:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	84		36 - 120	10/22/18 07:49	10/22/18 20:54	1
2-Fluorobiphenyl (Surr)	87		34 - 110	10/22/18 07:49	10/22/18 20:54	1
Terphenyl-d14 (Surr)	127		40 - 145	10/22/18 07:49	10/22/18 20:54	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.085		0.095	0.085	ug/L		10/22/18 10:37	10/23/18 02:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	82		25 - 130	10/22/18 10:37	10/23/18 02:32	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-08

Lab Sample ID: 500-153349-8

Date Collected: 10/16/18 10:18

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 16:37	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 16:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 16:37	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 16:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		75 - 126		10/24/18 16:37	1
Toluene-d8 (Surr)	95		75 - 120		10/24/18 16:37	1
4-Bromofluorobenzene (Surr)	98		72 - 124		10/24/18 16:37	1
Dibromofluoromethane	82		75 - 120		10/24/18 16:37	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.79	0.24	ug/L		10/22/18 07:49	10/22/18 21:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	106		36 - 120	10/22/18 07:49	10/22/18 21:25	1
2-Fluorobiphenyl (Surr)	105		34 - 110	10/22/18 07:49	10/22/18 21:25	1
Terphenyl-d14 (Surr)	142		40 - 145	10/22/18 07:49	10/22/18 21:25	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/22/18 10:37	10/23/18 02:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	74		25 - 130	10/22/18 10:37	10/23/18 02:56	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-09

Lab Sample ID: 500-153349-9

Date Collected: 10/16/18 10:28

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 17:03	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 17:03	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 17:03	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 17:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		75 - 126		10/24/18 17:03	1
Toluene-d8 (Surr)	96		75 - 120		10/24/18 17:03	1
4-Bromofluorobenzene (Surr)	100		72 - 124		10/24/18 17:03	1
Dibromofluoromethane	81		75 - 120		10/24/18 17:03	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.77	0.24	ug/L		10/22/18 07:49	10/22/18 22:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	91		36 - 120	10/22/18 07:49	10/22/18 22:26	1
2-Fluorobiphenyl (Surr)	94		34 - 110	10/22/18 07:49	10/22/18 22:26	1
Terphenyl-d14 (Surr)	136		40 - 145	10/22/18 07:49	10/22/18 22:26	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.088		0.098	0.088	ug/L		10/22/18 10:37	10/23/18 04:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	72		25 - 130	10/22/18 10:37	10/23/18 04:09	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-10

Lab Sample ID: 500-153349-10

Date Collected: 10/16/18 10:58

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 18:44	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 18:44	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 18:44	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 18:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		75 - 126		10/24/18 18:44	1
Toluene-d8 (Surr)	94		75 - 120		10/24/18 18:44	1
4-Bromofluorobenzene (Surr)	98		72 - 124		10/24/18 18:44	1
Dibromofluoromethane	82		75 - 120		10/24/18 18:44	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.82	0.25	ug/L		10/22/18 07:49	10/22/18 22:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	106		36 - 120	10/22/18 07:49	10/22/18 22:57	1
2-Fluorobiphenyl (Surr)	109		34 - 110	10/22/18 07:49	10/22/18 22:57	1
Terphenyl-d14 (Surr)	142		40 - 145	10/22/18 07:49	10/22/18 22:57	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.085		0.095	0.085	ug/L		10/22/18 10:37	10/23/18 04:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	76		25 - 130	10/22/18 10:37	10/23/18 04:33	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-11

Lab Sample ID: 500-153349-11

Date Collected: 10/16/18 12:50

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 19:10	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 19:10	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 19:10	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 19:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		75 - 126		10/24/18 19:10	1
Toluene-d8 (Surr)	94		75 - 120		10/24/18 19:10	1
4-Bromofluorobenzene (Surr)	98		72 - 124		10/24/18 19:10	1
Dibromofluoromethane	82		75 - 120		10/24/18 19:10	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.78	0.24	ug/L		10/22/18 07:49	10/22/18 23:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	90		36 - 120	10/22/18 07:49	10/22/18 23:28	1
2-Fluorobiphenyl (Surr)	90		34 - 110	10/22/18 07:49	10/22/18 23:28	1
Terphenyl-d14 (Surr)	116		40 - 145	10/22/18 07:49	10/22/18 23:28	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 19:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	106		60 - 140		10/25/18 19:38	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	110		4.9	4.4	ug/L		10/22/18 10:37	10/23/18 09:24	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130	10/22/18 10:37	10/23/18 09:24	50

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.53	J	1.0	0.23	ug/L		10/18/18 15:58	10/19/18 18:47	1
Copper	1.3	J	2.0	0.50	ug/L		10/18/18 15:58	10/19/18 18:47	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 18:47	1
Manganese	72.2		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 18:47	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 18:47	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	231		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.1		0.40	0.34	mg/L			10/27/18 07:45	2
Nitrate as N	0.61		0.20	0.068	mg/L			10/18/18 12:17	1
Sulfate	59.9		2.0	0.95	mg/L			10/18/18 12:29	10
Total Organic Carbon - Duplicates	2.1		1.0	0.47	mg/L			10/29/18 12:39	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-11

Lab Sample ID: 500-153349-11

Date Collected: 10/16/18 12:50

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	173		5.0	3.7	mg/L			10/30/18 13:03	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-12

Lab Sample ID: 500-153349-12

Date Collected: 10/16/18 13:20

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 19:35	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 19:35	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 19:35	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 19:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		75 - 126		10/24/18 19:35	1
Toluene-d8 (Surr)	94		75 - 120		10/24/18 19:35	1
4-Bromofluorobenzene (Surr)	99		72 - 124		10/24/18 19:35	1
Dibromofluoromethane	82		75 - 120		10/24/18 19:35	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/22/18 07:49	10/22/18 23:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	94		36 - 120	10/22/18 07:49	10/22/18 23:58	1
2-Fluorobiphenyl (Surr)	96		34 - 110	10/22/18 07:49	10/22/18 23:58	1
Terphenyl-d14 (Surr)	125		40 - 145	10/22/18 07:49	10/22/18 23:58	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 19:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	106		60 - 140		10/25/18 19:55	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.094		0.10	0.094	ug/L		10/22/18 10:37	10/23/18 06:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	81		25 - 130	10/22/18 10:37	10/23/18 06:10	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.26	J	1.0	0.23	ug/L		10/18/18 15:58	10/19/18 19:13	1
Copper	3.2		2.0	0.50	ug/L		10/18/18 15:58	10/19/18 19:13	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 19:13	1
Manganese	<0.79		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 19:13	1
Zinc	13.0	J	20.0	6.9	ug/L		10/18/18 15:58	10/19/18 19:13	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	28.6		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.5		0.20	0.17	mg/L			10/18/18 12:42	1
Nitrate as N	0.74		0.20	0.068	mg/L			10/18/18 12:42	1
Sulfate	3.5		0.20	0.095	mg/L			10/18/18 12:42	1
Total Organic Carbon - Duplicates	1.8		1.0	0.47	mg/L			10/29/18 13:19	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-12

Lab Sample ID: 500-153349-12

Date Collected: 10/16/18 13:20

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	32.0		5.0	3.7	mg/L			10/30/18 13:09	1

1

2

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15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-13

Lab Sample ID: 500-153349-13

Date Collected: 10/16/18 14:14

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 03:10	1
Toluene	<0.15		0.50	0.15	ug/L			10/26/18 03:10	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 03:10	1
Xylenes, Total	0.46	J	1.0	0.22	ug/L			10/26/18 03:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 126		10/26/18 03:10	1
Toluene-d8 (Surr)	99		75 - 120		10/26/18 03:10	1
4-Bromofluorobenzene (Surr)	120		72 - 124		10/26/18 03:10	1
Dibromofluoromethane	86		75 - 120		10/26/18 03:10	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.79	0.24	ug/L		10/22/18 07:49	10/24/18 15:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	90		36 - 120	10/22/18 07:49	10/24/18 15:43	1
2-Fluorobiphenyl (Surr)	89		34 - 110	10/22/18 07:49	10/24/18 15:43	1
Terphenyl-d14 (Surr)	106		40 - 145	10/22/18 07:49	10/24/18 15:43	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 20:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	105		60 - 140		10/25/18 20:12	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/22/18 10:37	10/23/18 06:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	77		25 - 130	10/22/18 10:37	10/23/18 06:35	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/18/18 15:58	10/19/18 19:17	1
Copper	0.63	J	2.0	0.50	ug/L		10/18/18 15:58	10/19/18 19:17	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 19:17	1
Manganese	1.0	J	2.5	0.79	ug/L		10/18/18 15:58	10/19/18 19:17	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 19:17	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	181		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.67		0.20	0.17	mg/L			10/18/18 13:06	1
Nitrate as N	0.55		0.20	0.068	mg/L			10/18/18 13:06	1
Sulfate	1.5		0.20	0.095	mg/L			10/18/18 13:06	1
Total Organic Carbon - Duplicates	0.70	J	1.0	0.47	mg/L			10/29/18 13:38	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-13

Lab Sample ID: 500-153349-13

Date Collected: 10/16/18 14:14

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	187		5.0	3.7	mg/L			10/30/18 13:28	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-14

Lab Sample ID: 500-153349-14

Date Collected: 10/16/18 15:23

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 03:35	1
Toluene	0.15	J	0.50	0.15	ug/L			10/26/18 03:35	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 03:35	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/26/18 03:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 126					10/26/18 03:35	1
Toluene-d8 (Surr)	97		75 - 120					10/26/18 03:35	1
4-Bromofluorobenzene (Surr)	119		72 - 124					10/26/18 03:35	1
Dibromofluoromethane	89		75 - 120					10/26/18 03:35	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.79	0.24	ug/L		10/22/18 07:49	10/24/18 16:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	127	X	36 - 120				10/22/18 07:49	10/24/18 16:11	1
2-Fluorobiphenyl (Surr)	92		34 - 110				10/22/18 07:49	10/24/18 16:11	1
Terphenyl-d14 (Surr)	116		40 - 145				10/22/18 07:49	10/24/18 16:11	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 20:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	104		60 - 140					10/25/18 20:29	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.35		0.096	0.086	ug/L		10/22/18 10:37	10/23/18 06:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	81		25 - 130				10/22/18 10:37	10/23/18 06:59	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/18/18 15:58	10/19/18 19:21	1
Copper	1.8	J	2.0	0.50	ug/L		10/18/18 15:58	10/19/18 19:21	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 19:21	1
Manganese	3.2		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 19:21	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 19:21	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	47.7		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.83		0.20	0.17	mg/L			10/18/18 13:31	1
Nitrate as N	0.41		0.20	0.068	mg/L			10/18/18 13:31	1
Sulfate	2.8		0.20	0.095	mg/L			10/18/18 13:31	1
Total Organic Carbon - Duplicates	2.4		1.0	0.47	mg/L			10/29/18 13:58	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-14

Lab Sample ID: 500-153349-14

Date Collected: 10/16/18 15:23

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	54.9		5.0	3.7	mg/L			10/30/18 13:34	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-15

Lab Sample ID: 500-153349-15

Date Collected: 10/17/18 08:58

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 04:01	1
Toluene	0.18	J	0.50	0.15	ug/L			10/26/18 04:01	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 04:01	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/26/18 04:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 126					10/26/18 04:01	1
Toluene-d8 (Surr)	97		75 - 120					10/26/18 04:01	1
4-Bromofluorobenzene (Surr)	117		72 - 124					10/26/18 04:01	1
Dibromofluoromethane	89		75 - 120					10/26/18 04:01	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.79	0.25	ug/L		10/22/18 07:49	10/24/18 16:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	83		36 - 120				10/22/18 07:49	10/24/18 16:39	1
2-Fluorobiphenyl (Surr)	86		34 - 110				10/22/18 07:49	10/24/18 16:39	1
Terphenyl-d14 (Surr)	103		40 - 145				10/22/18 07:49	10/24/18 16:39	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 20:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	103		60 - 140					10/25/18 20:46	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.099	0.089	ug/L		10/22/18 10:37	10/23/18 07:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	77		25 - 130				10/22/18 10:37	10/23/18 07:23	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.58	J	1.0	0.23	ug/L		10/18/18 15:58	10/19/18 19:25	1
Copper	0.82	J	2.0	0.50	ug/L		10/18/18 15:58	10/19/18 19:25	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 19:25	1
Manganese	<0.79		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 19:25	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 19:25	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	239		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	39.7		2.0	1.7	mg/L			10/18/18 14:08	10
Nitrate as N	2.1		0.20	0.068	mg/L			10/18/18 13:56	1
Sulfate	8.7		0.20	0.095	mg/L			10/18/18 13:56	1
Total Organic Carbon - Duplicates	0.90	J	1.0	0.47	mg/L			10/29/18 14:38	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-15

Lab Sample ID: 500-153349-15

Date Collected: 10/17/18 08:58

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	191		5.0	3.7	mg/L			10/31/18 11:45	1

1

2

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15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-16

Lab Sample ID: 500-153349-16

Date Collected: 10/17/18 10:00

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 04:26	1
Toluene	0.15	J	0.50	0.15	ug/L			10/26/18 04:26	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 04:26	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/26/18 04:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		75 - 126					10/26/18 04:26	1
Toluene-d8 (Surr)	97		75 - 120					10/26/18 04:26	1
4-Bromofluorobenzene (Surr)	117		72 - 124					10/26/18 04:26	1
Dibromofluoromethane	87		75 - 120					10/26/18 04:26	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.81	0.25	ug/L		10/22/18 07:49	10/24/18 17:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	120		36 - 120				10/22/18 07:49	10/24/18 17:07	1
2-Fluorobiphenyl (Surr)	88		34 - 110				10/22/18 07:49	10/24/18 17:07	1
Terphenyl-d14 (Surr)	104		40 - 145				10/22/18 07:49	10/24/18 17:07	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 21:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	99		60 - 140					10/25/18 21:19	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.096		0.11	0.096	ug/L		10/22/18 10:37	10/23/18 07:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	78		25 - 130				10/22/18 10:37	10/23/18 07:47	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.63	J	1.0	0.23	ug/L		10/18/18 15:58	10/19/18 19:29	1
Copper	1.1	J	2.0	0.50	ug/L		10/18/18 15:58	10/19/18 19:29	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 19:29	1
Manganese	<0.79		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 19:29	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 19:29	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	317		1.3	0.66	mg/L		10/18/18 15:56	10/19/18 14:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.6		2.0	1.7	mg/L			10/18/18 15:22	10
Nitrate as N	2.9		0.20	0.068	mg/L			10/18/18 15:10	1
Sulfate	106		4.0	1.9	mg/L			10/27/18 08:22	20
Total Organic Carbon - Duplicates	0.61	J	1.0	0.47	mg/L			10/29/18 14:58	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-16

Lab Sample ID: 500-153349-16

Date Collected: 10/17/18 10:00

Matrix: Water

Date Received: 10/18/18 09:00

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	185		5.0	3.7	mg/L			10/31/18 11:59	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: Trip Blank

Lab Sample ID: 500-153349-17

Date Collected: 10/17/18 11:00

Matrix: Water

Date Received: 10/18/18 09:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 01:30	1
Toluene	<0.15		0.50	0.15	ug/L			10/26/18 01:30	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 01:30	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/26/18 01:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		75 - 126		10/26/18 01:30	1
Toluene-d8 (Surr)	97		75 - 120		10/26/18 01:30	1
4-Bromofluorobenzene (Surr)	115		72 - 124		10/26/18 01:30	1
Dibromofluoromethane	88		75 - 120		10/26/18 01:30	1

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

GC/MS VOA

Analysis Batch: 456467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-1	W-181015-MH-01	Total/NA	Water	8260B	
500-153349-2	W-181015-MH-02	Total/NA	Water	8260B	
500-153349-3	W-181015-MH-03	Total/NA	Water	8260B	
500-153349-4	W-181016-MH-04	Total/NA	Water	8260B	
500-153349-5	W-181016-MH-05	Total/NA	Water	8260B	
500-153349-6	W-181016-MH-06	Total/NA	Water	8260B	
500-153349-7	W-181016-MH-07	Total/NA	Water	8260B	
500-153349-8	W-181016-MH-08	Total/NA	Water	8260B	
500-153349-9	W-181016-MH-09	Total/NA	Water	8260B	
500-153349-10	W-181016-MH-10	Total/NA	Water	8260B	
500-153349-11	W-181016-MH-11	Total/NA	Water	8260B	
500-153349-12	W-181016-MH-12	Total/NA	Water	8260B	
MB 500-456467/6	Method Blank	Total/NA	Water	8260B	
LCS 500-456467/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 456883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-13	W-181016-MH-13	Total/NA	Water	8260B	
500-153349-14	W-181017-MH-14	Total/NA	Water	8260B	
500-153349-15	W-181017-MH-15	Total/NA	Water	8260B	
500-153349-16	W-181017-MH-16	Total/NA	Water	8260B	
500-153349-17	Trip Blank	Total/NA	Water	8260B	
MB 500-456883/29	Method Blank	Total/NA	Water	8260B	
LCS 500-456883/8	Lab Control Sample	Total/NA	Water	8260B	
500-153349-10 MS	W-181016-MH-10	Total/NA	Water	8260B	
500-153349-10 MSD	W-181016-MH-10	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 456052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-1	W-181015-MH-01	Total/NA	Water	3510C	
500-153349-2	W-181015-MH-02	Total/NA	Water	3510C	
500-153349-3	W-181015-MH-03	Total/NA	Water	3510C	
500-153349-4	W-181016-MH-04	Total/NA	Water	3510C	
500-153349-5	W-181016-MH-05	Total/NA	Water	3510C	
500-153349-6	W-181016-MH-06	Total/NA	Water	3510C	
500-153349-7	W-181016-MH-07	Total/NA	Water	3510C	
500-153349-8	W-181016-MH-08	Total/NA	Water	3510C	
500-153349-9	W-181016-MH-09	Total/NA	Water	3510C	
500-153349-10	W-181016-MH-10	Total/NA	Water	3510C	
500-153349-11	W-181016-MH-11	Total/NA	Water	3510C	
500-153349-12	W-181016-MH-12	Total/NA	Water	3510C	
500-153349-13	W-181016-MH-13	Total/NA	Water	3510C	
500-153349-14	W-181017-MH-14	Total/NA	Water	3510C	
500-153349-15	W-181017-MH-15	Total/NA	Water	3510C	
500-153349-16	W-181017-MH-16	Total/NA	Water	3510C	
MB 500-456052/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-456052/2-A	Lab Control Sample	Total/NA	Water	3510C	
500-153349-10 MS	W-181016-MH-10	Total/NA	Water	3510C	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

GC/MS Semi VOA (Continued)

Prep Batch: 456052 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-10 MSD	W-181016-MH-10	Total/NA	Water	3510C	

Analysis Batch: 456122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-1	W-181015-MH-01	Total/NA	Water	8270D	456052
500-153349-2	W-181015-MH-02	Total/NA	Water	8270D	456052
500-153349-3	W-181015-MH-03	Total/NA	Water	8270D	456052
500-153349-4	W-181016-MH-04	Total/NA	Water	8270D	456052
500-153349-5	W-181016-MH-05	Total/NA	Water	8270D	456052
500-153349-6	W-181016-MH-06	Total/NA	Water	8270D	456052
500-153349-7	W-181016-MH-07	Total/NA	Water	8270D	456052
500-153349-8	W-181016-MH-08	Total/NA	Water	8270D	456052
500-153349-9	W-181016-MH-09	Total/NA	Water	8270D	456052
500-153349-10	W-181016-MH-10	Total/NA	Water	8270D	456052
500-153349-11	W-181016-MH-11	Total/NA	Water	8270D	456052
500-153349-12	W-181016-MH-12	Total/NA	Water	8270D	456052
MB 500-456052/1-A	Method Blank	Total/NA	Water	8270D	456052
LCS 500-456052/2-A	Lab Control Sample	Total/NA	Water	8270D	456052

Analysis Batch: 456532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-13	W-181016-MH-13	Total/NA	Water	8270D	456052
500-153349-14	W-181017-MH-14	Total/NA	Water	8270D	456052
500-153349-15	W-181017-MH-15	Total/NA	Water	8270D	456052
500-153349-16	W-181017-MH-16	Total/NA	Water	8270D	456052
500-153349-10 MS	W-181016-MH-10	Total/NA	Water	8270D	456052
500-153349-10 MSD	W-181016-MH-10	Total/NA	Water	8270D	456052

GC VOA

Analysis Batch: 351927

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	RSK-175	
500-153349-12	W-181016-MH-12	Total/NA	Water	RSK-175	
500-153349-13	W-181016-MH-13	Total/NA	Water	RSK-175	
500-153349-14	W-181017-MH-14	Total/NA	Water	RSK-175	
500-153349-15	W-181017-MH-15	Total/NA	Water	RSK-175	
500-153349-16	W-181017-MH-16	Total/NA	Water	RSK-175	
MB 240-351927/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-351927/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 240-351927/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 456105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-1	W-181015-MH-01	Total/NA	Water	8151A	
500-153349-2	W-181015-MH-02	Total/NA	Water	8151A	
500-153349-3	W-181015-MH-03	Total/NA	Water	8151A	
500-153349-4	W-181016-MH-04	Total/NA	Water	8151A	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

GC Semi VOA (Continued)

Prep Batch: 456105 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-5	W-181016-MH-05	Total/NA	Water	8151A	
500-153349-6	W-181016-MH-06	Total/NA	Water	8151A	
500-153349-7	W-181016-MH-07	Total/NA	Water	8151A	
500-153349-8	W-181016-MH-08	Total/NA	Water	8151A	
500-153349-9	W-181016-MH-09	Total/NA	Water	8151A	
500-153349-10	W-181016-MH-10	Total/NA	Water	8151A	
500-153349-11	W-181016-MH-11	Total/NA	Water	8151A	
500-153349-12	W-181016-MH-12	Total/NA	Water	8151A	
500-153349-13	W-181016-MH-13	Total/NA	Water	8151A	
500-153349-14	W-181017-MH-14	Total/NA	Water	8151A	
500-153349-15	W-181017-MH-15	Total/NA	Water	8151A	
500-153349-16	W-181017-MH-16	Total/NA	Water	8151A	
MB 500-456105/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-456105/2-A	Lab Control Sample	Total/NA	Water	8151A	
500-153349-10 MS	W-181016-MH-10	Total/NA	Water	8151A	
500-153349-10 MSD	W-181016-MH-10	Total/NA	Water	8151A	

Analysis Batch: 456162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-1	W-181015-MH-01	Total/NA	Water	8151A	456105
500-153349-2	W-181015-MH-02	Total/NA	Water	8151A	456105
500-153349-3	W-181015-MH-03	Total/NA	Water	8151A	456105
500-153349-4	W-181016-MH-04	Total/NA	Water	8151A	456105
500-153349-5	W-181016-MH-05	Total/NA	Water	8151A	456105
500-153349-6	W-181016-MH-06	Total/NA	Water	8151A	456105
500-153349-7	W-181016-MH-07	Total/NA	Water	8151A	456105
500-153349-8	W-181016-MH-08	Total/NA	Water	8151A	456105
500-153349-9	W-181016-MH-09	Total/NA	Water	8151A	456105
500-153349-10	W-181016-MH-10	Total/NA	Water	8151A	456105
500-153349-11	W-181016-MH-11	Total/NA	Water	8151A	456105
500-153349-12	W-181016-MH-12	Total/NA	Water	8151A	456105
500-153349-13	W-181016-MH-13	Total/NA	Water	8151A	456105
500-153349-14	W-181017-MH-14	Total/NA	Water	8151A	456105
500-153349-15	W-181017-MH-15	Total/NA	Water	8151A	456105
500-153349-16	W-181017-MH-16	Total/NA	Water	8151A	456105
MB 500-456105/1-A	Method Blank	Total/NA	Water	8151A	456105
LCS 500-456105/2-A	Lab Control Sample	Total/NA	Water	8151A	456105
500-153349-10 MS	W-181016-MH-10	Total/NA	Water	8151A	456105
500-153349-10 MSD	W-181016-MH-10	Total/NA	Water	8151A	456105

Metals

Prep Batch: 455657

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	3010A	
500-153349-12	W-181016-MH-12	Total/NA	Water	3010A	
500-153349-13	W-181016-MH-13	Total/NA	Water	3010A	
500-153349-14	W-181017-MH-14	Total/NA	Water	3010A	
500-153349-15	W-181017-MH-15	Total/NA	Water	3010A	
500-153349-16	W-181017-MH-16	Total/NA	Water	3010A	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Metals (Continued)

Prep Batch: 455661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Dissolved	Water	3005A	
500-153349-12	W-181016-MH-12	Dissolved	Water	3005A	
500-153349-13	W-181016-MH-13	Dissolved	Water	3005A	
500-153349-14	W-181017-MH-14	Dissolved	Water	3005A	
500-153349-15	W-181017-MH-15	Dissolved	Water	3005A	
500-153349-16	W-181017-MH-16	Dissolved	Water	3005A	
MB 500-455661/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-455661/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-153349-11 MS	W-181016-MH-11	Dissolved	Water	3005A	
500-153349-11 MSD	W-181016-MH-11	Dissolved	Water	3005A	
500-153349-11 DU	W-181016-MH-11	Dissolved	Water	3005A	

Analysis Batch: 455850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	SM 2340B	455657
500-153349-12	W-181016-MH-12	Total/NA	Water	SM 2340B	455657
500-153349-13	W-181016-MH-13	Total/NA	Water	SM 2340B	455657
500-153349-14	W-181017-MH-14	Total/NA	Water	SM 2340B	455657
500-153349-15	W-181017-MH-15	Total/NA	Water	SM 2340B	455657
500-153349-16	W-181017-MH-16	Total/NA	Water	SM 2340B	455657

Analysis Batch: 456087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Dissolved	Water	6020A	455661
500-153349-12	W-181016-MH-12	Dissolved	Water	6020A	455661
500-153349-13	W-181016-MH-13	Dissolved	Water	6020A	455661
500-153349-14	W-181017-MH-14	Dissolved	Water	6020A	455661
500-153349-15	W-181017-MH-15	Dissolved	Water	6020A	455661
500-153349-16	W-181017-MH-16	Dissolved	Water	6020A	455661
MB 500-455661/1-A	Method Blank	Total Recoverable	Water	6020A	455661
LCS 500-455661/2-A	Lab Control Sample	Total Recoverable	Water	6020A	455661
500-153349-11 MS	W-181016-MH-11	Dissolved	Water	6020A	455661
500-153349-11 MSD	W-181016-MH-11	Dissolved	Water	6020A	455661
500-153349-11 DU	W-181016-MH-11	Dissolved	Water	6020A	455661

General Chemistry

Analysis Batch: 456303

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	300.0	
500-153349-11	W-181016-MH-11	Total/NA	Water	300.0	
500-153349-12	W-181016-MH-12	Total/NA	Water	300.0	
500-153349-13	W-181016-MH-13	Total/NA	Water	300.0	
500-153349-14	W-181017-MH-14	Total/NA	Water	300.0	
500-153349-15	W-181017-MH-15	Total/NA	Water	300.0	
500-153349-15	W-181017-MH-15	Total/NA	Water	300.0	
500-153349-16	W-181017-MH-16	Total/NA	Water	300.0	
500-153349-16	W-181017-MH-16	Total/NA	Water	300.0	
MB 500-456303/15	Method Blank	Total/NA	Water	300.0	
LCS 500-456303/31	Lab Control Sample	Total/NA	Water	300.0	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

General Chemistry (Continued)

Analysis Batch: 457128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	300.0	
500-153349-16	W-181017-MH-16	Total/NA	Water	300.0	
MB 500-457128/3	Method Blank	Total/NA	Water	300.0	
LCS 500-457128/4	Lab Control Sample	Total/NA	Water	300.0	
500-153349-11 MS	W-181016-MH-11	Total/NA	Water	300.0	
500-153349-11 MSD	W-181016-MH-11	Total/NA	Water	300.0	

Analysis Batch: 457539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	9060A	
500-153349-12	W-181016-MH-12	Total/NA	Water	9060A	
500-153349-13	W-181016-MH-13	Total/NA	Water	9060A	
500-153349-14	W-181017-MH-14	Total/NA	Water	9060A	
500-153349-15	W-181017-MH-15	Total/NA	Water	9060A	
500-153349-16	W-181017-MH-16	Total/NA	Water	9060A	
MB 500-457539/4	Method Blank	Total/NA	Water	9060A	
LCS 500-457539/5	Lab Control Sample	Total/NA	Water	9060A	
500-153349-11 MS	W-181016-MH-11	Total/NA	Water	9060A	
500-153349-11 MSD	W-181016-MH-11	Total/NA	Water	9060A	

Analysis Batch: 457599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-11	W-181016-MH-11	Total/NA	Water	SM 2320B	
500-153349-12	W-181016-MH-12	Total/NA	Water	SM 2320B	
500-153349-13	W-181016-MH-13	Total/NA	Water	SM 2320B	
500-153349-14	W-181017-MH-14	Total/NA	Water	SM 2320B	
MB 500-457599/28	Method Blank	Total/NA	Water	SM 2320B	
MB 500-457599/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-457599/29	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 500-457599/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 457885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153349-15	W-181017-MH-15	Total/NA	Water	SM 2320B	
500-153349-16	W-181017-MH-16	Total/NA	Water	SM 2320B	
MB 500-457885/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-457885/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-153349-15 DU	W-181017-MH-15	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-126)	TOL (75-120)	BFB (72-124)	DBFM (75-120)
500-153349-1	W-181015-MH-01	81	98	96	77
500-153349-2	W-181015-MH-02	84	98	97	75
500-153349-3	W-181015-MH-03	83	99	96	77
500-153349-4	W-181016-MH-04	86	97	97	78
500-153349-5	W-181016-MH-05	88	95	99	79
500-153349-6	W-181016-MH-06	91	96	98	78
500-153349-7	W-181016-MH-07	92	94	99	80
500-153349-8	W-181016-MH-08	93	95	98	82
500-153349-9	W-181016-MH-09	91	96	100	81
500-153349-10	W-181016-MH-10	91	94	98	82
500-153349-10 MS	W-181016-MH-10	97	103	104	92
500-153349-10 MSD	W-181016-MH-10	96	104	108	89
500-153349-11	W-181016-MH-11	92	94	98	82
500-153349-12	W-181016-MH-12	96	94	99	82
500-153349-13	W-181016-MH-13	99	99	120	86
500-153349-14	W-181017-MH-14	99	97	119	89
500-153349-15	W-181017-MH-15	99	97	117	89
500-153349-16	W-181017-MH-16	98	97	117	87
500-153349-17	Trip Blank	97	97	115	88
LCS 500-456467/4	Lab Control Sample	84	97	99	85
LCS 500-456883/8	Lab Control Sample	90	103	104	89
MB 500-456467/6	Method Blank	87	95	97	83
MB 500-456883/29	Method Blank	95	99	121	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		NBZ (36-120)	FBP (34-110)	TPHL (40-145)
500-153349-1	W-181015-MH-01	93	98	121
500-153349-2	W-181015-MH-02	93	99	121
500-153349-3	W-181015-MH-03	85	92	110
500-153349-4	W-181016-MH-04	85	90	111
500-153349-5	W-181016-MH-05	99	103	131
500-153349-6	W-181016-MH-06	97	101	130
500-153349-7	W-181016-MH-07	84	87	127
500-153349-8	W-181016-MH-08	106	105	142
500-153349-9	W-181016-MH-09	91	94	136
500-153349-10	W-181016-MH-10	106	109	142
500-153349-10 MS	W-181016-MH-10	146 X	102	123
500-153349-10 MSD	W-181016-MH-10	141 X	95	116
500-153349-11	W-181016-MH-11	90	90	116

TestAmerica Chicago

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		NBZ (36-120)	FBP (34-110)	TPHL (40-145)
500-153349-12	W-181016-MH-12	94	96	125
500-153349-13	W-181016-MH-13	90	89	106
500-153349-14	W-181017-MH-14	127 X	92	116
500-153349-15	W-181017-MH-15	83	86	103
500-153349-16	W-181017-MH-16	120	88	104
LCS 500-456052/2-A	Lab Control Sample	94	85	113
MB 500-456052/1-A	Method Blank	87	83	119

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)

FBP = 2-Fluorobiphenyl (Surr)

TPHL = Terphenyl-d14 (Surr)

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TFE2
		(60-140)
500-153349-11	W-181016-MH-11	106
500-153349-12	W-181016-MH-12	106
500-153349-13	W-181016-MH-13	105
500-153349-14	W-181017-MH-14	104
500-153349-15	W-181017-MH-15	103
500-153349-16	W-181017-MH-16	99
LCS 240-351927/5	Lab Control Sample	106
LCS 240-351927/6	Lab Control Sample Dup	105
MB 240-351927/4	Method Blank	106

Surrogate Legend

TFE = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPAA2
		(25-130)
500-153349-1	W-181015-MH-01	78
500-153349-2	W-181015-MH-02	77
500-153349-3	W-181015-MH-03	75
500-153349-4	W-181016-MH-04	75
500-153349-5	W-181016-MH-05	73
500-153349-6	W-181016-MH-06	74
500-153349-7	W-181016-MH-07	82
500-153349-8	W-181016-MH-08	74
500-153349-9	W-181016-MH-09	72
500-153349-10	W-181016-MH-10	76
500-153349-10 MS	W-181016-MH-10	73
500-153349-10 MSD	W-181016-MH-10	75

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8151A - Herbicides (GC) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPAA2 (25-130)
500-153349-11	W-181016-MH-11	0 D
500-153349-12	W-181016-MH-12	81
500-153349-13	W-181016-MH-13	77
500-153349-14	W-181017-MH-14	81
500-153349-15	W-181017-MH-15	77
500-153349-16	W-181017-MH-16	78
LCS 500-456105/2-A	Lab Control Sample	73
MB 500-456105/1-A	Method Blank	75

Surrogate Legend

DCPAA = DCAA

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456467/6
Matrix: Water
Analysis Batch: 456467

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 10:17	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 10:17	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 10:17	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 10:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		75 - 126		10/24/18 10:17	1
Toluene-d8 (Surr)	95		75 - 120		10/24/18 10:17	1
4-Bromofluorobenzene (Surr)	97		72 - 124		10/24/18 10:17	1
Dibromofluoromethane	83		75 - 120		10/24/18 10:17	1

Lab Sample ID: LCS 500-456467/4
Matrix: Water
Analysis Batch: 456467

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	42.6		ug/L		85	70 - 120
Toluene	50.0	43.7		ug/L		87	70 - 125
Ethylbenzene	50.0	44.4		ug/L		89	70 - 123
Xylenes, Total	100	91.5		ug/L		91	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		75 - 126
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	99		72 - 124
Dibromofluoromethane	85		75 - 120

Lab Sample ID: MB 500-456883/29
Matrix: Water
Analysis Batch: 456883

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/26/18 01:05	1
Toluene	<0.15		0.50	0.15	ug/L			10/26/18 01:05	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/26/18 01:05	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/26/18 01:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		75 - 126		10/26/18 01:05	1
Toluene-d8 (Surr)	99		75 - 120		10/26/18 01:05	1
4-Bromofluorobenzene (Surr)	121		72 - 124		10/26/18 01:05	1
Dibromofluoromethane	89		75 - 120		10/26/18 01:05	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-456883/8

Matrix: Water

Analysis Batch: 456883

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	47.4		ug/L		95	70 - 120
Toluene	50.0	51.4		ug/L		103	70 - 125
Ethylbenzene	50.0	45.4		ug/L		91	70 - 123
Xylenes, Total	100	97.1		ug/L		97	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		75 - 126
Toluene-d8 (Surr)	103		75 - 120
4-Bromofluorobenzene (Surr)	104		72 - 124
Dibromofluoromethane	89		75 - 120

Lab Sample ID: 500-153349-10 MS

Matrix: Water

Analysis Batch: 456883

Client Sample ID: W-181016-MH-10

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	<0.15		50.0	49.1		ug/L		98	70 - 120
Toluene	<0.15		50.0	51.1		ug/L		102	70 - 125
Ethylbenzene	<0.18		50.0	46.2		ug/L		92	70 - 123
Xylenes, Total	<0.22		100	97.6		ug/L		98	70 - 125

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 126
Toluene-d8 (Surr)	103		75 - 120
4-Bromofluorobenzene (Surr)	104		72 - 124
Dibromofluoromethane	92		75 - 120

Lab Sample ID: 500-153349-10 MSD

Matrix: Water

Analysis Batch: 456883

Client Sample ID: W-181016-MH-10

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Benzene	<0.15		50.0	44.3		ug/L		89	70 - 120	10	20
Toluene	<0.15		50.0	46.9		ug/L		94	70 - 125	9	20
Ethylbenzene	<0.18		50.0	41.2		ug/L		82	70 - 123	11	20
Xylenes, Total	<0.22		100	87.1		ug/L		87	70 - 125	11	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	96		75 - 126
Toluene-d8 (Surr)	104		75 - 120
4-Bromofluorobenzene (Surr)	108		72 - 124
Dibromofluoromethane	89		75 - 120

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456052/1-A
Matrix: Water
Analysis Batch: 456122

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456052

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/22/18 07:49	10/22/18 14:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	87		36 - 120	10/22/18 07:49	10/22/18 14:16	1
2-Fluorobiphenyl (Surr)	83		34 - 110	10/22/18 07:49	10/22/18 14:16	1
Terphenyl-d14 (Surr)	119		40 - 145	10/22/18 07:49	10/22/18 14:16	1

Lab Sample ID: LCS 500-456052/2-A
Matrix: Water
Analysis Batch: 456122

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456052

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	32.0	24.6		ug/L		77	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	94		36 - 120
2-Fluorobiphenyl (Surr)	85		34 - 110
Terphenyl-d14 (Surr)	113		40 - 145

Lab Sample ID: 500-153349-10 MS
Matrix: Water
Analysis Batch: 456532

Client Sample ID: W-181016-MH-10
Prep Type: Total/NA
Prep Batch: 456052

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Naphthalene	<0.25		33.2	20.8		ug/L		63	36 - 110

Surrogate	MS %Recovery	MS Qualifier	Limits
Nitrobenzene-d5 (Surr)	146	X	36 - 120
2-Fluorobiphenyl (Surr)	102		34 - 110
Terphenyl-d14 (Surr)	123		40 - 145

Lab Sample ID: 500-153349-10 MSD
Matrix: Water
Analysis Batch: 456532

Client Sample ID: W-181016-MH-10
Prep Type: Total/NA
Prep Batch: 456052

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Naphthalene	<0.25		31.8	20.3		ug/L		64	36 - 110	3	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Nitrobenzene-d5 (Surr)	141	X	36 - 120
2-Fluorobiphenyl (Surr)	95		34 - 110
Terphenyl-d14 (Surr)	116		40 - 145

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-351927/4
Matrix: Water
Analysis Batch: 351927

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/25/18 16:49	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	106		60 - 140					10/25/18 16:49	1

Lab Sample ID: LCS 240-351927/5
Matrix: Water
Analysis Batch: 351927

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane	511	457		ug/L		89	80 - 120		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
1,1,1-Trifluoroethane	106		60 - 140						

Lab Sample ID: LCSD 240-351927/6
Matrix: Water
Analysis Batch: 351927

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane	511	448		ug/L		88	80 - 120	2	35
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
1,1,1-Trifluoroethane	105		60 - 140						

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-456105/1-A
Matrix: Water
Analysis Batch: 456162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456105

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		10/22/18 10:37	10/22/18 23:18	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	75		25 - 130				10/22/18 10:37	10/22/18 23:18	1

Lab Sample ID: LCS 500-456105/2-A
Matrix: Water
Analysis Batch: 456162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Pentachlorophenol	2.53	1.37		ug/L		54	40 - 122		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
DCAA	73		25 - 130						

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QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: 500-153349-10 MS

Matrix: Water
Analysis Batch: 456162

Client Sample ID: W-181016-MH-10

Prep Type: Total/NA
Prep Batch: 456105
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Pentachlorophenol	<0.085		2.52	1.45		ug/L		57	40 - 122
Surrogate	%Recovery	MS Qualifier	Limits						
DCAA	73		25 - 130						

Lab Sample ID: 500-153349-10 MSD

Matrix: Water
Analysis Batch: 456162

Client Sample ID: W-181016-MH-10

Prep Type: Total/NA
Prep Batch: 456105
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Pentachlorophenol	<0.085		2.50	1.51		ug/L		61	40 - 122	19	20
Surrogate	%Recovery	MSD Qualifier	Limits								
DCAA	75		25 - 130								

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-455661/1-A

Matrix: Water
Analysis Batch: 456087

Client Sample ID: Method Blank

Prep Type: Total Recoverable
Prep Batch: 455661

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/18/18 15:58	10/19/18 17:53	1
Copper	<0.50		2.0	0.50	ug/L		10/18/18 15:58	10/19/18 17:53	1
Iron	<46.7		100	46.7	ug/L		10/18/18 15:58	10/19/18 17:53	1
Manganese	<0.79		2.5	0.79	ug/L		10/18/18 15:58	10/19/18 17:53	1
Zinc	<6.9		20.0	6.9	ug/L		10/18/18 15:58	10/19/18 17:53	1

Lab Sample ID: LCS 500-455661/2-A

Matrix: Water
Analysis Batch: 456087

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable
Prep Batch: 455661
%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	100	95.70		ug/L		96	80 - 120
Copper	250	243.7		ug/L		97	80 - 120
Iron	1000	973.2		ug/L		97	80 - 120
Manganese	500	494.1		ug/L		99	80 - 120
Zinc	500	491.8		ug/L		98	80 - 120

Lab Sample ID: 500-153349-11 MS

Matrix: Water
Analysis Batch: 456087

Client Sample ID: W-181016-MH-11

Prep Type: Dissolved
Prep Batch: 455661
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.53	J	100	100.4		ug/L		100	75 - 125
Copper	1.3	J	250	248.3		ug/L		99	75 - 125
Iron	<46.7		1000	969.2		ug/L		97	75 - 125
Manganese	72.2		500	556.6		ug/L		97	75 - 125

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-153349-11 MS
Matrix: Water
Analysis Batch: 456087

Client Sample ID: W-181016-MH-11
Prep Type: Dissolved
Prep Batch: 455661

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	<6.9		500	493.2		ug/L		99	75 - 125

Lab Sample ID: 500-153349-11 MSD
Matrix: Water
Analysis Batch: 456087

Client Sample ID: W-181016-MH-11
Prep Type: Dissolved
Prep Batch: 455661

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	0.53	J	100	102.1		ug/L		102	75 - 125	2	20
Copper	1.3	J	250	252.9		ug/L		101	75 - 125	2	20
Iron	<46.7		1000	975.2		ug/L		98	75 - 125	1	20
Manganese	72.2		500	559.7		ug/L		98	75 - 125	1	20
Zinc	<6.9		500	507.6		ug/L		102	75 - 125	3	20

Lab Sample ID: 500-153349-11 DU
Matrix: Water
Analysis Batch: 456087

Client Sample ID: W-181016-MH-11
Prep Type: Dissolved
Prep Batch: 455661

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Arsenic	0.53	J	0.547	J	ug/L		4	20
Copper	1.3	J	1.29	J	ug/L		3	20
Iron	<46.7		<46.7		ug/L		NC	20
Manganese	72.2		73.36		ug/L		2	20
Zinc	<6.9		<6.9		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-456303/15
Matrix: Water
Analysis Batch: 456303

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			10/18/18 14:45	1
Nitrate as N	<0.068		0.20	0.068	mg/L			10/18/18 14:45	1
Sulfate	<0.095		0.20	0.095	mg/L			10/18/18 14:45	1

Lab Sample ID: LCS 500-456303/31
Matrix: Water
Analysis Batch: 456303

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.89		mg/L		96	90 - 110
Nitrate as N	2.00	2.02		mg/L		101	90 - 110
Sulfate	5.00	5.09		mg/L		102	90 - 110

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 500-457128/3
Matrix: Water
Analysis Batch: 457128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			10/27/18 02:11	1
Sulfate	<0.095		0.20	0.095	mg/L			10/27/18 02:11	1

Lab Sample ID: LCS 500-457128/4
Matrix: Water
Analysis Batch: 457128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.90		mg/L		97	90 - 110
Sulfate	5.00	5.11		mg/L		102	90 - 110

Lab Sample ID: 500-153349-11 MS
Matrix: Water
Analysis Batch: 457128

Client Sample ID: W-181016-MH-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	8.1		2.00	10.44	4	mg/L		116	80 - 120

Lab Sample ID: 500-153349-11 MSD
Matrix: Water
Analysis Batch: 457128

Client Sample ID: W-181016-MH-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	8.1		2.00	10.49	4	mg/L		118	80 - 120	0	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 500-457539/4
Matrix: Water
Analysis Batch: 457539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			10/29/18 08:19	1

Lab Sample ID: LCS 500-457539/5
Matrix: Water
Analysis Batch: 457539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	10.05		mg/L		101	80 - 120

Lab Sample ID: 500-153349-11 MS
Matrix: Water
Analysis Batch: 457539

Client Sample ID: W-181016-MH-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	2.1		10.0	11.86		mg/L		98	75 - 125

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: 500-153349-11 MSD
Matrix: Water
Analysis Batch: 457539

Client Sample ID: W-181016-MH-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	2.1		10.0	11.89		mg/L		98	75 - 125	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-457599/28
Matrix: Water
Analysis Batch: 457599

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/30/18 13:15	1

Lab Sample ID: MB 500-457599/3
Matrix: Water
Analysis Batch: 457599

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/30/18 10:23	1

Lab Sample ID: LCS 500-457599/29
Matrix: Water
Analysis Batch: 457599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.96		mg/L		100	90 - 110

Lab Sample ID: LCS 500-457599/4
Matrix: Water
Analysis Batch: 457599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	101.0		mg/L		101	90 - 110

Lab Sample ID: MB 500-457885/3
Matrix: Water
Analysis Batch: 457885

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/31/18 10:56	1

Lab Sample ID: LCS 500-457885/4
Matrix: Water
Analysis Batch: 457885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	98.70		mg/L		99	90 - 110

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 500-153349-15 DU
Matrix: Water
Analysis Batch: 457885

Client Sample ID: W-181017-MH-15
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Alkalinity	191		190.6		mg/L		0.2	20

1

2

3

4

5

6

7

8

9

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12

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Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181015-MH-01

Date Collected: 10/15/18 15:50

Date Received: 10/18/18 09:00

Lab Sample ID: 500-153349-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 13:15	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 14:46	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 00:06	BJB	TAL CHI

Client Sample ID: W-181015-MH-02

Date Collected: 10/15/18 16:29

Date Received: 10/18/18 09:00

Lab Sample ID: 500-153349-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 13:40	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 16:18	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 00:31	BJB	TAL CHI

Client Sample ID: W-181015-MH-03

Date Collected: 10/15/18 16:41

Date Received: 10/18/18 09:00

Lab Sample ID: 500-153349-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 14:05	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 16:49	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 00:55	BJB	TAL CHI

Client Sample ID: W-181016-MH-04

Date Collected: 10/16/18 09:08

Date Received: 10/18/18 09:00

Lab Sample ID: 500-153349-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 14:56	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 17:20	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 01:19	BJB	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-05

Lab Sample ID: 500-153349-5

Date Collected: 10/16/18 09:15

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 15:21	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 19:53	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 01:43	JBj	TAL CHI

Client Sample ID: W-181016-MH-06

Lab Sample ID: 500-153349-6

Date Collected: 10/16/18 09:50

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 15:47	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 20:24	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 02:08	JBj	TAL CHI

Client Sample ID: W-181016-MH-07

Lab Sample ID: 500-153349-7

Date Collected: 10/16/18 09:57

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 16:12	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 20:54	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 02:32	JBj	TAL CHI

Client Sample ID: W-181016-MH-08

Lab Sample ID: 500-153349-8

Date Collected: 10/16/18 10:18

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 16:37	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 21:25	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 02:56	JBj	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-09

Lab Sample ID: 500-153349-9

Date Collected: 10/16/18 10:28

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 17:03	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 22:26	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 04:09	JBj	TAL CHI

Client Sample ID: W-181016-MH-10

Lab Sample ID: 500-153349-10

Date Collected: 10/16/18 10:58

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 18:44	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 22:57	AJD	TAL CHI
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 04:33	JBj	TAL CHI

Client Sample ID: W-181016-MH-11

Lab Sample ID: 500-153349-11

Date Collected: 10/16/18 12:50

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 19:10	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 23:28	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 19:38	LKG	TAL CAN
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		50	456162	10/23/18 09:24	JBj	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI
Dissolved	Analysis	6020A		1	456087	10/19/18 18:47	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 12:17	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456303	10/18/18 12:29	EAT	TAL CHI
Total/NA	Analysis	300.0		2	457128	10/27/18 07:45	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 12:39	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457599	10/30/18 13:03	SMO	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181016-MH-12

Lab Sample ID: 500-153349-12

Date Collected: 10/16/18 13:20

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456467	10/24/18 19:35	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456122	10/22/18 23:58	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 19:55	LKG	TAL CAN
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 06:10	JBH	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI
Dissolved	Analysis	6020A		1	456087	10/19/18 19:13	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 12:42	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 13:19	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457599	10/30/18 13:09	SMO	TAL CHI

Client Sample ID: W-181016-MH-13

Lab Sample ID: 500-153349-13

Date Collected: 10/16/18 14:14

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456883	10/26/18 03:10	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456532	10/24/18 15:43	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 20:12	LKG	TAL CAN
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 06:35	JBH	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI
Dissolved	Analysis	6020A		1	456087	10/19/18 19:17	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 13:06	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 13:38	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457599	10/30/18 13:28	SMO	TAL CHI

Client Sample ID: W-181017-MH-14

Lab Sample ID: 500-153349-14

Date Collected: 10/16/18 15:23

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456883	10/26/18 03:35	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456532	10/24/18 16:11	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 20:29	LKG	TAL CAN

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-14

Lab Sample ID: 500-153349-14

Date Collected: 10/16/18 15:23

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 06:59	JBK	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI
Dissolved	Analysis	6020A		1	456087	10/19/18 19:21	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 13:31	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 13:58	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457599	10/30/18 13:34	SMO	TAL CHI

Client Sample ID: W-181017-MH-15

Lab Sample ID: 500-153349-15

Date Collected: 10/17/18 08:58

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456883	10/26/18 04:01	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456532	10/24/18 16:39	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 20:46	LKG	TAL CAN
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 07:23	JBK	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI
Dissolved	Analysis	6020A		1	456087	10/19/18 19:25	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 13:56	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456303	10/18/18 14:08	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 14:38	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 11:45	SMO	TAL CHI

Client Sample ID: W-181017-MH-16

Lab Sample ID: 500-153349-16

Date Collected: 10/17/18 10:00

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456883	10/26/18 04:26	JJH	TAL CHI
Total/NA	Prep	3510C			456052	10/22/18 07:49	JVD	TAL CHI
Total/NA	Analysis	8270D		1	456532	10/24/18 17:07	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	351927	10/25/18 21:19	LKG	TAL CAN
Total/NA	Prep	8151A			456105	10/22/18 10:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456162	10/23/18 07:47	JBK	TAL CHI
Dissolved	Prep	3005A			455661	10/18/18 15:58	BDE	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Client Sample ID: W-181017-MH-16

Lab Sample ID: 500-153349-16

Date Collected: 10/17/18 10:00

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6020A		1	456087	10/19/18 19:29	FXG	TAL CHI
Total/NA	Prep	3010A			455657	10/18/18 15:56	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	455850	10/19/18 14:06	EEN	TAL CHI
Total/NA	Analysis	300.0		1	456303	10/18/18 15:10	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456303	10/18/18 15:22	EAT	TAL CHI
Total/NA	Analysis	300.0		20	457128	10/27/18 08:22	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457539	10/29/18 14:58	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 11:59	SMO	TAL CHI

Client Sample ID: Trip Blank

Lab Sample ID: 500-153349-17

Date Collected: 10/17/18 11:00

Matrix: Water

Date Received: 10/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456883	10/26/18 01:30	JJH	TAL CHI

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153349-1

Laboratory: TestAmerica Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date								
Wisconsin	State Program	5	999580010	08-31-19								
<p>The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Analysis Method</th> <th style="text-align: left;">Prep Method</th> <th style="text-align: left;">Matrix</th> <th style="text-align: left;">Analyte</th> </tr> </thead> <tbody> <tr> <td>SM 2320B</td> <td></td> <td>Water</td> <td>Alkalinity</td> </tr> </tbody> </table>					Analysis Method	Prep Method	Matrix	Analyte	SM 2320B		Water	Alkalinity
Analysis Method	Prep Method	Matrix	Analyte									
SM 2320B		Water	Alkalinity									

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

274732

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

TAL-8210 (0713)

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: <u>Tim Lee</u>		Site Contact: <u>Gant Amason</u>		Date: <u>10-17-18</u>		COC No:	
Company Name: <u>GHD</u>		Tel/Fax:		Lab Contact: <u>Richard Wright</u>		Carrier: <u>Fed Ex</u>		_____ of _____ COCs	
Address: <u>1801 Old Hwy 8</u>		Analysis Turnaround Time							
City/State/Zip: <u>St. Paul, MN 55112</u>		<input type="checkbox"/> CALENDAR DAYS		<input type="checkbox"/> WORKING DAYS					
Phone: <u>651-639-0913</u>		TAT If different from Below _____							
Fax:		<input type="checkbox"/>		2 weeks					
Project Name: <u>Penta Wood</u>		<input type="checkbox"/>		1 week					
Site: <u>086165-05-04</u>		<input type="checkbox"/>		2 days					
P O #		<input type="checkbox"/>		1 day					
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
<u>13 W-181016-MH-13</u>		<u>10-16-18</u>	<u>1414</u>	<u>G</u>	<u>W</u>	<u>15</u>			
<u>14 W-181017-MH-14</u>		<u>↓</u>	<u>1523</u>	<u>↓</u>	<u>↓</u>	<u>15</u>			
<u>15 W-181018-MH-15</u>		<u>10-17-18</u>	<u>0858</u>	<u>↓</u>	<u>↓</u>	<u>15</u>			
<u>16 W-181017-MH-16</u>		<u>↓</u>	<u>1000</u>	<u>↓</u>	<u>↓</u>	<u>15</u>			
<u>17 Trip Blank-001</u>		<u>10-17-18</u>	<u>1100</u>	<u>↓</u>	<u>↓</u>	<u>1</u>			
Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							<input type="checkbox"/> Return to Client		
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown							<input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months		
Special Instructions/QC Requirements & Comments:									
<u>3.9, 2.1, 3.3, 1.8, 2.6, 3.3, 4.1</u>									
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd:		Temp ID No.:			
Relinquished by: <u>FedEx</u>		Company: <u>GHD</u>		Date/Time: <u>10-17-10/1400</u>		Received by:		Company: _____	
Relinquished by:		Company:		Date/Time:		Received by:		Company: _____	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by: <u>David Saunby</u>		Company: <u>TRAC</u> Date/Time: <u>10/18/18 0900</u>	

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TRK# 8100 2372 3600
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

FedEx Express Package
US Airbill

FedEx Tracking Number 8100 2372 3574

1 From [Redacted]
Date 10-17-18
Sender's Name Peter Starke Phone 651 639-0913
Company GMD SERVICES INC
Address 1801 OLD HIGHWAY B NW STE 114
City SAINT PAUL State MN ZIP 55112-2007

2 Your Internal Billing Reference 086165-05-04

3 To Recipient's Name Receiving Phone 708 534-5200
Company Test America
Address 2417 Bond St.
City University Park State IL ZIP 60484



8100 2372 3574

TRK# 8100 2372 3622
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 8100 2372 3563
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 8100 2372 3633
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 8100 2372 3585
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

FedEx TRK# 8100 2372 3596
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

60484

TRK# 8100 2372 3611
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

Form ID No. 0215

4 Express Package Service *To most locations. Packages up to 150 lbs. For packages over 150 lbs., use the FedEx Express Freight US Airbill.

Next Business Day

- FedEx First Overnight Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.
- FedEx Priority Overnight Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.
- FedEx Standard Overnight Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- FedEx 2Day A.M. Second business morning.* Saturday Delivery NOT available.
- FedEx 2Day Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.
- FedEx Express Saver Third business day.* Saturday Delivery NOT available.

5 Packaging *Declared value limit \$500.

- FedEx Envelope* FedEx Pak* FedEx Box FedEx Tube Other

6 Special Handling and Delivery Signature Options Fees may apply. See the FedEx Service Guide.

- Saturday Delivery NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.
 - No Signature Required Package may be left without obtaining a signature for delivery.
 - Direct Signature Someone at recipient's address may sign for delivery.
 - Indirect Signature If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only.
- Does this shipment contain dangerous goods?
One box must be checked.
 No Yes As per attached Shipper's Declaration. Yes Shipper's Declaration not required. Dry Ice Dry Ice, 9, UN 1845 _____ x _____ kg
Restrictions apply for dangerous goods -- see the current FedEx Service Guide. Cargo Aircraft Only

7 Payment Bill to:

- Sender Acct. No. in Section 1 will be billed. Recipient Third Party Credit Card Cash/Check

Total Packages 1 Total Weight 3.0 lbs. Credit Card Acct. [Redacted]

*Our liability is limited to US\$100 unless you declare a higher value. See the current FedEx Service Guide for details.

611

fedex.com 1.800.607.FEDX 1.800.463.3339

TRK# 8100 2372 3633
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 8100 2372 3585
0215

THU - 18 OCT 10:30A
PRIORITY OVERNIGHT

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM: Wright, Richard C	Carrier Tracking No(s): 500-112181.1				
Client Contact: TestAmerica Laboratories, Inc.		E-Mail: richard.wright@testamericainc.com	Page: Page 1 of 1				
Shipping/Receiving: 4101 Shuffel Street NW, North Canton, OH, 44720		Phone: 330-497-9396(Tel) 330-497-0772(Fax)	Job #: 500-153349-1				
Company: TestAmerica Laboratories, Inc.		Address: 4101 Shuffel Street NW	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)				
Due Date Requested: 10/31/2018		Analysis Requested					
TAT Requested (days):							
PO #:	WO #:	<input checked="" type="checkbox"/> Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> RSK, 175f (MOD) Methane Total Number of Containers: 3					
Project #: 50013796	SSOW#:						
Project Name: Penta Wood 086165		Special Instructions/Note: BSK					
Site:							
Sample Identification - Client ID (Lab ID)	Sample Date			Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewat, I=IT-tissue, A-Air)	Preservation Code:
W-181016-MH-11 (500-153349-11)	10/16/18			12:50 Central	Water	Water	X
W-181016-MH-12 (500-153349-12)	10/16/18			13:20 Central	Water	Water	X
W-181016-MH-13 (500-153349-13)	10/16/18			14:14 Central	Water	Water	X
W-181017-MH-14 (500-153349-14)	10/16/18			15:23 Central	Water	Water	X
W-181017-MH-15 (500-153349-15)	10/17/18	08:58 Central	Water	Water	X		
W-181017-MH-16 (500-153349-16)	10/17/18	10:00 Central	Water	Water	X		
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.							
Possible Hazard Identification							
Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) _____ Primary Deliverable Rank: 2 Special Instructions/QC Requirements: _____							
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Empty Kit Relinquished by: _____ Date: _____ Relinquished by: _____ Date: 10/18/18 Company: TACT Company: 1700 Relinquished by: _____ Date: _____ Company: _____ Relinquished by: _____ Date: _____ Company: _____							
Relinquished by: _____ Date: _____ Relinquished by: _____ Date: _____ Company: _____ Relinquished by: _____ Date: _____ Company: _____							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Cooler Temperature(s) °C and Other Remarks: _____							



TestAmerica Canton Sample Receipt Form/Narrative Login # : _____

Canton Facility

Client TA Chicago Site Name _____ Cooler unpacked by: [Signature]

Cooler Received on 10/19/18 Opened on 10/19/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form

IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 1.5 °C

IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No

-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

-Were tamper/custody seals intact and uncompromised? Yes No NA

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels be reconciled with the COC? Yes No

9. Were correct bottle(s) used for the test(s) indicated? Yes No

10. Sufficient quantity received to perform indicated analyses? Yes No

11. Are these work share samples? Yes No

If yes, Questions 12-16 have been checked at the originating laboratory.

12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC849161

13. Were VOAs on the COC? Yes No

14. Were air bubbles >6 mm in any VOA vials? Yes No NA ● ← Larger than this.

15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No

16. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: _____

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-153349-1

Login Number: 153349

List Source: TestAmerica Chicago

List Number: 1

Creator: Sanchez, Ariel M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.3, 1.8, 2.1, 2.6,3.1, 3.3, 3.9, 4.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

TestAmerica Job ID: 500-153458-1
Client Project/Site: Penta Wood 086165

For:
GHD Services Inc.
1801 Old Highway 8 NW
Suite 114
St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:
11/6/2018 4:46:03 PM

Richard Wright, Senior Project Manager
(708)534-5200
richard.wright@testamericainc.com

LINKS

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results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Job ID: 500-153458-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative 500-153458-1

Receipt

The samples were received on 10/19/2018 8:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 2.0° C, 2.4° C, 2.9° C, 3.2° C and 5.5° C.

GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D: Surrogate recovery for the following sample was outside the upper control limit: W-181018-MH-24 (500-153458-8). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method(s) 8151A: The following sample required a dilution due to the nature of the sample matrix: W-181018-MH-26 (500-153458-10). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method(s) 300.0: Manual integration was performed on the following IC 8 samples due to the software identifying the baseline incorrectly: W-181018-MH-24 (500-153458-8), (500-153458-O-10 MS) and (500-153458-O-10 MSD).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-17

Lab Sample ID: 500-153458-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	5.9		1.0	0.17	ug/L	1		RSK-175	Total/NA
Arsenic	1.2		1.0	0.23	ug/L	1		6020A	Dissolved
Manganese	33.8		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	138		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	40.9		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.20		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	13.0		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	0.72	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	86.5		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-18

Lab Sample ID: 500-153458-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	6.7		1.0	0.17	ug/L	1		RSK-175	Total/NA
Arsenic	1.2		1.0	0.23	ug/L	1		6020A	Dissolved
Manganese	36.0		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	6.9	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	138		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	40.3		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.22		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	13.1		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	0.68	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	87.1		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-19

Lab Sample ID: 500-153458-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.38	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.0	J	2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	7.1	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	126		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	21.2		1.0	0.85	mg/L	5		300.0	Total/NA
Nitrate as N	2.2		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	5.4		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.97	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	106		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-20

Lab Sample ID: 500-153458-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	3.2		2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	16.3	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	70.2		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	2.5	F1	0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.71		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	3.8		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.78	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	61.7		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-21

Lab Sample ID: 500-153458-5

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-21 (Continued)

Lab Sample ID: 500-153458-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.33	J	1.0	0.22	ug/L	1		8260B	Total/NA
Copper	10.2		2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	7.2	J	20.0	6.9	ug/L	1		6020A	Dissolved

Client Sample ID: W-181017-MH-22

Lab Sample ID: 500-153458-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	1.2	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	65.6		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	66.6		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	1.9		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	6.0		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	1.1		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	35.4		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181017-MH-23

Lab Sample ID: 500-153458-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.1		1.0	0.23	ug/L	1		6020A	Dissolved
Manganese	1.3	J	2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	142		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	15.6		1.0	0.85	mg/L	5		300.0	Total/NA
Nitrate as N	1.8		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	6.4		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.68	J ^	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	122		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181018-MH-24

Lab Sample ID: 500-153458-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.50		0.097	0.087	ug/L	1		8151A	Total/NA
Copper	1.7	J	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	77.2	J	100	46.7	ug/L	1		6020A	Dissolved
Manganese	9.2		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	231		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	23.9		1.0	0.85	mg/L	5		300.0	Total/NA
Nitrate as N	1.7		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	10.2		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	1.3		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	227		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181018-MH-25

Lab Sample ID: 500-153458-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.34	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.3	J	2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	8.8	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	109		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	13.1		1.0	0.85	mg/L	5		300.0	Total/NA
Nitrate as N	2.9		0.20	0.068	mg/L	1		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-25 (Continued)

Lab Sample ID: 500-153458-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Sulfate	5.9		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	1.0		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	85.5		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181018-MH-26

Lab Sample ID: 500-153458-10

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	1.3		0.81	0.25	ug/L	1		8270D	Total/NA
Pentachlorophenol	640		24	22	ug/L	250		8151A	Total/NA
Copper	0.94	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	15.4		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	7.9	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	82.9		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	1.7		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	2.2		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	3.7		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	2.6		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	77.5		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank-002

Lab Sample ID: 500-153458-11

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL CHI
6020A	Metals (ICP/MS)	SW846	TAL CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL CHI
300.0	Anions, Ion Chromatography	MCAWW	TAL CHI
9060A	Organic Carbon, Total (TOC)	SW846	TAL CHI
SM 2320B	Alkalinity	SM	TAL CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CHI
3010A	Preparation, Total Metals	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CHI
5030B	Purge and Trap	SW846	TAL CHI
8151A	Extraction (Herbicides)	SW846	TAL CHI

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-153458-1	W-181017-MH-17	Water	10/17/18 12:49	10/19/18 08:50
500-153458-2	W-181017-MH-18	Water	10/17/18 12:59	10/19/18 08:50
500-153458-3	W-181017-MH-19	Water	10/17/18 13:34	10/19/18 08:50
500-153458-4	W-181017-MH-20	Water	10/17/18 14:02	10/19/18 08:50
500-153458-5	W-181017-MH-21	Water	10/17/18 14:35	10/19/18 08:50
500-153458-6	W-181017-MH-22	Water	10/17/18 15:18	10/19/18 08:50
500-153458-7	W-181017-MH-23	Water	10/17/18 16:02	10/19/18 08:50
500-153458-8	W-181018-MH-24	Water	10/18/18 09:40	10/19/18 08:50
500-153458-9	W-181018-MH-25	Water	10/18/18 10:43	10/19/18 08:50
500-153458-10	W-181018-MH-26	Water	10/18/18 11:33	10/19/18 08:50
500-153458-11	Trip Blank-002	Water	10/18/18 13:00	10/19/18 08:50



Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-17

Lab Sample ID: 500-153458-1

Date Collected: 10/17/18 12:49

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 05:28	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 05:28	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 05:28	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/25/18 05:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		75 - 126		10/25/18 05:28	1
Toluene-d8 (Surr)	103		75 - 120		10/25/18 05:28	1
4-Bromofluorobenzene (Surr)	93		72 - 124		10/25/18 05:28	1
Dibromofluoromethane	82		75 - 120		10/25/18 05:28	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.17		0.55	0.17	ug/L		10/22/18 14:46	10/29/18 11:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	101		36 - 120	10/22/18 14:46	10/29/18 11:48	1
2-Fluorobiphenyl (Surr)	96		34 - 110	10/22/18 14:46	10/29/18 11:48	1
Terphenyl-d14 (Surr)	135		40 - 145	10/22/18 14:46	10/29/18 11:48	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	5.9		1.0	0.17	ug/L			10/26/18 13:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	107		60 - 140		10/26/18 13:32	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/23/18 11:05	10/23/18 22:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	92		25 - 130	10/23/18 11:05	10/23/18 22:52	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:04	1
Copper	<0.50		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:04	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:04	1
Manganese	33.8		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:04	1
Zinc	<6.9		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:04	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	138		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40.9		2.0	1.7	mg/L			10/30/18 12:23	10
Nitrate as N	0.20		0.20	0.068	mg/L			10/19/18 11:30	1
Sulfate	13.0		0.40	0.19	mg/L			10/30/18 12:11	2
Total Organic Carbon - Duplicates	0.72	J	1.0	0.47	mg/L			10/30/18 08:52	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-17

Lab Sample ID: 500-153458-1

Date Collected: 10/17/18 12:49

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	86.5		5.0	3.7	mg/L			10/31/18 15:53	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-18

Lab Sample ID: 500-153458-2

Date Collected: 10/17/18 12:59

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 05:53	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 05:53	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 05:53	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/25/18 05:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		75 - 126		10/25/18 05:53	1
Toluene-d8 (Surr)	111		75 - 120		10/25/18 05:53	1
4-Bromofluorobenzene (Surr)	93		72 - 124		10/25/18 05:53	1
Dibromofluoromethane	86		75 - 120		10/25/18 05:53	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.82	0.25	ug/L		10/22/18 14:46	10/29/18 12:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	112		36 - 120	10/22/18 14:46	10/29/18 12:16	1
2-Fluorobiphenyl (Surr)	104		34 - 110	10/22/18 14:46	10/29/18 12:16	1
Terphenyl-d14 (Surr)	134		40 - 145	10/22/18 14:46	10/29/18 12:16	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	6.7		1.0	0.17	ug/L			10/26/18 13:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	106		60 - 140		10/26/18 13:49	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		10/23/18 11:05	10/23/18 23:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	89		25 - 130	10/23/18 11:05	10/23/18 23:16	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:08	1
Copper	<0.50		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:08	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:08	1
Manganese	36.0		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:08	1
Zinc	6.9 J		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:08	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	138		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40.3		2.0	1.7	mg/L			10/30/18 12:48	10
Nitrate as N	0.22		0.20	0.068	mg/L			10/19/18 11:55	1
Sulfate	13.1		0.40	0.19	mg/L			10/30/18 12:36	2
Total Organic Carbon - Duplicates	0.68 J		1.0	0.47	mg/L			10/30/18 09:33	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-18

Lab Sample ID: 500-153458-2

Date Collected: 10/17/18 12:59

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	87.1		5.0	3.7	mg/L			10/31/18 16:07	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-19

Lab Sample ID: 500-153458-3

Date Collected: 10/17/18 13:34

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 06:19	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 06:19	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 06:19	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/25/18 06:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/25/18 06:19	1
Toluene-d8 (Surr)	91		75 - 120		10/25/18 06:19	1
4-Bromofluorobenzene (Surr)	97		72 - 124		10/25/18 06:19	1
Dibromofluoromethane	92		75 - 120		10/25/18 06:19	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.81	0.25	ug/L		10/22/18 14:46	10/29/18 12:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	110		36 - 120	10/22/18 14:46	10/29/18 12:43	1
2-Fluorobiphenyl (Surr)	105		34 - 110	10/22/18 14:46	10/29/18 12:43	1
Terphenyl-d14 (Surr)	139		40 - 145	10/22/18 14:46	10/29/18 12:43	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 14:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	105		60 - 140		10/26/18 14:06	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.091		0.10	0.091	ug/L		10/23/18 11:05	10/23/18 23:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	89		25 - 130	10/23/18 11:05	10/23/18 23:41	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.38	J	1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:11	1
Copper	1.0	J	2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:11	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:11	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:11	1
Zinc	7.1	J	20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:11	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	126		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21.2		1.0	0.85	mg/L			10/30/18 13:01	5
Nitrate as N	2.2		0.20	0.068	mg/L			10/19/18 12:20	1
Sulfate	5.4		0.20	0.095	mg/L			10/19/18 12:20	1
Total Organic Carbon - Duplicates	0.97	J	1.0	0.47	mg/L			10/30/18 09:53	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-19

Lab Sample ID: 500-153458-3

Date Collected: 10/17/18 13:34

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	106		5.0	3.7	mg/L			10/31/18 16:17	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-20

Lab Sample ID: 500-153458-4

Date Collected: 10/17/18 14:02

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 06:44	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 06:44	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 06:44	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/25/18 06:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/25/18 06:44	1
Toluene-d8 (Surr)	97		75 - 120		10/25/18 06:44	1
4-Bromofluorobenzene (Surr)	92		72 - 124		10/25/18 06:44	1
Dibromofluoromethane	96		75 - 120		10/25/18 06:44	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.81	0.25	ug/L		10/22/18 14:46	10/29/18 13:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	95		36 - 120	10/22/18 14:46	10/29/18 13:11	1
2-Fluorobiphenyl (Surr)	94		34 - 110	10/22/18 14:46	10/29/18 13:11	1
Terphenyl-d14 (Surr)	124		40 - 145	10/22/18 14:46	10/29/18 13:11	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 14:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	103		60 - 140		10/26/18 14:23	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		10/23/18 11:05	10/24/18 00:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	86		25 - 130	10/23/18 11:05	10/24/18 00:05	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:23	1
Copper	3.2		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:23	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:23	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:23	1
Zinc	16.3 J		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:23	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	70.2		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.5	F1	0.20	0.17	mg/L			10/30/18 13:13	1
Nitrate as N	0.71		0.20	0.068	mg/L			10/19/18 12:46	1
Sulfate	3.8		0.20	0.095	mg/L			10/19/18 12:46	1
Total Organic Carbon - Duplicates	0.78 J		1.0	0.47	mg/L			10/30/18 10:13	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-20

Lab Sample ID: 500-153458-4

Date Collected: 10/17/18 14:02

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	61.7		5.0	3.7	mg/L			10/31/18 16:23	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-21

Lab Sample ID: 500-153458-5

Date Collected: 10/17/18 14:35

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 07:10	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 07:10	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 07:10	1
Xylenes, Total	0.33	J	1.0	0.22	ug/L			10/25/18 07:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 126		10/25/18 07:10	1
Toluene-d8 (Surr)	100		75 - 120		10/25/18 07:10	1
4-Bromofluorobenzene (Surr)	93		72 - 124		10/25/18 07:10	1
Dibromofluoromethane	87		75 - 120		10/25/18 07:10	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.82	0.25	ug/L		10/22/18 14:46	10/29/18 13:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	117		36 - 120	10/22/18 14:46	10/29/18 13:39	1
2-Fluorobiphenyl (Surr)	107		34 - 110	10/22/18 14:46	10/29/18 13:39	1
Terphenyl-d14 (Surr)	139		40 - 145	10/22/18 14:46	10/29/18 13:39	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.086		0.096	0.086	ug/L		10/23/18 11:05	10/24/18 00:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	96		25 - 130	10/23/18 11:05	10/24/18 00:29	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:27	1
Copper	10.2		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:27	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:27	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:27	1
Zinc	7.2	J	20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:27	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-22

Lab Sample ID: 500-153458-6

Date Collected: 10/17/18 15:18

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/28/18 00:07	1
Toluene	<0.15		0.50	0.15	ug/L			10/28/18 00:07	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/28/18 00:07	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/28/18 00:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		75 - 126		10/28/18 00:07	1
Toluene-d8 (Surr)	99		75 - 120		10/28/18 00:07	1
4-Bromofluorobenzene (Surr)	118		72 - 124		10/28/18 00:07	1
Dibromofluoromethane	87		75 - 120		10/28/18 00:07	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/22/18 14:46	10/29/18 14:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	114		36 - 120	10/22/18 14:46	10/29/18 14:06	1
2-Fluorobiphenyl (Surr)	106		34 - 110	10/22/18 14:46	10/29/18 14:06	1
Terphenyl-d14 (Surr)	139		40 - 145	10/22/18 14:46	10/29/18 14:06	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 14:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	105		60 - 140		10/26/18 14:40	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.099	0.089	ug/L		10/23/18 11:05	10/24/18 00:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	78		25 - 130	10/23/18 11:05	10/24/18 00:53	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:30	1
Copper	1.2	J	2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:30	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:30	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:30	1
Zinc	<6.9		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:30	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	65.6		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	66.6		2.0	1.7	mg/L			10/30/18 22:05	10
Nitrate as N	1.9		0.20	0.068	mg/L			10/19/18 14:27	1
Sulfate	6.0		0.20	0.095	mg/L			10/19/18 14:27	1
Total Organic Carbon - Duplicates	1.1		1.0	0.47	mg/L			10/30/18 10:33	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-22

Lab Sample ID: 500-153458-6

Date Collected: 10/17/18 15:18

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	35.4		5.0	3.7	mg/L			10/31/18 16:29	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-23

Lab Sample ID: 500-153458-7

Date Collected: 10/17/18 16:02

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/28/18 00:32	1
Toluene	<0.15		0.50	0.15	ug/L			10/28/18 00:32	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/28/18 00:32	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/28/18 00:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		75 - 126		10/28/18 00:32	1
Toluene-d8 (Surr)	97		75 - 120		10/28/18 00:32	1
4-Bromofluorobenzene (Surr)	118		72 - 124		10/28/18 00:32	1
Dibromofluoromethane	87		75 - 120		10/28/18 00:32	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.78	0.24	ug/L		10/22/18 14:46	10/29/18 14:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	118		36 - 120	10/22/18 14:46	10/29/18 14:34	1
2-Fluorobiphenyl (Surr)	106		34 - 110	10/22/18 14:46	10/29/18 14:34	1
Terphenyl-d14 (Surr)	134		40 - 145	10/22/18 14:46	10/29/18 14:34	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 14:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	103		60 - 140		10/26/18 14:57	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/23/18 11:05	10/24/18 01:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	95		25 - 130	10/23/18 11:05	10/24/18 01:42	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.1		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:34	1
Copper	<0.50		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:34	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:34	1
Manganese	1.3	J	2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:34	1
Zinc	<6.9		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:34	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	142		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.6		1.0	0.85	mg/L			10/30/18 14:27	5
Nitrate as N	1.8		0.20	0.068	mg/L			10/19/18 14:52	1
Sulfate	6.4		0.20	0.095	mg/L			10/19/18 14:52	1
Total Organic Carbon - Duplicates	0.68	J ^	1.0	0.47	mg/L			11/05/18 13:22	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-23

Lab Sample ID: 500-153458-7

Date Collected: 10/17/18 16:02

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	122		5.0	3.7	mg/L			10/31/18 16:36	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-24

Lab Sample ID: 500-153458-8

Date Collected: 10/18/18 09:40

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/28/18 00:57	1
Toluene	<0.15		0.50	0.15	ug/L			10/28/18 00:57	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/28/18 00:57	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/28/18 00:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		75 - 126		10/28/18 00:57	1
Toluene-d8 (Surr)	98		75 - 120		10/28/18 00:57	1
4-Bromofluorobenzene (Surr)	119		72 - 124		10/28/18 00:57	1
Dibromofluoromethane	85		75 - 120		10/28/18 00:57	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.79	0.24	ug/L		10/22/18 14:46	10/29/18 15:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	124	X	36 - 120	10/22/18 14:46	10/29/18 15:57	1
2-Fluorobiphenyl (Surr)	116	X	34 - 110	10/22/18 14:46	10/29/18 15:57	1
Terphenyl-d14 (Surr)	139		40 - 145	10/22/18 14:46	10/29/18 15:57	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 15:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	105		60 - 140		10/26/18 15:14	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.50		0.097	0.087	ug/L		10/23/18 11:05	10/24/18 02:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	98		25 - 130	10/23/18 11:05	10/24/18 02:06	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:53	1
Copper	1.7	J	2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:53	1
Iron	77.2	J	100	46.7	ug/L		10/22/18 09:49	10/27/18 01:53	1
Manganese	9.2		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:53	1
Zinc	<6.9		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:53	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	231		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23.9		1.0	0.85	mg/L			10/30/18 14:40	5
Nitrate as N	1.7		0.20	0.068	mg/L			10/19/18 15:18	1
Sulfate	10.2		0.40	0.19	mg/L			10/30/18 22:18	2
Total Organic Carbon - Duplicates	1.3		1.0	0.47	mg/L			11/01/18 14:40	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-24

Lab Sample ID: 500-153458-8

Date Collected: 10/18/18 09:40

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	227		5.0	3.7	mg/L			11/01/18 15:09	1

- 1
- 2
- 3
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- 6
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- 8
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- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-25

Lab Sample ID: 500-153458-9

Date Collected: 10/18/18 10:43

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/28/18 01:22	1
Toluene	<0.15		0.50	0.15	ug/L			10/28/18 01:22	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/28/18 01:22	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/28/18 01:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 126		10/28/18 01:22	1
Toluene-d8 (Surr)	97		75 - 120		10/28/18 01:22	1
4-Bromofluorobenzene (Surr)	118		72 - 124		10/28/18 01:22	1
Dibromofluoromethane	86		75 - 120		10/28/18 01:22	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.81	0.25	ug/L		10/22/18 14:46	10/29/18 16:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	113		36 - 120	10/22/18 14:46	10/29/18 16:25	1
2-Fluorobiphenyl (Surr)	108		34 - 110	10/22/18 14:46	10/29/18 16:25	1
Terphenyl-d14 (Surr)	135		40 - 145	10/22/18 14:46	10/29/18 16:25	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 15:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	103		60 - 140		10/26/18 15:31	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.086		0.096	0.086	ug/L		10/23/18 11:05	10/24/18 02:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	87		25 - 130	10/23/18 11:05	10/24/18 02:31	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.34	J	1.0	0.23	ug/L		10/22/18 09:49	10/27/18 01:57	1
Copper	1.3	J	2.0	0.50	ug/L		10/22/18 09:49	10/27/18 01:57	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 01:57	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 01:57	1
Zinc	8.8	J	20.0	6.9	ug/L		10/22/18 09:49	10/27/18 01:57	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	109		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.1		1.0	0.85	mg/L			10/30/18 14:52	5
Nitrate as N	2.9		0.20	0.068	mg/L			10/19/18 15:43	1
Sulfate	5.9		0.20	0.095	mg/L			10/19/18 15:43	1
Total Organic Carbon - Duplicates	1.0		1.0	0.47	mg/L			11/01/18 14:59	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-25

Lab Sample ID: 500-153458-9

Date Collected: 10/18/18 10:43

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	85.5		5.0	3.7	mg/L			11/01/18 15:16	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-26

Lab Sample ID: 500-153458-10

Date Collected: 10/18/18 11:33

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/28/18 01:47	1
Toluene	<0.15		0.50	0.15	ug/L			10/28/18 01:47	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/28/18 01:47	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/28/18 01:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		75 - 126		10/28/18 01:47	1
Toluene-d8 (Surr)	99		75 - 120		10/28/18 01:47	1
4-Bromofluorobenzene (Surr)	119		72 - 124		10/28/18 01:47	1
Dibromofluoromethane	88		75 - 120		10/28/18 01:47	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	1.3		0.81	0.25	ug/L		10/22/18 14:46	10/30/18 13:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	109		36 - 120	10/22/18 14:46	10/30/18 13:33	1
2-Fluorobiphenyl (Surr)	101		34 - 110	10/22/18 14:46	10/30/18 13:33	1
Terphenyl-d14 (Surr)	128		40 - 145	10/22/18 14:46	10/30/18 13:33	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 15:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	100		60 - 140		10/26/18 15:48	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	640		24	22	ug/L		10/23/18 11:05	10/24/18 13:00	250

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130	10/23/18 11:05	10/24/18 13:00	250

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 02:12	1
Copper	0.94	J	2.0	0.50	ug/L		10/22/18 09:49	10/27/18 02:12	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 02:12	1
Manganese	15.4		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 02:12	1
Zinc	7.9	J	20.0	6.9	ug/L		10/22/18 09:49	10/27/18 02:12	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	82.9		1.3	0.66	mg/L		10/20/18 09:32	10/24/18 07:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.7		0.20	0.17	mg/L			10/30/18 15:04	1
Nitrate as N	2.2		0.20	0.068	mg/L			10/19/18 16:34	1
Sulfate	3.7		0.20	0.095	mg/L			10/19/18 16:34	1
Total Organic Carbon - Duplicates	2.6		1.0	0.47	mg/L			11/01/18 15:17	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-26

Lab Sample ID: 500-153458-10

Date Collected: 10/18/18 11:33

Matrix: Water

Date Received: 10/19/18 08:50

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	77.5		5.0	3.7	mg/L			11/01/18 15:22	1

- 1
- 2
- 3
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- 11
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- 13
- 14
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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: Trip Blank-002

Lab Sample ID: 500-153458-11

Date Collected: 10/18/18 13:00

Matrix: Water

Date Received: 10/19/18 08:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/27/18 21:37	1
Toluene	<0.15		0.50	0.15	ug/L			10/27/18 21:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/27/18 21:37	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/27/18 21:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		75 - 126		10/27/18 21:37	1
Toluene-d8 (Surr)	101		75 - 120		10/27/18 21:37	1
4-Bromofluorobenzene (Surr)	118		72 - 124		10/27/18 21:37	1
Dibromofluoromethane	86		75 - 120		10/27/18 21:37	1

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
F1	MS and/or MSD Recovery is outside acceptance limits.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

GC/MS VOA

Analysis Batch: 456662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	8260B	
500-153458-2	W-181017-MH-18	Total/NA	Water	8260B	
500-153458-3	W-181017-MH-19	Total/NA	Water	8260B	
500-153458-4	W-181017-MH-20	Total/NA	Water	8260B	
500-153458-5	W-181017-MH-21	Total/NA	Water	8260B	
MB 500-456662/6	Method Blank	Total/NA	Water	8260B	
LCS 500-456662/8	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 457156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-6	W-181017-MH-22	Total/NA	Water	8260B	
500-153458-7	W-181017-MH-23	Total/NA	Water	8260B	
500-153458-8	W-181018-MH-24	Total/NA	Water	8260B	
500-153458-9	W-181018-MH-25	Total/NA	Water	8260B	
500-153458-10	W-181018-MH-26	Total/NA	Water	8260B	
500-153458-11	Trip Blank-002	Total/NA	Water	8260B	
MB 500-457156/6	Method Blank	Total/NA	Water	8260B	
LCS 500-457156/4	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 456172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	3510C	
500-153458-2	W-181017-MH-18	Total/NA	Water	3510C	
500-153458-3	W-181017-MH-19	Total/NA	Water	3510C	
500-153458-4	W-181017-MH-20	Total/NA	Water	3510C	
500-153458-5	W-181017-MH-21	Total/NA	Water	3510C	
500-153458-6	W-181017-MH-22	Total/NA	Water	3510C	
500-153458-7	W-181017-MH-23	Total/NA	Water	3510C	
500-153458-8	W-181018-MH-24	Total/NA	Water	3510C	
500-153458-9	W-181018-MH-25	Total/NA	Water	3510C	
500-153458-10	W-181018-MH-26	Total/NA	Water	3510C	
MB 500-456172/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-456172/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 456274

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-456172/2-A	Lab Control Sample	Total/NA	Water	8270D	456172

Analysis Batch: 456330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-456172/1-A	Method Blank	Total/NA	Water	8270D	456172

Analysis Batch: 457267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	8270D	456172
500-153458-2	W-181017-MH-18	Total/NA	Water	8270D	456172
500-153458-3	W-181017-MH-19	Total/NA	Water	8270D	456172
500-153458-4	W-181017-MH-20	Total/NA	Water	8270D	456172

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

GC/MS Semi VOA (Continued)

Analysis Batch: 457267 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-5	W-181017-MH-21	Total/NA	Water	8270D	456172
500-153458-6	W-181017-MH-22	Total/NA	Water	8270D	456172
500-153458-7	W-181017-MH-23	Total/NA	Water	8270D	456172
500-153458-8	W-181018-MH-24	Total/NA	Water	8270D	456172
500-153458-9	W-181018-MH-25	Total/NA	Water	8270D	456172

Analysis Batch: 457518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-10	W-181018-MH-26	Total/NA	Water	8270D	456172

GC VOA

Analysis Batch: 352106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	RSK-175	
500-153458-2	W-181017-MH-18	Total/NA	Water	RSK-175	
500-153458-3	W-181017-MH-19	Total/NA	Water	RSK-175	
500-153458-4	W-181017-MH-20	Total/NA	Water	RSK-175	
500-153458-6	W-181017-MH-22	Total/NA	Water	RSK-175	
500-153458-7	W-181017-MH-23	Total/NA	Water	RSK-175	
500-153458-8	W-181018-MH-24	Total/NA	Water	RSK-175	
500-153458-9	W-181018-MH-25	Total/NA	Water	RSK-175	
500-153458-10	W-181018-MH-26	Total/NA	Water	RSK-175	
MB 240-352106/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-352106/5	Lab Control Sample	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 456314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	8151A	
500-153458-2	W-181017-MH-18	Total/NA	Water	8151A	
500-153458-3	W-181017-MH-19	Total/NA	Water	8151A	
500-153458-4	W-181017-MH-20	Total/NA	Water	8151A	
500-153458-5	W-181017-MH-21	Total/NA	Water	8151A	
500-153458-6	W-181017-MH-22	Total/NA	Water	8151A	
500-153458-7	W-181017-MH-23	Total/NA	Water	8151A	
500-153458-8	W-181018-MH-24	Total/NA	Water	8151A	
500-153458-9	W-181018-MH-25	Total/NA	Water	8151A	
500-153458-10	W-181018-MH-26	Total/NA	Water	8151A	
MB 500-456314/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-456314/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-456314/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 456426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	8151A	456314
500-153458-2	W-181017-MH-18	Total/NA	Water	8151A	456314
500-153458-3	W-181017-MH-19	Total/NA	Water	8151A	456314
500-153458-4	W-181017-MH-20	Total/NA	Water	8151A	456314

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

GC Semi VOA (Continued)

Analysis Batch: 456426 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-5	W-181017-MH-21	Total/NA	Water	8151A	456314
500-153458-6	W-181017-MH-22	Total/NA	Water	8151A	456314
500-153458-7	W-181017-MH-23	Total/NA	Water	8151A	456314
500-153458-8	W-181018-MH-24	Total/NA	Water	8151A	456314
500-153458-9	W-181018-MH-25	Total/NA	Water	8151A	456314
500-153458-10	W-181018-MH-26	Total/NA	Water	8151A	456314
MB 500-456314/1-A	Method Blank	Total/NA	Water	8151A	456314
LCS 500-456314/2-A	Lab Control Sample	Total/NA	Water	8151A	456314
LCS 500-456314/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	456314

Metals

Prep Batch: 455957

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	3010A	
500-153458-2	W-181017-MH-18	Total/NA	Water	3010A	
500-153458-3	W-181017-MH-19	Total/NA	Water	3010A	
500-153458-4	W-181017-MH-20	Total/NA	Water	3010A	
500-153458-6	W-181017-MH-22	Total/NA	Water	3010A	
500-153458-7	W-181017-MH-23	Total/NA	Water	3010A	
500-153458-8	W-181018-MH-24	Total/NA	Water	3010A	
500-153458-9	W-181018-MH-25	Total/NA	Water	3010A	
500-153458-10	W-181018-MH-26	Total/NA	Water	3010A	

Prep Batch: 456088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Dissolved	Water	3005A	
500-153458-2	W-181017-MH-18	Dissolved	Water	3005A	
500-153458-3	W-181017-MH-19	Dissolved	Water	3005A	
500-153458-4	W-181017-MH-20	Dissolved	Water	3005A	
500-153458-5	W-181017-MH-21	Dissolved	Water	3005A	
500-153458-6	W-181017-MH-22	Dissolved	Water	3005A	
500-153458-7	W-181017-MH-23	Dissolved	Water	3005A	
500-153458-8	W-181018-MH-24	Dissolved	Water	3005A	
500-153458-9	W-181018-MH-25	Dissolved	Water	3005A	
500-153458-10	W-181018-MH-26	Dissolved	Water	3005A	
MB 500-456088/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-456088/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-153458-7 MS	W-181017-MH-23	Dissolved	Water	3005A	
500-153458-7 MSD	W-181017-MH-23	Dissolved	Water	3005A	
500-153458-7 DU	W-181017-MH-23	Dissolved	Water	3005A	

Analysis Batch: 456464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	SM 2340B	455957
500-153458-2	W-181017-MH-18	Total/NA	Water	SM 2340B	455957
500-153458-3	W-181017-MH-19	Total/NA	Water	SM 2340B	455957
500-153458-4	W-181017-MH-20	Total/NA	Water	SM 2340B	455957
500-153458-6	W-181017-MH-22	Total/NA	Water	SM 2340B	455957
500-153458-7	W-181017-MH-23	Total/NA	Water	SM 2340B	455957

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Metals (Continued)

Analysis Batch: 456464 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-8	W-181018-MH-24	Total/NA	Water	SM 2340B	455957
500-153458-9	W-181018-MH-25	Total/NA	Water	SM 2340B	455957
500-153458-10	W-181018-MH-26	Total/NA	Water	SM 2340B	455957

Analysis Batch: 457318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Dissolved	Water	6020A	456088
500-153458-2	W-181017-MH-18	Dissolved	Water	6020A	456088
500-153458-3	W-181017-MH-19	Dissolved	Water	6020A	456088
500-153458-4	W-181017-MH-20	Dissolved	Water	6020A	456088
500-153458-5	W-181017-MH-21	Dissolved	Water	6020A	456088
500-153458-6	W-181017-MH-22	Dissolved	Water	6020A	456088
500-153458-7	W-181017-MH-23	Dissolved	Water	6020A	456088
500-153458-8	W-181018-MH-24	Dissolved	Water	6020A	456088
500-153458-9	W-181018-MH-25	Dissolved	Water	6020A	456088
500-153458-10	W-181018-MH-26	Dissolved	Water	6020A	456088
MB 500-456088/1-A	Method Blank	Total Recoverable	Water	6020A	456088
LCS 500-456088/2-A	Lab Control Sample	Total Recoverable	Water	6020A	456088
500-153458-7 MS	W-181017-MH-23	Dissolved	Water	6020A	456088
500-153458-7 MSD	W-181017-MH-23	Dissolved	Water	6020A	456088
500-153458-7 DU	W-181017-MH-23	Dissolved	Water	6020A	456088

General Chemistry

Analysis Batch: 456127

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	300.0	
500-153458-2	W-181017-MH-18	Total/NA	Water	300.0	
500-153458-3	W-181017-MH-19	Total/NA	Water	300.0	
500-153458-4	W-181017-MH-20	Total/NA	Water	300.0	
500-153458-6	W-181017-MH-22	Total/NA	Water	300.0	
500-153458-7	W-181017-MH-23	Total/NA	Water	300.0	
500-153458-8	W-181018-MH-24	Total/NA	Water	300.0	
500-153458-9	W-181018-MH-25	Total/NA	Water	300.0	
500-153458-10	W-181018-MH-26	Total/NA	Water	300.0	
MB 500-456127/7	Method Blank	Total/NA	Water	300.0	
LCS 500-456127/8	Lab Control Sample	Total/NA	Water	300.0	
500-153458-10 MS	W-181018-MH-26	Total/NA	Water	300.0	
500-153458-10 MSD	W-181018-MH-26	Total/NA	Water	300.0	

Analysis Batch: 457627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	300.0	
500-153458-1	W-181017-MH-17	Total/NA	Water	300.0	
500-153458-2	W-181017-MH-18	Total/NA	Water	300.0	
500-153458-2	W-181017-MH-18	Total/NA	Water	300.0	
500-153458-3	W-181017-MH-19	Total/NA	Water	300.0	
500-153458-4	W-181017-MH-20	Total/NA	Water	300.0	
500-153458-6	W-181017-MH-22	Total/NA	Water	300.0	
500-153458-7	W-181017-MH-23	Total/NA	Water	300.0	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

General Chemistry (Continued)

Analysis Batch: 457627 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-8	W-181018-MH-24	Total/NA	Water	300.0	
500-153458-8	W-181018-MH-24	Total/NA	Water	300.0	
500-153458-9	W-181018-MH-25	Total/NA	Water	300.0	
500-153458-10	W-181018-MH-26	Total/NA	Water	300.0	
MB 500-457627/3	Method Blank	Total/NA	Water	300.0	
LCS 500-457627/4	Lab Control Sample	Total/NA	Water	300.0	
500-153458-4 MS	W-181017-MH-20	Total/NA	Water	300.0	
500-153458-4 MSD	W-181017-MH-20	Total/NA	Water	300.0	

Analysis Batch: 457813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	9060A	
500-153458-2	W-181017-MH-18	Total/NA	Water	9060A	
500-153458-3	W-181017-MH-19	Total/NA	Water	9060A	
500-153458-4	W-181017-MH-20	Total/NA	Water	9060A	
500-153458-6	W-181017-MH-22	Total/NA	Water	9060A	
MB 500-457813/4	Method Blank	Total/NA	Water	9060A	
LCS 500-457813/5	Lab Control Sample	Total/NA	Water	9060A	
500-153458-1 MS	W-181017-MH-17	Total/NA	Water	9060A	
500-153458-1 MSD	W-181017-MH-17	Total/NA	Water	9060A	

Analysis Batch: 457885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-1	W-181017-MH-17	Total/NA	Water	SM 2320B	
500-153458-2	W-181017-MH-18	Total/NA	Water	SM 2320B	
500-153458-3	W-181017-MH-19	Total/NA	Water	SM 2320B	
500-153458-4	W-181017-MH-20	Total/NA	Water	SM 2320B	
500-153458-6	W-181017-MH-22	Total/NA	Water	SM 2320B	
500-153458-7	W-181017-MH-23	Total/NA	Water	SM 2320B	
MB 500-457885/28	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-457885/29	Lab Control Sample	Total/NA	Water	SM 2320B	
500-153458-1 DU	W-181017-MH-17	Total/NA	Water	SM 2320B	

Analysis Batch: 458019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-8	W-181018-MH-24	Total/NA	Water	SM 2320B	
500-153458-9	W-181018-MH-25	Total/NA	Water	SM 2320B	
500-153458-10	W-181018-MH-26	Total/NA	Water	SM 2320B	
MB 500-458019/28	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-458019/29	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 458110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-8	W-181018-MH-24	Total/NA	Water	9060A	
500-153458-9	W-181018-MH-25	Total/NA	Water	9060A	
500-153458-10	W-181018-MH-26	Total/NA	Water	9060A	
MB 500-458110/4	Method Blank	Total/NA	Water	9060A	
LCS 500-458110/5	Lab Control Sample	Total/NA	Water	9060A	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

General Chemistry (Continued)

Analysis Batch: 458686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153458-7	W-181017-MH-23	Total/NA	Water	9060A	
MB 500-458686/4	Method Blank	Total/NA	Water	9060A	
LCS 500-458686/5	Lab Control Sample	Total/NA	Water	9060A	

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-126)	TOL (75-120)	BFB (72-124)	DBFM (75-120)
500-153458-1	W-181017-MH-17	80	103	93	82
500-153458-2	W-181017-MH-18	81	111	93	86
500-153458-3	W-181017-MH-19	88	91	97	92
500-153458-4	W-181017-MH-20	88	97	92	96
500-153458-5	W-181017-MH-21	86	100	93	87
500-153458-6	W-181017-MH-22	100	99	118	87
500-153458-7	W-181017-MH-23	97	97	118	87
500-153458-8	W-181018-MH-24	95	98	119	85
500-153458-9	W-181018-MH-25	99	97	118	86
500-153458-10	W-181018-MH-26	98	99	119	88
500-153458-11	Trip Blank-002	92	101	118	86
LCS 500-456662/8	Lab Control Sample	85	97	91	108
LCS 500-457156/4	Lab Control Sample	93	107	100	90
MB 500-456662/6	Method Blank	88	98	103	93
MB 500-457156/6	Method Blank	100	99	117	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		NBZ (36-120)	FBP (34-110)	TPHL (40-145)
500-153458-1	W-181017-MH-17	101	96	135
500-153458-2	W-181017-MH-18	112	104	134
500-153458-3	W-181017-MH-19	110	105	139
500-153458-4	W-181017-MH-20	95	94	124
500-153458-5	W-181017-MH-21	117	107	139
500-153458-6	W-181017-MH-22	114	106	139
500-153458-7	W-181017-MH-23	118	106	134
500-153458-8	W-181018-MH-24	124 X	116 X	139
500-153458-9	W-181018-MH-25	113	108	135
500-153458-10	W-181018-MH-26	109	101	128
LCS 500-456172/2-A	Lab Control Sample	104	97	120
MB 500-456172/1-A	Method Blank	101	100	129

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TPHL = Terphenyl-d14 (Surr)

TestAmerica Chicago

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TFE2 (60-140)
500-153458-1	W-181017-MH-17	107
500-153458-2	W-181017-MH-18	106
500-153458-3	W-181017-MH-19	105
500-153458-4	W-181017-MH-20	103
500-153458-6	W-181017-MH-22	105
500-153458-7	W-181017-MH-23	103
500-153458-8	W-181018-MH-24	105
500-153458-9	W-181018-MH-25	103
500-153458-10	W-181018-MH-26	100
LCS 240-352106/5	Lab Control Sample	106
MB 240-352106/4	Method Blank	107

Surrogate Legend

TFE = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPAA2 (25-130)
500-153458-1	W-181017-MH-17	92
500-153458-2	W-181017-MH-18	89
500-153458-3	W-181017-MH-19	89
500-153458-4	W-181017-MH-20	86
500-153458-5	W-181017-MH-21	96
500-153458-6	W-181017-MH-22	78
500-153458-7	W-181017-MH-23	95
500-153458-8	W-181018-MH-24	98
500-153458-9	W-181018-MH-25	87
500-153458-10	W-181018-MH-26	0 D
LCS 500-456314/2-A	Lab Control Sample	95
LCSD 500-456314/3-A	Lab Control Sample Dup	96
MB 500-456314/1-A	Method Blank	90

Surrogate Legend

DCPAA = DCAA

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456662/6

Matrix: Water

Analysis Batch: 456662

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 23:43	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 23:43	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 23:43	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 23:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/24/18 23:43	1
Toluene-d8 (Surr)	98		75 - 120		10/24/18 23:43	1
4-Bromofluorobenzene (Surr)	103		72 - 124		10/24/18 23:43	1
Dibromofluoromethane	93		75 - 120		10/24/18 23:43	1

Lab Sample ID: LCS 500-456662/8

Matrix: Water

Analysis Batch: 456662

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	40.9		ug/L		82	70 - 120
Toluene	50.0	40.4		ug/L		81	70 - 125
Ethylbenzene	50.0	42.0		ug/L		84	70 - 123
Xylenes, Total	100	87.9		ug/L		88	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	85		75 - 126
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	91		72 - 124
Dibromofluoromethane	108		75 - 120

Lab Sample ID: MB 500-457156/6

Matrix: Water

Analysis Batch: 457156

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/27/18 21:01	1
Toluene	<0.15		0.50	0.15	ug/L			10/27/18 21:01	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/27/18 21:01	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/27/18 21:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		75 - 126		10/27/18 21:01	1
Toluene-d8 (Surr)	99		75 - 120		10/27/18 21:01	1
4-Bromofluorobenzene (Surr)	117		72 - 124		10/27/18 21:01	1
Dibromofluoromethane	91		75 - 120		10/27/18 21:01	1

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 500-457156/4

Matrix: Water

Analysis Batch: 457156

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	43.7		ug/L		87	70 - 120
Toluene	50.0	48.8		ug/L		98	70 - 125
Ethylbenzene	50.0	43.7		ug/L		87	70 - 123
Xylenes, Total	100	93.1		ug/L		93	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		75 - 126
Toluene-d8 (Surr)	107		75 - 120
4-Bromofluorobenzene (Surr)	100		72 - 124
Dibromofluoromethane	90		75 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456172/1-A

Matrix: Water

Analysis Batch: 456330

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 456172

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/22/18 14:46	10/23/18 16:44	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	101		36 - 120	10/22/18 14:46	10/23/18 16:44	1
2-Fluorobiphenyl (Surr)	100		34 - 110	10/22/18 14:46	10/23/18 16:44	1
Terphenyl-d14 (Surr)	129		40 - 145	10/22/18 14:46	10/23/18 16:44	1

Lab Sample ID: LCS 500-456172/2-A

Matrix: Water

Analysis Batch: 456274

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 456172

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	28.4		ug/L		89	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	104		36 - 120
2-Fluorobiphenyl (Surr)	97		34 - 110
Terphenyl-d14 (Surr)	120		40 - 145

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-352106/4

Matrix: Water

Analysis Batch: 352106

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 12:59	1

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: MB 240-352106/4
Matrix: Water
Analysis Batch: 352106

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	<i>MB</i> %Recovery	<i>MB</i> Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	107		60 - 140		10/26/18 12:59	1

Lab Sample ID: LCS 240-352106/5
Matrix: Water
Analysis Batch: 352106

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	511	450		ug/L		88	80 - 120

Surrogate	<i>LCS</i> %Recovery	<i>LCS</i> Qualifier	Limits
1,1,1-Trifluoroethane	106		60 - 140

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-456314/1-A
Matrix: Water
Analysis Batch: 456426

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456314

Analyte	<i>MB</i> Result	<i>MB</i> Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		10/23/18 11:05	10/23/18 21:15	1

Surrogate	<i>MB</i> %Recovery	<i>MB</i> Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	90		25 - 130	10/23/18 11:05	10/23/18 21:15	1

Lab Sample ID: LCS 500-456314/2-A
Matrix: Water
Analysis Batch: 456426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456314

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	2.53	2.01		ug/L		80	40 - 122

Surrogate	<i>LCS</i> %Recovery	<i>LCS</i> Qualifier	Limits
DCAA	95		25 - 130

Lab Sample ID: LCSD 500-456314/3-A
Matrix: Water
Analysis Batch: 456426

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 456314

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	2.53	2.05		ug/L		81	40 - 122	2	20

Surrogate	<i>LCSD</i> %Recovery	<i>LCSD</i> Qualifier	Limits
DCAA	96		25 - 130

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-456088/1-A
Matrix: Water
Analysis Batch: 457318

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 456088

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/22/18 09:49	10/27/18 00:38	1
Copper	<0.50		2.0	0.50	ug/L		10/22/18 09:49	10/27/18 00:38	1
Iron	<46.7		100	46.7	ug/L		10/22/18 09:49	10/27/18 00:38	1
Manganese	<0.79		2.5	0.79	ug/L		10/22/18 09:49	10/27/18 00:38	1
Zinc	<6.9		20.0	6.9	ug/L		10/22/18 09:49	10/27/18 00:38	1

Lab Sample ID: LCS 500-456088/2-A
Matrix: Water
Analysis Batch: 457318

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 456088

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	100	96.98		ug/L		97	80 - 120
Copper	250	246.6		ug/L		99	80 - 120
Iron	1000	1009		ug/L		101	80 - 120
Manganese	500	502.5		ug/L		101	80 - 120
Zinc	500	569.7		ug/L		114	80 - 120

Lab Sample ID: 500-153458-7 MS
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-181017-MH-23
Prep Type: Dissolved
Prep Batch: 456088

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	1.1		100	100.7		ug/L		100	75 - 125
Copper	<0.50		250	248.1		ug/L		99	75 - 125
Iron	<46.7		1000	984.5		ug/L		98	75 - 125
Manganese	1.3	J	500	491.4		ug/L		98	75 - 125
Zinc	<6.9		500	510.4		ug/L		102	75 - 125

Lab Sample ID: 500-153458-7 MSD
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-181017-MH-23
Prep Type: Dissolved
Prep Batch: 456088

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	1.1		100	100.7		ug/L		100	75 - 125	0	20
Copper	<0.50		250	248.8		ug/L		100	75 - 125	0	20
Iron	<46.7		1000	997.6		ug/L		100	75 - 125	1	20
Manganese	1.3	J	500	500.0		ug/L		100	75 - 125	2	20
Zinc	<6.9		500	496.8		ug/L		99	75 - 125	3	20

Lab Sample ID: 500-153458-7 DU
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-181017-MH-23
Prep Type: Dissolved
Prep Batch: 456088

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Arsenic	1.1		1.03		ug/L		9	20
Copper	<0.50		<0.50		ug/L		NC	20
Iron	<46.7		<46.7		ug/L		NC	20
Manganese	1.3	J	1.27	J	ug/L		5	20
Zinc	<6.9		7.05	J	ug/L		NC	20

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-456127/7

Matrix: Water

Analysis Batch: 456127

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.068		0.20	0.068	mg/L			10/19/18 14:02	1
Sulfate	<0.095		0.20	0.095	mg/L			10/19/18 14:02	1

Lab Sample ID: LCS 500-456127/8

Matrix: Water

Analysis Batch: 456127

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.00	1.99		mg/L		99	90 - 110
Sulfate	5.00	5.11		mg/L		102	90 - 110

Lab Sample ID: 500-153458-10 MS

Matrix: Water

Analysis Batch: 456127

Client Sample ID: W-181018-MH-26

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.2		1.00	3.28		mg/L		113	80 - 120
Sulfate	3.7		2.50	6.44		mg/L		110	80 - 120

Lab Sample ID: 500-153458-10 MSD

Matrix: Water

Analysis Batch: 456127

Client Sample ID: W-181018-MH-26

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	2.2		1.00	3.31		mg/L		116	80 - 120	1	20
Sulfate	3.7		2.50	6.53		mg/L		114	80 - 120	1	20

Lab Sample ID: MB 500-457627/3

Matrix: Water

Analysis Batch: 457627

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			10/30/18 09:30	1
Sulfate	<0.095		0.20	0.095	mg/L			10/30/18 09:30	1

Lab Sample ID: LCS 500-457627/4

Matrix: Water

Analysis Batch: 457627

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.89		mg/L		96	90 - 110
Sulfate	5.00	4.94		mg/L		99	90 - 110

Lab Sample ID: 500-153458-4 MS

Matrix: Water

Analysis Batch: 457627

Client Sample ID: W-181017-MH-20

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.5	F1	1.00	3.30		mg/L		81	80 - 120

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-153458-4 MSD
Matrix: Water
Analysis Batch: 457627

Client Sample ID: W-181017-MH-20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.5	F1	1.00	3.26	F1	mg/L		77	80 - 120	1	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 500-457813/4
Matrix: Water
Analysis Batch: 457813

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			10/30/18 07:52	1

Lab Sample ID: LCS 500-457813/5
Matrix: Water
Analysis Batch: 457813

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	9.99		mg/L		100	80 - 120

Lab Sample ID: 500-153458-1 MS
Matrix: Water
Analysis Batch: 457813

Client Sample ID: W-181017-MH-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	0.72	J	10.0	10.52		mg/L		98	75 - 125

Lab Sample ID: 500-153458-1 MSD
Matrix: Water
Analysis Batch: 457813

Client Sample ID: W-181017-MH-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	0.72	J	10.0	10.46		mg/L		97	75 - 125	1	20

Lab Sample ID: MB 500-458110/4
Matrix: Water
Analysis Batch: 458110

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			11/01/18 10:23	1

Lab Sample ID: LCS 500-458110/5
Matrix: Water
Analysis Batch: 458110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	9.90		mg/L		99	80 - 120

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: MB 500-458686/4
Matrix: Water
Analysis Batch: 458686

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47	^	1.0	0.47	mg/L			11/05/18 11:46	1

Lab Sample ID: LCS 500-458686/5
Matrix: Water
Analysis Batch: 458686

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	9.94	^	mg/L		99	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-457885/28
Matrix: Water
Analysis Batch: 457885

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			10/31/18 13:57	1

Lab Sample ID: LCS 500-457885/29
Matrix: Water
Analysis Batch: 457885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.62		mg/L		100	90 - 110

Lab Sample ID: 500-153458-1 DU
Matrix: Water
Analysis Batch: 457885

Client Sample ID: W-181017-MH-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	86.5		84.83		mg/L		2	20

Lab Sample ID: MB 500-458019/28
Matrix: Water
Analysis Batch: 458019

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			11/01/18 14:48	1

Lab Sample ID: LCS 500-458019/29
Matrix: Water
Analysis Batch: 458019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	98.19		mg/L		98	90 - 110

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-17

Date Collected: 10/17/18 12:49

Date Received: 10/19/18 08:50

Lab Sample ID: 500-153458-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 05:28	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 11:48	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 13:32	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/23/18 22:52	JBj	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:04	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		2	457627	10/30/18 12:11	EAT	TAL CHI
Total/NA	Analysis	300.0		10	457627	10/30/18 12:23	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 11:30	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 08:52	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 15:53	SMO	TAL CHI

Client Sample ID: W-181017-MH-18

Date Collected: 10/17/18 12:59

Date Received: 10/19/18 08:50

Lab Sample ID: 500-153458-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 05:53	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 12:16	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 13:49	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/23/18 23:16	JBj	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:08	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		2	457627	10/30/18 12:36	EAT	TAL CHI
Total/NA	Analysis	300.0		10	457627	10/30/18 12:48	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 11:55	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 09:33	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 16:07	SMO	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-19

Lab Sample ID: 500-153458-3

Date Collected: 10/17/18 13:34

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 06:19	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 12:43	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 14:06	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/23/18 23:41	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:11	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		5	457627	10/30/18 13:01	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 12:20	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 09:53	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 16:17	SMO	TAL CHI

Client Sample ID: W-181017-MH-20

Lab Sample ID: 500-153458-4

Date Collected: 10/17/18 14:02

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 06:44	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 13:11	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 14:23	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 00:05	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:23	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		1	457627	10/30/18 13:13	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 12:46	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 10:13	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 16:23	SMO	TAL CHI

Client Sample ID: W-181017-MH-21

Lab Sample ID: 500-153458-5

Date Collected: 10/17/18 14:35

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 07:10	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-21

Lab Sample ID: 500-153458-5

Date Collected: 10/17/18 14:35

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D		1	457267	10/29/18 13:39	GES	TAL CHI
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 00:29	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:27	FXG	TAL CHI

Client Sample ID: W-181017-MH-22

Lab Sample ID: 500-153458-6

Date Collected: 10/17/18 15:18

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/28/18 00:07	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 14:06	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 14:40	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 00:53	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:30	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		10	457627	10/30/18 22:05	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 14:27	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 10:33	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 16:29	SMO	TAL CHI

Client Sample ID: W-181017-MH-23

Lab Sample ID: 500-153458-7

Date Collected: 10/17/18 16:02

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/28/18 00:32	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 14:34	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 14:57	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 01:42	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:34	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		5	457627	10/30/18 14:27	EAT	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181017-MH-23

Lab Sample ID: 500-153458-7

Date Collected: 10/17/18 16:02

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	456127	10/19/18 14:52	EAT	TAL CHI
Total/NA	Analysis	9060A		1	458686	11/05/18 13:22	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	457885	10/31/18 16:36	SMO	TAL CHI

Client Sample ID: W-181018-MH-24

Lab Sample ID: 500-153458-8

Date Collected: 10/18/18 09:40

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/28/18 00:57	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 15:57	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 15:14	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 02:06	JB	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:53	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		5	457627	10/30/18 14:40	EAT	TAL CHI
Total/NA	Analysis	300.0		2	457627	10/30/18 22:18	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 15:18	EAT	TAL CHI
Total/NA	Analysis	9060A		1	458110	11/01/18 14:40	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458019	11/01/18 15:09	SMO	TAL CHI

Client Sample ID: W-181018-MH-25

Lab Sample ID: 500-153458-9

Date Collected: 10/18/18 10:43

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/28/18 01:22	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457267	10/29/18 16:25	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 15:31	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456426	10/24/18 02:31	JB	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 01:57	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		5	457627	10/30/18 14:52	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 15:43	EAT	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Client Sample ID: W-181018-MH-25

Lab Sample ID: 500-153458-9

Date Collected: 10/18/18 10:43

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	458110	11/01/18 14:59	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458019	11/01/18 15:16	SMO	TAL CHI

Client Sample ID: W-181018-MH-26

Lab Sample ID: 500-153458-10

Date Collected: 10/18/18 11:33

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/28/18 01:47	PMF	TAL CHI
Total/NA	Prep	3510C			456172	10/22/18 14:46	JVD	TAL CHI
Total/NA	Analysis	8270D		1	457518	10/30/18 13:33	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 15:48	BPM	TAL CAN
Total/NA	Prep	8151A			456314	10/23/18 11:05	DAK	TAL CHI
Total/NA	Analysis	8151A		250	456426	10/24/18 13:00	JBK	TAL CHI
Dissolved	Prep	3005A			456088	10/22/18 09:49	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 02:12	FXG	TAL CHI
Total/NA	Prep	3010A			455957	10/20/18 09:32	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	456464	10/24/18 07:01	JEF	TAL CHI
Total/NA	Analysis	300.0		1	457627	10/30/18 15:04	EAT	TAL CHI
Total/NA	Analysis	300.0		1	456127	10/19/18 16:34	EAT	TAL CHI
Total/NA	Analysis	9060A		1	458110	11/01/18 15:17	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458019	11/01/18 15:22	SMO	TAL CHI

Client Sample ID: Trip Blank-002

Lab Sample ID: 500-153458-11

Date Collected: 10/18/18 13:00

Matrix: Water

Date Received: 10/19/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	457156	10/27/18 21:37	PMF	TAL CHI

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153458-1

Laboratory: TestAmerica Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	999580010	08-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
SM 2320B		Water	Alkalinity

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: <u>REE</u>		Site Contact: <u>Grant Anderson</u>		Date: <u>10-18-2018</u>		COC No:												
Company Name: <u>GHP</u>		Tel/Fax:		Lab Contact: <u>R. Wright</u>		Carrier: <u>Fed Ex</u>		1 of 1 COCs												
Address: <u>1806 Old Hwy 8</u>		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS /MSD (Y/N) BTEX Naphthalene Pentachlorobenzene TAL Metals (Chrom) AHL, NO ₃ , Sulfate, Cl ⁻ ToC Dis Methane Hardness				Sampler: <u>P. Strine</u>												
City/State/Zip: <u>St. Paul, MN 55112</u>		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS						For Lab Use Only:												
Phone: <u>651-639-0913</u>		TAT if different from Below						Walk-in Client:												
Fax:		<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day						Lab Sampling:												
Project Name: <u>Penta Wood</u>		STANDARD						Job / SDG No.:												
Site: <u>086165-05-04</u>										500-153458										
PO#																				
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:													
1	W-181017-MH-17		1249				X	X	X	X	X	X	X	X	X	X	X	X	X	
2	18		1259				X	X	X	X	X	X	X	X	X	X	X	X	X	⊗ - field filtered
3	19		1334				X	X	X	X	X	X	X	X	X	X	X	X	X	
4	20		1402				X	X	X	X	X	X	X	X	X	X	X	X	X	
5	21		1435				X	X	X	X	X	X	X	X	X	X	X	X	X	
6	22		1518				X	X	X	X	X	X	X	X	X	X	X	X	X	
7	23		1602				X	X	X	X	X	X	X	X	X	X	X	X	X	
8	W-181018-MH-24		0940				X	X	X	X	X	X	X	X	X	X	X	X	X	
9	25		1043				X	X	X	X	X	X	X	X	X	X	X	X	X	
10	26		1133				X	X	X	X	X	X	X	X	X	X	X	X	X	
11	TRIP BLANK-002		1300				X													
Preservation Used: 1=Ice; 2=HCl; 3=H2SO4; 4=HN03; 5=NaOH; 6= Other		Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.		<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months																
Special Instructions/QC Requirements & Comments:										20, 24, 29, 3, 2, 55										
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C):		Obs'd:		Cor'd:		Therm ID No.:										
Relinquished by: <u>[Signature]</u>		Company: <u>GHP</u>		Date/Time: <u>10-18-18/1330</u>		Received by:		Company:		Date/Time:										
Relinquished by:		Company:		Date/Time:		Received by:		Company:		Date/Time:										
Relinquished by:		Company:		Date/Time:		Received in Laboratory by: <u>Anil Saundh</u>		Company: <u>TALHE</u>		Date/Time: <u>10/19/18 0850</u>										

00044

00076

FedEx Package
Express US Airbill

FedEx
Tracking
Number

8100 2372 3861

Form
ID No. 0215

1 From
Date 10-18-18

Sender's Name Peter Starke Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 2 NW STE 114 Dept./Floor/Suite/Room

City SAINT PAUL State MN ZIP 55112-2307

2 Your Internal Billing Reference 086165-05-04

3 To Recipient's Name Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St. Hold Weekday
FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Address Use this line for the HOLD location address or for continuation of your shipping address. Hold Saturday
FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

City University Park State IL ZIP 60484

fedex.com 1.800.GoFedEx 1.800.463.3339



8100 2372 3861

FedEx
TRK# 0215 8100 2372 3883

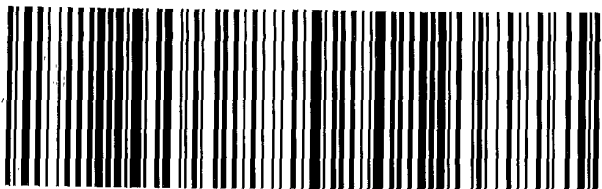
FRI - 19 OCT 10:30
PRIORITY OVERNIGHT

FedEx
TRK# 0215 8100 2372 3909

FRI - 19 OCT 10:30A
PRIORITY OVERNIGHT

GE JOTA

60484
IL-US
ORD



FID 80701 180CT18 JDTA 553C1/88FB/0C8A

4 Express Package Service * To most locations.

Packages up to 150 lbs.
For packages over 150 lbs., use the
FedEx Express Freight US Airbill.

Next Business Day

FedEx First Overnight
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

FedEx Priority Overnight
Next business morning. * Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

FedEx Standard Overnight
Next business afternoon. * Saturday Delivery NOT available.

2 or 3 Business Days

FedEx 2Day A.M.
Second business morning. * Saturday Delivery NOT available.

FedEx 2Day
Second business afternoon. * Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.

FedEx Express Saver
Third business day. * Saturday Delivery NOT available.

5 Packaging * Declared value limit \$500.

FedEx Envelope* FedEx Pak* FedEx Box FedEx Tube Other

6 Special Handling and Delivery Signature Options Fees may apply. See the FedEx Service Guide.

Saturday Delivery
NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

No Signature Required
Package may be left without obtaining a signature for delivery.

Direct Signature
Someone at recipient's address may sign for delivery.

Indirect Signature
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only.

Does this shipment contain dangerous goods?

One box must be checked.
 No Yes As per attached Shipper's Declaration. Yes Shipper's Declaration not required. Dry Ice Dry Ice, 9 UN 1845 x kg

Restrictions apply for dangerous goods — see the current FedEx Service Guide. Cargo Aircraft Only

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No.
 Sender Acct. No. in Section You'll be billed Recipient Third Party Credit Card Cash/Check

Total Packages Total Weight 55 lbs. Credit Card Auth.

FedEx
TRK# 0215 8100 2372 3872

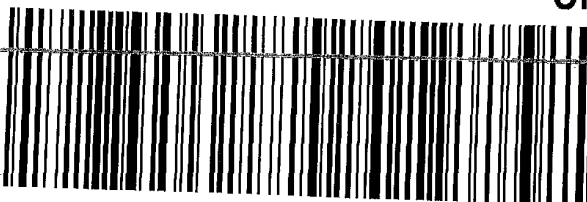
FRI - 19 OCT 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 0215 8100 2372 3894

FRI - 19 OCT 10:30A
PRIORITY OVERNIGHT

GE JOTA

60484
IL-US
ORD



FID 80701 180CT18 JDTA 553C1/88FB/0C8A

TestAmerica Chicago
 2417 Bond Street
 University Park, IL 60484
 Phone (708) 534-5200 Fax (708) 534-5211

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING



Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:				
Client Contact:		Wright, Richard C	Wright, Richard C		500-112229-1				
Shipping/Receiving:		Phone:	E-Mail:	State of Origin:	Page:				
TestAmerica Laboratories, Inc.			richard.wright@testamericainc.com	Wisconsin	Page 1 of 1				
Address:		Due Date Requested:	Accreditations Required (See note):	Job #:	Preservation Codes:				
4101 Shuffel Street NW		11/1/2018	State Program - Wisconsin	500-153458-1	A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2OHS E - NaHSO4 F - MeOH R - Na2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:				
City:	North Canton	TAT Requested (days):	Analysis Requested						
State, Zip:	OH, 44720	PO #:							
Phone:	330-497-9396(Tel) 330-497-0772(Fax)	WO #:							
Email:		Project #:							
Project Name:	Pentia Wood 086165	SSOW#:							
Site:									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, AT=tissue, A=air)	Field Filtered Sample (Yes or No)	Form M/MSD (Yes or No)	RSK 175/ (MD) Methane	Total Number of Containers	Special Instructions/Note:
W-181017-MH-17 (500-153458-1)	10/17/18	12:49 Central	Water	Water	X	X		3	
W-181017-MH-18 (500-153458-2)	10/17/18	12:59 Central	Water	Water	X	X		3	
W-181017-MH-19 (500-153458-3)	10/17/18	13:34 Central	Water	Water	X	X		3	
W-181017-MH-20 (500-153458-4)	10/17/18	14:02 Central	Water	Water	X	X		3	
W-181017-MH-22 (500-153458-6)	10/17/18	15:18 Central	Water	Water	X	X		3	
W-181017-MH-23 (500-153458-7)	10/17/18	16:02 Central	Water	Water	X	X		3	
W-181018-MH-24 (500-153458-8)	10/18/18	09:40 Central	Water	Water	X	X		3	
W-181018-MH-25 (500-153458-9)	10/18/18	10:43 Central	Water	Water	X	X		3	
W-181018-MH-26 (500-153458-10)	10/18/18	11:33 Central	Water	Water	X	X		3	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>									
Possible Hazard Identification									
Unconfirmed									
Deliverable Requested: I, II, III, IV, Other (specify)									
Primary Deliverable Rank: 2									
Time:									
Method of Shipment:									
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Special Instructions/QC Requirements:									
Empty Kit Reinquished by:									
Date/Time:									
Company:									
Reinquished by:									
Date/Time:									
Company:									
Reinquished by:									
Date/Time:									
Company:									
Custody Seals Intact:									
Custody Seal No.:									
Cooler Temperature(s) °C and Other Remarks:									



TestAmerica Canton Sample Receipt Form/Narrative

Login # : _____


Canton Facility

Client TA Chicago Site Name _____
Cooler Received on 10/20/18 Opened on 10/20/18
FedEx: 1st Grd UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Cooler unpacked by: DSD

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
COOLANT: Wet Ice Blue Ice Dry Ice Water None

- Cooler temperature upon receipt See Multiple Cooler Form
IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp 0.2 °C Corrected Cooler Temp. 1.1 °C
IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
- Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
-Were tamper/custody seals intact and uncompromised? Yes No
- Shippers' packing slip attached to the cooler(s)? Yes No
- Did custody papers accompany the sample(s)? Yes No
- Were the custody papers relinquished & signed in the appropriate place? Yes No
- Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
- Did all bottles arrive in good condition (Unbroken)? Yes No
- Could all bottle labels be reconciled with the COC? Yes No
- Were correct bottle(s) used for the test(s) indicated? Yes No
- Sufficient quantity received to perform indicated analyses? Yes No
- Are these work share samples? Yes No
If yes, Questions 12-16 have been checked at the originating laboratory.
- Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC849161
- Were VOAs on the COC? Yes No
- Were air bubbles >6 mm in any VOA vials? Yes No NA  ← Larger than this.
- Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
- Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-153458-1

Login Number: 153458

List Source: TestAmerica Chicago

List Number: 1

Creator: Sanchez, Ariel M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.0, 2.4, 2.9, 3.2, 5.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

TestAmerica Job ID: 500-153535-1
Client Project/Site: Penta Wood 086165

For:
GHD Services Inc.
1801 Old Highway 8 NW
Suite 114
St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:
11/6/2018 9:38:07 AM

Richard Wright, Senior Project Manager
(708)534-5200
richard.wright@testamericainc.com

LINKS

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results through
TotalAccess

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Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Job ID: 500-153535-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative 500-153535-1

Receipt

The samples were received on 10/20/2018 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 6 coolers at receipt time were -1.0° C, 0.6° C, 0.8° C, 1.6° C, 1.7° C and 2.4° C.

GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D: The following sample was diluted due to the nature of the sample matrix (large hydrocarbon background): W-1810198MH-28 (500-153535-2). Elevated reporting limits (RLs) are provided.

Method(s) 8270D: Surrogate recoveries for the following QC samples was outside the upper control limit: W-1810198MH-31 (500-153535-5[MSJ]), W-1810198MH-31 (500-153535-5[MSD]) and (LCS 500-456829/2-A). The associated spike recoveries for the samples were all within QC limits; therefore, corrective action was not performed.

Method(s) 8270D: The following samples contained one base surrogate outside acceptance limits: W-1810198MH-29 (500-153535-3), W-1810198MH-30 (500-153535-4), W-1810198MH-35 (500-153535-9) and (MB 500-456829/1-A). The laboratory's SOP allows one base surrogate to be outside acceptance limits; therefore, re-extraction was not performed. These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method(s) 8151A: The following samples required a dilution due to the nature of the sample matrix: W-181019-MH-27 (500-153535-1), W-1810198MH-28 (500-153535-2), W-1810198MH-29 (500-153535-3) and W-1810198MH-30 (500-153535-4). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method(s) 300.0: The following IC 8 samples were analyzed outside of analytical holding time due to laboratory error: W-181019-MH-27 (500-153535-1), W-1810198MH-28 (500-153535-2), W-1810198MH-29 (500-153535-3), W-1810198MH-30 (500-153535-4), W-1810198MH-31 (500-153535-5), W-1810198MH-31 (500-153535-5[MSJ]), W-1810198MH-31 (500-153535-5[MSD]), W-1810198MH-32 (500-153535-6), W-1810198MH-33 (500-153535-7) and W-1810198MH-35 (500-153535-9).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-181019-MH-27

Lab Sample ID: 500-153535-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.1		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	1.2		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	8.6		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	21		7.7	2.4	ug/L	10		8270D	Total/NA
Methane	40		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	2500		97	88	ug/L	1000		8151A	Total/NA
Arsenic	1.1		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	13.6		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	1310		100	46.7	ug/L	1		6020A	Dissolved
Manganese	907		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	182		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	19.9		2.0	1.7	mg/L	10		300.0	Total/NA
Sulfate	15.3		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	26.2		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	146		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181019MH-28

Lab Sample ID: 500-153535-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.34	J	0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	0.84		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	10		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	5.9	J	8.6	2.7	ug/L	10		8270D	Total/NA
Pentachlorophenol	1900		99	89	ug/L	1000		8151A	Total/NA
Arsenic	0.51	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	8.2		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	716		100	46.7	ug/L	1		6020A	Dissolved
Manganese	2030		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	388		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	32.9		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.76	H	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	23.5		1.0	0.48	mg/L	5		300.0	Total/NA
Total Organic Carbon - Duplicates	26.1		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	311		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181019MH-29

Lab Sample ID: 500-153535-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.23	J	0.50	0.15	ug/L	1		8260B	Total/NA
Toluene	1.2		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	1.2		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	21		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	34		8.0	2.5	ug/L	10		8270D	Total/NA
Methane	16		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	10000		970	870	ug/L	10000		8151A	Total/NA
Arsenic	16.0		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	12.5		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	16400		100	46.7	ug/L	1		6020A	Dissolved
Manganese	2620		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	11.5	J	20.0	6.9	ug/L	1		6020A	Dissolved

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-29 (Continued)

Lab Sample ID: 500-153535-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Hardness as calcium carbonate	251		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	33.4		2.0	1.7	mg/L	10		300.0	Total/NA
Sulfate	17.4		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	35.3		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	242		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-1810198MH-30

Lab Sample ID: 500-153535-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.3		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	1.3		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	19		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	33		8.3	2.6	ug/L	10		8270D	Total/NA
Methane	17		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	9800		1000	900	ug/L	10000		8151A	Total/NA
Arsenic	16.3		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	17.3		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	16300		100	46.7	ug/L	1		6020A	Dissolved
Manganese	2610		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	255		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	32.6		2.0	1.7	mg/L	10		300.0	Total/NA
Sulfate	17.0		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	34.7		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	241		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-1810198MH-31

Lab Sample ID: 500-153535-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.41	J	1.0	0.22	ug/L	1		8260B	Total/NA
Copper	4.7		2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	1.3	J	2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	138		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	30.1		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.8	H	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	5.9		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.95	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	98.2		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-1810198MH-32

Lab Sample ID: 500-153535-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.44	J	1.0	0.22	ug/L	1		8260B	Total/NA
Copper	13.1		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	144		100	46.7	ug/L	1		6020A	Dissolved
Manganese	34.5		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	121		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	7.2		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	9.9	H	2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	40.3		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	4.3		1.0	0.47	mg/L	1		9060A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-32 (Continued)

Lab Sample ID: 500-153535-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	131		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-1810198MH-33

Lab Sample ID: 500-153535-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.23	J	1.0	0.22	ug/L	1		8260B	Total/NA
Copper	9.6		2.0	0.50	ug/L	1		6020A	Dissolved
Iron	213		100	46.7	ug/L	1		6020A	Dissolved
Manganese	63.5		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	12.8	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	182		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	7.4		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	11.9	H	2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	29.2		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	2.7		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	56.4		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-1810198MH-34

Lab Sample ID: 500-153535-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.53	J	1.0	0.22	ug/L	1		8260B	Total/NA
Arsenic	0.43	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	12.3		2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	3.3		2.5	0.79	ug/L	1		6020A	Dissolved

Client Sample ID: W-1810198MH-35

Lab Sample ID: 500-153535-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.24	J	1.0	0.22	ug/L	1		8260B	Total/NA
Arsenic	0.28	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	15.7		2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	5.2		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	12.4	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	306		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	13.1		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	5.1	H	2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	8.0		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	3.2		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	249		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank - 003

Lab Sample ID: 500-153535-10

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.48	J	1.0	0.22	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL CHI
6020A	Metals (ICP/MS)	SW846	TAL CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL CHI
300.0	Anions, Ion Chromatography	MCAWW	TAL CHI
9060A	Organic Carbon, Total (TOC)	SW846	TAL CHI
SM 2320B	Alkalinity	SM	TAL CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CHI
3010A	Preparation, Total Metals	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CHI
5030B	Purge and Trap	SW846	TAL CHI
8151A	Extraction (Herbicides)	SW846	TAL CHI

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-153535-1	W-181019-MH-27	Water	10/19/18 08:15	10/20/18 10:20
500-153535-2	W-1810198MH-28	Water	10/19/18 08:55	10/20/18 10:20
500-153535-3	W-1810198MH-29	Water	10/19/18 11:25	10/20/18 10:20
500-153535-4	W-1810198MH-30	Water	10/19/18 11:25	10/20/18 10:20
500-153535-5	W-1810198MH-31	Water	10/19/18 09:49	10/20/18 10:20
500-153535-6	W-1810198MH-32	Water	10/19/18 11:38	10/20/18 10:20
500-153535-7	W-1810198MH-33	Water	10/19/18 12:33	10/20/18 10:20
500-153535-8	W-1810198MH-34	Water	10/19/18 12:35	10/20/18 10:20
500-153535-9	W-1810198MH-35	Water	10/19/18 12:54	10/20/18 10:20
500-153535-10	Trip Blank - 003	Water	10/19/18 13:45	10/20/18 10:20



Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-181019-MH-27

Lab Sample ID: 500-153535-1

Date Collected: 10/19/18 08:15

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 01:12	1
Toluene	1.1		0.50	0.15	ug/L			10/25/18 01:12	1
Ethylbenzene	1.2		0.50	0.18	ug/L			10/25/18 01:12	1
Xylenes, Total	8.6		1.0	0.22	ug/L			10/25/18 01:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		75 - 126		10/25/18 01:12	1
Toluene-d8 (Surr)	86		75 - 120		10/25/18 01:12	1
4-Bromofluorobenzene (Surr)	89		72 - 124		10/25/18 01:12	1
Dibromofluoromethane	97		75 - 120		10/25/18 01:12	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	21		7.7	2.4	ug/L		10/25/18 13:45	10/31/18 20:28	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	99		36 - 120	10/25/18 13:45	10/31/18 20:28	10
2-Fluorobiphenyl (Surr)	92		34 - 110	10/25/18 13:45	10/31/18 20:28	10
Terphenyl-d14 (Surr)	127		40 - 145	10/25/18 13:45	10/31/18 20:28	10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	40		1.0	0.17	ug/L			10/26/18 16:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	104		60 - 140		10/26/18 16:56	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	2500		97	88	ug/L		10/24/18 11:37	10/29/18 12:05	1000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130	10/24/18 11:37	10/29/18 12:05	1000

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.1		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 04:31	1
Copper	13.6		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:00	1
Iron	1310		100	46.7	ug/L		10/24/18 07:52	10/27/18 04:31	1
Manganese	907		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 04:31	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 04:31	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	182		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19.9		2.0	1.7	mg/L			10/23/18 08:40	10
Nitrate as N	<0.068	H	0.20	0.068	mg/L			10/23/18 08:27	1
Sulfate	15.3		0.40	0.19	mg/L			10/30/18 04:23	2
Total Organic Carbon - Duplicates	26.2		1.0	0.47	mg/L			10/30/18 11:53	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-181019-MH-27

Lab Sample ID: 500-153535-1

Date Collected: 10/19/18 08:15

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	146		5.0	3.7	mg/L			11/02/18 11:50	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-28

Lab Sample ID: 500-153535-2

Date Collected: 10/19/18 08:55

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 02:03	1
Toluene	0.34	J	0.50	0.15	ug/L			10/25/18 02:03	1
Ethylbenzene	0.84		0.50	0.18	ug/L			10/25/18 02:03	1
Xylenes, Total	10		1.0	0.22	ug/L			10/25/18 02:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		75 - 126					10/25/18 02:03	1
Toluene-d8 (Surr)	114		75 - 120					10/25/18 02:03	1
4-Bromofluorobenzene (Surr)	93		72 - 124					10/25/18 02:03	1
Dibromofluoromethane	89		75 - 120					10/25/18 02:03	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	5.9	J	8.6	2.7	ug/L		10/25/18 13:45	10/31/18 20:53	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	120		36 - 120				10/25/18 13:45	10/31/18 20:53	10
2-Fluorobiphenyl (Surr)	110		34 - 110				10/25/18 13:45	10/31/18 20:53	10
Terphenyl-d14 (Surr)	133		40 - 145				10/25/18 13:45	10/31/18 20:53	10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 17:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	100		60 - 140					10/26/18 17:13	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	1900		99	89	ug/L		10/24/18 11:37	10/29/18 12:30	1000
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130				10/24/18 11:37	10/29/18 12:30	1000

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.51	J	1.0	0.23	ug/L		10/24/18 07:52	10/27/18 04:35	1
Copper	8.2		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:04	1
Iron	716		100	46.7	ug/L		10/24/18 07:52	10/27/18 04:35	1
Manganese	2030		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 04:35	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 04:35	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	388		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.9		2.0	1.7	mg/L			10/23/18 09:05	10
Nitrate as N	0.76	H	0.20	0.068	mg/L			10/23/18 08:52	1
Sulfate	23.5		1.0	0.48	mg/L			10/30/18 05:01	5
Total Organic Carbon - Duplicates	26.1		1.0	0.47	mg/L			10/30/18 12:14	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-28

Lab Sample ID: 500-153535-2

Date Collected: 10/19/18 08:55

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	311		5.0	3.7	mg/L			11/02/18 11:58	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-29

Lab Sample ID: 500-153535-3

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.23	J	0.50	0.15	ug/L			10/25/18 02:28	1
Toluene	1.2		0.50	0.15	ug/L			10/25/18 02:28	1
Ethylbenzene	1.2		0.50	0.18	ug/L			10/25/18 02:28	1
Xylenes, Total	21		1.0	0.22	ug/L			10/25/18 02:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		75 - 126					10/25/18 02:28	1
Toluene-d8 (Surr)	100		75 - 120					10/25/18 02:28	1
4-Bromofluorobenzene (Surr)	95		72 - 124					10/25/18 02:28	1
Dibromofluoromethane	91		75 - 120					10/25/18 02:28	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	34		8.0	2.5	ug/L		10/25/18 13:45	11/01/18 20:27	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	117		36 - 120				10/25/18 13:45	11/01/18 20:27	10
2-Fluorobiphenyl (Surr)	121	X	34 - 110				10/25/18 13:45	11/01/18 20:27	10
Terphenyl-d14 (Surr)	142		40 - 145				10/25/18 13:45	11/01/18 20:27	10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	16		1.0	0.17	ug/L			10/26/18 17:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	99		60 - 140					10/26/18 17:30	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	10000		970	870	ug/L		10/24/18 11:37	10/29/18 13:43	10000
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130				10/24/18 11:37	10/29/18 13:43	10000

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16.0		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 04:46	1
Copper	12.5		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:08	1
Iron	16400		100	46.7	ug/L		10/24/18 07:52	10/27/18 04:46	1
Manganese	2620		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 04:46	1
Zinc	11.5	J	20.0	6.9	ug/L		10/24/18 07:52	10/27/18 04:46	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	251		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33.4		2.0	1.7	mg/L			10/23/18 09:30	10
Nitrate as N	<0.068	H	0.20	0.068	mg/L			10/23/18 09:18	1
Sulfate	17.4		0.40	0.19	mg/L			10/30/18 05:14	2
Total Organic Carbon - Duplicates	35.3		1.0	0.47	mg/L			10/30/18 12:34	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-29

Lab Sample ID: 500-153535-3

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	242		5.0	3.7	mg/L			11/02/18 11:43	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-30

Lab Sample ID: 500-153535-4

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 02:54	1
Toluene	1.3		0.50	0.15	ug/L			10/25/18 02:54	1
Ethylbenzene	1.3		0.50	0.18	ug/L			10/25/18 02:54	1
Xylenes, Total	19		1.0	0.22	ug/L			10/25/18 02:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		75 - 126		10/25/18 02:54	1
Toluene-d8 (Surr)	105		75 - 120		10/25/18 02:54	1
4-Bromofluorobenzene (Surr)	96		72 - 124		10/25/18 02:54	1
Dibromofluoromethane	90		75 - 120		10/25/18 02:54	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	33		8.3	2.6	ug/L		10/25/18 13:45	11/01/18 20:55	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	119		36 - 120	10/25/18 13:45	11/01/18 20:55	10
2-Fluorobiphenyl (Surr)	120	X	34 - 110	10/25/18 13:45	11/01/18 20:55	10
Terphenyl-d14 (Surr)	139		40 - 145	10/25/18 13:45	11/01/18 20:55	10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	17		1.0	0.17	ug/L			10/26/18 17:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	101		60 - 140		10/26/18 17:47	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	9800		1000	900	ug/L		10/24/18 11:37	10/29/18 14:07	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130	10/24/18 11:37	10/29/18 14:07	10000

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16.3		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 04:50	1
Copper	17.3		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:12	1
Iron	16300		100	46.7	ug/L		10/24/18 07:52	10/27/18 04:50	1
Manganese	2610		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 04:50	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 04:50	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	255		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.6		2.0	1.7	mg/L			10/23/18 09:56	10
Nitrate as N	<0.068	H	0.20	0.068	mg/L			10/23/18 09:43	1
Sulfate	17.0		0.40	0.19	mg/L			10/30/18 05:26	2
Total Organic Carbon - Duplicates	34.7		1.0	0.47	mg/L			10/30/18 12:55	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-30

Lab Sample ID: 500-153535-4

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	241		5.0	3.7	mg/L			11/02/18 11:36	1

1

2

3

4

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-31

Lab Sample ID: 500-153535-5

Date Collected: 10/19/18 09:49

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 03:20	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 03:20	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 03:20	1
Xylenes, Total	0.41	J	1.0	0.22	ug/L			10/25/18 03:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		75 - 126		10/25/18 03:20	1
Toluene-d8 (Surr)	99		75 - 120		10/25/18 03:20	1
4-Bromofluorobenzene (Surr)	93		72 - 124		10/25/18 03:20	1
Dibromofluoromethane	83		75 - 120		10/25/18 03:20	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/25/18 13:45	10/31/18 18:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	104		36 - 120	10/25/18 13:45	10/31/18 18:23	1
2-Fluorobiphenyl (Surr)	108		34 - 110	10/25/18 13:45	10/31/18 18:23	1
Terphenyl-d14 (Surr)	130		40 - 145	10/25/18 13:45	10/31/18 18:23	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 18:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	104		60 - 140		10/26/18 18:04	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.085		0.095	0.085	ug/L		10/24/18 11:37	10/25/18 11:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	71		25 - 130	10/24/18 11:37	10/25/18 11:51	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 04:54	1

Copper	4.7		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:28	1
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Iron	<46.7		100	46.7	ug/L		10/24/18 07:52	10/27/18 04:54	1
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Manganese	1.3	J	2.5	0.79	ug/L		10/24/18 07:52	10/27/18 04:54	1
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Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 04:54	1
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Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	138		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30.1		2.0	1.7	mg/L			10/23/18 11:12	10

Nitrate as N	2.8	H	0.20	0.068	mg/L			10/23/18 10:34	1
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Sulfate	5.9		0.20	0.095	mg/L			10/23/18 10:34	1
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Total Organic Carbon - Duplicates	0.95	J	1.0	0.47	mg/L			10/30/18 15:15	1
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TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-31

Lab Sample ID: 500-153535-5

Date Collected: 10/19/18 09:49

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	98.2		5.0	3.7	mg/L			11/02/18 13:09	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-32

Lab Sample ID: 500-153535-6

Date Collected: 10/19/18 11:38

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 03:45	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 03:45	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 03:45	1
Xylenes, Total	0.44	J	1.0	0.22	ug/L			10/25/18 03:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 126		10/25/18 03:45	1
Toluene-d8 (Surr)	96		75 - 120		10/25/18 03:45	1
4-Bromofluorobenzene (Surr)	94		72 - 124		10/25/18 03:45	1
Dibromofluoromethane	93		75 - 120		10/25/18 03:45	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.24		0.76	0.24	ug/L		10/25/18 13:45	10/31/18 18:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	120		36 - 120	10/25/18 13:45	10/31/18 18:48	1
2-Fluorobiphenyl (Surr)	103		34 - 110	10/25/18 13:45	10/31/18 18:48	1
Terphenyl-d14 (Surr)	128		40 - 145	10/25/18 13:45	10/31/18 18:48	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 18:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	101		60 - 140		10/26/18 18:54	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.086		0.096	0.086	ug/L		10/24/18 11:37	10/25/18 13:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	86		25 - 130	10/24/18 11:37	10/25/18 13:05	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 05:20	1
Copper	13.1		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:47	1
Iron	144		100	46.7	ug/L		10/24/18 07:52	10/27/18 05:20	1
Manganese	34.5		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 05:20	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 05:20	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	121		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.2		0.20	0.17	mg/L			10/23/18 11:50	1
Nitrate as N	9.9	H	2.0	0.68	mg/L			10/23/18 12:02	10
Sulfate	40.3		2.0	0.95	mg/L			10/23/18 12:02	10
Total Organic Carbon - Duplicates	4.3		1.0	0.47	mg/L			10/30/18 13:55	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-32

Lab Sample ID: 500-153535-6

Date Collected: 10/19/18 11:38

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	131		5.0	3.7	mg/L			11/02/18 13:22	1

- 1
- 2
- 3
- 4
- 5
- 6
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- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-33

Lab Sample ID: 500-153535-7

Date Collected: 10/19/18 12:33

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 04:11	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 04:11	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 04:11	1
Xylenes, Total	0.23	J	1.0	0.22	ug/L			10/25/18 04:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		75 - 126		10/25/18 04:11	1
Toluene-d8 (Surr)	94		75 - 120		10/25/18 04:11	1
4-Bromofluorobenzene (Surr)	94		72 - 124		10/25/18 04:11	1
Dibromofluoromethane	88		75 - 120		10/25/18 04:11	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.81	0.25	ug/L		10/25/18 13:45	10/31/18 19:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	95		36 - 120	10/25/18 13:45	10/31/18 19:13	1
2-Fluorobiphenyl (Surr)	109		34 - 110	10/25/18 13:45	10/31/18 19:13	1
Terphenyl-d14 (Surr)	128		40 - 145	10/25/18 13:45	10/31/18 19:13	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 19:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	102		60 - 140		10/26/18 19:11	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.089		0.099	0.089	ug/L		10/24/18 11:37	10/25/18 13:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	66		25 - 130	10/24/18 11:37	10/25/18 13:29	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 05:24	1
Copper	9.6		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:51	1
Iron	213		100	46.7	ug/L		10/24/18 07:52	10/27/18 05:24	1
Manganese	63.5		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 05:24	1
Zinc	12.8	J	20.0	6.9	ug/L		10/24/18 07:52	10/27/18 05:24	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	182		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.4		0.20	0.17	mg/L			10/23/18 12:15	1
Nitrate as N	11.9	H	2.0	0.68	mg/L			10/23/18 12:28	10
Sulfate	29.2		2.0	0.95	mg/L			10/23/18 12:28	10
Total Organic Carbon - Duplicates	2.7		1.0	0.47	mg/L			10/30/18 14:35	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-33

Lab Sample ID: 500-153535-7

Date Collected: 10/19/18 12:33

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	56.4		5.0	3.7	mg/L			11/02/18 13:28	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-34

Lab Sample ID: 500-153535-8

Date Collected: 10/19/18 12:35

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 04:36	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 04:36	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 04:36	1
Xylenes, Total	0.53	J	1.0	0.22	ug/L			10/25/18 04:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 126		10/25/18 04:36	1
Toluene-d8 (Surr)	98		75 - 120		10/25/18 04:36	1
4-Bromofluorobenzene (Surr)	100		72 - 124		10/25/18 04:36	1
Dibromofluoromethane	91		75 - 120		10/25/18 04:36	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.26		0.85	0.26	ug/L		10/25/18 13:45	10/31/18 19:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	104		36 - 120	10/25/18 13:45	10/31/18 19:38	1
2-Fluorobiphenyl (Surr)	108		34 - 110	10/25/18 13:45	10/31/18 19:38	1
Terphenyl-d14 (Surr)	131		40 - 145	10/25/18 13:45	10/31/18 19:38	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.085		0.095	0.085	ug/L		10/24/18 11:37	10/25/18 13:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	68		25 - 130	10/24/18 11:37	10/25/18 13:54	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.43	J	1.0	0.23	ug/L		10/24/18 07:52	10/27/18 05:28	1
Copper	12.3		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:55	1
Iron	<46.7		100	46.7	ug/L		10/24/18 07:52	10/27/18 05:28	1
Manganese	3.3		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 05:28	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 05:28	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-35

Lab Sample ID: 500-153535-9

Date Collected: 10/19/18 12:54

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 05:02	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 05:02	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 05:02	1
Xylenes, Total	0.24	J	1.0	0.22	ug/L			10/25/18 05:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/25/18 05:02	1
Toluene-d8 (Surr)	84		75 - 120		10/25/18 05:02	1
4-Bromofluorobenzene (Surr)	109		72 - 124		10/25/18 05:02	1
Dibromofluoromethane	89		75 - 120		10/25/18 05:02	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.23		0.76	0.23	ug/L		10/25/18 13:45	10/31/18 20:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	103		36 - 120	10/25/18 13:45	10/31/18 20:03	1
2-Fluorobiphenyl (Surr)	102		34 - 110	10/25/18 13:45	10/31/18 20:03	1
Terphenyl-d14 (Surr)	156	X	40 - 145	10/25/18 13:45	10/31/18 20:03	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			10/26/18 19:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	98		60 - 140		10/26/18 19:28	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.087		0.097	0.087	ug/L		10/24/18 11:37	10/25/18 14:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	61		25 - 130	10/24/18 11:37	10/25/18 14:18	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.28	J	1.0	0.23	ug/L		10/24/18 07:52	10/27/18 05:31	1
Copper	15.7		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 13:58	1
Iron	<46.7		100	46.7	ug/L		10/24/18 07:52	10/27/18 05:31	1
Manganese	5.2		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 05:31	1
Zinc	12.4	J	20.0	6.9	ug/L		10/24/18 07:52	10/27/18 05:31	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	306		1.3	0.66	mg/L		10/22/18 09:52	10/24/18 08:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.1		2.0	1.7	mg/L			10/23/18 13:18	10
Nitrate as N	5.1	H	2.0	0.68	mg/L			10/23/18 13:18	10
Sulfate	8.0		0.20	0.095	mg/L			10/23/18 13:06	1
Total Organic Carbon - Duplicates	3.2		1.0	0.47	mg/L			10/30/18 14:55	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-35

Lab Sample ID: 500-153535-9

Date Collected: 10/19/18 12:54

Matrix: Water

Date Received: 10/20/18 10:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	249		5.0	3.7	mg/L			11/02/18 13:36	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: Trip Blank - 003

Lab Sample ID: 500-153535-10

Date Collected: 10/19/18 13:45

Matrix: Water

Date Received: 10/20/18 10:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/25/18 01:37	1
Toluene	<0.15		0.50	0.15	ug/L			10/25/18 01:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/25/18 01:37	1
Xylenes, Total	0.48	J	1.0	0.22	ug/L			10/25/18 01:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		75 - 126		10/25/18 01:37	1
Toluene-d8 (Surr)	99		75 - 120		10/25/18 01:37	1
4-Bromofluorobenzene (Surr)	92		72 - 124		10/25/18 01:37	1
Dibromofluoromethane	90		75 - 120		10/25/18 01:37	1

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
E	Result exceeded calibration range.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

GC/MS VOA

Analysis Batch: 456662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	8260B	
500-153535-2	W-1810198MH-28	Total/NA	Water	8260B	
500-153535-3	W-1810198MH-29	Total/NA	Water	8260B	
500-153535-4	W-1810198MH-30	Total/NA	Water	8260B	
500-153535-5	W-1810198MH-31	Total/NA	Water	8260B	
500-153535-6	W-1810198MH-32	Total/NA	Water	8260B	
500-153535-7	W-1810198MH-33	Total/NA	Water	8260B	
500-153535-8	W-1810198MH-34	Total/NA	Water	8260B	
500-153535-9	W-1810198MH-35	Total/NA	Water	8260B	
500-153535-10	Trip Blank - 003	Total/NA	Water	8260B	
MB 500-456662/6	Method Blank	Total/NA	Water	8260B	
LCS 500-456662/8	Lab Control Sample	Total/NA	Water	8260B	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	8260B	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 456829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	3510C	
500-153535-2	W-1810198MH-28	Total/NA	Water	3510C	
500-153535-3	W-1810198MH-29	Total/NA	Water	3510C	
500-153535-4	W-1810198MH-30	Total/NA	Water	3510C	
500-153535-5	W-1810198MH-31	Total/NA	Water	3510C	
500-153535-6	W-1810198MH-32	Total/NA	Water	3510C	
500-153535-7	W-1810198MH-33	Total/NA	Water	3510C	
500-153535-8	W-1810198MH-34	Total/NA	Water	3510C	
500-153535-9	W-1810198MH-35	Total/NA	Water	3510C	
MB 500-456829/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-456829/2-A	Lab Control Sample	Total/NA	Water	3510C	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	3510C	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	3510C	

Analysis Batch: 457137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-456829/1-A	Method Blank	Total/NA	Water	8270D	456829
LCS 500-456829/2-A	Lab Control Sample	Total/NA	Water	8270D	456829

Analysis Batch: 457706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	8270D	456829
500-153535-2	W-1810198MH-28	Total/NA	Water	8270D	456829
500-153535-5	W-1810198MH-31	Total/NA	Water	8270D	456829
500-153535-6	W-1810198MH-32	Total/NA	Water	8270D	456829
500-153535-7	W-1810198MH-33	Total/NA	Water	8270D	456829
500-153535-8	W-1810198MH-34	Total/NA	Water	8270D	456829
500-153535-9	W-1810198MH-35	Total/NA	Water	8270D	456829

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

GC/MS Semi VOA (Continued)

Analysis Batch: 457966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-3	W-1810198MH-29	Total/NA	Water	8270D	456829
500-153535-4	W-1810198MH-30	Total/NA	Water	8270D	456829
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	8270D	456829
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	8270D	456829

GC VOA

Analysis Batch: 352106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	RSK-175	
500-153535-2	W-1810198MH-28	Total/NA	Water	RSK-175	
500-153535-3	W-1810198MH-29	Total/NA	Water	RSK-175	
500-153535-4	W-1810198MH-30	Total/NA	Water	RSK-175	
500-153535-5	W-1810198MH-31	Total/NA	Water	RSK-175	
500-153535-6	W-1810198MH-32	Total/NA	Water	RSK-175	
500-153535-7	W-1810198MH-33	Total/NA	Water	RSK-175	
500-153535-9	W-1810198MH-35	Total/NA	Water	RSK-175	
MB 240-352106/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-352106/5	Lab Control Sample	Total/NA	Water	RSK-175	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	RSK-175	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 456576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	8151A	
500-153535-2	W-1810198MH-28	Total/NA	Water	8151A	
500-153535-3	W-1810198MH-29	Total/NA	Water	8151A	
500-153535-4	W-1810198MH-30	Total/NA	Water	8151A	
500-153535-5	W-1810198MH-31	Total/NA	Water	8151A	
500-153535-6	W-1810198MH-32	Total/NA	Water	8151A	
500-153535-7	W-1810198MH-33	Total/NA	Water	8151A	
500-153535-8	W-1810198MH-34	Total/NA	Water	8151A	
500-153535-9	W-1810198MH-35	Total/NA	Water	8151A	
MB 500-456576/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-456576/2-A	Lab Control Sample	Total/NA	Water	8151A	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	8151A	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	8151A	

Analysis Batch: 456686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	8151A	456576
500-153535-2	W-1810198MH-28	Total/NA	Water	8151A	456576
500-153535-3	W-1810198MH-29	Total/NA	Water	8151A	456576
500-153535-4	W-1810198MH-30	Total/NA	Water	8151A	456576
500-153535-5	W-1810198MH-31	Total/NA	Water	8151A	456576
500-153535-6	W-1810198MH-32	Total/NA	Water	8151A	456576
500-153535-7	W-1810198MH-33	Total/NA	Water	8151A	456576
500-153535-8	W-1810198MH-34	Total/NA	Water	8151A	456576

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

GC Semi VOA (Continued)

Analysis Batch: 456686 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-9	W-1810198MH-35	Total/NA	Water	8151A	456576
MB 500-456576/1-A	Method Blank	Total/NA	Water	8151A	456576
LCS 500-456576/2-A	Lab Control Sample	Total/NA	Water	8151A	456576
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	8151A	456576
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	8151A	456576

Metals

Prep Batch: 456090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	3010A	
500-153535-2	W-1810198MH-28	Total/NA	Water	3010A	
500-153535-3	W-1810198MH-29	Total/NA	Water	3010A	
500-153535-4	W-1810198MH-30	Total/NA	Water	3010A	
500-153535-5	W-1810198MH-31	Total/NA	Water	3010A	
500-153535-6	W-1810198MH-32	Total/NA	Water	3010A	
500-153535-7	W-1810198MH-33	Total/NA	Water	3010A	
500-153535-9	W-1810198MH-35	Total/NA	Water	3010A	

Prep Batch: 456490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Dissolved	Water	3005A	
500-153535-2	W-1810198MH-28	Dissolved	Water	3005A	
500-153535-3	W-1810198MH-29	Dissolved	Water	3005A	
500-153535-4	W-1810198MH-30	Dissolved	Water	3005A	
500-153535-5	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-6	W-1810198MH-32	Dissolved	Water	3005A	
500-153535-7	W-1810198MH-33	Dissolved	Water	3005A	
500-153535-8	W-1810198MH-34	Dissolved	Water	3005A	
500-153535-9	W-1810198MH-35	Dissolved	Water	3005A	
MB 500-456490/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-456490/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-153535-5 MS	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-5 MSD	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-5 DU	W-1810198MH-31	Dissolved	Water	3005A	

Analysis Batch: 456513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	SM 2340B	456090
500-153535-2	W-1810198MH-28	Total/NA	Water	SM 2340B	456090
500-153535-3	W-1810198MH-29	Total/NA	Water	SM 2340B	456090
500-153535-4	W-1810198MH-30	Total/NA	Water	SM 2340B	456090
500-153535-5	W-1810198MH-31	Total/NA	Water	SM 2340B	456090
500-153535-6	W-1810198MH-32	Total/NA	Water	SM 2340B	456090
500-153535-7	W-1810198MH-33	Total/NA	Water	SM 2340B	456090
500-153535-9	W-1810198MH-35	Total/NA	Water	SM 2340B	456090

Analysis Batch: 457318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Dissolved	Water	6020A	456490

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Metals (Continued)

Analysis Batch: 457318 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-2	W-1810198MH-28	Dissolved	Water	6020A	456490
500-153535-3	W-1810198MH-29	Dissolved	Water	6020A	456490
500-153535-4	W-1810198MH-30	Dissolved	Water	6020A	456490
500-153535-5	W-1810198MH-31	Dissolved	Water	6020A	456490
500-153535-6	W-1810198MH-32	Dissolved	Water	6020A	456490
500-153535-7	W-1810198MH-33	Dissolved	Water	6020A	456490
500-153535-8	W-1810198MH-34	Dissolved	Water	6020A	456490
500-153535-9	W-1810198MH-35	Dissolved	Water	6020A	456490
MB 500-456490/1-A	Method Blank	Total Recoverable	Water	6020A	456490
LCS 500-456490/2-A	Lab Control Sample	Total Recoverable	Water	6020A	456490
500-153535-5 MS	W-1810198MH-31	Dissolved	Water	6020A	456490
500-153535-5 MSD	W-1810198MH-31	Dissolved	Water	6020A	456490
500-153535-5 DU	W-1810198MH-31	Dissolved	Water	6020A	456490

Prep Batch: 457477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Dissolved	Water	3005A	
500-153535-2	W-1810198MH-28	Dissolved	Water	3005A	
500-153535-3	W-1810198MH-29	Dissolved	Water	3005A	
500-153535-4	W-1810198MH-30	Dissolved	Water	3005A	
500-153535-5	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-6	W-1810198MH-32	Dissolved	Water	3005A	
500-153535-7	W-1810198MH-33	Dissolved	Water	3005A	
500-153535-8	W-1810198MH-34	Dissolved	Water	3005A	
500-153535-9	W-1810198MH-35	Dissolved	Water	3005A	
MB 500-457477/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-457477/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-153535-5 MS	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-5 MSD	W-1810198MH-31	Dissolved	Water	3005A	
500-153535-5 DU	W-1810198MH-31	Dissolved	Water	3005A	

Analysis Batch: 457806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Dissolved	Water	6020A	457477
500-153535-2	W-1810198MH-28	Dissolved	Water	6020A	457477
500-153535-3	W-1810198MH-29	Dissolved	Water	6020A	457477
500-153535-4	W-1810198MH-30	Dissolved	Water	6020A	457477
500-153535-5	W-1810198MH-31	Dissolved	Water	6020A	457477
500-153535-6	W-1810198MH-32	Dissolved	Water	6020A	457477
500-153535-7	W-1810198MH-33	Dissolved	Water	6020A	457477
500-153535-8	W-1810198MH-34	Dissolved	Water	6020A	457477
500-153535-9	W-1810198MH-35	Dissolved	Water	6020A	457477
MB 500-457477/1-A	Method Blank	Total Recoverable	Water	6020A	457477
LCS 500-457477/2-A	Lab Control Sample	Total Recoverable	Water	6020A	457477
500-153535-5 MS	W-1810198MH-31	Dissolved	Water	6020A	457477
500-153535-5 MSD	W-1810198MH-31	Dissolved	Water	6020A	457477
500-153535-5 DU	W-1810198MH-31	Dissolved	Water	6020A	457477

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

General Chemistry

Analysis Batch: 456223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	300.0	
500-153535-1	W-181019-MH-27	Total/NA	Water	300.0	
500-153535-2	W-1810198MH-28	Total/NA	Water	300.0	
500-153535-2	W-1810198MH-28	Total/NA	Water	300.0	
500-153535-3	W-1810198MH-29	Total/NA	Water	300.0	
500-153535-3	W-1810198MH-29	Total/NA	Water	300.0	
500-153535-4	W-1810198MH-30	Total/NA	Water	300.0	
500-153535-4	W-1810198MH-30	Total/NA	Water	300.0	
500-153535-5	W-1810198MH-31	Total/NA	Water	300.0	
500-153535-5	W-1810198MH-31	Total/NA	Water	300.0	
500-153535-6	W-1810198MH-32	Total/NA	Water	300.0	
500-153535-6	W-1810198MH-32	Total/NA	Water	300.0	
500-153535-7	W-1810198MH-33	Total/NA	Water	300.0	
500-153535-7	W-1810198MH-33	Total/NA	Water	300.0	
500-153535-9	W-1810198MH-35	Total/NA	Water	300.0	
500-153535-9	W-1810198MH-35	Total/NA	Water	300.0	
MB 500-456223/3	Method Blank	Total/NA	Water	300.0	
LCS 500-456223/4	Lab Control Sample	Total/NA	Water	300.0	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	300.0	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	300.0	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	300.0	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	300.0	

Analysis Batch: 457437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	300.0	
500-153535-2	W-1810198MH-28	Total/NA	Water	300.0	
500-153535-3	W-1810198MH-29	Total/NA	Water	300.0	
500-153535-4	W-1810198MH-30	Total/NA	Water	300.0	
MB 500-457437/3	Method Blank	Total/NA	Water	300.0	
LCS 500-457437/4	Lab Control Sample	Total/NA	Water	300.0	
500-153535-1 MS	W-181019-MH-27	Total/NA	Water	300.0	
500-153535-1 MSD	W-181019-MH-27	Total/NA	Water	300.0	

Analysis Batch: 457813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	9060A	
500-153535-2	W-1810198MH-28	Total/NA	Water	9060A	
500-153535-3	W-1810198MH-29	Total/NA	Water	9060A	
500-153535-4	W-1810198MH-30	Total/NA	Water	9060A	
500-153535-5	W-1810198MH-31	Total/NA	Water	9060A	
500-153535-6	W-1810198MH-32	Total/NA	Water	9060A	
500-153535-7	W-1810198MH-33	Total/NA	Water	9060A	
500-153535-9	W-1810198MH-35	Total/NA	Water	9060A	
MB 500-457813/4	Method Blank	Total/NA	Water	9060A	
LCS 500-457813/5	Lab Control Sample	Total/NA	Water	9060A	
500-153535-5 MS	W-1810198MH-31	Total/NA	Water	9060A	
500-153535-5 MSD	W-1810198MH-31	Total/NA	Water	9060A	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

General Chemistry (Continued)

Analysis Batch: 458246

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-153535-1	W-181019-MH-27	Total/NA	Water	SM 2320B	
500-153535-2	W-1810198MH-28	Total/NA	Water	SM 2320B	
500-153535-3	W-1810198MH-29	Total/NA	Water	SM 2320B	
500-153535-4	W-1810198MH-30	Total/NA	Water	SM 2320B	
500-153535-5	W-1810198MH-31	Total/NA	Water	SM 2320B	
500-153535-6	W-1810198MH-32	Total/NA	Water	SM 2320B	
500-153535-7	W-1810198MH-33	Total/NA	Water	SM 2320B	
500-153535-9	W-1810198MH-35	Total/NA	Water	SM 2320B	
MB 500-458246/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-458246/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-153535-5 DU	W-1810198MH-31	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-126)	TOL (75-120)	BFB (72-124)	DBFM (75-120)
500-153535-1	W-181019-MH-27	82	86	89	97
500-153535-2	W-1810198MH-28	81	114	93	89
500-153535-3	W-1810198MH-29	82	100	95	91
500-153535-4	W-1810198MH-30	82	105	96	90
500-153535-5	W-1810198MH-31	81	99	93	83
500-153535-5 MS	W-1810198MH-31	86	102	97	90
500-153535-5 MSD	W-1810198MH-31	89	80	94	95
500-153535-6	W-1810198MH-32	86	96	94	93
500-153535-7	W-1810198MH-33	83	94	94	88
500-153535-8	W-1810198MH-34	86	98	100	91
500-153535-9	W-1810198MH-35	88	84	109	89
500-153535-10	Trip Blank - 003	83	99	92	90
LCS 500-456662/8	Lab Control Sample	85	97	91	108
MB 500-456662/6	Method Blank	88	98	103	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		NBZ (36-120)	FBP (34-110)	TPHL (40-145)
500-153535-1	W-181019-MH-27	99	92	127
500-153535-2	W-1810198MH-28	120	110	133
500-153535-3	W-1810198MH-29	117	121 X	142
500-153535-4	W-1810198MH-30	119	120 X	139
500-153535-5	W-1810198MH-31	104	108	130
500-153535-5 MS	W-1810198MH-31	113	104	159 X
500-153535-5 MSD	W-1810198MH-31	125 X	117 X	165 X
500-153535-6	W-1810198MH-32	120	103	128
500-153535-7	W-1810198MH-33	95	109	128
500-153535-8	W-1810198MH-34	104	108	131
500-153535-9	W-1810198MH-35	103	102	156 X
LCS 500-456829/2-A	Lab Control Sample	121 X	111 X	139
MB 500-456829/1-A	Method Blank	109	112 X	144

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TPHL = Terphenyl-d14 (Surr)

TestAmerica Chicago

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TFE2 (60-140)
500-153535-1	W-181019-MH-27	104
500-153535-2	W-1810198MH-28	100
500-153535-3	W-1810198MH-29	99
500-153535-4	W-1810198MH-30	101
500-153535-5	W-1810198MH-31	104
500-153535-5 MS	W-1810198MH-31	102
500-153535-5 MSD	W-1810198MH-31	100
500-153535-6	W-1810198MH-32	101
500-153535-7	W-1810198MH-33	102
500-153535-9	W-1810198MH-35	98
LCS 240-352106/5	Lab Control Sample	106
MB 240-352106/4	Method Blank	107

Surrogate Legend

TFE = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPAA2 (25-130)
500-153535-1	W-181019-MH-27	0 D
500-153535-2	W-1810198MH-28	0 D
500-153535-3	W-1810198MH-29	0 D
500-153535-4	W-1810198MH-30	0 D
500-153535-5	W-1810198MH-31	71
500-153535-5 MS	W-1810198MH-31	74
500-153535-5 MSD	W-1810198MH-31	73
500-153535-6	W-1810198MH-32	86
500-153535-7	W-1810198MH-33	66
500-153535-8	W-1810198MH-34	68
500-153535-9	W-1810198MH-35	61
LCS 500-456576/2-A	Lab Control Sample	74
MB 500-456576/1-A	Method Blank	69

Surrogate Legend

DCPAA = DCAA

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456662/6
Matrix: Water
Analysis Batch: 456662

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			10/24/18 23:43	1
Toluene	<0.15		0.50	0.15	ug/L			10/24/18 23:43	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			10/24/18 23:43	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			10/24/18 23:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		75 - 126		10/24/18 23:43	1
Toluene-d8 (Surr)	98		75 - 120		10/24/18 23:43	1
4-Bromofluorobenzene (Surr)	103		72 - 124		10/24/18 23:43	1
Dibromofluoromethane	93		75 - 120		10/24/18 23:43	1

Lab Sample ID: LCS 500-456662/8
Matrix: Water
Analysis Batch: 456662

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	40.9		ug/L		82	70 - 120
Toluene	50.0	40.4		ug/L		81	70 - 125
Ethylbenzene	50.0	42.0		ug/L		84	70 - 123
Xylenes, Total	100	87.9		ug/L		88	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	85		75 - 126
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	91		72 - 124
Dibromofluoromethane	108		75 - 120

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 456662

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	<0.15		50.0	41.5		ug/L		83	70 - 120
Toluene	<0.15		50.0	42.8		ug/L		86	70 - 125
Ethylbenzene	<0.18		50.0	41.3		ug/L		83	70 - 123
Xylenes, Total	0.41	J	100	83.2		ug/L		83	70 - 125

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 126
Toluene-d8 (Surr)	102		75 - 120
4-Bromofluorobenzene (Surr)	97		72 - 124
Dibromofluoromethane	90		75 - 120

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 456662

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<0.15		50.0	44.5		ug/L		89	70 - 120	7	20
Toluene	<0.15		50.0	36.7		ug/L		73	70 - 125	15	20
Ethylbenzene	<0.18		50.0	44.3		ug/L		89	70 - 123	7	20
Xylenes, Total	0.41	J	100	89.6		ug/L		89	70 - 125	7	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	89		75 - 126
Toluene-d8 (Surr)	80		75 - 120
4-Bromofluorobenzene (Surr)	94		72 - 124
Dibromofluoromethane	95		75 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-456829/1-A
Matrix: Water
Analysis Batch: 457137

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456829

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		10/25/18 13:45	10/27/18 17:25	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	109		36 - 120	10/25/18 13:45	10/27/18 17:25	1
2-Fluorobiphenyl (Surr)	112	X	34 - 110	10/25/18 13:45	10/27/18 17:25	1
Terphenyl-d14 (Surr)	144		40 - 145	10/25/18 13:45	10/27/18 17:25	1

Lab Sample ID: LCS 500-456829/2-A
Matrix: Water
Analysis Batch: 457137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456829

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	32.1		ug/L		100	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	121	X	36 - 120
2-Fluorobiphenyl (Surr)	111	X	34 - 110
Terphenyl-d14 (Surr)	139		40 - 145

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 457966

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA
Prep Batch: 456829

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	<0.25		32.0	26.8		ug/L		84	36 - 110

Surrogate	MS %Recovery	MS Qualifier	Limits
Nitrobenzene-d5 (Surr)	113		36 - 120

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 457966

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA
Prep Batch: 456829

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl (Surr)	104		34 - 110
Terphenyl-d14 (Surr)	159	X	40 - 145

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 457966

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA
Prep Batch: 456829

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Naphthalene	<0.25		32.2	29.6		ug/L		92	36 - 110	10

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
Nitrobenzene-d5 (Surr)	125	X	36 - 120
2-Fluorobiphenyl (Surr)	117	X	34 - 110
Terphenyl-d14 (Surr)	165	X	40 - 145

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-352106/4
Matrix: Water
Analysis Batch: 352106

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Methane	<0.17		1.0	0.17	ug/L			10/26/18 12:59	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,1,1-Trifluoroethane	107		60 - 140		10/26/18 12:59	1

Lab Sample ID: LCS 240-352106/5
Matrix: Water
Analysis Batch: 352106

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Methane	511	450		ug/L		88	80 - 120

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,1,1-Trifluoroethane	106		60 - 140

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 352106

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
	Methane	<0.17		285	270		ug/L		95

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,1,1-Trifluoroethane	102		60 - 140

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 352106

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane	<0.17		285	262		ug/L		92	50 - 150	3	30
Surrogate	%Recovery	MSD Qualifier	Limits								
1,1,1-Trifluoroethane	100		60 - 140								

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-456576/1-A
Matrix: Water
Analysis Batch: 456686

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456576

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		10/24/18 11:37	10/25/18 07:48	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCAA	69		25 - 130				10/24/18 11:37	10/25/18 07:48	1

Lab Sample ID: LCS 500-456576/2-A
Matrix: Water
Analysis Batch: 456686

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456576

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	2.53	1.56		ug/L		62	40 - 122
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
DCAA	74		25 - 130				

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 456686

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA
Prep Batch: 456576

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	<0.085		2.44	1.31		ug/L		54	40 - 122
Surrogate	MS %Recovery	MS Qualifier	Limits						
DCAA	74		25 - 130						

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 456686

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA
Prep Batch: 456576

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	<0.085		2.46	1.36		ug/L		55	40 - 122	3	20
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
DCAA	73		25 - 130								

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-456490/1-A
Matrix: Water
Analysis Batch: 457318

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 456490

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/24/18 07:52	10/27/18 03:35	1
Iron	<46.7		100	46.7	ug/L		10/24/18 07:52	10/27/18 03:35	1
Manganese	<0.79		2.5	0.79	ug/L		10/24/18 07:52	10/27/18 03:35	1
Zinc	<6.9		20.0	6.9	ug/L		10/24/18 07:52	10/27/18 03:35	1

Lab Sample ID: LCS 500-456490/2-A
Matrix: Water
Analysis Batch: 457318

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 456490

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.02		ug/L		96	80 - 120
Iron	1000	1046		ug/L		105	80 - 120
Manganese	500	521.1		ug/L		104	80 - 120
Zinc	500	492.2		ug/L		98	80 - 120

Lab Sample ID: MB 500-457477/1-A
Matrix: Water
Analysis Batch: 457806

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 457477

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<0.50		2.0	0.50	ug/L		10/30/18 08:26	10/31/18 12:53	1

Lab Sample ID: LCS 500-457477/2-A
Matrix: Water
Analysis Batch: 457806

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 457477

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	250	270.4		ug/L		108	80 - 120

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 456490

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	<0.23		100	97.10		ug/L		97	75 - 125
Iron	<46.7		1000	1024		ug/L		102	75 - 125
Manganese	1.3	J	500	508.9		ug/L		102	75 - 125
Zinc	<6.9		500	488.5		ug/L		98	75 - 125

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 456490

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	<0.23		100	97.97		ug/L		98	75 - 125	1	20
Iron	<46.7		1000	1027		ug/L		103	75 - 125	0	20
Manganese	1.3	J	500	509.1		ug/L		102	75 - 125	0	20
Zinc	<6.9		500	490.4		ug/L		98	75 - 125	0	20

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-153535-5 DU
Matrix: Water
Analysis Batch: 457318

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 456490

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	Limit
			Result	Qualifier				
Arsenic	<0.23		<0.23		ug/L		NC	20
Iron	<46.7		<46.7		ug/L		NC	20
Manganese	1.3	J	<0.79		ug/L		NC	20
Zinc	<6.9		<6.9		ug/L		NC	20

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 457806

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 457477

Analyte	Sample Result	Sample Qualifier	Spike Added	MS		Unit	D	%Rec	%Rec. Limits	RPD	Limit
				Result	Qualifier						
Copper	4.7		250	300.5		ug/L		118	75 - 125		

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 457806

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 457477

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec. Limits	RPD	Limit
				Result	Qualifier						
Copper	4.7		250	274.2		ug/L		108	75 - 125	9	20

Lab Sample ID: 500-153535-5 DU
Matrix: Water
Analysis Batch: 457806

Client Sample ID: W-1810198MH-31
Prep Type: Dissolved
Prep Batch: 457477

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	Limit
			Result	Qualifier				
Copper	4.7		4.50		ug/L		4	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-456223/3
Matrix: Water
Analysis Batch: 456223

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB		LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	<0.17		0.20	0.17	mg/L			10/23/18 08:02	1
Nitrate as N	<0.068		0.20	0.068	mg/L			10/23/18 08:02	1
Sulfate	<0.095		0.20	0.095	mg/L			10/23/18 08:02	1

Lab Sample ID: LCS 500-456223/4
Matrix: Water
Analysis Batch: 456223

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Chloride	3.00	2.95		mg/L		98	90 - 110
Nitrate as N	2.00	2.00		mg/L		100	90 - 110
Sulfate	5.00	5.25		mg/L		105	90 - 110

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-153535-5 MS

Matrix: Water

Analysis Batch: 456223

Client Sample ID: W-1810198MH-31

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.8	H	1.00	3.81	H	mg/L		102	80 - 120
Sulfate	5.9		2.50	8.35		mg/L		96	80 - 120

Lab Sample ID: 500-153535-5 MS

Matrix: Water

Analysis Batch: 456223

Client Sample ID: W-1810198MH-31

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	30.1		10.0	42.17		mg/L		120	80 - 120

Lab Sample ID: 500-153535-5 MSD

Matrix: Water

Analysis Batch: 456223

Client Sample ID: W-1810198MH-31

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	2.8	H	1.00	3.82	H	mg/L		103	80 - 120	0	20
Sulfate	5.9		2.50	8.40		mg/L		98	80 - 120	1	20

Lab Sample ID: 500-153535-5 MSD

Matrix: Water

Analysis Batch: 456223

Client Sample ID: W-1810198MH-31

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	30.1		10.0	41.92		mg/L		118	80 - 120	1	20

Lab Sample ID: MB 500-457437/3

Matrix: Water

Analysis Batch: 457437

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<0.095		0.20	0.095	mg/L			10/30/18 01:26	1

Lab Sample ID: LCS 500-457437/4

Matrix: Water

Analysis Batch: 457437

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	5.00	5.16		mg/L		103	90 - 110

Lab Sample ID: 500-153535-1 MS

Matrix: Water

Analysis Batch: 457437

Client Sample ID: W-181019-MH-27

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	15.3		5.00	21.12	E	mg/L		116	80 - 120

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-153535-1 MSD
Matrix: Water
Analysis Batch: 457437

Client Sample ID: W-181019-MH-27
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	15.3		5.00	21.03	E	mg/L		114	80 - 120	0	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 500-457813/4
Matrix: Water
Analysis Batch: 457813

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			10/30/18 07:52	1

Lab Sample ID: LCS 500-457813/5
Matrix: Water
Analysis Batch: 457813

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	9.99		mg/L		100	80 - 120

Lab Sample ID: 500-153535-5 MS
Matrix: Water
Analysis Batch: 457813

Client Sample ID: W-181019MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	0.95	J	10.0	11.60		mg/L		107	75 - 125

Lab Sample ID: 500-153535-5 MSD
Matrix: Water
Analysis Batch: 457813

Client Sample ID: W-181019MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	0.95	J	10.0	11.52		mg/L		106	75 - 125	1	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-458246/3
Matrix: Water
Analysis Batch: 458246

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			11/02/18 11:24	1

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 500-458246/4
Matrix: Water
Analysis Batch: 458246

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.65		mg/L		100	90 - 110

Lab Sample ID: 500-153535-5 DU
Matrix: Water
Analysis Batch: 458246

Client Sample ID: W-1810198MH-31
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	98.2		96.92		mg/L		1	20

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-181019-MH-27

Date Collected: 10/19/18 08:15

Date Received: 10/20/18 10:20

Lab Sample ID: 500-153535-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 01:12	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		10	457706	10/31/18 20:28	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 16:56	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1000	456686	10/29/18 12:05	JBj	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 04:31	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:00	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 08:27	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 08:40	EAT	TAL CHI
Total/NA	Analysis	300.0		2	457437	10/30/18 04:23	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 11:53	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 11:50	SMO	TAL CHI

Client Sample ID: W-1810198MH-28

Date Collected: 10/19/18 08:55

Date Received: 10/20/18 10:20

Lab Sample ID: 500-153535-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 02:03	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		10	457706	10/31/18 20:53	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 17:13	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1000	456686	10/29/18 12:30	JBj	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 04:35	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:04	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 08:52	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 09:05	EAT	TAL CHI
Total/NA	Analysis	300.0		5	457437	10/30/18 05:01	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 12:14	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 11:58	SMO	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-29

Lab Sample ID: 500-153535-3

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 02:28	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		10	457966	11/01/18 20:27	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 17:30	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		10000	456686	10/29/18 13:43	JBj	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 04:46	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:08	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 09:18	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 09:30	EAT	TAL CHI
Total/NA	Analysis	300.0		2	457437	10/30/18 05:14	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 12:34	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 11:43	SMO	TAL CHI

Client Sample ID: W-1810198MH-30

Lab Sample ID: 500-153535-4

Date Collected: 10/19/18 11:25

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 02:54	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		10	457966	11/01/18 20:55	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 17:47	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		10000	456686	10/29/18 14:07	JBj	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 04:50	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:12	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 09:43	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 09:56	EAT	TAL CHI
Total/NA	Analysis	300.0		2	457437	10/30/18 05:26	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 12:55	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 11:36	SMO	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-31

Lab Sample ID: 500-153535-5

Date Collected: 10/19/18 09:49

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 03:20	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		1	457706	10/31/18 18:23	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 18:04	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456686	10/25/18 11:51	JBK	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 04:54	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:28	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 10:34	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 11:12	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 15:15	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 13:09	SMO	TAL CHI

Client Sample ID: W-1810198MH-32

Lab Sample ID: 500-153535-6

Date Collected: 10/19/18 11:38

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 03:45	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		1	457706	10/31/18 18:48	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 18:54	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456686	10/25/18 13:05	JBK	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 05:20	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:47	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 11:50	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 12:02	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 13:55	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 13:22	SMO	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-33

Lab Sample ID: 500-153535-7

Date Collected: 10/19/18 12:33

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 04:11	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		1	457706	10/31/18 19:13	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 19:11	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456686	10/25/18 13:29	JBK	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 05:24	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:51	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 12:15	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 12:28	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 14:35	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 13:28	SMO	TAL CHI

Client Sample ID: W-1810198MH-34

Lab Sample ID: 500-153535-8

Date Collected: 10/19/18 12:35

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 04:36	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		1	457706	10/31/18 19:38	AJD	TAL CHI
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI
Total/NA	Analysis	8151A		1	456686	10/25/18 13:54	JBK	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 05:28	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:55	FXG	TAL CHI

Client Sample ID: W-1810198MH-35

Lab Sample ID: 500-153535-9

Date Collected: 10/19/18 12:54

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 05:02	PMF	TAL CHI
Total/NA	Prep	3510C			456829	10/25/18 13:45	DAK	TAL CHI
Total/NA	Analysis	8270D		1	457706	10/31/18 20:03	AJD	TAL CHI
Total/NA	Analysis	RSK-175		1	352106	10/26/18 19:28	BPM	TAL CAN
Total/NA	Prep	8151A			456576	10/24/18 11:37	DAK	TAL CHI

TestAmerica Chicago

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Client Sample ID: W-1810198MH-35

Lab Sample ID: 500-153535-9

Date Collected: 10/19/18 12:54

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8151A		1	456686	10/25/18 14:18	JBJ	TAL CHI
Dissolved	Prep	3005A			456490	10/24/18 07:52	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457318	10/27/18 05:31	FXG	TAL CHI
Dissolved	Prep	3005A			457477	10/30/18 08:26	SAH	TAL CHI
Dissolved	Analysis	6020A		1	457806	10/31/18 13:58	FXG	TAL CHI
Total/NA	Prep	3010A			456090	10/22/18 09:52	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	456513	10/24/18 08:42	JEF	TAL CHI
Total/NA	Analysis	300.0		1	456223	10/23/18 13:06	EAT	TAL CHI
Total/NA	Analysis	300.0		10	456223	10/23/18 13:18	EAT	TAL CHI
Total/NA	Analysis	9060A		1	457813	10/30/18 14:55	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	458246	11/02/18 13:36	SMO	TAL CHI

Client Sample ID: Trip Blank - 003

Lab Sample ID: 500-153535-10

Date Collected: 10/19/18 13:45

Matrix: Water

Date Received: 10/20/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	456662	10/25/18 01:37	PMF	TAL CHI

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-153535-1

Laboratory: TestAmerica Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date								
Wisconsin	State Program	5	999580010	08-31-19								
<p>The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Analysis Method</th> <th style="text-align: left;">Prep Method</th> <th style="text-align: left;">Matrix</th> <th style="text-align: left;">Analyte</th> </tr> </thead> <tbody> <tr> <td>SM 2320B</td> <td></td> <td>Water</td> <td>Alkalinity</td> </tr> </tbody> </table>					Analysis Method	Prep Method	Matrix	Analyte	SM 2320B		Water	Alkalinity
Analysis Method	Prep Method	Matrix	Analyte									
SM 2320B		Water	Alkalinity									

Laboratory: TestAmerica Canton


All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

North Canton, OH 44720
Phone: 330.497.9396 Fax: 330.497.0772

Regulatory Program: DW NPDES RCRA Other:

Client Contact			Project Manager: <u>Tim Ree</u>			Site Contact: <u>Grant Anderson</u>			Date: <u>10-19-18</u>			COC No:				
Company Name: <u>GHD</u>			Tel/Fax:			Lab Contact: <u>Rich and Wright</u>			Carrier: <u>Fed Ex</u>			1 of 1 COCs				
Address: <u>1801 old HWY 8</u>			Analysis Turnaround Time						Sampler: <u>P. Storie</u>			For Lab Use Only:				
City/State/Zip: <u>St. Paul, MN</u>			<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS			Walk-in Client:			Lab Sampling:			Job / SDG No.:				
Phone: <u>651-639-0913</u>			TAT if different from Below			Filtered Sample (Y/N)			Perform MS /MSD (Y/N)			Sample Specific Notes:				
Fax:			<input type="checkbox"/> 2 weeks			BTEX			Naphthalene			 500-153535 COC				
Project Name: <u>Pentawood</u>			<input type="checkbox"/> 1 week			Pentachlorophenol			TAL Metals - filtered							
Site: <u>006165-05-04</u>			<input type="checkbox"/> 2 days			Alk. NO ₃ , Sulfate, Cl			TDC							
P O #			<input type="checkbox"/> 1 day			Dis. Methane			Hexachlor							
Sample Identification			Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.									
1 <u>W-181019-MH-27</u>			<u>10-19-18</u>	<u>08:15</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>				<u>X</u>	<u>X</u>
2 <u>-28</u>			<u>10-19-18</u>	<u>08:55</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>				<u>X</u>	<u>X</u>
3 <u>-29</u>			<u>10-19-18</u>	<u>11:25</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>				<u>X</u>	<u>X</u>
4 <u>-30</u>			<u>10-19-18</u>	<u>11:25</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>				<u>X</u>	<u>X</u>
5 <u>-31</u>			<u>10-19-18</u>	<u>09:49</u>	<u>G</u>	<u>W</u>	<u>45</u>	<u>X</u>		<u>X</u>	<u>X</u>				<u>X</u>	<u>X</u>
6 <u>-32</u>			<u>10-19-18</u>	<u>11:38</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
7 <u>-33</u>			<u>10-19-18</u>	<u>12:33</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
8 <u>-34</u>			<u>10-19-18</u>	<u>12:35</u>	<u>G</u>	<u>W</u>	<u>8</u>			<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
9 <u>-35</u>			<u>10-19-18</u>	<u>12:54</u>	<u>G</u>	<u>W</u>	<u>15</u>			<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
10 <u>Trip Blank - 003</u>			<u>10-19-18</u>	<u>13:45</u>	<u>B</u>		<u>2</u>									
Preservation Used: (1=Ice) (2=HC) (3=H2SO4) (4=HNO3) (5=NaOH) (6=Other)												Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.						<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown						<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months				
Special Instructions/QC Requirements & Comments: <u>0.6, 0.8, 1.6, 1.7, 2.4, -1.0</u>																
Custody Seals intact: <input type="checkbox"/> Yes <input type="checkbox"/> No			Custody Seal No.:			Cooler Temp. (°C) Obs'd:			Cooler ID No.:			Therm ID No.:				
Relinquished by: <u>Melissa Hackenmeyer</u>			Company: <u>GHD</u>			Date/Time: <u>10-19-18/1500</u>			Received by:			Company: _____ Date/Time: _____				
Relinquished by:			Company:			Date/Time:			Received by:			Company: _____ Date/Time: _____				
Relinquished by:			Company:			Date/Time:			Received in Laboratory by: <u>Devin Sluch</u>			Company: <u>TAL</u> Date/Time: <u>10/19/18 1020</u>				

023
076

FedEx Express
Package
US Airbill

FedEx Tracking Number
8100 2372 3655

MUR4

Form ID No. 0215

1 From
Date 10/19/18
Sender's Name Peter Storlie Phone 651 639-0913
Company QHD SERVICES INC
Address 1801 OLD HIGHWAY @ NW STE 114
City SAINT PAUL State MN ZIP 55112-2007

2 Your Internal Billing Reference

3 To
Recipient's Name Receiving Phone 708 534-5200
Company Test America
Address 2417 Bond St
City University Park State IL ZIP 60484

4 Express Package Service *To most locations. Packages up to 150 lbs. For packages over 150 lbs., use the FedEx Express Freight US Airbill.

Next Business Day
 FedEx First Overnight
 FedEx Priority Overnight
 FedEx Standard Overnight

2 or 3 Business Days
 FedEx 2Day A.M.
 FedEx 2Day
 FedEx Express Saver

5 Packaging *Declared value limit \$500.
 FedEx Envelope* FedEx Pak* FedEx Box FedEx Tube Other

6 Special Handling and Delivery Signature Options Fees may apply. See the FedEx Service Guide.

Saturday Delivery
 No Signature Required
 Direct Signature
 Indirect Signature

Does this shipment contain dangerous goods?
 No Yes Yes Dry Ice Cargo Aircraft Only

7 Payment Bill to:

Sender Recipient Third Party Credit Card Cash/Check

Total Packages 1 Total Weight 50 Credit Card Auth.

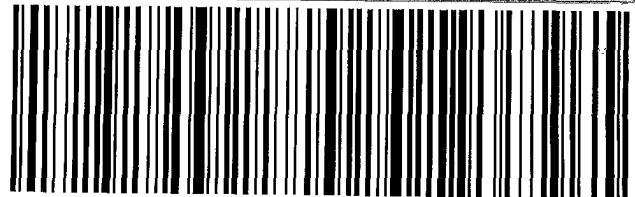


8100 2372 3655 500-153535 Waybill

FedEx TRK# 0215 8100 2372 3688 SATURDAY 12:00P PRIORITY OVERNIGHT
FedEx TRK# 0215 8100 2372 3677 SATURDAY 12:00P PRIORITY OVERNIGHT
FedEx TRK# 0215 8100 2372 3666 SATURDAY 12:00P PRIORITY OVERNIGHT

FedEx TRK# 0215 8100 2372 3850 SATURDAY 12:00P PRIORITY OVERNIGHT
FedEx TRK# 0215 8100 2372 3644 SATURDAY 12:00P PRIORITY OVERNIGHT

X0 JOTA 60484 IL-US ORD



FID 80701 190CT18 JDTA 553C1/88FB/9C8A

fedex.com 1.800.GoFedEx 1.800.463.3339

TestAmerica Chicago
 2417 Bond Street
 University Park, IL 60484
 Phone (708) 534-5200 Fax (708) 534-5211

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING



Client Information (Sub Contract Lab)		Lab PM: Wright, Richard C	Carrier Tracking No(s): 500-112268.1
Client Contact: Shipping/Receiving		E-Mail: richard.wright@testamericainc.com	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Wisconsin	
Address: 4101 Shuffel Street NW		Job #: 500-153535-1	
City: North Canton		Preservation Codes:	
State/Zip: OH, 44720		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Phone: 330-497-9396(Tel) 330-497-0772(Fax)		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Email:			
Project Name: Penta Wood 086165			
Project #: 50013796			
SSOW#:			
Due Date Requested: 11/2/2018		Analysis Requested	
TAT Requested (days):			
PO #:			
WO #:			
Field Filtered Sample (Yes or No)		Rsk, 175/ (MOD) Methane	
Platform MS/MSD (Yes or No)			
Total Number of Containers		Rsk	
Special Instructions/Note:			
Sample Identification - Client ID (Lab ID)			
Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=Basin, A=Air)
10/19/18	08:15 Central	Water	Water
10/19/18	08:55 Central	Water	Water
10/19/18	11:25 Central	Water	Water
10/19/18	11:25 Central	Water	Water
10/19/18	09:49 Central	Water	Water
10/19/18	09:49 Central	MS	Water
10/19/18	09:49 Central	MSD	Water
10/19/18	11:38 Central	Water	Water
10/19/18	12:33 Central	Water	Water
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>			
Possible Hazard Identification			
Unconfirmed			
Deliverable Requested: I, II, III, IV, Other (specify)			
Primary Deliverable Rank: 2			
Empty Kit Relinquished by:			
Relinquished by: <i>M. Bullock</i>			
Date/Time: 10/22/18 16:00			
Company: <i>TH</i>			
Relinquished by:			
Date/Time:			
Company:			
Relinquished by:			
Date/Time:			
Company:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Custody Seal No.:			
Cooler Temperature(s) °C and Other Remarks:			

0.6/1.5



Ver: 09/20/2016

Chain of Custody Record

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:																						
Client Contact: Shipping/Receiving		Phone:	Wright, Richard C	State of Origin: Wisconsin	500-112268-2																						
Company: TestAmerica Laboratories, Inc.		E-Mail: richard.wright@testamericainc.com		Page: Page 2 of 2																							
Address: 4101 Shuffel Street NW		Accreditations Required (See note): State Program - Wisconsin		Job #: 500-153535-1																							
City: North Canton	Due Date Requested: 11/2/2018	Analysis Requested																									
State, Zip: OH, 44720	TAT Requested (days):	<table border="1"> <tr> <th>Sample ID (Lab ID)</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=Comp, G=grab)</th> <th>Matrix (w-water, s-solid, o-wast/ool, BT=tissue, A=air)</th> <th>Preservation Code:</th> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>RSK 175/(MOD) Methane</th> <th>Total Number of Containers</th> <th>Special Instructions/Note:</th> </tr> <tr> <td>W-1810198MH-35 (500-153535-9)</td> <td>10/19/18</td> <td>12:54 Central</td> <td></td> <td>Water</td> <td></td> <td>X</td> <td>X</td> <td></td> <td>3</td> <td></td> </tr> </table>				Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (w-water, s-solid, o-wast/ool, BT=tissue, A=air)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK 175/(MOD) Methane	Total Number of Containers	Special Instructions/Note:	W-1810198MH-35 (500-153535-9)	10/19/18	12:54 Central		Water		X	X		3	
Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (w-water, s-solid, o-wast/ool, BT=tissue, A=air)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK 175/(MOD) Methane	Total Number of Containers	Special Instructions/Note:																	
W-1810198MH-35 (500-153535-9)	10/19/18	12:54 Central		Water		X	X		3																		
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:																										
Email:	WO #:																										
Project Name: Pentia Wood 086165	Project #: 50013796																										
Site:	SSOW#:																										

Sample Identification - Client ID (Lab ID)

W-1810198MH-35 (500-153535-9)

10/19/18 12:54 Central Water

Field Filtered Sample (Yes or No) X

Perform MS/MSD (Yes or No) X

RSK 175/(MOD) Methane

Total Number of Containers 3

Special Instructions/Note:

Other:

A - HCL
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO4
 F - MeOH
 G - Amchlor
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDA
 M - Hexane
 N - None
 O - AsNaO2
 P - Na2O4S
 Q - Na2SO3
 R - Na2SO3
 S - H2SO4
 T - TSP Dodecahydrate
 U - Acetone
 V - MCAA
 W - pH 4.5
 Z - other (specify)

Possible Hazard Identification
 Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by: _____ Date: _____

Relinquished by: *M. P. [Signature]* Date: 10/22/18 Company: 1600
 Relinquished by: _____ Date/Time: _____ Company: _____

Relinquished by: _____ Date/Time: _____ Company: _____

Relinquished by: _____ Date/Time: _____ Company: _____

Custody Seal No.: _____
 Δ Yes Δ No

Received by: *[Signature]* Date/Time: 10/23/18 9:40 Company: [Signature]
 Received by: _____ Date/Time: _____ Company: _____

Received by: _____ Date/Time: _____ Company: _____

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Canton Sample Receipt Form/Narrative


Login # : _____

Canton Facility

Client TA Chicago Site Name _____ Cooler unpacked by: [Signature]
 Cooler Received on 10/23/18 Opened on 10/23/18
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off _____ TestAmerica Courier _____ Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 1.5 °C
 IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC849161
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials?  Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
 VOAs
 Oil and Grease
 TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-153535-1

Login Number: 153535

List Source: TestAmerica Chicago

List Number: 1

Creator: Sanchez, Ariel M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-1.0, 0.6, 0.8, 1.6, 1.7, 2.4
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Containers recd broken. Sufficient sample in remaining containers for analysis.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

TestAmerica Job ID: 500-154040-1
Client Project/Site: Penta Wood 086165

For:
GHD Services Inc.
1801 Old Highway 8 NW
Suite 114
St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:
11/16/2018 4:49:57 PM

Richard Wright, Senior Project Manager
(708)534-5200
richard.wright@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
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- 14
- 15



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Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Job ID: 500-154040-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative 500-154040-1

Receipt

The samples were received on 10/31/2018 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D: Two base surrogate recoveries for the following sample were outside the upper control limit: W-181059-PS-37 (500-154040-2). The sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8270D: The following sample contained one base surrogate outside acceptance limits: W-181059-PS-36 (500-154040-1). The laboratory's SOP allows one base surrogate to be outside acceptance limits; therefore, re-extraction was not performed. These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method(s) 8151A: The following samples required a dilution due to the nature of the sample matrix: W-181059-PS-36 (500-154040-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-36

Lab Sample ID: 500-154040-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.53		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	0.57		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	6.5		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	23		0.76	0.24	ug/L	1		8270D	Total/NA
Methane	15		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	5600		480	430	ug/L	5000		8151A	Total/NA
Arsenic	0.71	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.5	J B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	7920		100	46.7	ug/L	1		6020A	Dissolved
Manganese	6730		12.5	4.0	ug/L	5		6020A	Dissolved
Hardness as calcium carbonate	292		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	28.5		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.084	J	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	28.5		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	39.6		2.0	0.94	mg/L	2		9060A	Total/NA
Alkalinity	249		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-181059-PS-37

Lab Sample ID: 500-154040-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.21		0.095	0.085	ug/L	1		8151A	Total/NA
Copper	2.8	B	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	1.8	J	2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	10.9	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	87.2		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	0.42		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.51		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	1.6		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	2.1		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	66.6		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank-005

Lab Sample ID: 500-154040-3

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL CHI
6020A	Metals (ICP/MS)	SW846	TAL CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL CHI
300.0	Anions, Ion Chromatography	MCAWW	TAL CHI
9060A	Organic Carbon, Total (TOC)	SW846	TAL CHI
SM 2320B	Alkalinity	SM	TAL CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CHI
3010A	Preparation, Total Metals	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CHI
5030B	Purge and Trap	SW846	TAL CHI
8151A	Extraction (Herbicides)	SW846	TAL CHI

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-154040-1	W-181059-PS-36	Water	10/29/18 13:18	10/31/18 09:40
500-154040-2	W-181059-PS-37	Water	10/29/18 15:15	10/31/18 09:40
500-154040-3	Trip Blank-005	Water	10/29/18 15:30	10/31/18 09:40

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-36

Lab Sample ID: 500-154040-1

Date Collected: 10/29/18 13:18

Matrix: Water

Date Received: 10/31/18 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/10/18 03:15	1
Toluene	0.53		0.50	0.15	ug/L			11/10/18 03:15	1
Ethylbenzene	0.57		0.50	0.18	ug/L			11/10/18 03:15	1
Xylenes, Total	6.5		1.0	0.22	ug/L			11/10/18 03:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		75 - 126		11/10/18 03:15	1
Toluene-d8 (Surr)	94		75 - 120		11/10/18 03:15	1
4-Bromofluorobenzene (Surr)	99		72 - 124		11/10/18 03:15	1
Dibromofluoromethane	93		75 - 120		11/10/18 03:15	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	23		0.76	0.24	ug/L		11/01/18 07:17	11/06/18 17:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	86		36 - 120	11/01/18 07:17	11/06/18 17:54	1
2-Fluorobiphenyl (Surr)	72		34 - 110	11/01/18 07:17	11/06/18 17:54	1
Terphenyl-d14 (Surr)	153	X	40 - 145	11/01/18 07:17	11/06/18 17:54	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	15		1.0	0.17	ug/L			11/03/18 01:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	101		60 - 140		11/03/18 01:36	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	5600		480	430	ug/L		11/05/18 10:41	11/06/18 09:43	5000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	0	D	25 - 130	11/05/18 10:41	11/06/18 09:43	5000

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.71	J	1.0	0.23	ug/L		10/31/18 15:29	11/02/18 12:45	1
Copper	1.5	J B	2.0	0.50	ug/L		10/31/18 15:29	11/02/18 12:45	1
Iron	7920		100	46.7	ug/L		10/31/18 15:29	11/02/18 12:45	1
Manganese	6730		12.5	4.0	ug/L		10/31/18 15:29	11/02/18 18:41	5
Zinc	<6.9		20.0	6.9	ug/L		10/31/18 15:29	11/02/18 12:45	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	292		1.3	0.66	mg/L		11/02/18 16:35	11/06/18 08:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.5		2.0	1.7	mg/L			10/31/18 12:11	10
Nitrate as N	0.084	J	0.20	0.068	mg/L			10/31/18 11:59	1
Sulfate	28.5		2.0	0.95	mg/L			10/31/18 12:11	10
Total Organic Carbon - Duplicates	39.6		2.0	0.94	mg/L			11/15/18 14:08	2

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-36

Lab Sample ID: 500-154040-1

Date Collected: 10/29/18 13:18

Matrix: Water

Date Received: 10/31/18 09:40

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	249		5.0	3.7	mg/L			11/12/18 11:38	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-37

Lab Sample ID: 500-154040-2

Date Collected: 10/29/18 15:15

Matrix: Water

Date Received: 10/31/18 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/10/18 03:42	1
Toluene	<0.15		0.50	0.15	ug/L			11/10/18 03:42	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/10/18 03:42	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/10/18 03:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		75 - 126		11/10/18 03:42	1
Toluene-d8 (Surr)	96		75 - 120		11/10/18 03:42	1
4-Bromofluorobenzene (Surr)	101		72 - 124		11/10/18 03:42	1
Dibromofluoromethane	92		75 - 120		11/10/18 03:42	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.27		0.86	0.27	ug/L		11/01/18 07:17	11/06/18 16:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	109		36 - 120	11/01/18 07:17	11/06/18 16:35	1
2-Fluorobiphenyl (Surr)	123	X	34 - 110	11/01/18 07:17	11/06/18 16:35	1
Terphenyl-d14 (Surr)	169	X	40 - 145	11/01/18 07:17	11/06/18 16:35	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			11/03/18 01:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	102		60 - 140		11/03/18 01:53	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.21		0.095	0.085	ug/L		11/05/18 10:41	11/06/18 07:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	67		25 - 130	11/05/18 10:41	11/06/18 07:41	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/31/18 15:29	11/02/18 12:49	1
Copper	2.8	B	2.0	0.50	ug/L		10/31/18 15:29	11/02/18 12:49	1
Iron	<46.7		100	46.7	ug/L		10/31/18 15:29	11/02/18 12:49	1
Manganese	1.8	J	2.5	0.79	ug/L		10/31/18 15:29	11/02/18 12:49	1
Zinc	10.9	J	20.0	6.9	ug/L		10/31/18 15:29	11/02/18 12:49	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	87.2		1.3	0.66	mg/L		11/02/18 16:35	11/06/18 08:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.42		0.20	0.17	mg/L			10/31/18 12:23	1
Nitrate as N	0.51		0.20	0.068	mg/L			10/31/18 12:23	1
Sulfate	1.6		0.20	0.095	mg/L			10/31/18 12:23	1
Total Organic Carbon - Duplicates	2.1		1.0	0.47	mg/L			11/13/18 16:07	1

TestAmerica Chicago

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-37

Lab Sample ID: 500-154040-2

Date Collected: 10/29/18 15:15

Matrix: Water

Date Received: 10/31/18 09:40

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	66.6		5.0	3.7	mg/L			11/12/18 13:31	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: Trip Blank-005

Lab Sample ID: 500-154040-3

Date Collected: 10/29/18 15:30

Matrix: Water

Date Received: 10/31/18 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/10/18 01:55	1
Toluene	<0.15		0.50	0.15	ug/L			11/10/18 01:55	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/10/18 01:55	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/10/18 01:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		75 - 126		11/10/18 01:55	1
Toluene-d8 (Surr)	96		75 - 120		11/10/18 01:55	1
4-Bromofluorobenzene (Surr)	103		72 - 124		11/10/18 01:55	1
Dibromofluoromethane	93		75 - 120		11/10/18 01:55	1

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

GC/MS VOA

Analysis Batch: 459413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	8260B	
500-154040-2	W-181059-PS-37	Total/NA	Water	8260B	
500-154040-3	Trip Blank-005	Total/NA	Water	8260B	
MB 500-459413/5	Method Blank	Total/NA	Water	8260B	
LCS 500-459413/3	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 457858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	3510C	
500-154040-2	W-181059-PS-37	Total/NA	Water	3510C	
MB 500-457858/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-457858/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 458316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-457858/1-A	Method Blank	Total/NA	Water	8270D	457858
LCS 500-457858/2-A	Lab Control Sample	Total/NA	Water	8270D	457858

Analysis Batch: 458647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	8270D	457858
500-154040-2	W-181059-PS-37	Total/NA	Water	8270D	457858

GC VOA

Analysis Batch: 353325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	RSK-175	
500-154040-2	W-181059-PS-37	Total/NA	Water	RSK-175	
MB 240-353325/34	Method Blank	Total/NA	Water	RSK-175	
LCS 240-353325/35	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 240-353325/36	Lab Control Sample Dup	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 458481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	8151A	
500-154040-2	W-181059-PS-37	Total/NA	Water	8151A	
MB 500-458481/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-458481/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCS 500-458481/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 458489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	8151A	458481
500-154040-2	W-181059-PS-37	Total/NA	Water	8151A	458481
MB 500-458481/1-A	Method Blank	Total/NA	Water	8151A	458481

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

GC Semi VOA (Continued)

Analysis Batch: 458489 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-458481/2-A	Lab Control Sample	Total/NA	Water	8151A	458481
LCS 500-458481/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	458481

Metals

Prep Batch: 457819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Dissolved	Water	3005A	
500-154040-2	W-181059-PS-37	Dissolved	Water	3005A	
MB 500-457819/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-457819/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 458232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Dissolved	Water	6020A	457819
500-154040-2	W-181059-PS-37	Dissolved	Water	6020A	457819
MB 500-457819/1-A	Method Blank	Total Recoverable	Water	6020A	457819
LCS 500-457819/2-A	Lab Control Sample	Total Recoverable	Water	6020A	457819

Prep Batch: 458253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	3010A	
500-154040-2	W-181059-PS-37	Total/NA	Water	3010A	

Analysis Batch: 458472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Dissolved	Water	6020A	457819

Analysis Batch: 458613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	SM 2340B	458253
500-154040-2	W-181059-PS-37	Total/NA	Water	SM 2340B	458253

General Chemistry

Analysis Batch: 457889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	300.0	
500-154040-1	W-181059-PS-36	Total/NA	Water	300.0	
500-154040-2	W-181059-PS-37	Total/NA	Water	300.0	
MB 500-457889/3	Method Blank	Total/NA	Water	300.0	
LCS 500-457889/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 459882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	SM 2320B	
500-154040-2	W-181059-PS-37	Total/NA	Water	SM 2320B	
MB 500-459882/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-459882/4	Lab Control Sample	Total/NA	Water	SM 2320B	

TestAmerica Chicago

QC Association Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

General Chemistry (Continued)

Analysis Batch: 460028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-2	W-181059-PS-37	Total/NA	Water	9060A	
MB 500-460028/4	Method Blank	Total/NA	Water	9060A	
LCS 500-460028/5	Lab Control Sample	Total/NA	Water	9060A	

Analysis Batch: 460448

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-154040-1	W-181059-PS-36	Total/NA	Water	9060A	
MB 500-460448/4	Method Blank	Total/NA	Water	9060A	
LCS 500-460448/5	Lab Control Sample	Total/NA	Water	9060A	

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-126)	TOL (75-120)	BFB (72-124)	DBFM (75-120)
500-154040-1	W-181059-PS-36	90	94	99	93
500-154040-2	W-181059-PS-37	90	96	101	92
500-154040-3	Trip Blank-005	89	96	103	93
LCS 500-459413/3	Lab Control Sample	95	97	99	100
MB 500-459413/5	Method Blank	95	94	104	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		NBZ (36-120)	FBP (34-110)	TPHL (40-145)
500-154040-1	W-181059-PS-36	86	72	153 X
500-154040-2	W-181059-PS-37	109	123 X	169 X
LCS 500-457858/2-A	Lab Control Sample	98	95	131
MB 500-457858/1-A	Method Blank	91	88	129

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)

FBP = 2-Fluorobiphenyl (Surr)

TPHL = Terphenyl-d14 (Surr)

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		TFE2 (60-140)
500-154040-1	W-181059-PS-36	101
500-154040-2	W-181059-PS-37	102
LCS 240-353325/35	Lab Control Sample	110
LCSD 240-353325/36	Lab Control Sample Dup	106
MB 240-353325/34	Method Blank	107

Surrogate Legend

TFE = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCPAA2 (25-130)
500-154040-1	W-181059-PS-36	0 D

TestAmerica Chicago

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: 8151A - Herbicides (GC) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPAA2 (25-130)
500-154040-2	W-181059-PS-37	67
LCS 500-458481/2-A	Lab Control Sample	71
LCSD 500-458481/3-A	Lab Control Sample Dup	74
MB 500-458481/1-A	Method Blank	69

Surrogate Legend

DCPAA = DCAA

- 1
- 2
- 3
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- 14
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QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-459413/5
Matrix: Water
Analysis Batch: 459413

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.15		0.50	0.15	ug/L			11/10/18 01:28	1
Toluene	<0.15		0.50	0.15	ug/L			11/10/18 01:28	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			11/10/18 01:28	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			11/10/18 01:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		75 - 126		11/10/18 01:28	1
Toluene-d8 (Surr)	94		75 - 120		11/10/18 01:28	1
4-Bromofluorobenzene (Surr)	104		72 - 124		11/10/18 01:28	1
Dibromofluoromethane	94		75 - 120		11/10/18 01:28	1

Lab Sample ID: LCS 500-459413/3
Matrix: Water
Analysis Batch: 459413

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	47.5		ug/L		95	70 - 120
Toluene	50.0	44.3		ug/L		89	70 - 125
Ethylbenzene	50.0	48.1		ug/L		96	70 - 123
Xylenes, Total	100	93.2		ug/L		93	70 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		75 - 126
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	99		72 - 124
Dibromofluoromethane	100		75 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 500-457858/1-A
Matrix: Water
Analysis Batch: 458316

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457858

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		11/01/18 07:17	11/03/18 17:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	91		36 - 120	11/01/18 07:17	11/03/18 17:57	1
2-Fluorobiphenyl (Surr)	88		34 - 110	11/01/18 07:17	11/03/18 17:57	1
Terphenyl-d14 (Surr)	129		40 - 145	11/01/18 07:17	11/03/18 17:57	1

Lab Sample ID: LCS 500-457858/2-A
Matrix: Water
Analysis Batch: 458316

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 457858

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	25.8		ug/L		81	36 - 110

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Nitrobenzene-d5 (Surr)	98		36 - 120
2-Fluorobiphenyl (Surr)	95		34 - 110
Terphenyl-d14 (Surr)	131		40 - 145

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-353325/34
Matrix: Water
Analysis Batch: 353325

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Methane	<0.17		1.0	0.17	ug/L			11/02/18 20:00	1
Surrogate	MB MB		Limits			Prepared	Analyzed	Dil Fac	
%Recovery	Qualifier								
1,1,1-Trifluoroethane	107		60 - 140				11/02/18 20:00	1	

Lab Sample ID: LCS 240-353325/35
Matrix: Water
Analysis Batch: 353325

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits	
		Result	Qualifier					
Methane	511	480		ug/L		94	80 - 120	
Surrogate	LCS LCS		Limits			Prepared	Analyzed	Dil Fac
%Recovery	Qualifier							
1,1,1-Trifluoroethane	110		60 - 140					

Lab Sample ID: LCSD 240-353325/36
Matrix: Water
Analysis Batch: 353325

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	Limit
		Result	Qualifier						
Methane	511	521		ug/L		102	80 - 120	8	35
Surrogate	LCSD LCSD		Limits			Prepared	Analyzed	Dil Fac	
%Recovery	Qualifier								
1,1,1-Trifluoroethane	106		60 - 140						

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-458481/1-A
Matrix: Water
Analysis Batch: 458489

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 458481

Analyte	MB MB		LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Pentachlorophenol	<0.090		0.10	0.090	ug/L		11/05/18 10:41	11/06/18 05:13	1
Surrogate	MB MB		Limits			Prepared	Analyzed	Dil Fac	
%Recovery	Qualifier								
DCAA	69		25 - 130			11/05/18 10:41	11/06/18 05:13	1	

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCS 500-458481/2-A
Matrix: Water
Analysis Batch: 458489

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 458481

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Pentachlorophenol	2.53	1.29		ug/L		51	40 - 122
Surrogate	%Recovery	LCS Qualifier	Limits				
DCAA	71		25 - 130				

Lab Sample ID: LCSD 500-458481/3-A
Matrix: Water
Analysis Batch: 458489

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 458481

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Pentachlorophenol	2.53	1.41		ug/L		56	40 - 122	9	20
Surrogate	%Recovery	LCSD Qualifier	Limits						
DCAA	74		25 - 130						

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-457819/1-A
Matrix: Water
Analysis Batch: 458232

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 457819

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		10/31/18 15:29	11/02/18 11:11	1
Copper	0.715	J	2.0	0.50	ug/L		10/31/18 15:29	11/02/18 11:11	1
Iron	<46.7		100	46.7	ug/L		10/31/18 15:29	11/02/18 11:11	1
Manganese	<0.79		2.5	0.79	ug/L		10/31/18 15:29	11/02/18 11:11	1
Zinc	<6.9		20.0	6.9	ug/L		10/31/18 15:29	11/02/18 11:11	1

Lab Sample ID: LCS 500-457819/2-A
Matrix: Water
Analysis Batch: 458232

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 457819

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	100	98.46		ug/L		98	80 - 120
Copper	250	257.3		ug/L		103	80 - 120
Iron	1000	1041		ug/L		104	80 - 120
Manganese	500	513.3		ug/L		103	80 - 120
Zinc	500	506.0		ug/L		101	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-457889/3
Matrix: Water
Analysis Batch: 457889

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			10/31/18 11:34	1

TestAmerica Chicago

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 500-457889/3
Matrix: Water
Analysis Batch: 457889

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.068		0.20	0.068	mg/L			10/31/18 11:34	1
Sulfate	<0.095		0.20	0.095	mg/L			10/31/18 11:34	1

Lab Sample ID: LCS 500-457889/4
Matrix: Water
Analysis Batch: 457889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.96		mg/L		99	90 - 110
Nitrate as N	2.00	2.00		mg/L		100	90 - 110
Sulfate	5.00	5.11		mg/L		102	90 - 110

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 500-460028/4
Matrix: Water
Analysis Batch: 460028

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			11/13/18 09:27	1

Lab Sample ID: LCS 500-460028/5
Matrix: Water
Analysis Batch: 460028

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	10.36		mg/L		104	80 - 120

Lab Sample ID: MB 500-460448/4
Matrix: Water
Analysis Batch: 460448

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	<0.47		1.0	0.47	mg/L			11/15/18 09:51	1

Lab Sample ID: LCS 500-460448/5
Matrix: Water
Analysis Batch: 460448

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	10.36		mg/L		104	80 - 120

QC Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-459882/3
Matrix: Water
Analysis Batch: 459882

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<3.7		5.0	3.7	mg/L			11/12/18 11:25	1

Lab Sample ID: LCS 500-459882/4
Matrix: Water
Analysis Batch: 459882

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.92		mg/L		100	90 - 110

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: W-181059-PS-36

Lab Sample ID: 500-154040-1

Date Collected: 10/29/18 13:18

Matrix: Water

Date Received: 10/31/18 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	459413	11/10/18 03:15	JLC	TAL CHI
Total/NA	Prep	3510C			457858	11/01/18 07:17	ACK	TAL CHI
Total/NA	Analysis	8270D		1	458647	11/06/18 17:54	STW	TAL CHI
Total/NA	Analysis	RSK-175		1	353325	11/03/18 01:36	LKG	TAL CAN
Total/NA	Prep	8151A			458481	11/05/18 10:41	DAK	TAL CHI
Total/NA	Analysis	8151A		5000	458489	11/06/18 09:43	JBj	TAL CHI
Dissolved	Prep	3005A			457819	10/31/18 15:29	BDE	TAL CHI
Dissolved	Analysis	6020A		1	458232	11/02/18 12:45	FXG	TAL CHI
Dissolved	Prep	3005A			457819	10/31/18 15:29	BDE	TAL CHI
Dissolved	Analysis	6020A		5	458472	11/02/18 18:41	FXG	TAL CHI
Total/NA	Prep	3010A			458253	11/02/18 16:35	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	458613	11/06/18 08:01	JEF	TAL CHI
Total/NA	Analysis	300.0		1	457889	10/31/18 11:59	EAT	TAL CHI
Total/NA	Analysis	300.0		10	457889	10/31/18 12:11	EAT	TAL CHI
Total/NA	Analysis	9060A		2	460448	11/15/18 14:08	MTB	TAL CHI
Total/NA	Analysis	SM 2320B		1	459882	11/12/18 11:38	SMO	TAL CHI

Client Sample ID: W-181059-PS-37

Lab Sample ID: 500-154040-2

Date Collected: 10/29/18 15:15

Matrix: Water

Date Received: 10/31/18 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	459413	11/10/18 03:42	JLC	TAL CHI
Total/NA	Prep	3510C			457858	11/01/18 07:17	ACK	TAL CHI
Total/NA	Analysis	8270D		1	458647	11/06/18 16:35	STW	TAL CHI
Total/NA	Analysis	RSK-175		1	353325	11/03/18 01:53	LKG	TAL CAN
Total/NA	Prep	8151A			458481	11/05/18 10:41	DAK	TAL CHI
Total/NA	Analysis	8151A		1	458489	11/06/18 07:41	JBj	TAL CHI
Dissolved	Prep	3005A			457819	10/31/18 15:29	BDE	TAL CHI
Dissolved	Analysis	6020A		1	458232	11/02/18 12:49	FXG	TAL CHI
Total/NA	Prep	3010A			458253	11/02/18 16:35	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	458613	11/06/18 08:01	JEF	TAL CHI
Total/NA	Analysis	300.0		1	457889	10/31/18 12:23	EAT	TAL CHI
Total/NA	Analysis	9060A		1	460028		MTB	TAL CHI
					(Start)	11/13/18 16:07		
					(End)	11/13/18 16:23		
Total/NA	Analysis	SM 2320B		1	459882	11/12/18 13:31	SMO	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Client Sample ID: Trip Blank-005

Lab Sample ID: 500-154040-3

Date Collected: 10/29/18 15:30

Matrix: Water

Date Received: 10/31/18 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	459413	11/10/18 01:55	JLC	TAL CHI

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

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Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165

TestAmerica Job ID: 500-154040-1

Laboratory: TestAmerica Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	999580010	08-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
SM 2320B		Water	Alkalinity

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.



CONESTOGA-ROVERS & ASSOCIATES


CHAIN OF CUSTODY RECORD

1801 Old Highway 8 Northwest, Suite 114
St. Paul, Minnesota 55112 United States
Phone: (651) 639-0913 Fax: (651) 639-0923

COC NO.: **SP-02750**

PAGE 1 OF 1

(See Reverse Side for Instructions)

Project No/Phase/Task Code: 086165-05-04				Laboratory Name: TA-Chicago				Lab Location: Chicago				SSOW ID:							
Project Name: Penta Wood				Lab Contact: Wright				Lab Quote No:				Cooler No: 500154040							
Project Location: Siren, WI				SAMPLE TYPE				CONTAINER QUANTITY & PRESERVATION				ANALYSIS REQUESTED (See Back of COC for Definitions)							
Chemistry Contact: Gant Anderson				Matrix Code (see back of COC) Grab (G) or Comp (C)				Unpreserved Hydrochloric Acid (HCl) Nitric Acid (HNO ₃) Sulfuric Acid (H ₂ SO ₄) Sodium Hydroxide (NaOH) Methanol/Water (Soil VOC) EnCores 3x5-g, 1x25-g Other:				Total Containers/Sample				Carrier: Fed Ex			
Sampler(s): Peter Storkie																Airbill No:			
DATE (mm/dd/yy)				TIME (hh:mm)				BTEX Napth the lens Penta Metals (G Hered) ALK, NO ₃ , SO ₄ , Cl TOC P.S. Metham Address				Date Shipped: 10-30-2018							
SAMPLE IDENTIFICATION (Containers for each sample may be combined on one line)				COMMENTS/SPECIAL INSTRUCTIONS:															
1	W-181029-PS-36			10-29-18	1318	WG	5	6	2	2	15	X	X	X	X	X	X	 500-154040 COC	
2	W-181029-PS-37			↓	1515	↓	5	6	2	2	15	X	X	X	X	X	X		
3	TRIP BLANK-005			↓	1530	↓	↓	↓	↓	↓	1	X							
4	/			/				/				/							
5	/			/				/				/							
TAT Required in business days (use separate COCs for different TATs): <input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 3 Days <input type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week <input type="checkbox"/> Other: Standard				Total Number of Containers:				Notes/ Special Requirements:											
				All Samples in Cooler must be on COC				-0.6 → 0.9											
1.	REQUISITIONED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME											
1.	<i>[Signature]</i>	GHP	10-30-18	1400	<i>[Signature]</i>	TACH	10/31/18	0940											
2.																			
3.																			

THE CHAIN OF CUSTODY IS A LEGAL DOCUMENT - ALL FIELDS MUST BE COMPLETED ACCURATELY

ORIGIN ID: GPZA (651) 639-0913
ST. PAUL FRONT DESK
GHD SERVICES INC.
1801 OLD HIGHWAY 8 NW
SUITE 114
SAINT PAUL, MN 55112
UNITED STATES US

SHIP DATE: 30OCT18
ACTWGT: 53.00 LB
CAD: 9292115/INET 4040
DIMS: 25x15x15 IN
BILL SENDER

TO **SAMPLE RECEIVING**
TEST AMERICA - UNIVERSITY PARK
2417 BOND ST



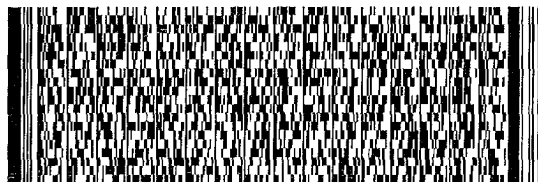
UNIVERSITY PARK IL 60484

(708) 534-5200
INV:
PO:

REF: 066165-05-04 P.STORLIE

DEPT:

500-154040 Waybill

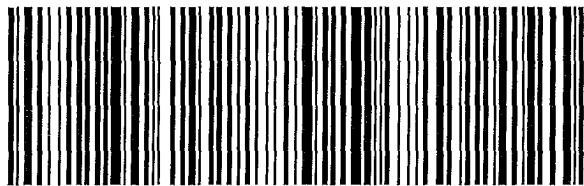


WED - 31 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 7736 0358 0115
0201

GE JOTA

60484
IL-US ORD



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
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Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-112675.1																												
Shipping/Receiving		E-Mail: richard.wright@testamericainc.com	State of Origin: Wisconsin	Page: Page 1 of 1																												
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Wisconsin																														
Address: 4101 Shuffel Street NW,		Job #: 500-154040-1																														
City: North Canton		Analysis Requested																														
State, Zip: OH, 44720		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDTA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)																														
Phone: 330-497-9396(Tel) 330-497-0772(Fax)		Other:																														
Email:		Total Number of containers																														
Project #: 50013796		Field Filtered Sample (Yes or No)																														
Site: Penta Wood 086165		Perform MS/MSD (Yes or No)																														
		RSK 15/ (MD) Methane																														
		Analysis Requested																														
		Due Date Requested: 11/13/2018																														
		TAT Requested (days):																														
		PO #:																														
		WO #:																														
		Project #:																														
		ISSOW#:																														
		Sample Identification - Client ID (Lab ID)																														
Sample ID	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastohol, ST=ISSAW, A=Air)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK 15/ (MD) Methane	Analysis Requested	Due Date Requested	TAT Requested (days)	PO #	WO #	Project #	ISSOW#	Sample ID	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastohol, ST=ISSAW, A=Air)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK 15/ (MD) Methane	Analysis Requested	Due Date Requested	TAT Requested (days)	PO #	WO #	Project #	ISSOW#	
W-181059-PS-36 (500-154040-1)	10/29/18	13:18 Central	Water	Water		X	X																									
W-181059-PS-37 (500-154040-2)	10/29/18	15:15 Central	Water	Water		X	X																									
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody to said compliance to TestAmerica Laboratories, Inc.</p>																																
<p>Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, V, Other (specify) _____ Primary Deliverable Rank: 2</p>																																
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>																																
<p>Special Instructions/OC Requirements:</p>																																
<p>Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____</p>																																
<p>Relinquished by: <i>Mimi Scott</i> Date: 10/31/18 Time: 1600 Company: <i>TA-CHI</i> Received by: _____ Date/Time: _____ Company: _____</p>																																
<p>Relinquished by: _____ Date/Time: _____ Company: _____ Received by: _____ Date/Time: _____ Company: _____</p>																																
<p>Custody Seals Intact: _____ Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____</p>																																




TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : _____

Client TA Chicago Site Name _____ Cooler unpacked by: [Signature]
 Cooler Received on 11/1/18 Opened on 11/1/18
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials?  ← Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
 VOAs
 Oil and Grease
 TOC

pH Strip Lot# HC849161

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: _____

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-154040-1

Login Number: 154040

List Source: TestAmerica Chicago

List Number: 1

Creator: Sanchez, Ariel M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Appendix C
Residential Well and Onsite Supply Well
Sample Data Validation



Memorandum

December 13, 2018

To: Tim Ree, GHD

Ref. No.: 086165-05-05

From:  Grant Anderson/sb/8

Tel: 651-639-0913

cc: Tim Braun, GHD

**Subject: Analytical Results and Reduced Validation
Residential Water Sampling Event
Penta Wood Products Superfund Site
Siren, Wisconsin
October 2018**

1. Introduction

This document details a reduced validation of analytical results for residential water samples collected at the Penta Wood Products Superfund Site during October 2018. Samples were submitted to TestAmerica Laboratories, Inc. (TA) located in University Park, Illinois. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD Services, Inc. (GHD) report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, recovery data from surrogate spikes, laboratory control samples (LCS), matrix spikes (MS), and field QA/QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

- i) "Quality Assurance Project Plan, Long Term Response Action, Rev. II, February 2005 with addendums
- ii) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", USEPA 540/R-99/008, October 1999

Item ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. The sample chain of custody document and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.



All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

Laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for benzene, toluene, ethylbenzene, and xylenes (BTEX), naphthalene, and pentachlorophenol analyses were spiked with the appropriate number of surrogate compounds prior to sample extraction or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the above criteria.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.



6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of the sample preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

MS/MSD analyses were performed as specified in Table 1.

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

7. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample, one field blank sample and one field duplicate sample set.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank sample was submitted to the laboratory for BTEX analysis. All results were non-detect for the compounds of interest.

Field Blank Sample Analysis

To assess ambient conditions at the site and cleanliness of sample containers, a field blank was submitted for analysis, as identified in Table 1. All results were non-detect for the compounds of interest.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, a field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with the duplicate samples must be less than 50 percent. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value.

All field duplicate results were within acceptable agreement (all results were non-detect), demonstrating acceptable sampling and analytical precision.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum (no positive analyte detections less than the RL but greater than the MDL were reported). Non-detect results were presented as non-detect at the RL in Table 2.



9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Table 1

**Sample Collection and Analysis Summary
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2018**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	<u>Analysis/Parameters</u>			Comments
					BTEX	Naphthalene	Pentachlorophenol	
W-181015-MH-01	RW04	water	10/15/2018	15:50	X	X	X	
W-181015-MH-02	RW05	water	10/15/2018	16:29	X	X	X	
W-181015-MH-03	RW01	water	10/15/2018	16:41	X	X	X	
W-181016-MH-04	RW02	water	10/16/2018	09:08	X	X	X	
W-181016-MH-05	RW02	water	10/16/2018	09:15	X	X	X	duplicate (MH-04)
W-181016-MH-06	RW06	water	10/16/2018	09:50	X	X	X	
W-181016-MH-07	RW06 SHOP	water	10/16/2018	09:57	X	X	X	
W-181016-MH-08	RW03	water	10/16/2018	10:18	X	X	X	field blank
W-181016-MH-09	RW03	water	10/16/2018	10:28	X	X	X	
W-181016-MH-10	DW01	water	10/16/2018	10:58	X	X	X	MS/MSD
Trip Blank	Lab	water	10/17/2018	11:00	X	-	-	trip blank

Notes:

MS/MSD - Matrix spike/matrix spike duplicate

BTEX - Benzene, toluene, ethylbenzene, and xylenes (total)

**Validated Analytical Results Summary
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2018**

Location ID:	DW01	RW01	RW02	RW02	RW03	RW04
Sample Name:	W-181016-MH-10	W-181015-MH-03	W-181016-MH-04	W-181016-MH-05	W-181016-MH-09	W-181015-MH-01
Sample Date:	10/16/2018	10/15/2018	10/16/2018	10/16/2018 Duplicate	10/16/2018	10/15/2018
Parameters	Unit					
Volatile Organic Compounds, BTEX						
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Semivolatile Organic Compounds						
Naphthalene	µg/L	0.82 U	0.79 U	0.77 U	0.80 U	0.90 U
Herbicides						
Pentachlorophenol	µg/L	0.095 U	0.10 U	0.097 U	0.099 U	0.11 U

**Validated Analytical Results Summary
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2018**

Location ID:	RW05	RW06	RW06 SHOP
Sample Name:	W-181015-MH-02	W-181016-MH-06	W-181016-MH-07
Sample Date:	10/15/2018	10/16/2018	10/16/2018

Parameters	Unit			
Volatile Organic Compounds, BTEX				
Benzene	µg/L	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	1.7
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U
Semivolatile Organic Compounds				
Naphthalene	µg/L	0.87 U	0.78 U	0.75 U
Herbicides				
Pentachlorophenol	µg/L	0.16	0.099 U	0.095 U

Note

U - Not detected at the associated reporting limit

Table 3

**Analytical Methods and Holding Time Criteria
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2018**

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
BTEX	SW 8260B	Water	-	14
Naphthalene	SW 8270C	Water	7	40
Pentachlorophenol	SW 8151	Water	7	40

Notes:

Method References:

- SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
 BTEX - Benzene, toluene, ethylbenzene, and xylenes (total)

Appendix D

Site Inspection Forms

Well Inspection Form
Penta Wood Products Superfund Site
Siren, Wisconsin

086165

	Protective Casing	Lock & Cover	J-Plug	Well Casing	Ground Surface	Notes
Monitoring Wells						
MW1	✓	✓	✓	✓	✓	
MW2	↓	↓	↓	↓	↓	
MW3	↓	↓	↓	↓	↓	
MW4	↓	↓	↓	↓	↓	
MW5	↓	↓	↓	↓	↓	
MW6	↓	↓	↓	↓	↓	
MW6S	↓	↓	↓	↓	↓	
MW7	↓	↓	↓	↓	↓	
MW8	↓	↓	↓	↓	↓	
MW9	↓	↓	↓	↓	↓	
MW10	↓	↓	↓	↓	↓	
MW10S	↓	↓	↓	↓	↓	
MW11	↓	↓	↓	↓	↓	
MW12	↓	↓	↓	↓	↓	
MW13	↓	↓	↓	↓	↓	
MW14	↓	↓	↓	↓	↓	
MW15	↓	↓	↓	↓	↓	
MW16	↓	↓	↓	↓	↓	
MW17	↓	↓	↓	↓	↓	
MW18	↓	↓	↓	↓	↓	
MW19	↓	↓	↓	↓	↓	
MW20	↓	↓	↓	↓	↓	
MW21	↓	↓	↓	↓	↓	
MW22	↓	↓	↓	↓	↓	
MW23	↓	↓	↓	↓	↓	
MW24	↓	↓	↓	↓	↓	
MW25	↓	↓	↓	↓	↓	
MW26	↓	↓	↓	↓	↓	
MW27	↓	↓	↓	↓	↓	
MW28	↓	↓	↓	↓	↓	
MW29	↓	↓	↓	↓	↓	
MW30	↓	↓	↓	↓	↓	
MW31	↓	↓	↓	↓	↓	

	Vault & Cover	Well Casings	Ground Surface	Notes
Extraction Wells				
EW2	✓	✓	✓	
EW3	↓	↓	↓	
EW4	↓	↓	↓	
EW5	↓	↓	↓	
EW6	↓	↓	↓	
EW7	↓	↓	↓	
EW10	↓	↓	↓	
EW12	↓	↓	↓	
EW13	↓	↓	↓	
EW14	↓	↓	↓	

	Protective Casing	Lock & Cover	Ground Surface	Inner Casing/Tubing	Notes

	Protective Casing	Lock & Cover	Ground Surface	Inner Casing/Tubing	Notes
Gas Probes					
SG-04DIS	✓	✓	✓	✓	
SG-05DIS	↓	↓	↓	↓	
SG-06DIS	↓	↓	↓	↓	
SG-07DIS	↓	↓	↓	↓	
SG-22	↓	↓	↓	↓	
SG-23	↓	↓	↓	↓	
SG-24	↓	↓	↓	↓	
SG-25	↓	↓	↓	↓	
SG-26	↓	↓	↓	↓	

Inspected By: Brady Halverson / Brady Halverson
Date: 10/19/18

Additional Notes: _____

Continuing Obligations Inspection Form
Penta Wood Products Superfund Site
Siren, Wisconsin

086165

Verified

Notes

Verify Site Conditions

- CAMU area fence condition is satisfactory
- CAMU signage is present/visible at all fence gates
- CAMU surface soil condition is satisfactory and does not require erosion/settlement repairs
- Perimeter area fence is satisfactory and does not require repairs
- Perimeter signage is present/visible
- Site access is limited and all perimeter fence locks in working order
- NaOH tank condition is satisfactory with no signs of leaks
- FeSO4 tank condition is satisfactory with no signs of leaks

✓	
✓	
✓	
✓	
✓	
✓	
✓	
✓	

Verify situations have not and are not occurring

- Removal of the existing barrier or cover
- Replacement with another barrier or cover
- Excavating or grading of the land surface
- Filling on covered or paved areas
- Plowing for agricultural cultivation
- Construction or placement of a building or other structure
- Change in use or occupancy of the property

✓	
✓	
✓	
✓	
✓	
✓	
✓	

Inspected By: Brady Halverson / Brady Halverson

Date: 10/19/19



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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