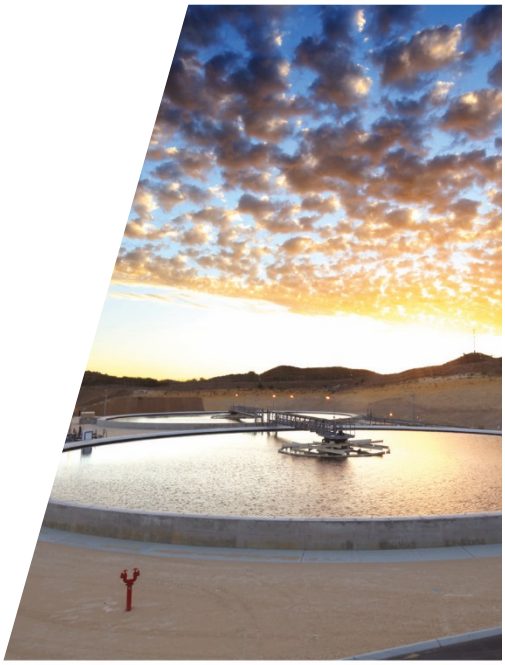
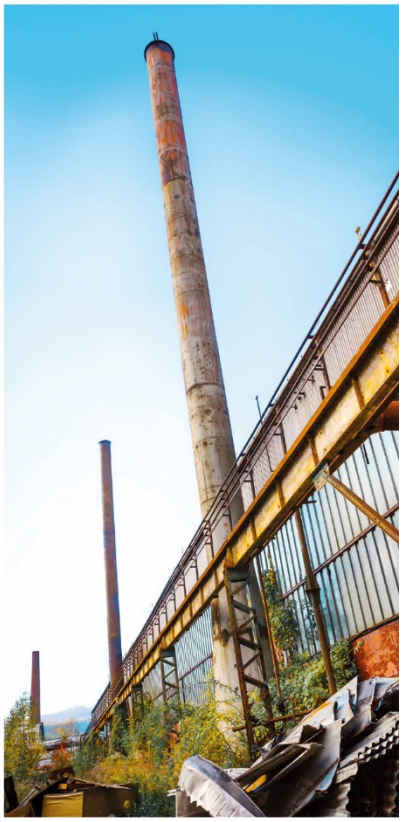


Semiannual Report

January through June 2018
Penta Wood Products Superfund Site
WDNR BRRTS Activity #02-07-000532



Wisconsin Department of Natural Resources

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Appendix Index

1. Introduction

GHD Services Inc. (GHD) prepared this Semiannual Report (Report) for the Penta Woods 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 January through June 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 January, May and June 2018 and sampling was conducted at the Site in May and June 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. 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 January 3, 2018 and on May 24, May 25 and June 1, 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 January and May 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 January 2018 and May/June 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 six extraction wells (EW05S, EW06S, EW07S, EW10S, EW12S, and EW14S) with casings screened in the unconfined (upper) aquifer during the January 2018 and May/June 2018 monitoring events. This is consistent with recent monitoring. LNAPL was not observed in any monitoring wells with casings screened in the semiconfined (lower) aquifer during January or May/June 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 0.004 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 May 29 through June 1, 2018 and consisted of collecting groundwater samples from eighteen (18) monitoring wells (MW1, MW3, MW4, 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 May/June 2018 naphthalene and BTEX analytical data are summarized in Table 2.4. Naphthalene was detected in three (3) wells (MW10, MW10S, EW13S) at concentrations that exceeded the PAL of 10 micrograms per liter (µg/L) (Table 2.4). Naphthalene concentrations did not exceed the ES of 100 µg/L.

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

2.2.2 PCP Analytical Data

The May/June 2018 PCP analytical data are summarized in Table 2.4. PCP was detected in seven (7) wells (MW3, MW10, MW10S, MW30, EW11D, EW11S, and EW13S) at concentrations exceeding the PAL of 0.1 µg/L. Of those seven wells, the PCP concentrations in four (4) wells (MW10, MW10S, MW30, and EW13S) exceeded the ES of 1.0 µg/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.

PCP was detected in well MW30 at a concentration of 630 µg/L, which is greater than previous concentrations at this location. Previous concentrations were less than 10 µg/L.

Based on a review of the May/June analytical data, it appears that the elevated PCP concentrations (i.e., greater than 1,000 µg/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.

Based on the increased PCP concentration in well MW30, groundwater samples will be collected from wells MW2 and MW5 during the next semiannual sampling event. These wells are located within the vicinity of well MW30 and will help confirm that the PCP plume is stable and not migrating and/or determine whether additional monitoring wells are necessary.

2.2.3 Dissolved Arsenic Analytical Data

The May/June 2018 dissolved arsenic analytical data are summarized in Table 2.4. Arsenic was detected in three (3) wells (MW4, MW14, and EW13S) at concentrations exceeding the PAL (1 µg/L). Of those three wells, the PCP 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 May/June 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 eighteen (18) monitoring wells and three (3) extraction wells.

Iron was detected in six (6) wells at concentrations exceeding the PAL (150 µg/L) and five (5) wells at concentrations exceeding the ES (300 µg/L). Manganese was detected in seven (7) 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.

3. Residential Well and Onsite Supply Well Sampling

On April 17 and June 5, 2018, water samples were collected from six 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)

GHD was informed by the resident at 8542 West Doctor Lake Road that he had a second well at his property that serves the shop. This well was also sampled during the April 2018 event in addition to the well that serves the house at this property.

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

PCP, 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). These results are similar with historical data. The residential well and onsite supply well sample analytical data are summarized in Table 3.1. Copies of the laboratory reports and data validation are 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 January through June 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 May 24 and 25, 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 May 24 and 25, 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:

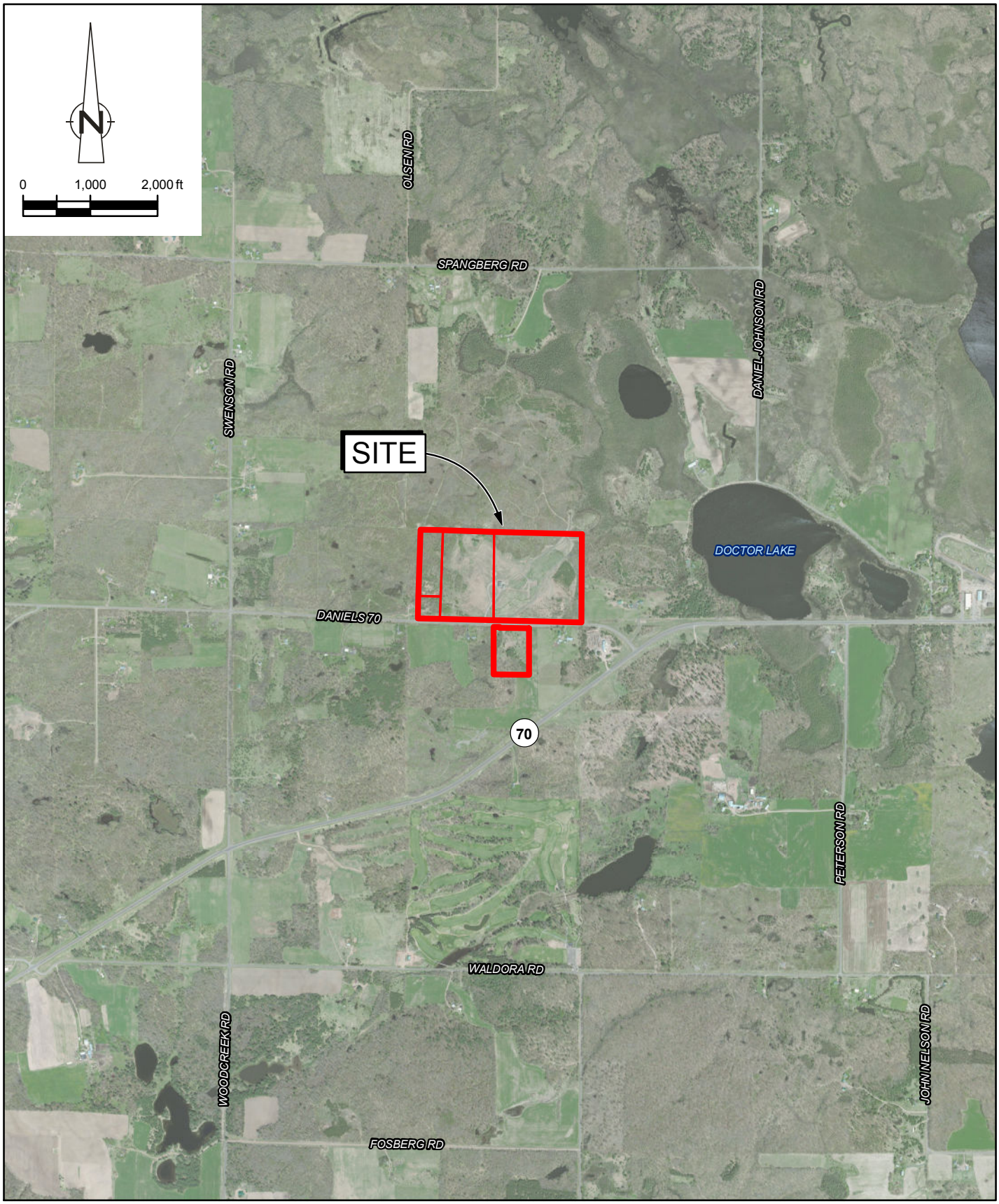
- LNAPL is stable and not migrating
- The dissolved PCP plume is stable and not migrating; however, the increased PCP concentration detected in well MW30 during May/June 2018 will be evaluated during future monitoring and sampling events to confirm that the PCP plume remains stable and not migrating
- 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
- Dissolved PCP degrades in the anaerobic zone (LNAPL source area) at a slow rate
- The current monitoring well network is sufficient to monitor plume conditions; however, elevated PCP concentrations detected in well MW30 during May/June 2018 will be evaluated during future monitoring and sampling events to determine whether additional wells are necessary

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
- Consider extending the anaerobic microcosm study laboratory analyses and evaluation
- Conduct quarterly groundwater and LNAPL level monitoring during July and October 2018
- Conduct semiannual groundwater monitoring and sampling during October 2018
- Conduct groundwater sampling at wells MW2 and MW5, located near well MW30, 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 October 2018
- 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 July through December 2018 and will be submitted in January 2019.
- Conduct a groundwater statistical evaluation using USEPA and ITRC guidance when sufficient groundwater data is obtained after future sampling events

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
SEMIANNUAL REPORT

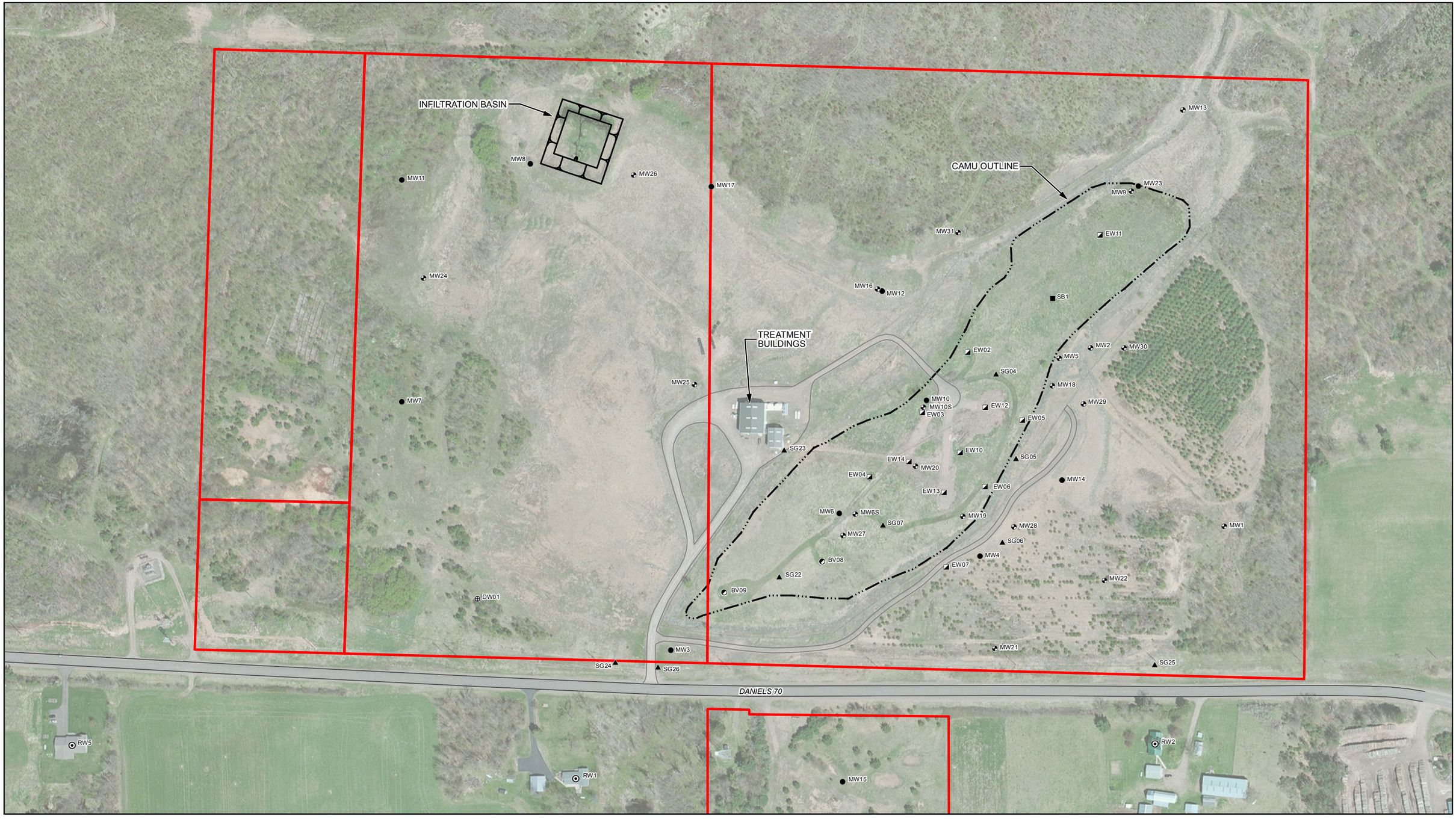
086165-05-06

Jul 10, 2018

SITE LOCATION

FIGURE 1.1

GIS File: I:\GIS\Projects\6-chars\08----\0861--\086165\086165-REPORTS\086165-05(017)\086165-05(017)GIS-SP001.mxd



0 100 200 ft

LEGEND

- EXTRACTION WELL NEST
- UNCONFINED MONITORING WELL
- SEMICONFINED MONITORING WELL
- BIOVENTING WELL
- SOIL GAS WELL NEST
- WATER SUPPLY WELL
- RESIDENTIAL WELL
- APPROXIMATE CAMU LIMIT
- SITE PARCEL BOUNDARY

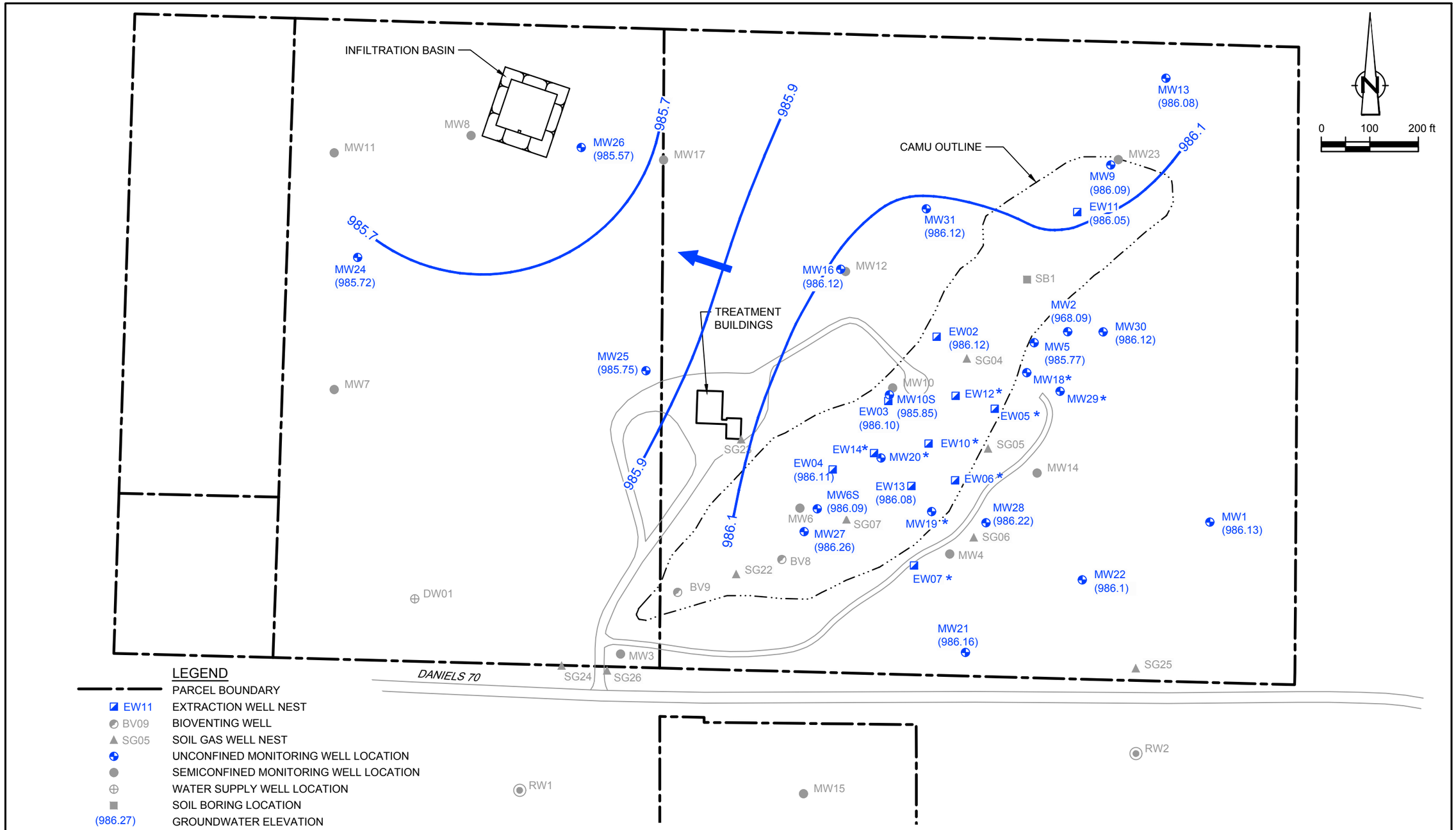
PENTA WOOD PRODUCTS SUPERFUND SITE
SIREN, WISCONSIN
SEMIANNUAL REPORT

086165-05-06
Jul 10, 2018

SITE PLAN

FIGURE 1.2

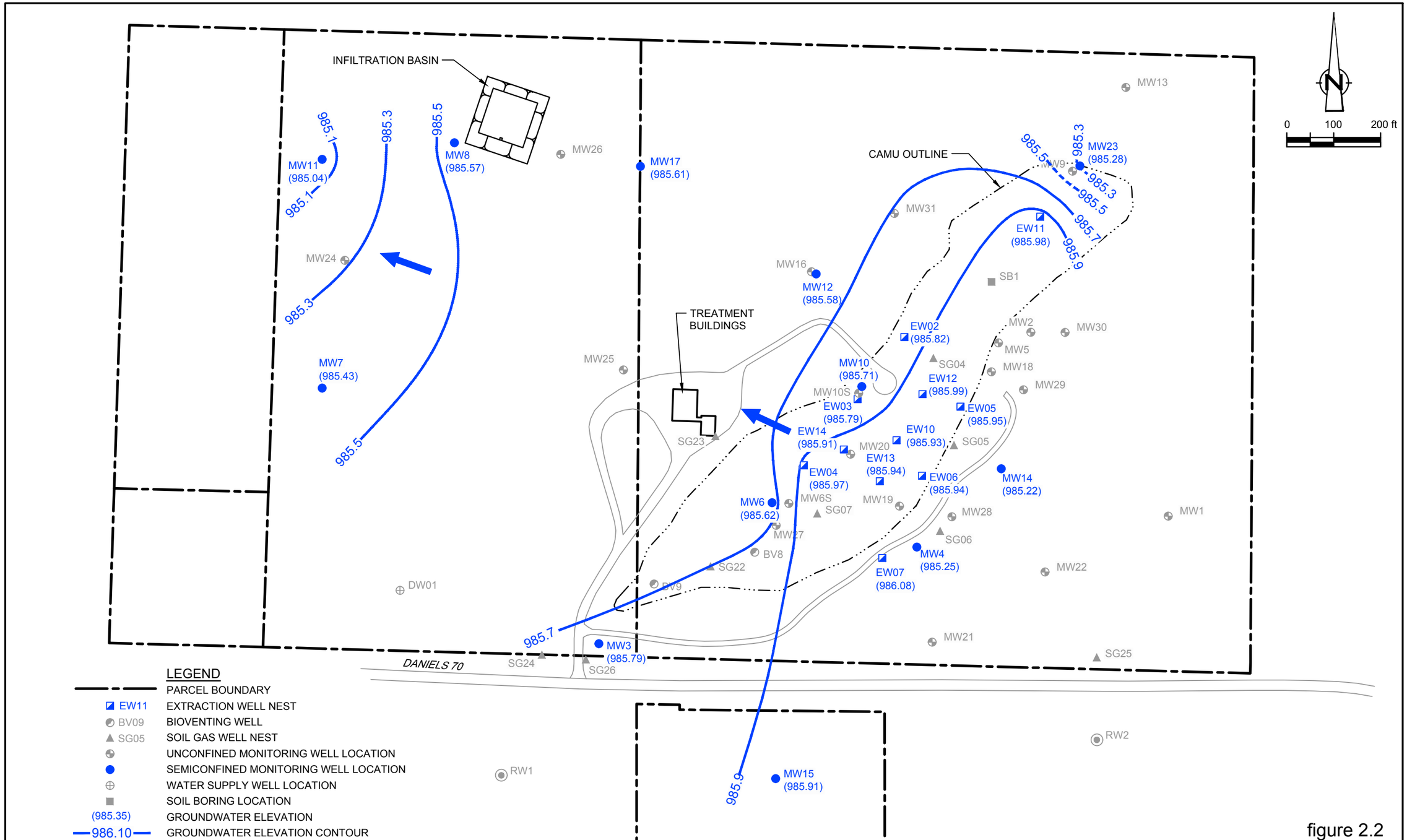
GIS File: I:\GIS\Projects\6-chars\08----\0861--\086165\086165-REPORTS\086165-05(017)\086165-05(017)GIS-SP002.mxd



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

figure 2.1

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



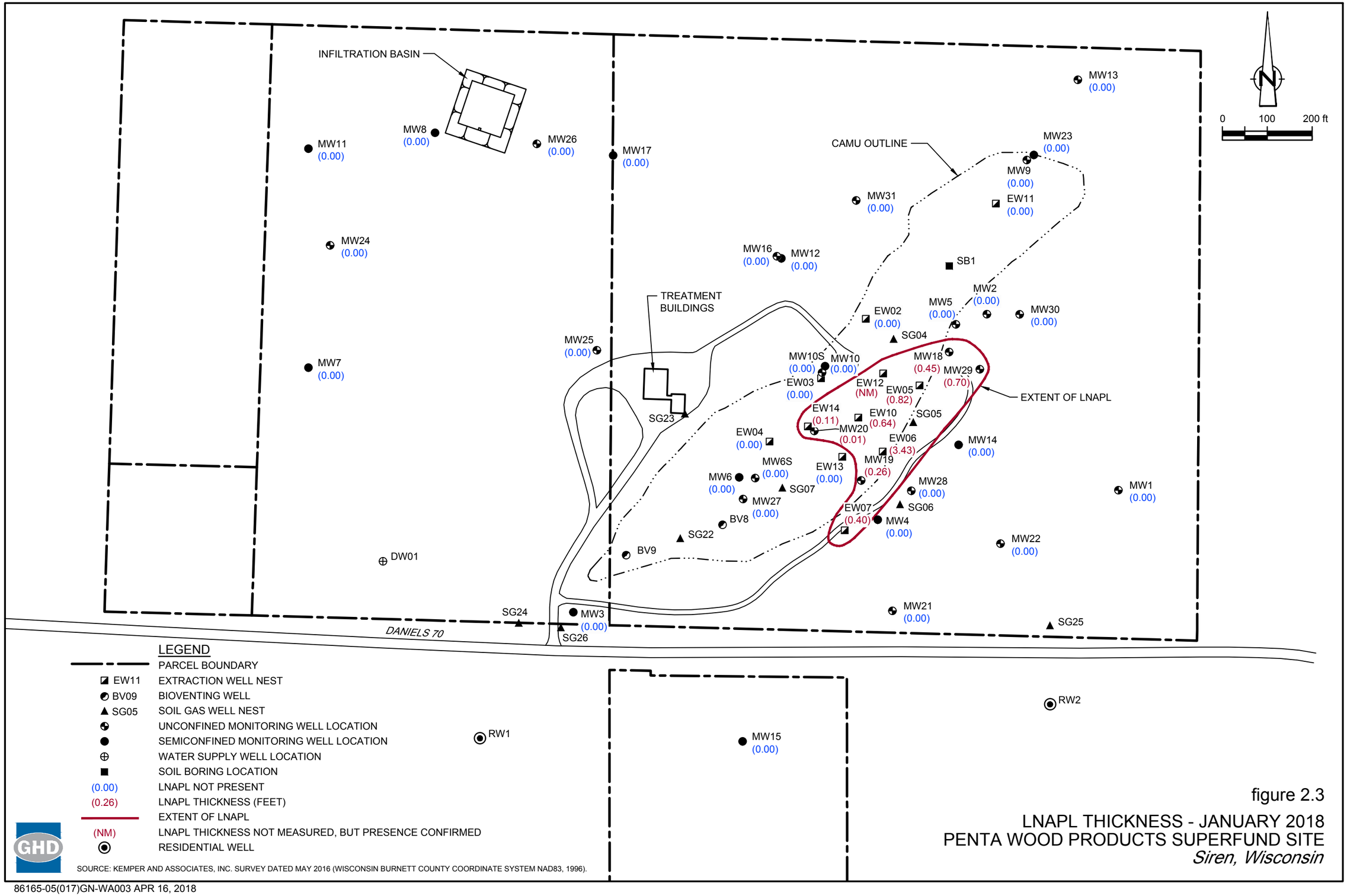
LEGEND

- 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

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

figure 2.2

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



LEGEND

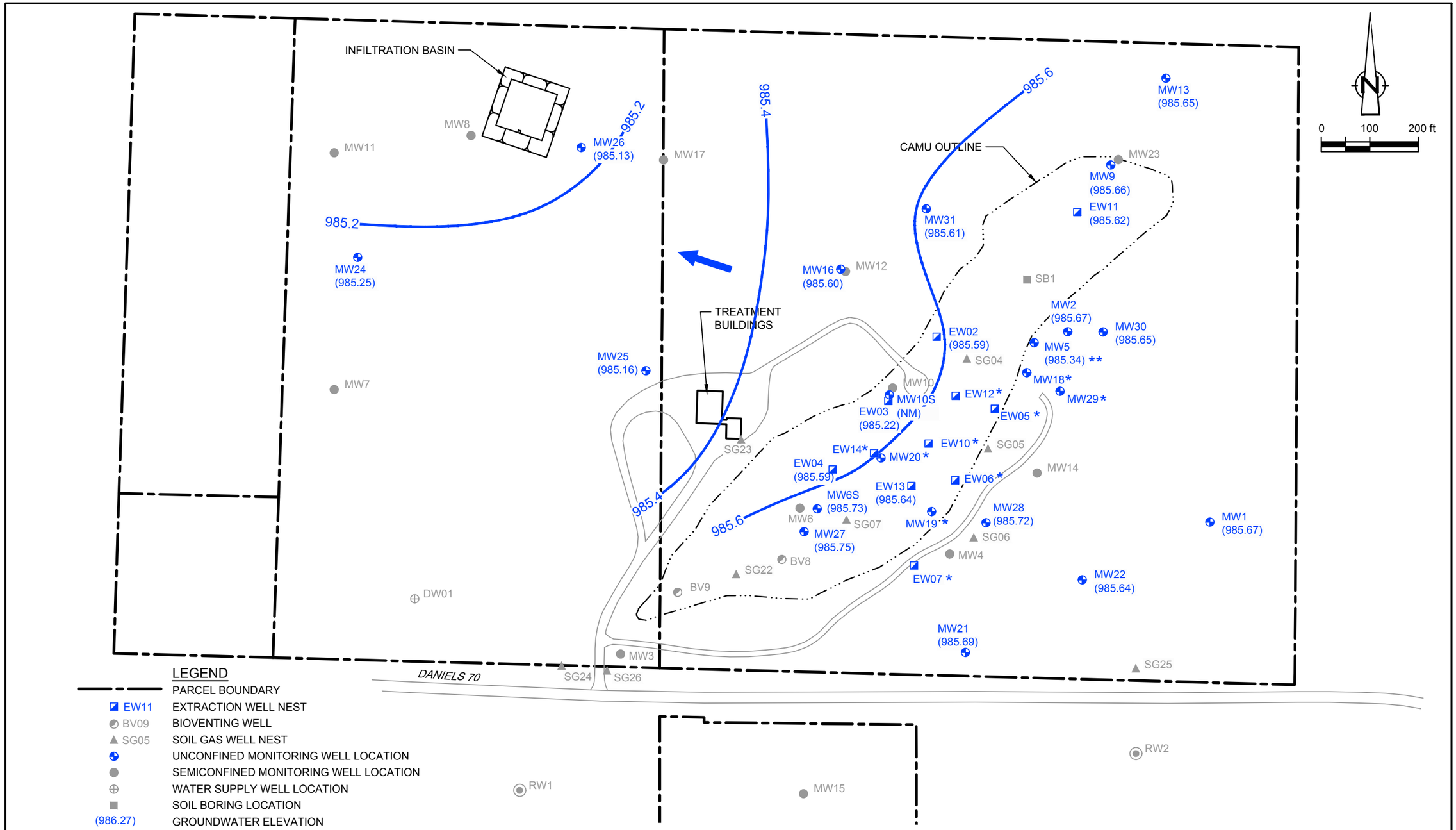
	PARCEL BOUNDARY
EW11	EXTRACTION WELL NEST
BV09	BIOVENTING WELL
SG05	SOIL GAS WELL NEST
	UNCONFINED MONITORING WELL LOCATION
	SEMICONFINED MONITORING WELL LOCATION
	WATER SUPPLY WELL LOCATION
	SOIL BORING LOCATION
(0.00)	LNAPL NOT PRESENT
(0.26)	LNAPL THICKNESS (FEET)
	EXTENT OF LNAPL
(NM)	LNAPL THICKNESS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

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

figure 2.3

LNAPL THICKNESS - JANUARY 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

86165-05(017)GN-WA003 APR 16, 2018



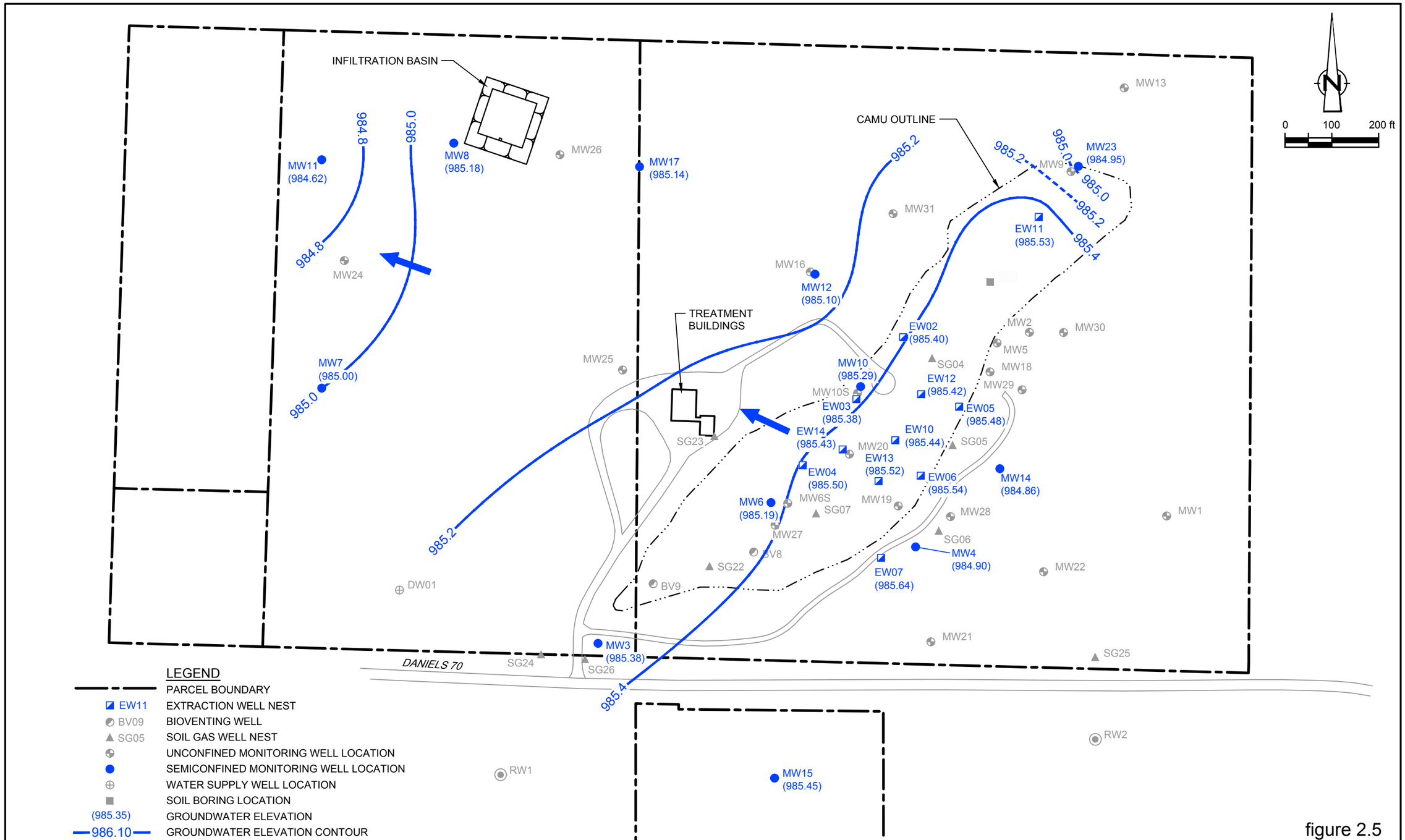
LEGEND

- 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 - MAY 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin



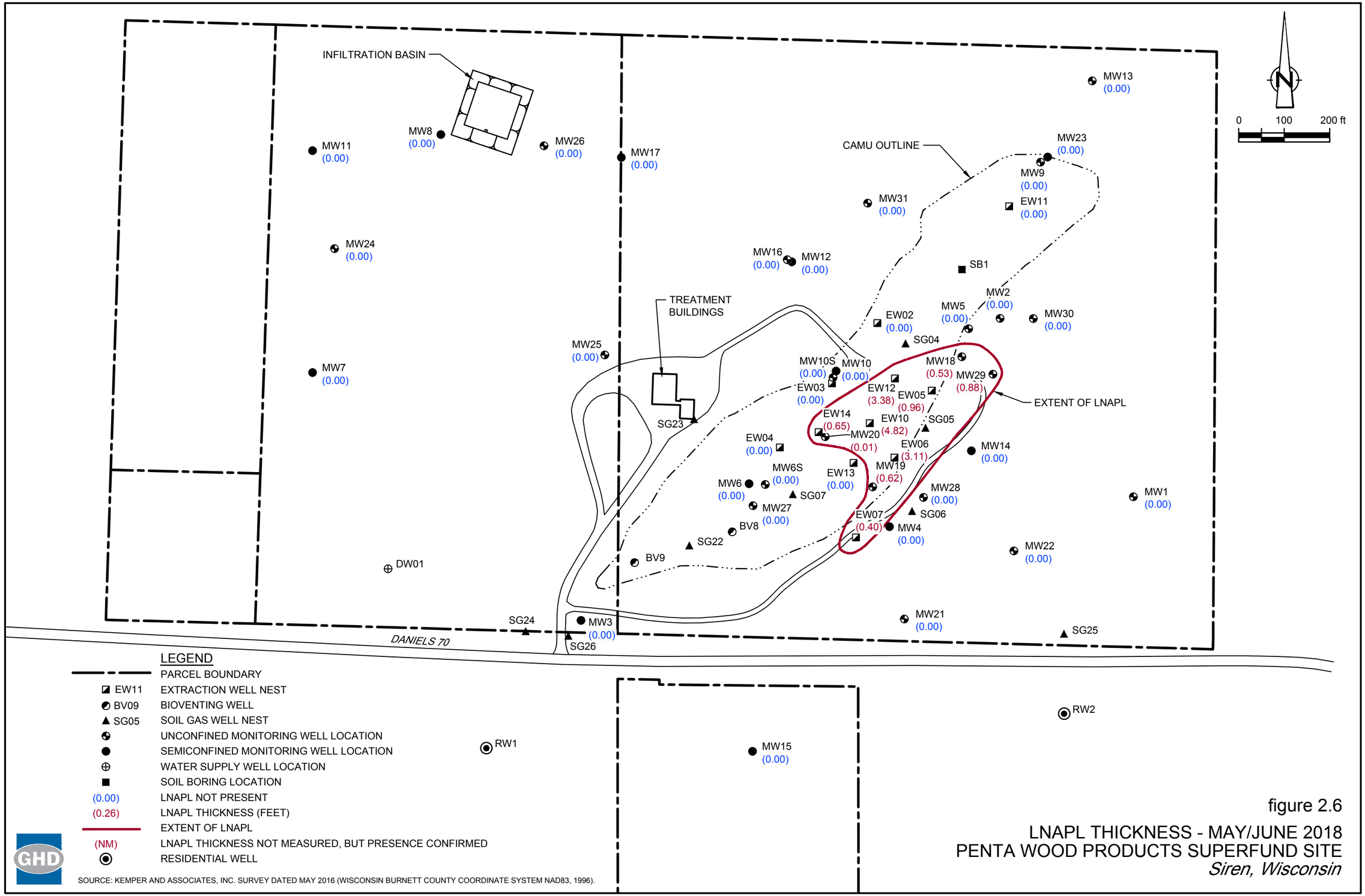
LEGEND

- 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

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

figure 2.5

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



LEGEND

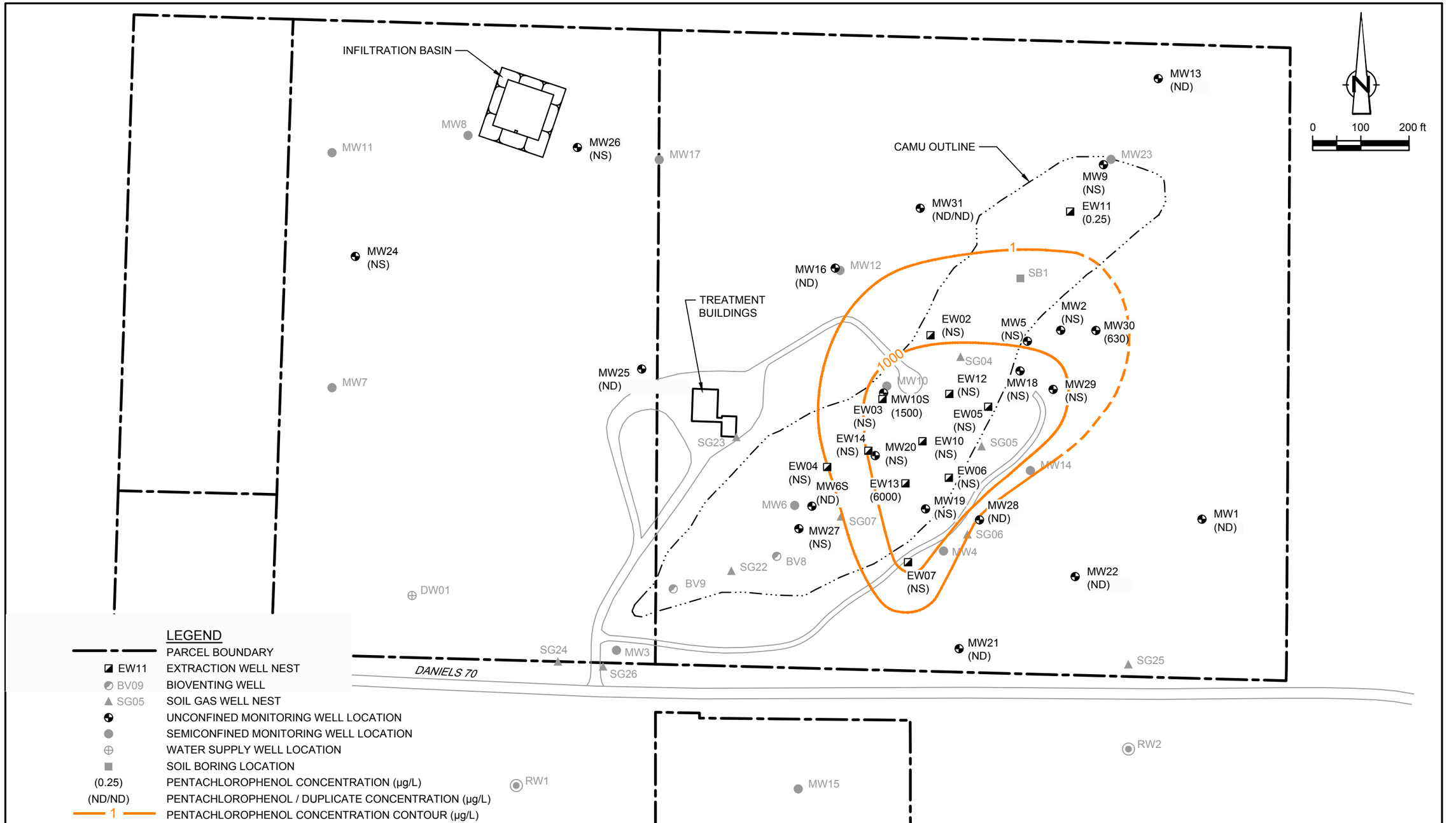
- PARCEL BOUNDARY
- EW11 EXTRACTION WELL NEST
- BV09 BIOVENTING WELL
- SG05 SOIL GAS WELL NEST
- UNCONFINED MONITORING WELL LOCATION
- SEMICONFINED MONITORING WELL LOCATION
- WATER SUPPLY WELL LOCATION
- SOIL BORING LOCATION
- (0.00) LNAPL NOT PRESENT
- (0.26) LNAPL THICKNESS (FEET)
- EXTENT OF LNAPL
- (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 - MAY/JUNE 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

86165-05(017)GN-WA006 JUN 21, 2018



LEGEND

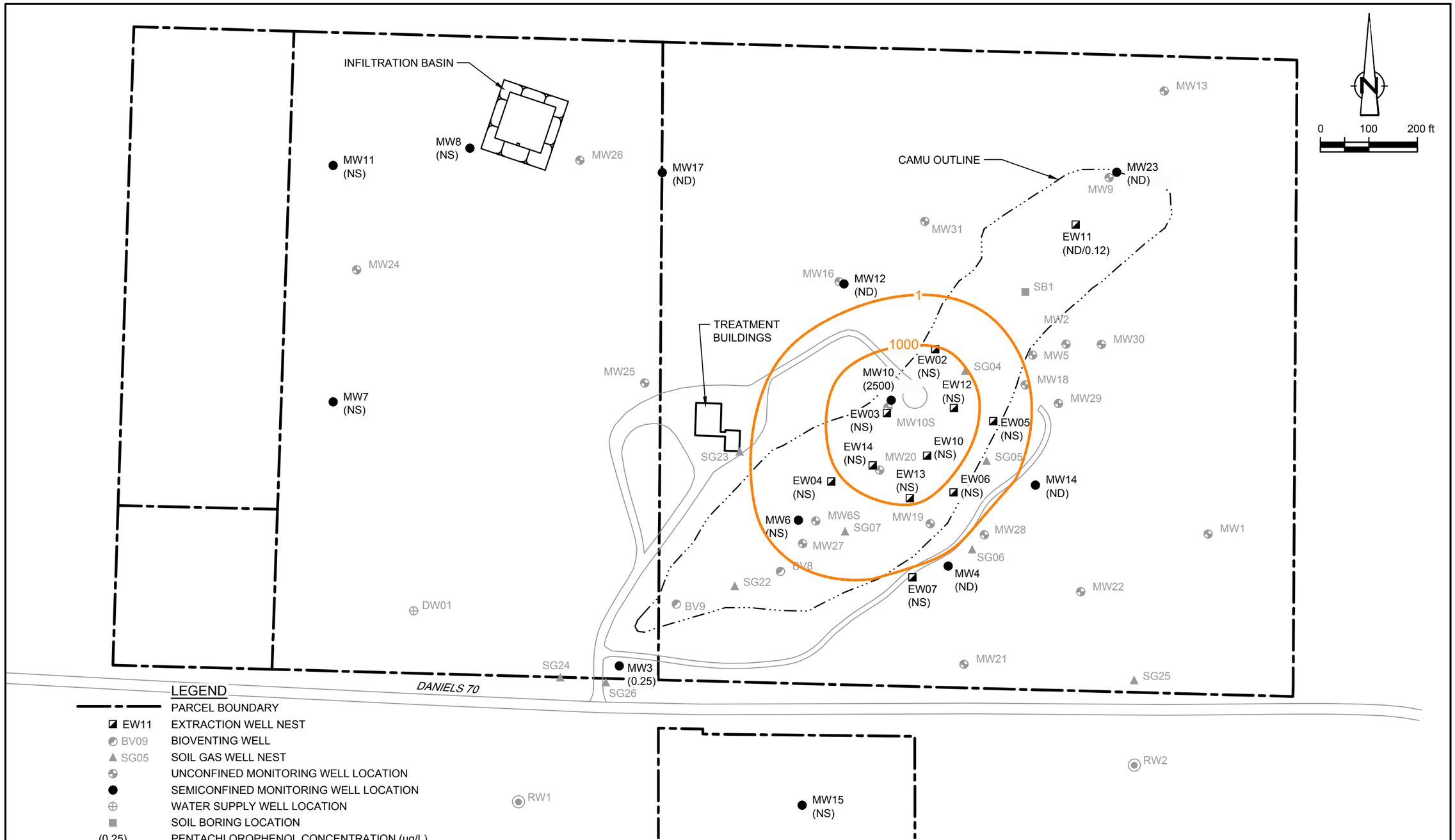
	PARCEL BOUNDARY
EW11	EXTRACTION WELL NEST
BV09	BIOVENTING WELL
SG05	SOIL GAS WELL NEST
	UNCONFINED MONITORING WELL LOCATION
	SEMICONFINED MONITORING WELL LOCATION
	WATER SUPPLY WELL LOCATION
	SOIL BORING LOCATION
(0.25)	PENTACHLOROPHENOL CONCENTRATION (µg/L)
(ND/ND)	PENTACHLOROPHENOL / DUPLICATE CONCENTRATION (µg/L)
1	PENTACHLOROPHENOL CONCENTRATION CONTOUR (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED
J	CONCENTRATION WAS BETWEEN THE LIMIT OF DETECTION AND LIMIT OF QUANTITATION
B	COMPOUND WAS FOUND IN BLANK AND SAMPLE
	RESIDENTIAL WELL

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

figure 2.7

UNCONFINED (UPPER) AQUIFER PENTACHLOROPHENOL CONCENTRATIONS - MAY/JUNE 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

86165-05(017)GN-WA007 JUN 25, 2018

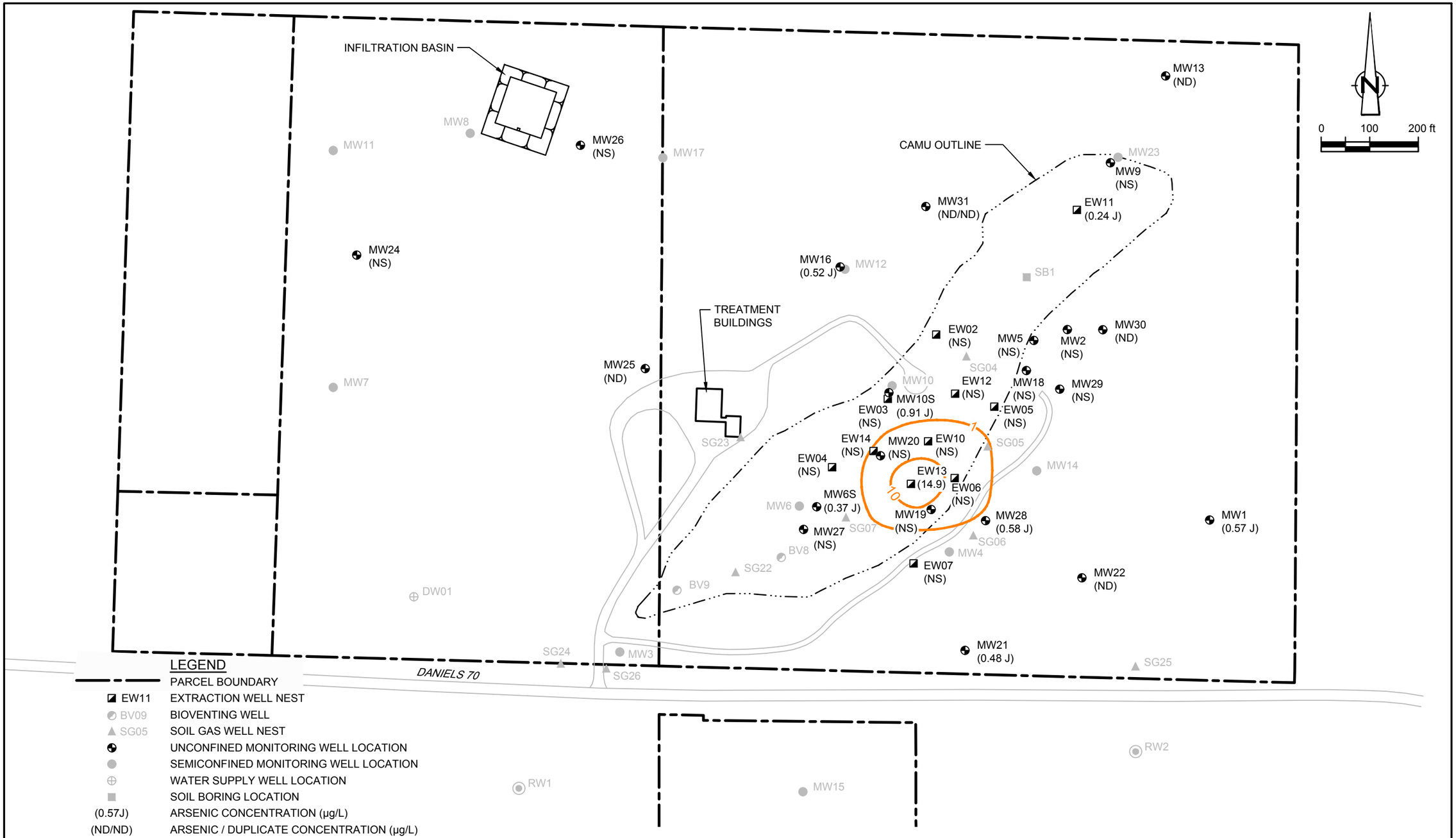


SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

figure 2.8

SEMICONFINED (LOWER) AQUIFER PENTACHLOROPHENOL CONCENTRATIONS - MAY/JUNE 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

86165-05(017)GN-WA008 JUN 25, 2018



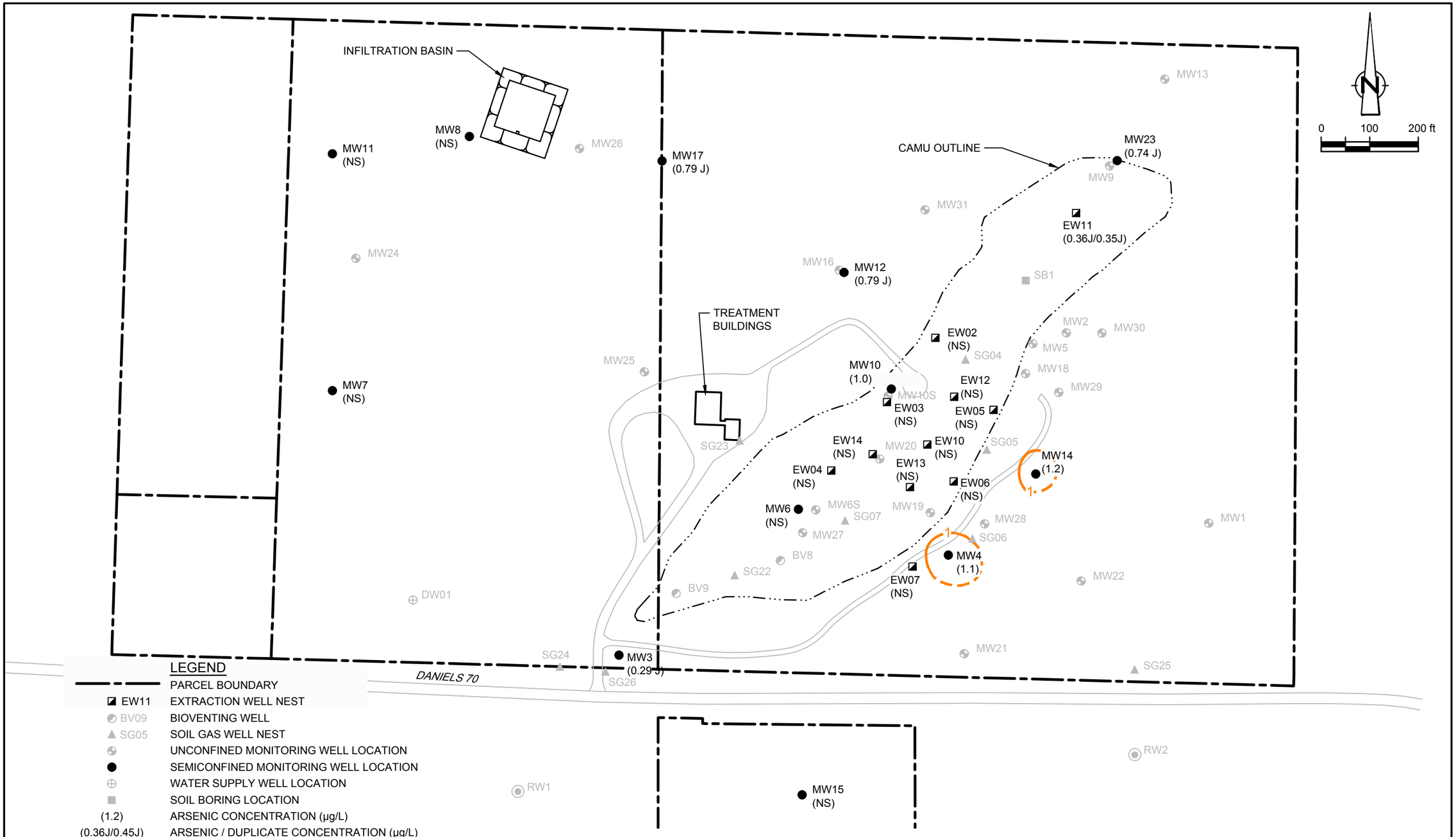
LEGEND

	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
(0.57J)	ARSENIC CONCENTRATION (µg/L)
(ND/ND)	ARSENIC / DUPLICATE CONCENTRATION (µg/L)
1	ARSENIC CONCENTRATION CONTOUR (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED
J	CONCENTRATION WAS BETWEEN THE LIMIT OF DETECTION AND LIMIT OF QUANTITATION
	RESIDENTIAL WELL

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

figure 2.9

UNCONFINED (UPPER) AQUIFER ARSENIC CONCENTRATIONS - MAY/JUNE 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin



LEGEND

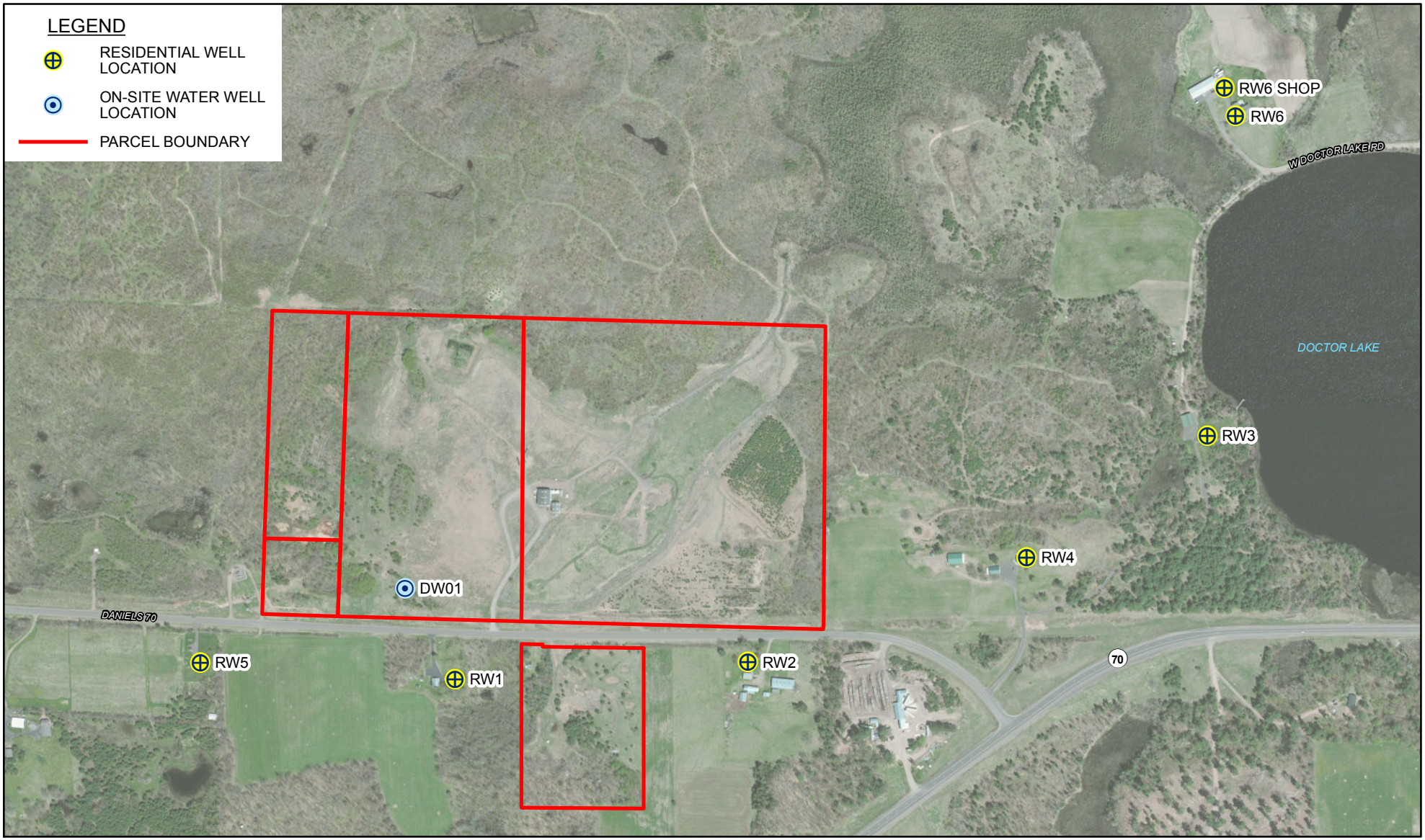
	PARCEL BOUNDARY
EW11	EXTRACTION WELL NEST
BV09	BIOVENTING WELL
SG05	SOIL GAS WELL NEST
	UNCONFINED MONITORING WELL LOCATION
	SEMICONFINED MONITORING WELL LOCATION
	WATER SUPPLY WELL LOCATION
	SOIL BORING LOCATION
(1.2)	ARSENIC CONCENTRATION (µg/L)
(0.36J/0.45J)	ARSENIC / DUPLICATE CONCENTRATION (µg/L)
1	ARSENIC CONCENTRATION CONTOUR (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED
J	CONCENTRATION WAS BETWEEN THE LIMIT OF DETECTION AND LIMIT OF QUANTITATION
	RESIDENTIAL WELL

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

figure 2.10

SEMICONFINED (LOWER) AQUIFER ARSENIC CONCENTRATIONS - MAY/JUNE 2018
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

86165-05(017)GN-WA010 JUN 25, 2018



0 200 400 600 ft

N

GHD

PENTA WOOD PRODUCTS SUPERFUND SITE
SIREN, WISCONSIN
SEMIANNUAL REPORT

086165-05-06
Jul 11, 2018

RESIDENTIAL WELL LOCATIONS

FIGURE 3.1

GIS File: I:\GIS\Projects\6-chars\08----\0861--\086165\086165-REPORTS\086165-05(017)\086165-05(017)GIS-SP003.mxd

Table 2.1

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, 5]
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	

Table 2.1

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, 5]
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: Pentachlorphenol (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.

5 Wells MW2 and MW5 were added to the semiannual groundwater sampling scope in July 2018.

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	1/3/2018	1129.44	143.65	ND	985.79	NA	0.00
MW3	5/24/2018	1129.44	144.06	ND	985.38	NA	0.00
MW4	1/3/2018	1087.74	102.49	ND	985.25	NA	0.00
MW4	5/24/2018	1087.74	102.84	ND	984.90	NA	0.00
MW6	1/3/2018	1109.11	123.49	ND	985.62	NA	0.00
MW6	5/24/2018	1109.11	123.92	ND	985.19	NA	0.00
MW7	1/3/2018	1096.25	110.82	ND	985.43	NA	0.00
MW7	5/24/2018	1096.25	111.25	ND	985.00	NA	0.00
MW8	1/3/2018	1091.13	105.56	ND	985.57	NA	0.00
MW8	5/24/2018	1091.13	105.95	ND	985.18	NA	0.00
MW10	1/3/2018	1089.01	103.30	ND	985.71	NA	0.00
MW10	5/24/2018	1089.01	103.72	ND	985.29	NA	0.00
MW11	1/3/2018	1085.48	100.44	ND	985.04	NA	0.00
MW11	5/24/2018	1085.48	100.86	ND	984.62	NA	0.00
MW12	1/3/2018	1080.91	95.33	ND	985.58	NA	0.00
MW12	5/24/2018	1080.91	95.81	ND	985.10	NA	0.00
MW14	1/3/2018	1078.28	93.06	ND	985.22	NA	0.00
MW14	5/24/2018	1078.28	93.42	ND	984.86	NA	0.00
MW15	1/3/2018	1127.09	141.18	ND	985.91	NA	0.00
MW15	5/24/2018	1127.09	141.64	ND	985.45	NA	0.00
MW17	1/3/2018	1084.43	98.82	ND	985.61	NA	0.00
MW17	5/24/2018	1084.43	99.29	ND	985.14	NA	0.00
MW23	1/3/2018	1017.45	32.17	ND	985.28	NA	0.00
MW23	5/24/2018	1017.45	32.50	ND	984.95	NA	0.00
EW02D	1/3/2018	1083.00	97.18	ND	985.82	NA	0.00
EW02D	5/24/2018	1083.00	97.60	ND	985.40	NA	0.00
EW03D	1/3/2018	1089.48	103.69	ND	985.79	NA	0.00
EW03D	5/24/2018	1089.48	104.10	ND	985.38	NA	0.00
EW04D	1/3/2018	1101.09	115.12	ND	985.97	NA	0.00
EW04D	5/24/2018	1101.09	115.59	ND	985.50	NA	0.00
EW05D	1/3/2018	1076.99	91.04	ND	985.95	NA	0.00
EW05D	5/24/2018	1076.99	91.51	ND	985.48	NA	0.00
EW06D	1/3/2018	1083.39	97.45	ND	985.94	NA	0.00
EW06D	5/24/2018	1083.39	97.85	ND	985.54	NA	0.00
EW07D	1/3/2018	1087.52	101.44	ND	986.08	NA	0.00
EW07D	5/24/2018	1087.52	101.88	ND	985.64	NA	0.00
EW10D	1/3/2018	1088.55	102.62	ND	985.93	NA	0.00
EW10D	5/24/2018	1088.55	103.11	ND	985.44	NA	0.00
EW11D	1/3/2018	1048.19	62.21	ND	985.98	NA	0.00
EW11D	5/24/2018	1048.19	62.66	ND	985.53	NA	0.00
EW12D	1/3/2018	1086.41	100.42	ND	985.99	NA	0.00
EW12D	5/24/2018	1086.41	100.99	ND	985.42	NA	0.00
EW13D	1/3/2018	1092.88	106.94	ND	985.94	NA	0.00
EW13D	5/25/2018	1092.88	107.36	ND	985.52	NA	0.00
EW14D	1/3/2018	1098.28	112.38	ND	985.90	NA	0.00
EW14D	5/24/2018	1098.28	112.85	ND	985.43	NA	0.00

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)							
MW1	1/3/2018	1072.27	86.14	ND	986.13	NA	0.00
MW1	5/24/2018	1072.27	86.60	ND	985.67	NA	0.00
MW2	1/3/2018	1065.03	96.94	ND	968.09	NA	0.00
MW2	5/24/2018	1065.03	79.36	ND	985.67	NA	0.00
MW5	1/3/2018	1071.39	85.62	ND	985.77	NA	0.00
MW5	5/24/2018	1071.39	86.05	ND	985.34	NA	0.00
MW6S	1/3/2018	1108.35	122.26	ND	986.09	NA	0.00
MW6S	5/24/2018	1108.35	122.62	ND	985.73	NA	0.00
MW9	1/3/2018	1019.58	33.49	ND	986.09	NA	0.00
MW9	5/24/2018	1019.58	33.92	ND	985.66	NA	0.00
MW10S	1/3/2018	1090.12	104.27	ND	985.85	NA	0.00
MW10S	6/1/2018	1090.12	104.86	ND	985.26	NA	0.00
MW13	1/3/2018	1005.81	19.73	ND	986.08	NA	0.00
MW13	5/24/2018	1005.81	20.16	ND	985.65	NA	0.00
MW16	1/3/2018	1081.95	95.83	ND	986.12	NA	0.00
MW16	5/24/2018	1081.95	96.35	ND	985.60	NA	0.00
MW18	1/3/2018	1071.96	86.33	85.88	985.63	986.08	0.45
MW18	5/25/2018	1071.96	86.82	86.29	985.14	985.67	0.53
MW19	1/3/2018	1087.96	102.45	102.19	985.51	985.77	0.26
MW19	5/25/2018	1087.96	103.20	102.58	984.76	985.38	0.62
MW20	1/3/2018	1098.16	112.10	112.09	986.06	986.07	0.01
MW20	5/25/2018	1098.16	112.52	112.51	985.64	985.65	0.01
MW21	1/3/2018	1095.82	109.66	ND	986.16	NA	0.00
MW21	5/24/2018	1095.82	110.13	ND	985.69	NA	0.00
MW22	1/3/2018	1084.65	98.55	ND	986.10	NA	0.00
MW22	5/24/2018	1084.65	99.01	ND	985.64	NA	0.00
MW24	1/3/2018	1084.04	98.32	ND	985.72	NA	0.00
MW24	5/24/2018	1084.04	98.79	ND	985.25	NA	0.00
MW25	1/3/2018	1095.25	109.50	ND	985.75	NA	0.00
MW25	5/24/2018	1095.25	110.09	ND	985.16	NA	0.00
MW26	1/3/2018	1086.87	101.30	ND	985.57	NA	0.00
MW26	5/24/2018	1086.87	101.74	ND	985.13	NA	0.00
MW27	1/3/2018	1110.96	124.70	ND	986.26	NA	0.00
MW27	5/24/2018	1110.96	125.21	ND	985.75	NA	0.00
MW28	1/3/2018	1083.52	97.30	ND	986.22	NA	0.00
MW28	5/24/2018	1083.52	97.80	ND	985.72	NA	0.00
MW29	1/3/2018	1070.24	84.80	84.10	985.44	986.14	0.70
MW29	5/24/2018	1070.24	85.40	84.52	984.84	985.72	0.88
MW30	1/3/2018	1048.98	62.86	ND	986.12	NA	0.00
MW30	5/24/2018	1048.98	63.33	ND	985.65	NA	0.00
MW31	1/3/2018	1076.34	90.22	ND	986.12	NA	0.00
MW31	5/24/2018	1076.34	90.73	ND	985.61	NA	0.00
EW02S	1/3/2018	1082.25	96.13	ND	986.12	NA	0.00
EW02S	5/24/2018	1082.25	96.66	ND	985.59	NA	0.00
EW03S	1/3/2018	1088.66	102.56	ND	986.10	NA	0.00
EW03S	5/24/2018	1088.66	103.44	ND	985.22	NA	0.00

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	1/3/2018	1101.01	114.90	ND	986.11	NA	0.00
EW04S	5/24/2018	1101.01	115.42	ND	985.59	NA	0.00
EW05S	1/3/2018	1077.04	91.82	91.00	985.22	986.04	0.82
EW05S	5/25/2018	1077.04	92.37	91.41	984.67	985.63	0.96
EW06S	1/3/2018	1083.61	101.05	97.62	982.56	985.99	3.43
EW06S	5/25/2018	1083.61	101.10	97.99	982.51	985.62	3.11
EW07S	1/3/2018	1087.49	101.89	101.49	985.60	986.00	0.40
EW07S	5/25/2018	1087.49	102.29	101.89	985.20	985.60	0.40
EW10S	1/3/2018	1088.72	103.36	102.72	985.36	986.00	0.64
EW10S	5/25/2018	1088.72	107.90	103.08	980.82	985.64	4.82
EW11S	1/3/2018	1047.23	61.18	ND	986.05	NA	0.00
EW11S	5/24/2018	1047.23	61.61	ND	985.62	NA	0.00
EW12S	1/3/2018	1086.31	NM	100.35	NM	985.96	NA
EW12S	5/25/2018	1086.31	104.10	100.72	982.21	985.59	3.38
EW13S	1/3/2018	1092.88	106.80	ND	986.08	NA	0.00
EW13S	5/24/2018	1092.88	107.24	ND	985.64	NA	0.00
EW14S	1/3/2018	1098.32	112.61	112.50	985.71	985.82	0.11
EW14S	5/25/2018	1098.32	113.53	112.88	984.79	985.44	0.65

Notes:

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

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)
MW13	5/29/2018	W-180529-PS-01	10:14	0.2	14.87	137	6.30	9.19	5.69	216	-	-
			10:19	1.5	12.41	126	1.40	6.97	5.51	238	-	-
			10:24	2.7	11.56	128	1.00	6.56	5.27	260	-	-
			10:29	4.0	11.50	128	0.70	6.37	5.22	267	-	-
			10:34	5.3	11.39	129	0.60	6.00	5.24	270	0.5	ND
MW31	5/29/2018	W-180529-PS-02 (MS/MSD)	11:25	0.2	14.22	273	5.20	11.29	6.71	167	-	-
		W-180529-PS-03 (duplicate)	11:29	1.3	14.64	274	4.40	9.33	6.89	178	-	-
			11:34	2.5	13.82	279	2.50	9.42	6.87	189	-	-
			11:41	4.2	12.93	282	1.30	10.05	6.78	202	-	-
			11:46	5.5	12.88	282	0.70	9.88	6.74	209	-	-
			11:51	6.7	12.84	281	0.40	9.75	6.72	211	0.2	ND
MW22	5/29/2018	W-180529-PS-04	13:14	3.0	16.00	233	11.90	6.82	7.24	183	2.7	ND
MW1	5/30/2018	W-180530-PS-05	8:41	0.1	11.28	211	4.90	14.32	7.79	169	-	-
			8:48	1.0	10.83	202	1.20	12.83	7.55	178	-	-
			8:53	1.5	10.71	201	0.70	12.82	7.50	181	-	-
			9:05	3.0	11.88	196	1.00	14.96	7.53	185	-	-
			9:09	3.4	11.96	194	0.70	14.21	7.51	187	ND	ND
MW21	5/30/2018	W-180530-PS-06	10:07	0.1	11.20	355	23.10	13.38	7.53	192	-	-
			10:14	0.9	10.81	359	4.40	13.00	7.23	196	-	-
			10:19	1.5	10.71	359	2.80	12.99	7.12	193	-	-
			10:24	2.1	10.67	360	1.70	13.07	7.06	189	ND	ND
MW28	5/30/2018	W-180530-PS-07	11:50	0.2	12.03	317	73.70	19.59	7.67	163	-	-
			11:55	1.2	12.78	319	22.50	10.91	7.84	110	-	-
			12:00	2.2	13.84	323	9.50	10.97	7.86	83	-	-
			12:05	3.2	14.19	325	5.50	11.06	7.87	81	-	-
			12:11	4.3	14.61	327	3.40	11.17	7.87	82	ND	ND

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	5/30/2018	W-180530-PS-09	13:42	0.1	14.13	414	0.70	15.75	7.84	166	-	-
			13:48	0.9	13.89	490	1.10	6.86	7.57	127	-	-
			13:53	1.7	13.87	518	0.80	4.11	7.46	95	-	-
			13:57	2.3	13.08	541	0.50	2.95	7.43	87	-	-
			14:01	2.9	13.04	554	0.40	2.19	7.39	85	-	-
			14:05	3.5	13.02	561	0.30	1.92	7.36	84	-	-
			14:09	4.1	12.98	563	0.30	1.72	7.35	85	-	-
			14:13	4.7	13.38	560	0.30	1.80	7.36	86	ND	ND
MW16	5/30/2018	W-180530-PS-10	14:30	3.0	16.94	116	10.80	8.85	7.59	142	ND	ND
MW17	5/31/2018	W-180531-PS-11	7:53	0.2	12.56	610	0.50	15.51	7.95	174	-	-
			7:59	1.9	12.72	645	0.60	7.68	7.71	120	-	-
			8:04	3.0	13.32	651	0.40	7.31	7.67	86	-	-
			8:08	4.2	13.40	651	0.30	7.14	7.67	87	-	-
			8:13	5.3	13.38	652	0.20	7.08	7.67	90	ND	ND
MW25	5/31/2018	W-180531-PS-12	8:37	0.2	11.92	298	39.20	17.72	7.76	149	-	-
			8:42	1.4	11.45	299	16.40	14.03	7.31	169	-	-
			8:47	2.5	11.42	300	3.90	13.84	7.21	179	-	-
			8:51	3.7	11.37	300	1.50	13.78	7.17	185	-	-
			8:56	4.9	11.38	300	0.80	13.69	7.15	191	ND	ND
MW30	5/31/2018	W-180531-PS-13	9:46	0.2	13.07	169	32.70	3.18	7.37	49	-	-
			9:51	1.6	12.27	166	12.30	0.09	6.91	47	-	-
			9:55	2.5	12.23	163	5.70	0.19	6.76	78	-	-
			9:59	3.7	12.14	163	4.30	0.25	6.70	93	-	-
			10:03	4.7	12.15	162	3.00	0.31	6.66	102	-	-
			10:07	5.5	12.16	162	2.20	0.37	6.64	108	ND	ND
MW14	5/31/2018	W-180531-PS-14	10:54	0.2	16.33	213	4.30	1.18	7.39	63	-	-
			10:58	1.5	12.86	309	5.40	4.85	7.92	70	-	-
			11:02	2.5	12.57	320	1.10	5.14	8.03	84	-	-
			11:07	3.5	12.51	322	0.80	5.33	8.05	92	-	-
			11:11	4.5	12.53	323	0.80	5.32	8.05	97	ND	ND

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	5/31/2018	W-180531-PS-15	11:53	0.2	15.85	235	0.40	0.00	8.81	-292	-	-
			12:00	1.9	15.64	238	0.50	0.00	8.84	-298	-	-
			12:05	3.1	15.21	241	1.00	2.90	8.81	-207	-	-
			12:10	4.5	16.02	243	1.80	0.00	8.84	-292	-	-
			12:15	5.5	15.45	238	1.90	0.00	8.86	-300	0.8	ND
EW11D	5/31/2018	W-180531-PS-16	13:15	0.2	19.68	479	357.00	14.50	8.21	130	-	-
		W-180531-PS-17 (duplicate)	13:19	1.4	14.77	530	130.00	4.72	7.63	-1	-	-
			13:24	2.6	13.92	528	93.80	4.14	7.44	-63	-	-
			13:29	3.8	11.59	542	122.00	4.27	7.27	-84	-	-
			13:33	4.9	11.35	535	80.40	3.54	7.14	-88	-	-
			13:38	6.0	11.49	528	36.80	3.16	7.06	-90	-	-
			13:42	7.1	11.53	529	34.90	3.13	7.03	-91	-	-
			13:47	8.3	11.85	530	34.00	3.18	7.14	-89	8.4	ND
MW3	6/1/2018	W-180601-PS-19	7:30	0.2	10.39	597	82.00	3.76	7.19	-87	-	-
			7:35	1.5	10.62	610	23.00	13.53	7.30	-26	-	-
			7:40	2.8	10.64	614	12.40	17.68	7.33	2	-	-
			7:44	4.0	10.67	617	7.80	19.66	7.33	24	-	-
			7:49	5.2	10.69	618	4.90	21.07	7.33	40	-	-
			7:54	6.3	10.70	620	3.00	22.85	7.34	38	0.8	ND
EW13S	6/1/2018	W-180601-PS-21	15:30	0.2	12.47	734	0.50	16.73	6.72	-116	-	-
			15:35	1.5	13.11	822	84.30	12.10	6.53	-131	-	-
			15:40	2.7	13.52	661	1000.00	15.11	6.84	-117	8.5	ND
MW23	6/1/2018	W-180601-PS-20	8:39	0.2	9.29	549	7.80	16.63	7.77	124	-	-
			8:43	1.5	9.34	551	2.50	19.77	7.98	116	-	-
			8:48	2.5	9.62	551	0.00	20.21	8.00	108	-	-
			8:53	3.8	9.71	551	0.00	20.27	8.00	105	0.5	ND

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)
EW11S	6/1/2018	W-180601-PS-22	10:02	0.2	13.68	400	22.60	11.77	7.91	141	-	-
			10:07	1.3	12.47	402	11.20	11.17	7.18	156	-	-
			10:11	2.4	12.10	387	8.50	11.81	6.95	145	-	-
			10:15	3.5	12.15	373	6.70	11.75	6.81	119	-	-
			10:20	4.6	12.08	354	4.90	11.08	6.70	100	-	-
			10:25	5.8	12.31	345	4.00	10.46	6.61	93	-	-
			10:29	6.9	12.49	350	3.30	11.60	6.53	86	2.4	ND
MW10	6/1/2018	W-180601-PS-23	11:06	0.2	11.66	476	3.70	5.80	7.32	-141	-	-
			11:11	1.6	12.61	467	5.00	0.00	7.55	-142	-	-
			11:16	2.8	12.79	455	1.90	0.00	7.58	-143	-	-
			11:21	3.8	12.81	458	1.00	0.00	7.59	-139	1.5	ND
MW10S	6/1/2018	W-180601-PS-24	11:42	0.2	15.01	950	65.90	11.79	6.67	3	-	-
			11:47	1.4	19.68	993	9.00	0.00	6.47	-5	-	-
			11:51	2.6	13.48	938	1.70	0.00	6.51	8	-	-
			11:56	3.7	14.03	933	1.20	0.00	6.50	10	-	-
			12:00	4.8	14.10	929	1.20	0.00	6.50	10	1.5	ND
MW6S	6/1/2018	W-180601-PS-25	12:43	0.2	19.80	600	47.00	13.50	6.76	151	0.8	ND

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 Idendification	Sample Date	Alkalinity, total (as CaCO3)	Chloride[3]	Hardness, carbonate	Nitrate (as N)	Sulfate[3]	TOC averages	Methane (dissolved)	Arsenic (dissolved)	Copper (dissolved)	Iron (dissolved)	Manganese (dissolved)	Zinc (dissolved)	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)
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
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Semiconfined Aquifer (Lower)																				
EW11D	W-180531-PS-16	5/31/2018	137	9.0	202	**13.0**	49.5 B	3.4	2.5	0.36 J	0.87 J	**2600**	**124**	10.2 J	0.091 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U
EW11D duplicate	W-180531-PS-17	5/31/2018	137	8.9	204	**13.4**	51.7 B	3.4	2.4	0.35 J	1.2 J	**2690**	**126**	10.2 J	0.12	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW3	W-180601-PS-19	6/1/2018	698	31.5	246	1.9 B	10.8	1.2	0.17 U	0.29 J	1.7 J	50.6 J	9.4	6.9 U	0.25	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW4	W-180531-PS-15	5/31/2018	76.8	47.9	145	0.096 J	14.1	0.85	300	1.1	0.50 U	149	38.6	6.9 U	0.095 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW10	W-180601-PS-23	6/1/2018	470	27.6	197	0.084 J	19.9	2.1	23	1.0	3.6 B	**796**	**951**	6.9 U	**2500**	24	0.15 U	1.4	1.5	10
MW12	W-180530-PS-09	5/30/2018	183	10.5	257	0.58	76.4 B	1.6	0.17 U	0.79 J	1.3 J	46.7 U	**216**	6.9 U	0.087 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U
MW14	W-180531-PS-14	5/31/2018	585	16.4	143	1.7	6.3 B	0.71 J	0.17 U	1.2	0.79 J	46.7 U	3.1	6.9 U	0.093 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U
MW17	W-180531-PS-11	5/31/2018	194	14.9	311	3.3	98.2 B	0.77 J	0.17 U	0.79 J	1.7 J	46.7 U	0.79 U	6.9 U	0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW23	W-180601-PS-20	6/1/2018	194	42.3	256	2.0 B	8.8	0.81 J	0.17 U	0.74 J	0.90 J	46.7 U	0.79 U	6.9 U	0.094 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
Unconfined Aquifer (Upper)																				
EW11S	W-180601-PS-22	6/1/2018	53.5	10.6	127	**13.2 B**	36.3	3.3	0.17 U	0.24 J	2.7 B	242	**74.7**	6.9 U	0.25	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U
EW13S	W-180601-PS-21	6/1/2018	271	34.2	253	0.085 J	13.6	33.8	24	**14.9**	3.6 B	**13400**	**2540**	6.9 U	**6000**	19	0.15 U	0.93	1.0	13
MW1	W-180530-PS-05	5/30/2018	73.2	9.5	84.1	1.2	5.0 B	0.67 J	0.17 U	0.57 J	0.88 J	46.7 U	0.79 U	6.9 U	0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW6S	W-180601-PS-25	6/1/2018	250	14.1	320	**11.6 B**	11.9	2.3	0.17 U	0.37 J	3.1 B	58.6 J	4.7	6.9 U	0.095 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U
MW10S	W-180601-PS-24	6/1/2018	322	69.8	456	0.083 J	39.7	5.5	0.17 U	0.91 J	5.2 B	**1010**	**2880**	6.9 U	**1500**	11	0.15 U	0.42 J	0.22 J	5.2
MW13	W-180529-PS-01	5/29/2018	109	1.2	52.7	0.46	3.4	2.1	0.17 U	0.23 U	1.9 J	**500**	4.0	6.9 U	0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW16	W-180530-PS-10	5/30/2018	34.1	5.0	34.9	0.71	4.0 B	1.5	0.17 U	0.52 J	2.2	46.7 U	2.3 J	6.9 U	0.090 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U
MW21	W-180530-PS-06	5/30/2018	32.9	74.7	65.6	1.7	6.6 B	0.89 J	0.17 U	0.48 J	1.4 J	46.7 U	0.84 J	6.9 U	0.089 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW22	W-180529-PS-04	5/29/2018	65.3	3.6	75.5	1.5	4.0	0.79 J	0.17 U	0.23 U	0.95 J	46.7 U	1.3 J	6.9 U	0.089 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U
MW25	W-180531-PS-12	5/31/2018	112	12.5	123	2.4	6.0 B	1.1	0.17 U	0.28 J	1.3 J	46.7 U	0.79 U	6.9 U	0.086 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U
MW28	W-180530-PS-07	5/30/2018	104	26.1	133	2.0	5.4 B	0.78 J	0.17 U	0.58 J	1.2 J	46.7 U	0.79 U	6.9 U	0.086 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U
MW30	W-180531-PS-13	5/31/2018	67.3	0.66	69.1	1.6	3.7 B	1.7	0.17 U	0.23 U	1.1 J	46.7 U	23.3	6.9 U	**630**	1.7	0.15 U	0.18 U	0.15 U	0.39 J
MW31	W-180529-PS-02	5/29/2018	137	1.0	140	0.88	2.3	0.75 J	0.17 U	0.23 U	0.81 J	46.7 U	0.79 U	7.4 J	0.094 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
MW31 duplicate	W-180529-PS-03	5/29/2018	136	1.0	135.0	0.87	2.3	0.67 J	0.17 U	0.23 U	0.60 J	46.7 U	0.79 U	6.9 U	0.086 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U

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
bold - Concentration exceeds the ES
shaded - 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)
		ES[1]	1	100	5	700	800	2000
		PAL[2]	0.1	10	0.5	140	160	400
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
DW01	R-180605-PS-10	6/5/2018	0.085 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
RW1	R-180605-PS-11	6/5/2018	0.086 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U
RW5	R-180417-PS-01	4/17/2018	0.011 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U
RW5 (Dup)	R-180417-PS-02	4/17/2018	0.011 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U
RW2	R-180417-PS-03	4/17/2018	0.011 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U
RW4	R-180417-PS-05	4/17/2018	0.011 U	0.28 U	0.15 U	0.18 U	0.15 U	0.22 U
RW3	R-180417-PS-06	4/17/2018	0.011 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U
RW6	R-180417-PS-07	4/17/2018	0.011 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U
RW6 Shop	R-180417-PS-08	4/17/2018	0.011 U	0.25 U	0.15 U	0.18 U	1.5	0.22 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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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	9/24/03	N2	0.5 U		1 U		1 U		50 UJ			5 U		40															
DW01	5/4/04	N	10.0 U		0.243 J		61.5 R		194 R	27300		108 R		2710 R	0.102 UB	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	5/4/04	N2			0.280 J		49.5 R		29.2 R			58.0 R		2590 R															
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		1.0 UJ		140 J		50 UJ			4.0 UJ		1900 J	0.039 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		1.0 UJ		100		50 UJ			15 J		1500 J	0.11 U	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		1.0 UJ		100		100 UJ			10 UB		620 J	0.074 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		0.63 J		89		100 UJ			2.4 J		1100	0.093 UJ	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		2 UJ		205 J		642 J	33000 J		4.6 J		81.2 J	0.1 U	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 UH	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	0.060 UJ	0.24 U	0.23 U	0.22 U	0.43 U									
DW01	4/21/15	N													0.023 J	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	10/15/15	FD													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	10/15/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	4/5/16	N													0.095 Jp	0.14 J	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	4/5/16	FD													0.097 Jp	0.062 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	4/18/17	N													0.020 J	0.063 U	0.29 JB	0.26 U	0.23 U	0.24 U									
DW01	4/18/17	FD													0.022 J	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U									
DW01	10/20/17	N													0.046 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U									
DW01	10/20/17	FD													0.046 U	0.27 U	0.15 U	0.18 U	0.15 U	0.22 U									
DW01	6/5/18	N													0.085 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U									
EW02D	4/14/16	N	0.15 J	0.49 J		3.8		299			384		46.7		1 U	1.7	0.35 U	0.25 U	0.23 U	0.52 U		55	12.1		70.6	0.7	8.7		4.8
EW02S	4/14/16	N	0.094 J	0.49 U		1.4 J		50.2 J			39.3		7.3 U		0.1 U	2.5	0.35 U	0.25 U	0.23 U	0.52 U		30	10.5		41.2	1	7		2.7
EW03D	4/18/16	N	1.3	2.7 J		9.8		12500 B			1780		398		0.071 J	2.4	0.35 U	0.33 J	0.23 U	3.6		184	13.4		169	0.035 UH	25.6		10
EW03S	4/18/16	N	0.15 J	0.53 J		10.8		1050 B			3530		7.3 U		0.1 U	12	0.70 U	0.50 U	0.46 U	5.2		88	73.8		220	0.29 H	39.1		59.1
EW04D	4/18/16	N	0.33 J	0.49 U		2.2		3060 B			316		172		0.05 U	0.16 J	0.35 U	0.25 U	0.23 U	0.52 U		129	16.5		131	1.9	6		5.3
EW04S	4/18/16	N	0.12 J	0.49 U		2.4		567 B			385		7.3 U		0.23	0.25	0.35 U	0.25 U	0.23 U	0.52 U		81	9.9		98	0.92	8.1		7.2
EW05D	4/20/16	N	0.44 J	2.7 J		8.6		8430			1980		372		0.04	19	0.35 U	0.79 J	0.95 J	6.7		145 B	14.4		171	0.035 U	17		36.7
EW07D	4/12/16	N	0.59	0.49 U		1.1 J		122			210		7.3 U		0.1 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		127	23.7		174	6.6 H	8.4		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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
EW10D	4/20/16	N	1.1	6.5		10.3		3350			2200		81		0.28	19	0.35 U	1.4	1.8	12		135 B	25.7 F1		180	0.057 JF1	21.8 F1		41.8
EW10D	4/20/16	FD	1.3	7.6		12.1		3720			2170		114		0.24	19	0.35 U	1.3	1.9	12		136 B	23.9		184	0.060 J	20.3		41
EW10D	4/20/16	RB		0.49 U		0.89 J		16.0 U			1.1 U		7.3 U		0.134 UB	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U									
EW11D	4/14/16	N	0.080 U	0.49 U		1.1 J		657			22.6		46.4		0.140 UB	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		187	12.7		282	2	155		1
EW11D	4/14/16	FD	0.080 J	0.49 U		0.75 U		825			27.4		55.9		1.51	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		190	12.8		276	2	198		1.2
EW11D	7/19/16	N	1.1	0.49 U		2.7 B		292			54.5		50		0.201	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		151	9.1	242		2.2	112 F1	1.9	
EW11D	10/10/16	N	3.2	0.35 U		0.67 JB		793 B			23.6 B		6.2 U		8.4	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		190	13.6	272		2.7	159	1.0 B	
EW11D	1/19/17	N	8.9	0.35 U		0.51 JB		897 B			40.4 B		10.8 J		0.15	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		168	12.2	70		3.3 H	129	1.9	
EW11D	4/19/17	N	35	5.0 U		0.58 J		2930 B			129 B		19.0 J		0.13	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	0.31 J		1.4 JB		1290			66.9		11.9 J		0.18	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		159	11.5	220		7.7	79.4	2.5	
EW11D	5/31/18	N	2.5	0.36 J		0.87 J		2600			124		10.2 J		0.091 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	137		9	202		13	49.5 B	3.4	
EW11D	5/31/18	FD	2.4	0.35 J		1.2 J		2690			126		10.2 J		0.12	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	137		8.9	204		13.4	51.7 B	3.4	
EW11S	4/14/16	N	0.080 U	0.49 U		3.4		451			63.5		7.3 U		0.0952 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		48.6	7		100	8.9	45.1		5.2
EW11S	7/19/16	N	0.080 U	0.49 U		2.3 B		84.2 J			37.3		7.3 U		0.053 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		65.7	7.9	106		6	36.5	2.7	
EW11S	10/10/16	N	0.080 U	0.40 J		3.0 B		114 B			97.9 B		6.2 U		0.7	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		64.7	7.9	118		7.9	39.1	4.7 B	
EW11S	1/19/17	N	0.20 J	0.40 J		2.2 B		211 B			157 B		6.2 U		0.96	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		50.5	9.8	108		7.7 H	36.3	4.3	
EW11S	4/19/17	N	0.26 J	5.0 U		1.8 J		445 B			185 B		20.0 U		0.2	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	0.31 J		2.9 B		164			65		7.9 J		0.25	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		65.2	9.4	129		8	39.1	3.9	
EW11S	6/1/18	N	0.17 U	0.24 J		2.7 B		242			74.7		6.9 U		0.25	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U	53.5		10.6	127		13.2 B	36.3	3.3	
EW12D	4/20/16	N	4	2.2 J		1.3 J		3820			1620		7.3 U		0.068 J	12	0.35 U	0.58 J	0.50 J	7.2		90.0 B	5.4		80.4	0.035 U	6.4		15.7
EW13D	4/19/16	N	1100	1.6 J		0.75 U		7660 B			956		11.7 J		0.035 J	13	0.35 U	0.27 J	0.32 J	4.8		180	15.1		167	0.093 J	2		20.7
EW13S	4/19/16	N	4.9	23.2		37.7		14100 B			2340		13.8 J		0.043 J	2	0.35 U	0.26 J	0.23 U	4.2		370	20.7		229	0.035 U	9.6		36.6
EW13S	7/26/16	N	20	58.9		133		45600			2580		52.2		0.049 J	4	0.35 U	0.31 J	0.35 J	4.4		312	21.2	292		0.035 U	7.8	32.6 ^	
EW13S	10/14/16	N	40 B	18.5		30.6 B		15600 B			2360		8.4 J		4200	6.8	0.28 U	0.53 J	0.54 J	7.1		296	25.1	236		0.035 U	11.8	34.7	
EW13S	1/24/17	N	48	11.4		3.2		8700 B			2220 B		6.2 U		6400	11	0.28 U	0.70 J	0.62 J	9.3		297	28	304		4.8	12.1	35.8 B	
EW13S	4/20/17	N	32	13.7		2.2 B		10600 B			2260		20.0 U		5100	20	0.50 U	0.96 J	0.90 J	13	240		29.1	294		0.10 UH	16.1	37.2	
EW13S	10/5/17	N	52	12.4		0.93 J		10400			2010		6.9 U		8700	16	0.15 U	1	1	14		276	34.5	276		0.075 JH	13.6	34.9	
EW13S	6/1/18	N	24	14.9		3.6 B		13400			2540		6.9 U		6000	19	0.15 U	0.93	1	13	271		34.2	253		0.085 J	13.6	33.8	
EW14D	4/19/16	N	4.2	0.49 U		3.4		301			77.4		17.5 J		0.050 J	3.5	0.35 U	0.25 U	0.23 U	2.4		137	12		139	0.48 H	7.2		6.5
EW14D	4/19/16	FD	3.5	0.49 U		0.75 U		292			77.8		17.2 J		0.055 J	3.1	0.35 U	0.25 U	0.23 U	2.4		136	11.9		145	0.48 H	7.1		6.3
EW6D	1/24/17	N	0.25 J	0.35 U		0.70 J		398 B			163 B		15.4 J		840	1.7	0.28 U	0.26 U	0.23 U	1.2 J		124	12.3	144		1	5.9	6.4 B	
MW1	10/9/97	FD	10 U	1		2.3		3.5 U		20 J			1180		0.048 J		0.1 U	1 U	1 U	1 U		190	16			4.5	5.8		43.5
MW1	10/9/97	FD2				2 U		70.9							0.023 J														
MW1	10/9/97	N	10 U	2		2 U		61.6		20 U			1070		0.11 U		0.1 U	1 U	1 U	1 U		190	18			6.5	6.3		20
MW1	10/9/97	N2		2		2 U		2 U							0.048 J		0.1 U	1 U	1 U	1 U									
MW1	4/24/01	N	0.11 U	0.1 U		2.4		33		9830			642		0.035 J	5.6 U	0.1 U	1 U	1 U	1 U		140	24		218	6.5 =	13		3.89
MW1	4/24/01	N2	0.11 U			1 U		25 U		25 U			15 U		0.27 R											6.5			
MW1	9/11/01	N	10 U	0.5		0.7 J		4 J		35 U			0.79 J		0.093 UJ	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	9/11/01	N2				1.3		25 U		4000			450		0.066 J														
MW1	5/14/02	N				1.4 U		1.6 J		11.2 U			0.48 J		0.060 J														
MW1	8/6/02	N	10.0 U	0.067		1.4 U		7.6 J		1700			180			5 U	1 U	5 U	5 U	5 U		170	7.4		190	0.15 U	7.9		2.6
MW1	8/6/02	N2	10.0 U	0.063		1.7 J		0.3 U		11 U			0.95 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	N3				1.8 J		9.5 J		2200			230		0.1 U														
MW1	8/6/02	N4				1.4 U		0.3 U		11 U			2.2 J		0.1 UJ														

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW1	4/29/03	N	0.5 U	0.1 U		1 U		14		3160			217		0.1 UJ	7.4 U	0.5 U	5 U	5 U	5 U		174	4.3		187	2.6	10		3.2
MW1	4/29/03	N2	0.5 U			1 U		1 U		25 U			5 U		0.1 UJ														
MW1	9/24/03	N	0.5 U	0.13		1 J		21		7000 J			416			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	9/24/03	N2	0.5 U			1 U		1 J		100 J			36															
MW1	5/4/04	N	0.863 J	1.06 J		0.346 J		5.73 R		790 R	13900		135 R		0.1 UJ	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	5/4/04	N2				0.190 J		0.785 R		29.9 R			15.0 R		0.1 UJ														
MW1	9/21/04	FD	10.0 U	0.442		0.470 J		13.6 J		1210			158		0.1 U	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	9/21/04	FD2				0.227 J		0.707 J		21.0 J			3.07 J		0.1 U														
MW1	9/21/04	N	10.0 U	0.348		0.353 J		8.41 J		838			103		0.1 U	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	N2				0.218 J		0.605 J		18.0 J			2.60 J		0.1 U														
MW1	5/10/05	N	2.0 U	0.12		1.0 U		18		3800			360			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	5/10/05	N2				1.0 U		10 U		50 U			10 U		0.1 U														
MW1	9/29/05	N	2.0 U	0.12		1.0 J		23 J		4800 J			400 J		0.1 U	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	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3.8 J		0.039 J														
MW1	5/31/06	N	2.0 U	0.049 J		1.0 UJ		10 UJ		50 UJ			10 UJ		0.040 J	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		0.031 R	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		0.096 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		0.017 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	0.080 U	0.49 U		0.75 U		19.9 JB			1.4 JB		7.3 U		0.019 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		79.9 B	5.1		102	0.53	5.2		0.73 J
MW1	7/20/16	N	0.080 U	0.49 U		0.75 U		16.0 U			1.1 U		7.3 U		0.035 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		82.4	5.6	30		0.53	5.2	0.83 J	
MW1	10/12/16	N	0.16 J	0.46 J		0.67 JB		5.3 U			0.96 JB		6.2 U		0.12	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		86.2	7.5	92		0.45 H	5.2	0.59 J	
MW1	1/19/17	N	0.080 U	0.77 J		0.76 JB		8.1 JB			0.25 U		6.2 U		0.19	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U		71.9	6.7	88		0.54	4.7	0.65 J	
MW1	1/19/17	FD	0.080 U	0.51 J		0.73 JB		5.7 JB			0.25 U		6.2 U		0.3	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		71.9	6.8	88		0.54	4.8	0.73 J	
MW1	4/18/17	N	0.50 U	0.37 J		2.0 U		100 U			5.0 U		20.0 U		0.12	0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	64.4		3.9	84		0.39	5.5	0.91 J	
MW1	10/4/17	N	0.15 JB	0.23 U		1.1 JB		46.7 U			0.79 U		6.9 U		0.17	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		78.5	8.1	81.3		1.1	5.5	0.63 J	
MW1	5/30/18	N	0.17 U	0.57 J		0.88 J		46.7 U			0.79 U		6.9 U		0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	73.2		9.5	84.1		1.2	5.0 B	0.67 J	
MW2	10/9/97	N	10 U	1 U		2 U		10.2 J		20 J			50.6		0.033 J		0.1 U	1 U	1 U	1 U		300	3.5			1.1	17		2.6
MW2	10/9/97	N2		1 U		2 U		11.4 J							0.027 J		0.1 U	1 U	1 U	1 U								
MW2	4/5/00	N		0.5 U											0.035 J	10 U												
MW2	6/18/01	N	0.14	0.1 U		0.37 J		25 U		24 U			8.3		0.045 J	5 U	0.1 U	1 U	1 U	1 U		36	5.73		66	38 =	105		5.57
MW2	6/18/01	N2	0.14			6.7		109		39900			1230		0.094 UJ											38			
MW2	9/12/01	N	10 U	0.51		3.9		110		29000			1200		0.095 U	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	9/12/01	N2				0.29 U		2.2 U		35 U			57		0.094 UJ														
MW2	8/6/02	N	10.0 U	0.12		6.4		30		10000			420		0.095 U	5 U	1 U	5 U	5 U	5 U		66	3		98	0.15 U	10		3.2
MW2	8/6/02	N2				1.4 U		0.3 U		48			18		0.029 J														
MW2	9/24/03	N	0.5 U	0.28		8		100		41300 J			1180		0.031 J	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	9/24/03	N2	0.5 U			1 U		16		3030 J			443		0.040 J														
MW2	9/21/04	N	10.0 UJ	1.26		4.03 J		87.2 J		25800 J			972 J		0.097 U	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	9/21/04	N2				0.237 J		3.10 J		662			22.2 J		0.051 J														
MW2	9/28/05	N	2.0 U	2.2 =		6.7		140 J		40000 J			1300 J		0.043 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	9/28/05	N2				1.0 UJ		2.5 J		65 J			9.3 J		0.015 U														
MW2	9/26/06	N	2.0 UJ	2.3		1.0 U		10 UJ		50 U			2.6 UB		0 U	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			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		2	1.00 U	0.5 U	2.0 U	2.0 U	5.0 U		138	3.17		276 J	1.10 J	12.9		2.59 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW2	10/6/09	N	0.83 UJ	2.21 J		2 UJ		10 UJ		129 J	19000 J		10 UJ		0.9 J	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		1 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		1 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		63	7.7		93.6	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		0.1 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	N	0.50 U	0.94 J		2.0 UJ		10.0 UJ		50 UJ	6900 J		10 UJ		9.5	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
MW2	10/9/13	N2													0.1 U											2.9 J			
MW2	9/24/14	N	0.070 U	0.32	0.18 U		0.75 U		16 U			1.4 J		7.3 U	0.1 U	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		62	0.69 J	68		0.73	2.4	0.50 U	
MW2	10/14/15	N	0.080 U	0.49 U		0.75 J		56.7 J			2.9 J		7.3 U		0.05 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		50.7 B	0.55 J	60.3		0.63	2.1	1.3	
MW2	4/14/16	N	0.080 U	1.3 J		20.1		6580			171		19.7 J		0.05 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		34.4	0.51 J		49	0.38	1.8		3.6
MW3	10/8/97	N	10 U	1 U		2 U		2 U		257			10.9		0.1		0.1 U	1 U	1 U	1 U		370	42 J			4.4 J	16		1.2
MW3	10/8/97	N2		1 U											0.04 U		0.1 U	1 U	1 U	1 U									
MW3	4/4/00	N		0.6 U											0.04 U	12 U													
MW3	4/25/01	N		0.11 U		1 U		25 U		147			7.3		0.11 U	6.1 U	0.1 U	1 U	0.46	1 U		442	47		544	4.42	11		1 U
MW3	4/25/01	N2				1 U		25 U		142			7.9		0.11 U	6.1 U										4.42 =			
MW3	9/13/01	N	10 U	0.092 J		0.29 U		2.2 U		930			31		0.11 U	0.26 U	0.44 U	0.5 U	0.4 U	1.2 U		440	58		480	4	14		1.1
MW3	9/13/01	N2				0.35 J		2.2 U		2400			31		0.0252 UB														
MW3	8/7/02	N	10.0 U	0.11		1.7 J		2.3 J		480			15 J		0.398	5 U	1 U	5 U	5 U	5 U		420	69		540	0.15 U	16		1.4
MW3	8/7/02	N2				1.9 J		0.58 J		160			12 J		0.0962 U														
MW3	9/23/03	N	2.5	0.31		1 U		1 J		150			5 U		0.11 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	9/23/03	N2	2.5												0.11 U														
MW3	9/24/03	N				1 U		1 U		1 U			8 J		0.11 UJ														
MW3	9/21/04	N	5.71 J	0.367		0.189 J		356 J		278 J			6.45 J		0.11 U	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	9/21/04	N2				0.119 J		1.91 J		137 J			4.99 J		0.092 UJ														
MW3	9/28/05	FD													0.093 UJ		0.50 U	5.0 U	5.0 U	5.0 U									
MW3	9/28/05	N	2.0 U	0.20 J		1.0 U		4.9 J		23000 J			93 J		0.095 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	N2				1.0 U		3.0 J		120 J			6.7 J																
MW3	10/21/08	N	4.90 J	0.10 UJ		2.00 U		10 UJ		2140	58700		15.20 J		0.1 U	3.13 U	0.50 U	2.0 U	2.0 U	5.0 U		513	60.5		836	2.73 J	15.2		18 J
MW3	10/7/09	N	21 J	0.1 UJ		2 UJ		10 UJ		722 J	46000 J		12.4 J		0.1 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		0.1 UJ	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		0.1 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		510	64		531	3.3	16		2.9
MW3	10/16/12	N	13	0.46		0.59 J		10 U		260	41000 =		8.3 J		0.1 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		0.1 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	0.18 U		0.75 U		160 B			7.6		7.3 U	0.095 U	0.060 U*	0.24 U	0.23 U	0.22 U	0.43 U		290	72	360		2.1	12	0.91 J	
MW3	10/15/15	FD	5.7	0.49 U		1.2 J		56.6 J			7.9		7.3 U		0.097 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		258 B	52.3	312		1.7 J	11.2 F1	1.2	
MW3	10/15/15	N	5.1	0.49 U		0.93 J		58.2 J			7.4		7.3 U		0.037 J	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		258 B	52.5	322		1.7 J	11.1	1.1	
MW3	4/5/16	N	4.4	0.49 U		1.4 JB^		716			20.4 B		7.3 U		0.057 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		224 B	48.2		299	1.4	10.1		0.98 J
MW3	4/5/16	FD	4.2	0.49 U		0.99 JB^		514			18.6 B		7.3 U		0.094 UJ	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		221 B	48.6		283	1.4	10		0.94 J
MW3	7/21/16	N	2.5	0.49 U		0.75 U		317 B			16.2		7.3 U		0.095 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		215	45.5	248		1.4	9.2	1	
MW3	10/11/16	N	1.5	0.35 U		1.7 JB		171 B			14.8 B		6.2 U		0.45	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		233	46.8	268		1.8	12.7	1.1 B	
MW3	1/20/17	N	1.9	0.35 U		2.0 B		812 B			16.4 B		6.2 U		0.93	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		230	47.3	284		1.9	14.5	1.6	
MW3	4/20/17	N	1.3	5.0 U		1.7 JB		83.6 JB			23		20.0 U		0.47	0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	232		45.5	358		1.8 H	15	1.4	
MW3	10/13/17	N	2.1	0.23 U		2		59.7 J			12.5		6.9 U		0.55	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		272	50.1	298		2	13.9	1.4	
MW3	6/1/18	N	0.17 U	0.29 J		1.7 J		50.6 J			9.4		6.9 U		0.25	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	698		31.5	246		1.9 B	10.8	1.2	
MW4	10/9/97	N	139	1 U		2 J		2 U		35.9 J			55.9		0.094 UJ		2	3	1	3		94	7.3			0.1 U	6.3		12.3

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW4	10/9/97	N2		1 U		2 U		2.4 U							0.097 U		2	3	1	3									
MW4	4/4/00	N		0.5 U											0.094 U	10 U													
MW4	1/20/17	N	0.92	1.5 J		0.36 U		124 B			37.9 B		6.2 U		3	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U		87.9	22.7	132		0.23	11.6	0.53 J	
MW4	4/21/17	N	10	1.2 J		2.0 U		85.4 JB			39		20.0 U		0.11	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	1.2		1.2 JB		501			41.8		6.9 U		0.045 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		93.7	37	134		0.26	30	0.47 U	
MW4	5/31/18	N	300	1.1		0.50 U		149			38.6		6.9 U		0.095 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	76.8		47.9	145		0.096 J	14.1	0.85	
MW5	10/10/97	FD	10 U	31000 J		4.3		26.2 J		5070			15500		0.095 U		0.1 U	2	4	18		370	50			0.1 U	16		160
MW5	10/10/97	FD2				4.6		4835 J							0.015 U														
MW5	10/10/97	N	10 U	28000 J		3.8		48.5 J		4860			12900		0.015 U		0.1 U	3	5	21		370	50			0.1 U	15		115
MW5	10/10/97	N2		28000 E		3.2		24 J							0 U		0.1 U	3	5	21									
MW5	4/7/00	N		20600 =												76 U													
MW5	4/26/01	N	0.4	20600		5.6		74		20400			11200		1 U	38	0.22	0.84	1.8	8.1		352	42		349	0.13 U	28		43
MW5	4/26/01	N2	0.4			3.9		25 U		7630			11300		0.1 J														
MW5	9/13/01	N	10 U	6300		3.7		5.1 J		4100			8500		0.1 U	23	0.44 U	0.54 J	0.78 J	4.3		270	29		240	0.17 J	22		27
MW5	9/13/01	N2				8.2		100		26000			8500		0.05 U														
MW5	8/7/02	N		510 J		4.1		28		34500			8130		0.094 J	3.2 J	1 U	5 U	5 U	5 U		220	26		4 U	0.15 U	21		25
MW5	8/7/02	N2				2 J		1.5 J		7900			7840		0.04 U														
MW5	9/25/03	N	0.47 J	1100		4		50		35100			9450		0.11 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	9/25/03	N2	0.47 J			3		7		13400			8320		0.11 U														
MW5	9/22/04	N	10.0 UJ	194		0.488 J		17.3 J		30500			7150		0.0952 U	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	9/22/04	N2		214 E		0.612 J		1.44 J		7480 J			5650 J		2.18														
MW5	9/28/05	N	2.3	1100 =		1.0 UJ		6.0 J		18000 J			7600 J		0.0962 U	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	9/28/05	N2				1.0 UJ		10 UJ		19000 J			7600 J		0.11 U														
MW5	9/26/06	N	8.7 J	460 =		1.0 UJ		10 UJ		23000 J			8000 J		0.11 U	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		0.11 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		0.11 U	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		0.092 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		0.093 UJ	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		0.097 UJ	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		260	15		397	0.10 U	150		2.6
MW5	10/17/12	N	17	0.59 J		0.57 J		10 U		2700	29000 =		7000			0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		180	11		302	0.10 UH	130 =		1.8
MW5	10/10/13	N	19	0.6		0.39 J		10.0 UJ		2200 J	20000 J		4700 J		0.1 U	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	FD	10	12	0.42 J		0.75 U		1200 B			2200		7.3 U	0.1 UJ	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		97	4.3	150		0.12	48	0.50 U	
MW5	9/24/14	N	12	12	0.41 J		0.75 U		1200 B			2200		7.3 U	0.1 UJ	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		100	4.3	150		0.14	48	2.3	
MW5	10/14/15	N	1.8 B	0.49 U		0.75 U		954			2230		7.3 U		0.1 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		98.7 B	12.7	159		0.053 J	48.9	3.3	
MW5	4/7/16	N	4.3	0.49 U		0.75 U		931			1990		7.3 U		0.1 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		72.0 B	12.7		113	0.97 H	38		4.6 B
MW5	4/7/16	FD	4.9	0.49 U		0.75 U		940			2070		7.3 U		0.1 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		71.3 B	12.5		113	0.96	37.6		4.5 B
MW6	4/19/16	N	0.78	0.49 U		5.2		282			5.6		9.0 J		0.095 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		183	35		245	10.2 H	26.3		6.2
MW6	4/19/16	FD		0.49 U		0.75 U		16.0 U			3.2 J		7.3 U		0.097 U	0.066 U	0.35 U	0.25 U	0.23 U	0.52 U									
MW6S	10/9/97	N	10 U	1 U		5.1		473		20 U			4720		0.015 J		0.1 U	1 U	1 U	1 U		62	72 J			4.5	0.9		1.6
MW6S	10/9/97	N2		1 U		2 U		2 U							0.095 U		0.1 U	1 U	1 U	1 U									
MW6S	4/26/01	N	0.12 U	2.5		15		202		82800			1950		0.095 UJ	5.4 U	0.1 U	1 U	1 U	1 U		148	14		285	0.87	12		5.29
MW6S	4/26/01	N2	0.12 U			0.26		25 U		25 U			347		0.053 J														
MW6S	9/12/01	N	10 U	1.1		7.4		190		42000			1900		0.096 U	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		160	12		290	1.1	16		6.3
MW6S	9/12/01	N2				0.58 J		3.1 J		35 U			800		0.095 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW6S	8/7/02	N	270	88 J		5.5		69.1		7570			2210		0.015 U	5 U	1 U	5 U	5 U	5 U		270	17		4 U	0.15 U	18		5.8
MW6S	8/7/02	N2				2.7		9.9 J		3330			1790		0.015 U														
MW6S	9/25/03	N	130	0.33		1 J		22		5900			1190		0.015 U	1 U	0.25 U	2.5 U	2.5 U	2.5 U		282	23.9		104	1.01	17		8.2
MW6S	9/25/03	N2	130			1 J		9		1100			961		0 U														
MW6S	9/27/06	N	3.5 J	0.21		1.0 U		2.6 J		50 U			590			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	FD	2.7	0.14 J		1.0 UJ		10 UJ		390			190		1 U	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	9/20/07	N	3	0.099 J		1.0 UJ		10 UJ		510			200		0.1 U	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	10/23/08	N	2.0 UJ	2.65		2 UJ		4.4 J		438 J	6260 J		65.3 J		0.073 J	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		0.1 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		0.05 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		15	17		45.6	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		0.13	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	N	0.50 U	0.52 J		2.0 UJ		10.0 UJ		1500 J	6000 J		32 J		0.04 U	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	10/9/13	N2													0.11 U											8.9 J			
MW6S	9/24/14	N	0.082 J	0.27	1.3 J		27		6000 B			110		41 B	0.11 U	0.062 U	0.24 U	0.23 U	0.22 U	0.43 U		22	9.3	100		3.6	7.3	0.50 U	
MW6S	10/14/15	N	0.080 U	0.49 U		2.5		16.8			1.4 J		7.3 U		0.100 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		12.5 B	10.8	76.4		3.6	6.7	3.4	
MW6S	4/19/16	N	0.080 U	0.51 J		4.7		831 B			15.4		7.3 U		0.266	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		42	7.4		70.6	4.8	6.3		18.2
MW6S	7/25/16	N	0.080 U	0.49 U		3.4 B		118 B			6.1		7.3 U		0.0962 R	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		49.4	13.8	86		7.7 F1	8	3.7	
MW6S	10/13/16	N	0.080 U	0.71 J		19.7 B		2290 B			52.7		11.7 J		0.2	0.061 UH	0.28 U	0.26 U	0.23 U	0.24 U		126	14.5	152		6.9 H	8.1	4.2 ^	
MW6S	1/23/17	N	0.080 U	0.35 U		2.8		5.3 U			6.0 B		6.2 U		0.059 J	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U		188	6.6	212		3.1	6	3.8 B	
MW6S	4/24/17	N		5.0 U		3.3 B		8.3 JB			7.4 B		20.0 U		0.13	0.23 U					198			268					
MW6S	6/1/18	N	0.17 U	0.37 J		3.1 B		58.6 J			4.7		6.9 U		0.095 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	250		14.1	320		11.6 B	11.9	2.3	
MW7	10/14/97	N	10 U	1 U		2 U		6.2		622			13.4		0.11 U		0.1 U	1 U	1 U	1 U		350	7.6			4.9	6		1.6
MW7	10/14/97	N2		1 U		2 U		2 U							0.11 U		0.1 U	1 U	1 U	1 U									
MW7	4/4/00	FD		0.5 U											0.11 UJ	10 U													
MW7	4/4/00	N		0.5 U											0.11 U	10 U													
MW7	4/25/01	N	4.65	0.1 U		1 U		25 U		352			5.4		0.093 UJ	5.2 U	0.1 U	1 U	1 U	1 U		352	8.36		388	3.63	6.54		2.8
MW7	4/25/01	N2	4.65			1 U		25 U		154			6.6		0.093 UJ	5.2 U										3.63 =			
MW7	9/11/01	N	12	0.083 J		0.4 J		2.2 U		560			6.4		0.093 UJ	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		340	23		410	3	10		2
MW7	9/11/01	N2	10 U	0.13 J		0.29 U		2.2 U		230			4.4			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	N3				0.47 J		2.2 U		560			5.7		0.1 U														
MW7	9/11/01	N4				0.29 U		2.2 U		230			4.6		0.1 UJ														
MW7	8/7/02	N	10.0 U	0.03 J		1.5 J		0.3 U		730			6.5 J		0.15 J	5 U	1 U	5 U	5 U	5 U		390	21		450	0.15 U	10		1.5
MW7	8/7/02	N2				1.4 U		0.3 U		300			4 J		0.1 UJ														
MW7	9/24/03	N	4.9	0.044 J		1 U		1 U		280 J			6 J		0.1 U	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	9/24/03	N2	4.9			1 U		1 U		90 J			5 U		0.1 U														
MW7	9/22/04	N	10.0 UJ	9.18 E		1.00 UJ		1.09 J		1640 J			9.86 J		0.1 U	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	9/22/04	N2		5.75		0.108 J		0.847 J		25.0 UJ			9.75 J		0.095 U														
MW7	9/27/05	N	2.0 UJ	0.12 U		1.0 U		10 U		1300			18		0.094 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	9/27/05	N2				1.0 U		10 U		880			16 J		0.071 J														
MW7	9/26/06	N	4.3 J	0.087 J		1.0 U		10 U		50 U			68 J		0.095 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		0.094 UJ	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	N	110 J	0.1 U		2 UJ		4 J		926 J	37700 J		41.6 J		0.094 U	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	10/22/08	N2													0.095 U														4.41
MW7	10/7/09	N	2.4 J	0.403 J		2 UJ		10 UJ		687 J	32600 J		109 J		0.023 J	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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW7	10/6/10	N	28	0.1 U		2 U		8 U		989	38900		63.2		0.015 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		0.015 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		230	12		249	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		0 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	N	2.2 B	0.094 U		0.34 J		10.0 UJ		10000 J	21000 J		74 J			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	10/9/13	N2													0.0935 U											1.8 J			
MW7	9/23/14	N	15	0.034 J	0.28 JB		0.75 U		260			33		30 B	0.293	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		200	9	240		1.9 H	110	0.96 J	
MW7	10/12/15	N	6.5 B	0.88 J		1.6 J		16.0 U			423		7.3 U		0.0962 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		228 B	8.3	229		1.5	46.2	0.85 J	
MW7	4/6/16	N	13	0.49 U		1.9 JB^		5270 B			117 B		36.2 B		0.11 U	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		212 B	10.3		237	1.7	25.7		0.58 J
MW8	10/14/97	N	36.5	1 U		2 U		2 U		148			17.8		0.11 U		0.1 U	1 U	1 U	1 U		170	4.2			1.4	4.5		2.3
MW8	10/14/97	N2		1 U		2 J		2 U							0.11 UJ		0.1 U	1 U	1 U	1 U									
MW8	4/5/00	N		0.5 U											0.11 U	10 U													
MW8	4/25/01	N	11.6	0.2		0.99		25 U		829			32		0.092 UJ	5 U	0.1 U	1 U	1 U	1 U		154	3.25		181	1.52	7.47		1.46
MW8	4/25/01	N2	11.6			0.75		25 U		25 U			27		0.093 UJ														
MW8	4/25/01	N3				0.57		25 U		25 U			22		0.095 UJ														
MW8	9/11/01	N	10 U	0.062 J		1		2.2 U		70 J			18			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	9/11/01	N2				1.2		2.2 U		350			19		0.1 U														
MW8	8/8/02	N	10.0 U	0.04 U		1.4 U		0.3 U		98			6.4 J		0.1 UJ	5 U	1 U	5 U	5 U	5 U		180	4.2		310	0.15 U	6		1.1
MW8	8/8/02	N2				1.8 J		0.27 U		11 J			5.3 J		0.1 UJ														
MW8	9/25/03	N	8.9	0.047 J		1 U		1 U		140			8 J		0.1 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	9/25/03	N2	9.2	0.11 U		1 U		1 U		50 U			8 J		0.1 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	N3	9.2			1 U		1 U		240			8 J		0.1 U														
MW8	9/25/03	N4				1 U		1 U		50 U			6 J		0.095 U														
MW8	9/23/04	N	3.75 J	1.94 =		0.127 J		0.465 J		256			15.1		0.095 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		200	15		1160	2.4 J	5.8 J		1.4
MW8	9/23/04	N2				0.539 J		0.660 J		11.0 J			12.0 J		0.030 J														
MW8	9/28/05	FD	2.0 U	0.12 U		1.0 UJ		2.3 J		4500 J			56 J		0.095 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	9/28/05	FD2				1.0 UJ		10 UJ		120 J			13 J		0.095 U														
MW8	9/28/05	N	2.6	0.031 J		1.0 UJ		3.8 J		4700 J			63 J		0.095 U	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	N2				1.0 UJ		10 UJ		130 J			16 J		0.098 U														
MW8	9/20/07	N	2.0 UJ	0.093 U		0.61 J		10 UJ		210			13 J		0.095 U	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		0.015 U	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	0.60 J		0.75 U		197 B			10.9 B		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		174 B	18		421	1.3 H	201		0.26 J
MW9	10/8/97	N	10 U	1 U		2 U		4.2 U		20 U			19.7		0.016 U		0.1 U	1 U	1 U	1 U		60	45			4.2	3.4		6.5
MW9	10/8/97	N2		1 U											0.015 U		0.1 U	1 U	1 U	1 U									
MW9	4/5/00	N		0.6 =											0.015 U	10 U													
MW9	4/23/01	N	0.12 U	0.12		0.38		25 U		470			46		0.015 U	5.3 U	0.1 U	1 U	1 U	1 U		60	3.22		59	2.46 =	27		9.94
MW9	4/23/01	N2	0.12 U												0.018 J											2.46			
MW9	4/24/01	N				0.28		25 U		25 U			34		0.015 U														
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	9/12/01	N2				0.34 J		2.2 U		110			16		6.6 J														
MW9	8/6/02	N	10.0 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	8/6/02	N2				1.4 U		0.3 U		11 U			6.3 J		9.6 J														
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	9/25/03	N2	0.5 U			1 U		1 U		240			16		10 U														
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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW9	9/22/04	N2				0.265 J		2.88 J		125 U			8.51 J		14.9 J														
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
MW9	9/27/05	N2				1.0 UJ		10 U		50 U			5.4 J		20 U													
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	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	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	10/9/13	N2																								3.8 J				
MW9	9/24/14	N	0.070 U	1.6	0.18 U		0.75 U		16 U			1.1 U		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		14	1.1	41		2.4	10	2.5	
MW9	10/13/15	N	0.080 U	0.49 U		1.3 J		21.1 J			1.1 U		7.3 U		0.17	0.066 U	0.35 U	0.23 U	0.25 U	0.52 U		31.0 B	0.70 J	40.2		1.5 H	7.4	4.4	
MW9	4/13/16	N	0.080 U	0.49 U		1.4 J		33.6 J			1.5 J		7.3 U		0.28	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		26.6	0.99 J		37.2	1.4	7.3		30.2
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	10/15/97	N2		8200 E		2 J		2.8 U							9.2		0.2	2	3	17									
MW10	4/6/00	N		9530 J												60 =													
MW10	4/6/00	N2		12900 =												5410 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	4/26/01	N2	2.9			2.4		5.9		5650			2380		25 U														
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	9/12/01	N2				4.5		40		20000			3300		13														
MW10	8/7/02	N	11	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	8/7/02	N2				7.3		10.1 J		10700			2540		6.1 J														
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	10/1/03	N2	0.62			2 J		8		2590			1850		10 U														
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	9/23/04	N2				3.01		12.4 J		24.1 J			1810		4.23 J	160													
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	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	10/23/08	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	10/7/09	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	10/7/09	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	10/7/10	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	10/7/10	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	10/20/11	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	0.22	54		2.1
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	0.21	53		2.1
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		292	0.067 J	69 J		1.7
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	10/10/13	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	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	9/25/14	N	8.1	37	0.21 J		0.75 U		250 B			1300		7.3 U		0.061 U*	0.24 U	0.23 U	0.22 U	0.43 U		180	6.1	270		0.1	77	0.50 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW10	10/15/15	N	8.2	0.49 U		1.0 J		188			861		7.3 U		150	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		178 B	6.5	244		ND	71.8	1.8	
MW10	4/7/16	N	290	0.49 U		0.75 U		1350			719		7.3 U		1900 *	4.8	0.35 U	0.46 J	0.53 J	2.9		162 B	9.8		189	0.035 UH	46.1		8.6 B
MW10	7/25/16	N	8.6	0.49 U		3.7 B		826 B			744		7.3 U		1700 B	5.2	0.35 U	0.66 J	0.64 J	5.2		160	12.3	188		0.035 U	31.7	11.6	
MW10	10/13/16	N	5.5 B	0.46 J		1.7 JB		434 B			777		6.2 U		7300	5.4 H	0.28 U	0.79 J	0.79 J	5.7		156	14.6	186		0.035 UH	24.3	11.1 ^	
MW10	1/24/17	N	8.5	0.46 J		1.9 J		539 B			831 B		6.2 U		6200	10	0.28 U	0.96 J	0.91 J	8.1		158	17.4	220		0.035 U	24	19.4 B	
MW10	4/24/17	N		0.76 J		5.9 B		756 B			897 B		20.0 U		7600	20					142			234					
MW10	10/5/17	N	13 B	0.53 J		3.0 B		626			903		6.9 U		4800	20	0.15 U	1.2	1.5	9.4		157	26.2	184		0.083 J	20.2 B	30.8	
MW10	10/5/17	FD	15 B	0.53 J		3.7 B		609			898		6.9 U		5000	19	0.15 U	1.3	1.5	9.5		157	25.9	182		0.081 J	20.1 F1	32	
MW10	6/1/18	N	23	1		3.6 B		796			951		6.9 U		2500	24	0.15 U	1.4	1.5	10	470		27.6	197		0.084 J	19.9	2.1	
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	10/15/97	N2		30000 J		2 J		10.9 J							8.4		0.4	0.9 J	1	8									
MW10S	4/7/00	N		56100 J												512 =													
MW10S	4/7/00	N2		34800 =												393 F													
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	12/5/00	N2	0.57	3810 J		9.36		160		11000			7100		35	152									570				
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	4/25/01	N2	0.55			2.3		46		11300			6030		45		10 U	100 U	100 U	100 U						1.49			
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	9/12/01	N2				0.29 U		3.2 J		48 J			7600		3.7 U														
MW10S	8/7/02	N	10.0 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	8/7/02	N2				3.1		2.3 J		67.3			7070		0.98 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	9/25/03	N2	0.5 U			1 U		1 J		50 U			5900		10 U														
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	9/22/04	N2				0.190 J		1.79 J		22.7 J			3740 J		6.07 J														
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	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3900 J		20 UJ														
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									
MW10S	4/18/16	N	0.080 U	0.59 J		2.6		190 B			388		7.3 U		3500	4.7	0.35 U	0.25 U	0.23 U	2.7		102	7.8		92.1	0.035 UH	9.1		9.5
MW10S	7/25/16	N	0.080 U	0.68 J		9.2 B		183 B			315		7.3 U		5200 B	13	0.35 U	0.39 J	0.23 U	5.6		107	7.7	124		0.035 U	11.8	15.6	
MW10S	10/13/16	N	0.12 JB	0.44 J		4.6 B		124 B			399		6.2 U		6600	8.4 H	0.28 U	0.30 J	0.23 U	4.6		83.7	6.1	100		0.035 UH	11.9	12.3 ^	
MW10S	1/24/17	N	0.12 J	0.80 J		2.5		254 B			624 B		6.2 U		9800	10	0.28 U	0.40 J	0.23 U	5.7		164	12.3	220		0.035 U	17.3 F1	23.4 B	
MW10S	4/24/17	N		0.74 J		3.3 B		394 B			1340 B		20.0 U		4300	11					195			332					
MW10S	4/24/17	FD		0.65 J		3.3 B		406 B			1380 B		20.0 U		3300	10					195			350					
MW10S	10/5/17	N	0.29 JB	0.50 J		2.9 B		770			1260		8.1 JB		4400	9.9	0.15 U	0.46 J	0.15 U	6		314	41.1	378		0.13 J	26.7	29.8	
MW10S	6/1/18	N	0.17 U	0.91 J		5.2 B		1010			2880		6.9 U		1500	11	0.15 U	0.42 J	0.22 J	5.2	322		69.8	456		0.083 J	39.7	5.5	
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	10/15/97	N2		1 U		2 J		4.2 U							10.3		0.3	1 J	0.2 J	0.5 J									
MW11	4/4/00	N		0.6 U												11 U													
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	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	N3	0.11 U			1.4		25 U		151			15 U		126	5.4 U										3.74 =			

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW11	4/24/01	N4				1.3		25 U		25 U			15 U		25 U	5.4 U										3.74			
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	9/10/01	N2				1.1		2.2 U		35 U			0.45 J		3.7 U														
MW11	8/6/02	N	10.0 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	8/6/02	N2	10.0 U			1.5 J		0.3 U		11.2 U			1.2 J		8.5 J														
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	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
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	9/21/04	N2				0.948 J		0.366 J		6.05 J			1.40 J		4.05 J														
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	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3.0 J		20 UJ														
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
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	0.080 U	0.75 J		0.75 U		32.1 JB			1.9 JB		7.3 U		0.016 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		229 B	18		470	1.6 H	200		0.32 J
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	10/15/97	N2		13000 J		2 U		6.1 U							16.3		1	2	3	14									
MW12	4/6/00	FD		10600 J												45 =													
MW12	4/6/00	FD2		14100 =												5150 U													
MW12	4/6/00	N		15000 =												5210 U													
MW12	4/6/00	N2		10300 J												47 =													
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	4/26/01	N2	0.99			0.91		25 U		131			1570		25 U														
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	9/13/01	N2				0.95 U		6.8 J		740			1400		12														
MW12	5/14/02	FD		4000																									
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	N2		4300		1.5 J		5 J		11.2 U			1670		9.3 J										520				
MW12	5/14/02	N3				1.4 U		4.9 J		11.2 U			1680		12 J														
MW12	8/8/02	N	10.0 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	8/8/02	N2				1.4 U		2.9 J		105			1600		3.3 J														
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	4/29/03	N2	0.5 U			1 U		4		25 U			1560		10 U														
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	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	N3	0.64			1 U		4		80 J			1490		10 U														
MW12	9/23/03	N4				1 U		3		50 U			1490		10 U														
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	5/4/04	N2				0.600 J		3.95 R		33.6 R			1480 R		8.80 R														
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
MW12	9/22/04	N2		3730 E		0.672 J		3.91 J		22.7 J			1230 J		8.10 J														
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	5/10/05	N2				1.0 U		4.8 J		50 U			1400		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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW12	9/27/05	N2				1.0 UJ		3.9 J		50 U			1300		20 U														
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	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	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	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	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	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	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	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	25		4.7 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	14.5		465 J	2.95 J	31.7		11.80 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	13.1		519 J	2.96 J	31.8		11.70 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		429.376	2.64 J	62.2		1.7 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		363.393	2.65 J	59.9		3.6 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	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	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	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	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	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	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	2.11 J	103 J		1.53 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	2.28	111		1.28 J+
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	2.1	100		2
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	2.1	98		2
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	1.8	120		1.6
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	1.8	120		1.5
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	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	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	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	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	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	5/14/14	N		19																									
MW12	9/23/14	N	0.076 J	24	0.66 JB		0.75 U		16 U			450		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		240	11	360		1.7	130	0.50 U	
MW12	4/20/15	N	0.070 U	16	1.1 JB		1.4 J		16 U			530		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		220 B	11		410	1.7	140		0.95 J
MW12	10/13/15	N	0.080 JB	0.49 U		0.75 U		362 B			27.4		7.3 U		25	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		279 B	11.7	74.4		1.6	159	1.2	
MW12	4/6/16	N	0.12 J	0.77 J		1.4 JB^		60.1 JB			148 B		7.3 U		5.2	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		236 B	10.6		358 F2	1.6	135		0.67 J
MW12	7/19/16	N	0.080 U	0.61 J		1.6 JB		16.0 U			388		7.3 U		14	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		238	10.1	358		1.4	134	0.96 J	
MW12	10/12/16	N	0.092 J	0.50 J		1.6 JB		10 JB			439 B		6.2 U		14	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		239	10.8	340		1.2 H	124	0.71 J	
MW12	1/18/17	N	0.13 JB	0.87 J		1.4 JB		8.5 JB			427		6.2 U		18	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		203	10.7	326		1.1 H	122	0.89 J	
MW12	4/19/17	N	0.13 J	0.46 J		1.2 JB		10.8 JB			362		20.0 U		14	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U	201		10.1	346		1	112	1	
MW12	10/2/17	N	0.48 J	0.49 J		1.9 JB		46.7 U			328		6.9 U		32	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		199	11.7	282		0.9	105	1.1	
MW12	5/30/18	N	0.17 U	0.79 J		1.3 J		46.7 U			216		6.9 U		0.087 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U	183		10.5	257		0.58	76.4 B	1.6	
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	10/8/97	N2		0.7 J													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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW13	4/5/00	N		0.8 =												10 U													
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	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	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	4/23/01	N2	0.12 U			0.24		25 U		25 U			110		25 U														
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	6/19/01	N2	0.12 U			9.1		6.1 J		141			26		25 U											2.87			
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
MW13	9/10/01	N2				0.54 J		2.8 J		52 J			27		4.7 J														
MW13	8/5/02	N	10.0 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	8/5/02	N2				2.2 J		2.5 J		1300			45		9.1 J														
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	9/23/03	N2	0.5 U			1 U		8		960			182		10 U														
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	9/21/04	N2				0.259 J		1.96 J		125 UJ			3.67 J		5.28 J														
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	9/27/05	N2				1.0 UJ		2.5 J		50 U			7.1 J		20 U														
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	1.9		110 J	0.45 J	10.1		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	0.080 U	0.49 U		3.2		449			13.4		7.3 U		0.34	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		51	1.4		54.9	0.7	3.4		4.2
MW13	7/20/16	N	0.080 U	0.49 U		1.5 J		19.4 J			1.1 U		7.3 U		1.1	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		39.5 B	0.91 J	86		1	2.2	2.1	
MW13	10/10/16	N	0.080 U	0.87 J		2.3 B		23.2 JB			0.94 JB		6.2 U		0.37	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		49.3	0.98 J	56		0.58 H F1	3.1 F1	1.9 B	
MW13	1/19/17	N	0.080 U	0.35 J		3.1 B		17.1 JB			1.1 JB		6.2 U		0.33	0.064 U	0.28 U	0.26 U	0.23 U	0.24 U		50.8	0.71 J	52		0.49 H	3.6	2.2	
MW13	4/19/17	N	0.50 U	5.0 U		1.1 J		100 U			0.28 JB		20.0 U		0.24	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	53.7		0.76 J	60		0.5	4.4	2.2	
MW13	9/29/17	N	0.25 JB	0.23 U		1.6 J		53.5 J			1.4 J		6.9 U		0.25 J	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		59	1.4	47.6		0.56	3.3	2	
MW13	5/29/18	N	0.17 U	0.23 U		1.9 J		500			4		6.9 U		0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	109		1.2	52.7		0.46	3.4	2.1	
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	10/9/97	N2		1 U		2 U		2 U							2 U		0.1 U	1 U	1 U	1 U									
MW14	4/6/00	N		0.5 U												11 U													
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	6/19/01	N2	0.11 U			2		25 U		25 U			4.4		25 U											2.06 =			
MW14	1/23/17	N	0.080 U	1.1 J		0.62 J		5.3 U			1.6 JB		6.2 U		0.12	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		129	15.8	146		1.7 H	6.6	0.51 JB	
MW14	4/20/17	N	0.50 U	1.0 J		0.37 JB		100 U			0.33 J		20.0 U		0.10 U	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	131		14.8	186		3.5	7	0.47 J	
MW14	4/20/17	FD	0.50 U	0.99 J		2.0 U		100 U			0.64 J		20.0 U		0.10 U	0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	133		14.7	188		1.7	7	0.49 J	
MW14	10/3/17	N	0.087 J	0.95 J		0.72 JB		46.7 U			1.1 J		6.9 U		0.046 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		129	16.1	166		1.9	6.9	0.47 J	
MW14	10/3/17	FD	0.11 J	1		0.74 JB		46.7 U			0.93 J		6.9 U		0.046 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		128	17.1	148		1.9	6.7	0.47 U	
MW14	5/31/18	N	0.17 U	1.2		0.79 J		46.7 U			3.1		6.9 U		0.093 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	585		16.4	143		1.7	6.3 B	0.71 J	
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	10/16/97	N2		1 U		2 U		3.5 U							13.9		0.1 U	1 U	1 U	1 U									
MW15	4/4/00	N		0.5 U												11 U													
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	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	N3	0.12 U			0.56		25 U		174			4.1		25 U	5.6 U										3.92			

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW15	4/25/01	N4				0.42		25 U		25 U			15 U		16											3.92 =			
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	9/12/01	N2				0.95 U		5.7 J		63 J			2.7		36														
MW15	8/6/02	N	10.0 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	8/6/02	N2				2.6		0.3 U		11 U			0.42 U		11 J														
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	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
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	9/21/04	N2				0.482 J		0.648 J		5.57 J			0.976 J		8.97 J														
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	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			1.6 J		20 UJ														
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	14.6		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		375.211	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	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	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	4.6 J	5.1 J		1.2
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	0.070 U	0.054 J	1.1 JB		0.75 U		28 J			1.9 J		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		210	11	250		5.3	5.6	0.85 J	
MW15	4/20/15	N	0.070 U	0.015 U	0.78 JB		0.75 U		16 U			1.1 J		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		190 B	11		270	5.6	5.7		0.44 J
MW15	10/12/15	N	0.080 U	0.54 J		1.0 J		16.0 U			1.1 U		7.3 U		0.015 U	0.063 U	0.35 U	0.23 U	0.25 U	0.52 U		224 B	12	302		6.7 F1	5.8	0.55	
MW15	4/5/16	N	0.080 U	0.70 J		1.7 JB		16.0 U			1.1 U		7.3 U		0.078 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		207 B	12.5		312	0.45	6.3		0.49 J
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	10/14/97	N2		1 U		2 U		2.7 U							1.9 J		0.1 U	1 U	1 U	1 U									
MW16	4/6/00	N		0.5 U												10 U													
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	4/23/01	N2	0.12 U			1 U		25 U		26			9.4		23											8.69			
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	9/10/01	N2				0.29 U		2.2 U		35 U			0.82 J		4.5 J														
MW16	8/6/02	N	10.0 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	8/6/02	N2				1.4 U		0.3 U		78			9.1 J		13 J														
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	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
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	9/21/04	N2				0.135 J		0.509 J		25.0 U			0.617 J		2.79 J														
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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW16	9/29/05	N2				1.0 UJ		2.9 J		50 UJ			2.1 J		20 UJ														
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
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		30.7	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	0.070 U	0.036 J	0.41 JB		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		31	5.4	60		0.54	2.8	1.1	
MW16	10/13/15	N	0.080 U	0.49 U		1.0 J		45.2 JB			2.1 J		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		48.4 B	4.3	84.4		0.61	5.9	0.70 J	
MW16	4/6/16	N	0.080 U	0.49 U		1.9 J		168 B			14.6 B		7.3 U		0.015 U	0.11 J	0.35 U	0.25 U	0.23 U	0.52 U		32.6 B	2.2		31.8	0.41	2.6		2.3
MW16	7/19/16	N	0.080 U	0.49 U		2.2 B		114			11.5		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		32.4	2.2	34		0.42	2.6	5.8	
MW16	10/12/16	N	0.080 U	0.40 J		1.7 JB		61.7 JB			5.3 B		6.2 U		0.18	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		33.1	2.4	24		0.30 H	2.2	0.58 J	
MW16	1/18/17	N	0.080 U	0.47 J		1.3 JB		11.5 JB			1.2 J		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		31.3	3.2	46		0.46 H	3.6 F1	1.1	
MW16	4/19/17	N	0.50 U	5.0 U		1.6 JB		7.7 JB			0.80 J		20.0 U		0.10 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U	39		3.3	60		0.57	4.5	2	
MW16	10/2/17	N	0.11 J	0.23 U		2.5 B		46.7 U			2.0 J		8.8 J		0.045 U	0.28 U	0.15 U	0.18 U	0.15 U	0.22 U		43.7	4	45.7		0.73	6.6	0.82 J	
MW16	5/30/18	N	0.17 U	0.52 J		2.2		46.7 U			2.3 J		6.9 U		0.090 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	34.1		5	34.9		0.71	4.0 B	1.5	
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	10/15/97	N2		1 U		2 U		2.3 U							2.5		0.1 U	1 J	1 U	0.6 J									
MW17	10/28/97	N		5																									
MW17	4/6/00	N		0.5 U												11 U													
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	4/26/01	N2	0.12 U			0.69		25 U		25 U			15 U		25 U											4.98 =			
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	9/11/01	N2				1		2.2 U		310			0.27 U		3.7 U														
MW17	8/8/02	N	10.0 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	8/8/02	N2				1.9 J		0.3 U		11 U			0.42 U		15 J														
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	9/25/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
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	9/22/04	N2				0.782 J		0.847 J		13.9 J			45.0 J		2.09 J														
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
MW17	9/27/05	N2				1.0 UJ		10 U		50 U			10 U		20 U														
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	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	0.070 U	0.015 U	0.83 J		0.75 U		16 U			1.3 J		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		150	15	250		4.8	40	0.72 J	
MW17	10/13/15	N	0.080 U	1.1 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		184 J	14.8	265		4.2 H	45.3	0.59	

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW17	4/5/16	N	0.080 U	0.81 J		1.8 JB		16.0 U			1.1 U		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		173 B	13.6		289	3.5	85.4		0.46 J
MW17	7/19/16	N	0.080 U	0.84 J		1.4 JB		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		195	14.7	336		2.8	142	0.52 J	
MW17	10/11/16	N	0.080 U	0.80 J		0.76 JB		5.3 U			0.28 JB		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		208	17	348		2.7	136	0.36 JB	
MW17	1/23/17	N	0.13 J	0.73 J		1.4 J		5.3 U			0.25 U		6.2 U		0.099	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		202	17.4	390		2.1 H	167	0.81 JB	
MW17	1/23/17	FD	0.080 U	0.76 J		0.66 J		5.3 U			0.25 U		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		213	17.4	380		2.1 H	167	0.50 JB	
MW17	4/20/17	N	0.50 U	0.71 J		0.77 JB		100 U			0.45 J		20.0 U		0.10 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	0.68 J		0.65 JB		100 U			0.58 J		20.0 U		0.10 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	0.74 J		1.8 JB		46.7 U			0.79 U		6.9 U		0.046 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U		212	17.2 F1	390		3.5	125	0.47 U	
MW17	5/31/18	N	0.17 U	0.79 J		1.7 J		46.7 U			0.79 U		6.9 U		0.086 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	194		14.9	311		3.3	98.2 B	0.77 J	
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	10/10/97	N2		27000 E		8.9		62.5							5.3		0.1 U	2	16	19									
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
MW18	6/19/01	N2	0.13 U			5		43		15200			6540		25 U														
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	10/16/97	N2		19000 E		2 U		3.4 U							2 U		0.2	1 U	1 U	0.2 J									
MW19	4/7/00	N		11800 =												5260 U													
MW19	4/7/00	N2		11000 J												22 =													
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	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	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	9/12/01	N2				1.7 J		44		5600			2100		53 J														
MW19	5/13/02	N		14000		1.4 U		5.1 J		11.2 U			2070		9.4 J	190													
MW19	8/8/02	N	10.0 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	8/8/02	N2				1.4 U		7.1 J		218			3110		5.7 J														
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	4/29/03	N2	2.4			1 U		5		25 U			3590		10 U														
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	9/25/03	N2	5.7			1 U		9		50 J			4470		10 U											2 J			
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		144	25 =		176	0.71 J	16 R		43.7 J
MW19	5/4/04	N2				0.169 J		5.77 R		31.4			3360 R		6.93 R														
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	9/22/04	N2				0.159 J		6.26 J		125 U			2650		16.0 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	5/10/05	N2				1.0 U		15		630			2100		8.4 J														
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	9/29/05	N2				1.0 UJ		5.0 J		50 UJ			2700 J		20 UJ														
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	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	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		317.645	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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
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
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	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		85.4	0.3	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		76.2	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	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	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	4/26/01	N2	2.73			1.1		14		841			2250		23	9970	10 U	100 U	100 U	71									
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	9/12/01	N2				1.5		15 U		35 U			2800		12 U														
MW20	8/7/02	N	10.0 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	8/7/02	N2				2.6		5.8 J		206			3280		15.4 J														
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	9/25/03	N2	5.4			1 U		11		350			3250		10 J											1.25 U			
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	9/22/04	N2				0.498 J		35.2 J		2070			2320		47.0 J														
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	10/25/05	N2				1.0 UJ		2.7 UJ		140 J			2400 J		20 UJ														
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	9/27/06	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	9/21/07	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
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	2/9/98	FD2				2 U		9.5 U							33.8														
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	N2		1 U		2 U		9.5 U							32.6 U		0.1 U	1 U	1 U	1 U									
MW21	5/14/02	N				1.9 J		1.3 J		130			9.7 J		11 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	8/6/02	N2				1.6 J		0.3 U		11 U			0.63 J		6.8 J														
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	4/29/03	N2	0.5 U			1 U		1 U		25 U			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	9/24/03	N2	0.5 U			1 U		1 U		50 UJ			5 U		10 U														
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	5/4/04	N2				0.122 J		1.28 R		28.6 R			0.718 R		4.48 R														
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	9/21/04	N2				0.130 J		0.955 J		25.0 UJ			0.484 J		3.30 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	5/10/05	N2				1.0 U		25		6200			480		16 J														
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

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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW21	9/27/05	N2				1.0 UJ		2.6 J		36 J			9.8 J		20 U														
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	68.8		149 J	2.69 J	7.27 U		2.38 J
MW21	4/6/16	N	0.092 J	0.70 J		1.0 J		22.8 J			1.7 J		7.3 U		0.016 Jp*	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		25.9 B	101		83.6	1.8 H	6.8		0.63 JB
MW21	7/20/16	N	0.11 J	0.49 U		1.3 J		29.4 J			1.1 U		7.3 U		8.5	0.062 U	0.35 U	0.25 U	0.23 U	0.52 U		29.4 B	84.5	84		1.7	6.8	0.93 J	
MW21	7/20/16	FD	0.080 U	0.49 U		0.86 J		23.5 J			1.1 U		7.3 U		5.5	0.075 U	0.35 U	0.25 U	0.23 U	0.52 U		29.9 B	84.9	78		1.7	6.6	0.90 J	
MW21	10/11/16	N	0.080 U	0.38 J		1.8 JB		6.2 JB			0.44 JB		6.2 U		5.7	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		30.5	74.4	82		1.8	6.6	0.61 JB	
MW21	1/18/17	N	0.080 U	0.39 J		2.2 B		6.8 JB			0.25 U		6.2 U		2.9	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		25.4	86.8	88		1.8 H	7.4	0.75 J	
MW21	4/18/17	N	0.50 U	5.0 U		0.44 J		100 U			5.0 U		20.0 U		0.017 Jp	0.22 U	0.50 U	1.0 U	1.0 U	2.0 U	26.7		78.6	92		1.8	7.5	0.77 J	
MW21	10/3/17	N	0.082 J	0.28 J		1.2 JB		46.7 U			0.79 U		6.9 U		0.045 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U		35.2	72.6	70.5		1.8	7.1	0.76 J	
MW21	5/30/18	N	0.17 U	0.48 J		1.4 J		46.7 U			0.84 J		6.9 U		0.089 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	32.9		74.7	65.6		1.7	6.6 B	0.89 J	
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	2/9/98	N2		1 U		2 U		9.5 U							12.6		0.1 U	1 U	1 U	1 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	N	10.0 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	8/6/02	N2				1.4 U		0.3 U		25 J			0.42 U		4.9 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	9/24/03	N2	0.5 U			1 U		20		2770			542		20 J														
MW22	9/21/04	N	10.0 UJ	0.22		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	9/21/04	N2				0.164 J		0.473 J		25.0 UJ			15.0 UJ		2.31 J														
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	9/28/05	N2				1.0 UJ		10 UJ		50 UJ			1.3 J		20 UJ														
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+		34.1	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		37.3	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		50.6	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	0.070 U	0.27	0.22 J		0.75 U		25 JB			19		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		51	1.7	60		0.69	3.6	0.71 J	
MW22	4/21/15	N	0.070 U	0.072 J	0.60 JB		2.8		390 B			23		7.3 U		0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		42 B	1.9		57	0.69	3.7		0.57 J
MW22	10/13/15	N	0.080 U	0.49 U		1.2 J		16.0 U			1.1 U		7.3 U		0.041 J	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		46.3 B	1.7	52.3		0.65 H	2.8	0.74 J	
MW22	4/6/16	N	0.080 U	0.49 U		0.92 J		17.5 J			2.2 J		7.3 U		0.025 Jp*	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		50.8 B	1.3		57.7	0.61 H	2.9		5.3 B
MW22	7/20/16	N	0.080 U	0.49 U		3.4		235			10		7.3 U		0.030 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		58.6 B	1.2	64		0.6	3.1	1.7	
MW22	10/12/16	N	0.080 U	0.41 J		1.7 JB		85.4 JB			5.4 B		6.2 U		0.043 J	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		67.2	1.7	70		0.53 H	3.5	0.96 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW22	1/18/17	N	0.080 JB	0.44 J		3.4 B		186 B			10.6		6.2 U		0.058 J	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		58.4	2.1	94		0.65 H	3.8	1.1	
MW22	4/21/17	N	0.50 U	5.0 U		2.6 B		100 U			0.31 J		20.0 U		0.090 J	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 JB	0.23 U		2.6 B		198			11.9		8.5 JB		0.049 J	0.27 U	0.15 U	0.18 U	0.15 U	0.22 U		74.1	2.7	77.9		0.71	3.7	0.90 J	
MW22	5/29/18	N	0.17 U	0.23 U		0.95 J		46.7 U			1.3 J		6.9 U		0.089 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	65.3		3.6	75.5		1.5	4	0.79 J	
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	2/26/98	N2		1 U		2 U		14.2 U							6.6		2 =	1 U	77 =	2 =									
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	9/11/01	N2				0.62 J		2.2 U		35 U			29		4.7 J													
MW23	4/13/16	N	0.080 U	0.58 J		0.75 U		35.1 J			1.1 U		7.3 U		0.015 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		197	29.5		255	1.8	7.1		0.62 J
MW23	7/20/16	N	0.080 U	0.70 J		0.75 U		16.0 U			1.1 U		7.3 U		0.31	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		195 B	30.6	230		1.8	7.2	0.66 J	
MW23	10/11/16	N	0.080 U	0.71 J		0.90 JB		5.3 U			0.38 JB		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		194	32.3	230		1.9	8.1	0.54 JB	
MW23	1/19/17	N	0.080 U	0.75 J		0.64 JB		5.3 U			0.25 U		6.2 U		0.015 U	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		177	35.1	238		1.8 H	8.2	0.81 J	
MW23	4/19/17	N	0.50 U	0.59 J		2.0 U		100 U			5.0 U		20.0 U		0.095 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	0.080 U	0.66 J		1.5 JB		46.7 U			0.79 U		6.9 U		0.046 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		197	40.3	240		2	9.1	0.68 J	
MW23	6/1/18	N	0.17 U	0.74 J		0.90 J		46.7 U			0.79 U		6.9 U		0.094 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	194		42.3	256		2.0 B	8.8	0.81 J	
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	2/8/98	N2		4 U		2 U		9.5 U							23		3 U	2 U	3 U	5 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	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	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	4/24/01	N2	0.1 U			0.29		5.2		25 U			2.4		11	5.3 U										3.64			
MW24	4/7/16	N	0.11 J	0.49 U		3		420			28.4		7.3 U		0.044 Jp*	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		168 B	9.1		135	1.9	17.4		0.79 JB
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	2/9/98	N2		1 =		2 U		9.5 U							16.4		0.1 U	1 U	1 U	1 U									
MW25	4/11/16	N	0.080 U	1.1 J		17.6 B		6090 B			148 B		12.4 JB		0.024 Jp	0.064 U	0.35 U	0.25 U	0.23 U	0.52 U		33.7 B	37.8		137	2.4	3.8		1.5
MW25	7/26/16	N	0.080 U	0.35 U		1.3 J		28.8 J			1.0 J		6.2 U		0.30 B	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		40.3	49.1	108		3.2	5	0.70 J^	
MW25	10/10/16	N	0.080 U	0.35 U		0.62 JB		5.4 JB			0.46 JB		6.2 U		0.23	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		31.1	17.5	52		1.6 H	2.8	0.44 JB	
MW25	10/10/16	D	0.080 U	0.35 U		0.71 JB		5.3 U			0.27 JB		6.2 U		0.17	0.066 U	0.28 U	0.26 U	0.23 U	0.24 U		31.1	16.9	54		1.6	2.7	0.44 JB	
MW25	1/18/17	N	0.080 U	0.35 U		1.2 JB		28.2 JB			0.70 J		6.2 U		4.9	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U		46	45.2	112		2.8 H	4.9	0.78 J	
MW25	4/18/17	N	0.50 U	5.0 U		1.4 J		100 U			5.0 U		20.0 U		0.094 U	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U	81.3		29	108		2.9	7.3	0.82 J	
MW25	10/13/17	N	0.17 U	0.23 U		1.3 J		46.7 U			0.79 U		6.9 U		0.051 J	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		79.5	36.1	125		3.2	7	0.84 J	
MW25	10/13/17	FD	0.17 U	0.23 U		1.1 J		46.7 U			0.79 U		6.9 U		0.083 JB	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		78.7	35	122		3.2	7	0.81 J	
MW25	5/31/18	N	0.17 U	0.28 J		1.3 J		46.7 U			0.79 U		6.9 U		0.086 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U	112		12.5	123		2.4	6.0 B	1.1	
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	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	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	N4				1.1		25		16000			290		33														
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	4/24/01	N2	0.1 U			0.24		25 U		36			15 U		19700											5			
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	6/18/01	N2	0.1 U			3.6		18		9140			232		28											30 =			
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	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	N3				0.75 J		2.9 J		55 J			1.5 U		3.7 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW26	9/10/01	N4				1.6		13		2500			96		24														
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	5/14/02	N2				1.4 U		1.2 J		11.2 U			0.73 J		9.3 J										300				
MW26	8/5/02	N	10.0 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	8/5/02	N2	10.0 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	N3				2.7		3.9 J		728			26		18.7 J														
MW26	8/5/02	N4				3.2		0.3 U		11.2 U			0.42 U		7.4 J														
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	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	N3	0.5 U			2 J		5		1690			48		20														
MW26	4/29/03	N4				1 U		1 U		25 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	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
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	5/4/04	FD2				0.323 J		1.19 R		49.3 R			2.07 R		4.15 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	N2				0.289 J		1.24 R		39.0 R			1.23 R		4.36 R														
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	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	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 =		2.4
MW26	9/23/04	N2				0.314 J		1.57 J		8.81 J			19.3		4.70 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	5/10/05	FD2				1.0 U		2.2 J		510			14		17 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	N2				1.0 U		2.4 J		680			18		7.5 J														
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	9/27/05	FD2				1.0 UJ		2.6 J		50 UJ			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	N2				1.0 UJ		2.2 J		50 U			10 U		20 U														
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	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	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
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	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
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		414.708	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	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	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	1.7	210		0.43 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	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
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	FD	0.070 U	0.015 U	0.32 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		150	17	280		1.2	160	0.50 U	
MW26	9/24/14	N	0.070 U	0.015 U	0.43 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		150	17	290		1.2	160	0.50 U	
MW26	4/21/15	FD		0.015 U	0.76 JB		0.75 U		16 U			1.1 U		7.3 U		0.060 U													
MW26	4/21/15	N	0.070 U	0.015 U	0.71 JB		0.75 U		16 U			4.4 J		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		160 B	16		240	2.4	82		0.26 U
MW26	10/13/15	FD	0.080 U	0.50 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		194 B	15.5	235		1.9 H	75.7	0.33 J	
MW26	10/13/15	N	0.080 U	0.76 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		198 B	15.3	229		1.9 H	74.6	0.32 J	
MW26	4/5/16	N	0.15 J	0.57 J		1.5 JB^		21.4 JB			58.7 B		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		154 B	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		28.7	3.1	9.1		1.6
MW27	4/7/16	N	0.092 J	0.59 J		1.9 J		21.1 J			1.1 U		7.3 U		0.15 *	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		137 B	20		113	6.5 F1	14.2		1.9 B
MW27	4/7/16	FD		0.49 U		0.75 U		29.9 J			2.3 J		7.3 U		0.015 U*	0.060 U	0.35 U	0.25 U	0.23 U	0.52 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	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	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	10/9/13	N2																							2.2 J				
MW28	9/25/14	N	0.070 U	0.099	0.31 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U*	0.24 U	0.23 U	0.22 U	0.43 U		120	18	150		1.3	5.1	0.85 J	
MW28	10/14/15	N	0.080 U	0.49 U		0.75 U		16.0 U			1.1 U		7.3 U		0.32	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		126 B	15.5	155		2	5.4	0.69 J	
MW28	4/6/16	N	0.20 J	0.49 U		0.76 J		29.7 J			2.7 J		7.3 U		47 *	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		122 B	9.4		125	1.2 H	4.8		1.6 B
MW28	7/21/16	N	0.10 J	0.49 J		0.75 U		25.9 JB			10.8		7.3 U		100	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		127	11.4	138		1.9	5.4	1.9	
MW28	10/13/16	N	0.28 JB	0.39 J		0.76 JB		9.8 JB			8.5		6.2 U		1900	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J		128	11.4	148		1.7 H	5.8	12.3 ^	
MW28	10/13/16	D	0.36 JB	0.38 J		0.61 JB		5.3 U			7.9		6.2 U		1200	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J		125	11.4	142		1.7 H	5.6	12.3 ^	
MW28	1/20/17	N	0.20 J	0.47 J		1.0 JB		5.3 U			10.3 B		6.2 U		290	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U		113	13.4	138		2	6.1	4.9	
MW28	4/20/17	N	0.50 U	0.55 J		1.0 JB		11.9 JB			4.0 J		20.0 U		22	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 JB	0.38 J		1.4 J		46.7 U			0.79 U		6.9 U		0.16	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U		116	31.8	171		2.3	6.6	0.83 J	
MW28	5/30/18	N	0.17 U	0.58 J		1.2 J		46.7 U			0.79 U		6.9 U		0.086 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U	104		26.1	133		2	5.4 B	0.78 J	
MW29	4/13/16	N	1.4	0.49 U		6.7		1660			2270		7.3 U		14000	34	0.35 U	0.58 J	0.90 J	7.2		87	4.5		120	0.035 U	6.4		70.2
MW29	7/21/16	N	0.67	0.49 U		2.1 B		1290 B			2800		7.3 U		11000	35	0.35 U	0.74 J	1.3	9.1		84	9.2	110		0.035 U	10.4	50.5	
MW29	7/21/16	FD	0.69	0.49 U		2.1 B		1250 B			2740		7.3 U		9100	30	0.35 U	0.83 J	1.2	9.3		83.8	9.2	110		0.035 U	10.5	51.6	
MW29	10/14/16	N	0.32 JB	0.35 J		2.6 B		1970 B			3220		6.2 U		20000	32	0.28 U	0.98 J	1.6	11		83	15.9	124		0.035 U	16.3	56.9 ^	
MW29	1/24/17	N	0.40 J	0.35 U		1.9 J		1400 B			3290 B		6.2 U		56000	40	0.28 U	0.98 J	1.2	12		113	4.3	120		0.035 U	6.8	51.4 B	
MW29	1/24/17	FD	0.37 J	0.35 U		3.3		1380 B			3170 B		6.2 U		67000	41	0.28 U	0.90 J	1.3	12		112	4.3	122		0.035 U	6.9	49.9 B	
MW30	4/13/16	N	0.080 U	0.49 U		0.81 J		46.1 J			147		7.3 U		0.72	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		42	3.2		82.3	3.4	32.8		1.2
MW30	7/21/16	N	0.080 U	0.49 U		0.75 U		16.0 U			52.9		7.3 U		1.7	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		44.5	2.9	82		4	29.9	1.4	
MW30	10/12/16	N	0.084 J	0.35 U		1.1 JB		13.8 JB			67.3 B		6.2 U		3.8	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		52.2	3.8	86		1.6 H	30.5	NA	
MW30	1/20/17	N	0.080 U	0.35 U		1.0 JB		9.4 JB			52.8 B		6.2 U		5.5	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		45.9	2.4	60		0.8	9.9	1.4	
MW30	4/21/17	N	0.50 U	5.0 U		0.95 JB		8.1 JB			37.7		20.0 U		3.6	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	0.23 U		1.1 J		49.4 J			31.5		6.9 U		2.1	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		48.4	0.55	52.3		2.0 H	4.6	1.6	
MW30	5/31/18	N	0.17 U	0.23 U		1.1 J		46.7 U			23.3		6.9 U		630	1.7	0.15 U	0.18 U	0.15 U	0.39 J	67.3		0.66	69.1		1.6	3.7 B	1.7	
MW31	4/12/16	N	0.080 U	0.49 U		0.75 U		20.9 JB			7.7 B		7.3 U		0.030 Jp	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		122 B	0.99 J		125	0.68	4		0.59 J
MW31	7/20/16	N	0.080 U	0.49 U		0.86 J		16.0 U			2.2 J		7.3 U		4.6	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		105 B	0.76 J	100		0.49	1.9	0.68 J	
MW31	10/13/16	N	0.11 JB	0.35 U		0.76 JB		5.3 U			0.25 U		6.2 U		3.7	0.062 UH	0.28 U	0.26 U	0.23 U	0.24 U		110	0.63 J	104		0.46 H	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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
MW31	1/17/17	N	0.20 JB	0.59 J		1.4 JB		10.5 JB			0.52 J		6.2 U		0.69	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		113	0.53 J	118		0.51 HF1	1.7	0.74 J	
MW31	4/18/17	N	0.21 J	5.0 U		0.58 J		100 U			0.63 JB		20.0 U		0.026 Jp	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	10/3/17	N	1.9	0.51 J		5.0 B		1630			34.5		9.7 J		0.044 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U		104	1.4	93.9		0.54	1.3	0.50 J	
MW31	5/29/18	N	0.17 U	0.23 U		0.81 J		46.7 U			0.79 U		7.4 J		0.094 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U	137		1	140		0.88	2.3	0.75 J	
MW31	5/29/18	FD	0.17 U	0.23 U		0.60 J		46.7 U			0.79 U		6.9 U		0.086 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U	136		1	135		0.87	2.3	0.67 J	
MW6S	10/5/17	N	0.080 U	0.23 U		5.5		46.7 U			4		7.2 J		0.32	0.27 U	0.15 U	0.18 U	0.15 U	0.22 U		225	18.2	283		6.6 H	8	1.8	
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	N													0.1 U														
RW01	9/28/01	N2													0.05 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	FD													0.134 UB	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW01	5/4/04	N													0.140 UB	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	9/22/04	N													0.201	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	FD													0.053 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 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	7/7/05	FD													0.035 J	0.96 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	9/27/05	FD													0.049 J	0.93 UJ	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	5/31/06	FD													0.055 J	0.94 U	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	9/25/06	FD													0.023 J	0.93 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									
RW01	5/9/07	FD													0.048 J	0.95 R	1.0 U	1.0 U	1.0 U	2.0 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	9/18/07	FD													0.27 R	0.93 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	5/20/08	FD													0.066 J	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW01	5/20/08	N													0.060 J	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW01	10/23/08	FD														1 U													
RW01	10/23/08	N														1 U													
RW01	12/11/08	FD													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW01	12/11/08	N													0.1 UJ		0.1 U	0.4 U	0.4 U	1.0 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	6/2/09	N													0.1 UJ	1.0 UJ	0.5 UB	2.0 UB	2.0 UB	5.0 U									
RW01	7/6/09	FD															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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
RW01	7/6/09	N															0.5 U	2.0 U	2.0 U	5.0 U									
RW01	10/7/09	FD													0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	10/7/09	N													0.1 UJ	1 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	5/19/10	FD													0.1 U	1.0 U	0.4 U	5 U	5 U	5 U									
RW01	5/19/10	N													0.1 U	1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ									
RW01	10/5/10	FD													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW01	10/5/10	N													0.1 U	1.0 U	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	11/30/10	N															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	6/30/11	N													0.1 U	0.997 U	0.1 U	0.4 U	0.4 U	1 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	10/20/11	N													0.040 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	12/16/11	FD													0.031 R														
RW01	12/16/11	N													0.096 UJ														
RW01	5/23/12	FD													0.017 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	5/23/12	N													0.019 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	7/11/12	FD													0.035 J														
RW01	7/11/12	FD2													0.033 J														
RW01	7/11/12	N													0.027 J														
RW01	10/17/12	FD													0.035 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	10/17/12	N													0.045 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	12/3/12	FD													0.094 UJ														
RW01	12/3/12	FD2													0.095 U														
RW01	12/3/12	N													0.094 UJ														
RW01	12/3/12	N2													0.095 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	5/21/13	N													0.031 J	0.19 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	10/8/13	N2													0.097 U	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	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW01	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW01	10/15/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW01	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW01	4/19/17	N													0.015 J	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U									
RW01	10/20/17	N													0.048 U	0.27 U	0.15 U	0.18 U	0.37 J	0.22 U									
RW1	6/5/18	N													0.086 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW02	10/9/97	FD													2														
RW02	10/9/97	N													0.9 J														
RW02	10/24/97	N													1 U														
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	N													0.1 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 ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
RW02	9/28/01	N2													0.1 U														
RW02	9/28/01	N3													0.05 U														
RW02	9/28/01	N4													0.05 U														
RW02	5/14/02	N													0.1	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	8/6/02	N2													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	N													0.11 U	0.97 U	0.25 U	2.5 U	2.5 U	2.5 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	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									
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	N													0.037 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	10/17/12	N2													0.057 J														
RW02	10/17/12	N3													0.094 UJ														
RW02	12/3/12	N													0.095 U														
RW02	12/3/12	N2													0.094 UJ														
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													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW02	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	10/15/15	N													0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	4/17/17	N													0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U									
RW02	10/20/17	N													0.046 U	0.23 U	0.15 U	0.18 U	0.33 J	0.22 U									
RW2	4/17/18	N													0.011 U	0.24 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW03	10/9/97	N													1 U														

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Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date[2]	Compound [1] / Units / Type[3]	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
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	N													0.1 U														
RW03	9/28/01	N2													0.05 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									
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	N													0.095 U														
RW03	12/3/12	N2													0.095 UJ														
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	FD													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW03	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW03	4/21/15	N													0.015 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	10/15/15	N													0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	4/17/17	N													0.015 U	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U									
RW03	10/20/17	N													0.045 U	0.24 U	0.15 U	0.18 U	0.29 J	0.22 U									
RW3	4/17/18	N													0.011 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 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	N													0.1 U														

Appendix A.1

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

Location	Compound [1] / Units / Date [2] / Type [3]	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CACO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03 N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
RW04	9/28/01 N2													0.05 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									
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 N													0.095 U														
RW04	12/3/12 N2													0.094 UJ														
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													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW04	4/21/15 N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	10/15/15 N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	4/5/16 N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	4/17/17 N													0.015 U	0.060 U	0.34 JB	0.26 U	0.23 U	0.24 U									
RW04	10/20/17 N													0.045 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW4	4/17/18 N													0.011 U	0.28 U	0.15 U	0.18 U	0.15 U	0.22 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														
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									

Appendix A.1

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

Location	Compound [1] / Units	Date [2]	Type [3]	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CACO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/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	mg/l	mg/l
DW01	9/24/03	N		0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	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
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	N														0.095 UJ														
RW05	12/4/12	N2														0.095 U														
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														0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW05	4/21/15	N														0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	10/15/15	N														0.016 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	4/5/16	N														0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	4/17/17	N														0.015 U	0.060 U	0.39 JB	0.26 U	0.23 U	0.24 U									
RW05	10/20/17	N														0.044 U	0.25 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW5	4/17/18	N														0.011 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW5	4/17/18	FD														0.011 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW06	9/25/14	N														0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW06	4/21/15	N														0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	10/15/15	N														0.018 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	4/5/16	N														0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	4/18/17	N														0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U									
RW06	10/20/17	N														0.044 U	0.23 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW6	4/17/18	N														0.011 U	0.26 U	0.15 U	0.18 U	0.15 U	0.22 U									
RW6 Shop	4/17/18	N														0.011 U	0.25 U	0.15 U	0.18 U	1.5	0.22 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
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

Notes:

NM - Not Measured
NA - Not Applicable
* - MW10S measured on 6/1/18 and MW29 measured on 5/24/18

Appendix A.3

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

Appendix A.6

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	

Appendix A.6

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	

Appendix A.6

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	

Appendix A.6

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	

Appendix A.6

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	

Appendix A.6

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	

Appendix A.6

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

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: 500-146110-1
Client Project/Site: Penta Wood 086165-04

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

Attn: Mr. Grant Anderson

Authorized for release by:
6/12/2018 4:20:30 PM

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

Table of Contents

Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Job ID: 500-146110-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-146110-1

Comments
No additional comments.

Receipt
The samples were received on 5/30/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.7º C and 2.4º C.

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

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

Metals
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 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-01 — Lab Sample ID: 500-146110-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	1.9	J	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	500		100	46.7	ug/L	1		6020A	Dissolved
Manganese	4.0		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	52.7		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	1.2		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.46		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	3.4		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	109	F2	5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180529-PS-02 — Lab Sample ID: 500-146110-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	0.81	J	2.0	0.50	ug/L	1		6020A	Dissolved
Zinc	7.4	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	140		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	1.0		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.88		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	2.3		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.75	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	137		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180529-PS-03 — Lab Sample ID: 500-146110-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	0.60	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	135		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	1.0		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	0.87		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	2.3		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.67	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	136		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180529-PS-04 — Lab Sample ID: 500-146110-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	0.95	J	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	75.5		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	3.6		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	1.5		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	4.0		0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.79	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	65.3		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank-001 — Lab Sample ID: 500-146110-5

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

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 086165-04

TestAmerica Job ID: 500-146110-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-146110-1	W-180529-PS-01	Water	05/29/18 10:40	05/30/18 09:45
500-146110-2	W-180529-PS-02	Water	05/29/18 11:52	05/30/18 09:45
500-146110-3	W-180529-PS-03	Water	05/29/18 12:02	05/30/18 09:45
500-146110-4	W-180529-PS-04	Water	05/29/18 13:27	05/30/18 09:45
500-146110-5	Trip Blank-001	Water	05/29/18 15:00	05/30/18 09:45

Client Sample ID: W-180529-PS-01

Date Collected: 05/29/18 10:40
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-1

Matrix: Water

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			06/04/18 11:38	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 11:38	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 11:38	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 11:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/04/18 11:38*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/04/18 11:38*	*1*
4-Bromofluorobenzene (Surr)	*87*		*72 - 124*		*06/04/18 11:38*	*1*
Dibromofluoromethane	*93*		*75 - 120*		*06/04/18 11:38*	*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		06/01/18 09:11	06/01/18 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*101*		*36 - 120*	*06/01/18 09:11*	*06/01/18 18:31*	*1*
2-Fluorobiphenyl (Surr)	*90*		*34 - 110*	*06/01/18 09:11*	*06/01/18 18:31*	*1*
Terphenyl-d14 (Surr)	*117*		*40 - 145*	*06/01/18 09:11*	*06/01/18 18:31*	*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			06/05/18 11:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/05/18 11:20*	*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		06/01/18 10:20	06/04/18 08:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*60*		*25 - 130*	*06/01/18 10:20*	*06/04/18 08:32*	*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		05/30/18 15:30	05/31/18 18:44	1
Copper	**1.9**	**J**	2.0	0.50	ug/L		05/30/18 15:30	05/31/18 18:44	1
Iron	**500**		100	46.7	ug/L		05/30/18 15:30	05/31/18 18:44	1
Manganese	**4.0**		2.5	0.79	ug/L		05/30/18 15:30	05/31/18 18:44	1
Zinc	<6.9		20.0	6.9	ug/L		05/30/18 15:30	05/31/18 18:44	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	**52.7**		1.3	0.66	mg/L		05/30/18 15:29	06/01/18 08:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.2**		0.20	0.17	mg/L			05/30/18 17:24	1
Nitrate as N	**0.46**		0.20	0.068	mg/L			05/30/18 17:24	1
Sulfate	**3.4**		0.20	0.095	mg/L			05/30/18 17:24	1
Total Organic Carbon - Duplicates	**2.1**		1.0	0.47	mg/L			06/03/18 18:12	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-01
Date Collected: 05/29/18 10:40
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-1
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	109	F2	5.0	3.7	mg/L			06/06/18 12:07	1

Client Sample ID: W-180529-PS-02

Date Collected: 05/29/18 11:52
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-2

Matrix: Water

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			06/04/18 12:07	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 12:07	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 12:07	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 126*		*06/04/18 12:07*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/04/18 12:07*	*1*
4-Bromofluorobenzene (Surr)	*88*		*72 - 124*		*06/04/18 12:07*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/04/18 12:07*	*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		06/01/18 09:11	06/01/18 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*97*		*36 - 120*	*06/01/18 09:11*	*06/01/18 18:56*	*1*
2-Fluorobiphenyl (Surr)	*85*		*34 - 110*	*06/01/18 09:11*	*06/01/18 18:56*	*1*
Terphenyl-d14 (Surr)	*116*		*40 - 145*	*06/01/18 09:11*	*06/01/18 18:56*	*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			06/05/18 11:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/05/18 11:38*	*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		06/01/18 10:20	06/04/18 08:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*61*		*25 - 130*	*06/01/18 10:20*	*06/04/18 08:56*	*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		05/30/18 15:30	05/31/18 18:48	1
Copper	**0.81**	**J**	2.0	0.50	ug/L		05/30/18 15:30	05/31/18 18:48	1
Iron	<46.7		100	46.7	ug/L		05/30/18 15:30	05/31/18 18:48	1
Manganese	<0.79		2.5	0.79	ug/L		05/30/18 15:30	05/31/18 18:48	1
Zinc	**7.4**	**J**	20.0	6.9	ug/L		05/30/18 15:30	05/31/18 18:48	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	**140**		1.3	0.66	mg/L		05/30/18 15:29	06/01/18 08:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.0**		0.20	0.17	mg/L			05/30/18 17:49	1
Nitrate as N	**0.88**		0.20	0.068	mg/L			05/30/18 17:49	1
Sulfate	**2.3**		0.20	0.095	mg/L			05/30/18 17:49	1
Total Organic Carbon - Duplicates	**0.75**	**J**	1.0	0.47	mg/L			06/03/18 19:30	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-02
Date Collected: 05/29/18 11:52
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-2
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	137		5.0	3.7	mg/L			06/06/18 12:19	1

Client Sample ID: W-180529-PS-03

Date Collected: 05/29/18 12:02
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-3

Matrix: Water

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			06/04/18 12:36	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 12:36	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 12:36	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 12:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 126*		*06/04/18 12:36*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/04/18 12:36*	*1*
4-Bromofluorobenzene (Surr)	*89*		*72 - 124*		*06/04/18 12:36*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/04/18 12:36*	*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		06/01/18 09:11	06/01/18 19:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*103*		*36 - 120*	*06/01/18 09:11*	*06/01/18 19:20*	*1*
2-Fluorobiphenyl (Surr)	*90*		*34 - 110*	*06/01/18 09:11*	*06/01/18 19:20*	*1*
Terphenyl-d14 (Surr)	*118*		*40 - 145*	*06/01/18 09:11*	*06/01/18 19:20*	*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			06/05/18 12:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/05/18 12:29*	*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		06/01/18 10:20	06/04/18 10:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*56*		*25 - 130*	*06/01/18 10:20*	*06/04/18 10:09*	*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		05/30/18 15:30	05/31/18 19:07	1
Copper	**0.60**	**J**	2.0	0.50	ug/L		05/30/18 15:30	05/31/18 19:07	1
Iron	<46.7		100	46.7	ug/L		05/30/18 15:30	05/31/18 19:07	1
Manganese	<0.79		2.5	0.79	ug/L		05/30/18 15:30	05/31/18 19:07	1
Zinc	<6.9		20.0	6.9	ug/L		05/30/18 15:30	05/31/18 19:07	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	**135**		1.3	0.66	mg/L		05/30/18 15:29	06/01/18 08:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.0**		0.20	0.17	mg/L			05/30/18 19:05	1
Nitrate as N	**0.87**		0.20	0.068	mg/L			05/30/18 19:05	1
Sulfate	**2.3**		0.20	0.095	mg/L			05/30/18 19:05	1
Total Organic Carbon - Duplicates	**0.67**	**J**	1.0	0.47	mg/L			06/03/18 19:05	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-03
Date Collected: 05/29/18 12:02
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-3
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	136		5.0	3.7	mg/L			06/06/18 12:26	1

Client Sample ID: W-180529-PS-04

Date Collected: 05/29/18 13:27
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-4

Matrix: Water

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			06/04/18 13:04	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 13:04	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 13:04	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 13:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 126*		*06/04/18 13:04*	*1*
Toluene-d8 (Surr)	*92*		*75 - 120*		*06/04/18 13:04*	*1*
4-Bromofluorobenzene (Surr)	*88*		*72 - 124*		*06/04/18 13:04*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/04/18 13:04*	*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		06/01/18 09:11	06/01/18 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*100*		*36 - 120*	*06/01/18 09:11*	*06/01/18 19:44*	*1*
2-Fluorobiphenyl (Surr)	*89*		*34 - 110*	*06/01/18 09:11*	*06/01/18 19:44*	*1*
Terphenyl-d14 (Surr)	*112*		*40 - 145*	*06/01/18 09:11*	*06/01/18 19:44*	*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			06/05/18 13:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/05/18 13:03*	*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		06/01/18 10:20	06/04/18 10:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*58*		*25 - 130*	*06/01/18 10:20*	*06/04/18 10:34*	*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		05/30/18 15:30	05/31/18 19:10	1
Copper	**0.95**	**J**	2.0	0.50	ug/L		05/30/18 15:30	05/31/18 19:10	1
Iron	<46.7		100	46.7	ug/L		05/30/18 15:30	05/31/18 19:10	1
Manganese	**1.3**	**J**	2.5	0.79	ug/L		05/30/18 15:30	05/31/18 19:10	1
Zinc	<6.9		20.0	6.9	ug/L		05/30/18 15:30	05/31/18 19:10	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	**75.5**		1.3	0.66	mg/L		05/30/18 15:29	06/01/18 08:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**3.6**		0.20	0.17	mg/L			05/30/18 19:56	1
Nitrate as N	**1.5**		0.20	0.068	mg/L			05/30/18 19:56	1
Sulfate	**4.0**		0.20	0.095	mg/L			05/30/18 19:56	1
Total Organic Carbon - Duplicates	**0.79**	**J**	1.0	0.47	mg/L			06/03/18 19:23	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-04
Date Collected: 05/29/18 13:27
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-4
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	65.3		5.0	3.7	mg/L			06/06/18 12:32	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: Trip Blank-001
Date Collected: 05/29/18 15:00
Date Received: 05/30/18 09:45

Lab Sample ID: 500-146110-5
Matrix: Water

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			06/04/18 11:10	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 11:10	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 11:10	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 11:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/04/18 11:10*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/04/18 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*72 - 124*		*06/04/18 11:10*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/04/18 11:10*	*1*

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.

General Chemistry

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
F3	Duplicate RPD exceeds the control limit
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)

GC/MS VOA

Analysis Batch: 435124

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	8260B	
500-146110-2	W-180529-PS-02	Total/NA	Water	8260B	
500-146110-3	W-180529-PS-03	Total/NA	Water	8260B	
500-146110-4	W-180529-PS-04	Total/NA	Water	8260B	
500-146110-5	Trip Blank-001	Total/NA	Water	8260B	
MB 500-435124/6	Method Blank	Total/NA	Water	8260B	
LCS 500-435124/4	Lab Control Sample	Total/NA	Water	8260B	
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	8260B	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 434899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	3510C	
500-146110-2	W-180529-PS-02	Total/NA	Water	3510C	
500-146110-3	W-180529-PS-03	Total/NA	Water	3510C	
500-146110-4	W-180529-PS-04	Total/NA	Water	3510C	
MB 500-434899/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-434899/2-A	Lab Control Sample	Total/NA	Water	3510C	
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	3510C	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	3510C	

Analysis Batch: 434915

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	8270D	434899
500-146110-2	W-180529-PS-02	Total/NA	Water	8270D	434899
500-146110-3	W-180529-PS-03	Total/NA	Water	8270D	434899
500-146110-4	W-180529-PS-04	Total/NA	Water	8270D	434899
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	8270D	434899

Analysis Batch: 434943

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-434899/1-A	Method Blank	Total/NA	Water	8270D	434899
LCS 500-434899/2-A	Lab Control Sample	Total/NA	Water	8270D	434899

Analysis Batch: 435616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	8270D	434899

GC VOA

Analysis Batch: 330033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	RSK-175	
500-146110-2	W-180529-PS-02	Total/NA	Water	RSK-175	
500-146110-3	W-180529-PS-03	Total/NA	Water	RSK-175	
500-146110-4	W-180529-PS-04	Total/NA	Water	RSK-175	
MB 240-330033/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-330033/5	Lab Control Sample	Total/NA	Water	RSK-175	

GC VOA (Continued)

Analysis Batch: 330033 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	RSK-175	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	RSK-175	

GC Semi VOA

Analysis Batch: 434895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	8151A	434908
500-146110-2	W-180529-PS-02	Total/NA	Water	8151A	434908
500-146110-3	W-180529-PS-03	Total/NA	Water	8151A	434908
500-146110-4	W-180529-PS-04	Total/NA	Water	8151A	434908
MB 500-434908/1-A	Method Blank	Total/NA	Water	8151A	434908
LCS 500-434908/2-A	Lab Control Sample	Total/NA	Water	8151A	434908
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	8151A	434908
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	8151A	434908

Prep Batch: 434908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	8151A	
500-146110-2	W-180529-PS-02	Total/NA	Water	8151A	
500-146110-3	W-180529-PS-03	Total/NA	Water	8151A	
500-146110-4	W-180529-PS-04	Total/NA	Water	8151A	
MB 500-434908/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-434908/2-A	Lab Control Sample	Total/NA	Water	8151A	
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	8151A	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	8151A	

Metals

Prep Batch: 434624

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	3010A	
500-146110-2	W-180529-PS-02	Total/NA	Water	3010A	
500-146110-3	W-180529-PS-03	Total/NA	Water	3010A	
500-146110-4	W-180529-PS-04	Total/NA	Water	3010A	

Prep Batch: 434625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Dissolved	Water	3005A	
500-146110-2	W-180529-PS-02	Dissolved	Water	3005A	
500-146110-3	W-180529-PS-03	Dissolved	Water	3005A	
500-146110-4	W-180529-PS-04	Dissolved	Water	3005A	
MB 500-434625/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-434625/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-146110-2 MS	W-180529-PS-02	Dissolved	Water	3005A	
500-146110-2 MSD	W-180529-PS-02	Dissolved	Water	3005A	
500-146110-2 DU	W-180529-PS-02	Dissolved	Water	3005A	

Metals (Continued)

Analysis Batch: 434873

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	SM 2340B	434624
500-146110-2	W-180529-PS-02	Total/NA	Water	SM 2340B	434624
500-146110-3	W-180529-PS-03	Total/NA	Water	SM 2340B	434624
500-146110-4	W-180529-PS-04	Total/NA	Water	SM 2340B	434624

Analysis Batch: 434887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Dissolved	Water	6020A	434625
500-146110-2	W-180529-PS-02	Dissolved	Water	6020A	434625
500-146110-3	W-180529-PS-03	Dissolved	Water	6020A	434625
500-146110-4	W-180529-PS-04	Dissolved	Water	6020A	434625
MB 500-434625/1-A	Method Blank	Total Recoverable	Water	6020A	434625
LCS 500-434625/2-A	Lab Control Sample	Total Recoverable	Water	6020A	434625
500-146110-2 MS	W-180529-PS-02	Dissolved	Water	6020A	434625
500-146110-2 MSD	W-180529-PS-02	Dissolved	Water	6020A	434625
500-146110-2 DU	W-180529-PS-02	Dissolved	Water	6020A	434625

General Chemistry

Analysis Batch: 434769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	300.0	
500-146110-2	W-180529-PS-02	Total/NA	Water	300.0	
500-146110-3	W-180529-PS-03	Total/NA	Water	300.0	
500-146110-4	W-180529-PS-04	Total/NA	Water	300.0	
MB 500-434769/23	Method Blank	Total/NA	Water	300.0	
LCS 500-434769/34	Lab Control Sample	Total/NA	Water	300.0	
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	300.0	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	300.0	

Analysis Batch: 435215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	9060A	
500-146110-2	W-180529-PS-02	Total/NA	Water	9060A	
500-146110-3	W-180529-PS-03	Total/NA	Water	9060A	
500-146110-4	W-180529-PS-04	Total/NA	Water	9060A	
MB 500-435215/4	Method Blank	Total/NA	Water	9060A	
LCS 500-435215/5	Lab Control Sample	Total/NA	Water	9060A	
500-146110-2 MS	W-180529-PS-02	Total/NA	Water	9060A	
500-146110-2 MSD	W-180529-PS-02	Total/NA	Water	9060A	

Analysis Batch: 435732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146110-1	W-180529-PS-01	Total/NA	Water	SM 2320B	
500-146110-2	W-180529-PS-02	Total/NA	Water	SM 2320B	
500-146110-3	W-180529-PS-03	Total/NA	Water	SM 2320B	
500-146110-4	W-180529-PS-04	Total/NA	Water	SM 2320B	
MB 500-435732/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-435732/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-146110-1 DU	W-180529-PS-01	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-146110-1	W-180529-PS-01	92	94	87	93
500-146110-2	W-180529-PS-02	94	93	88	96
500-146110-2 MS	W-180529-PS-02	96	90	89	100
500-146110-2 MSD	W-180529-PS-02	97	92	89	101
500-146110-3	W-180529-PS-03	94	94	89	96
500-146110-4	W-180529-PS-04	96	92	88	96
500-146110-5	Trip Blank-001	87	97	87	90
LCS 500-435124/4	Lab Control Sample	90	95	90	95
MB 500-435124/6	Method Blank	92	94	89	95

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-146110-1	W-180529-PS-01	101	90	117
500-146110-2	W-180529-PS-02	97	85	116
500-146110-2 MS	W-180529-PS-02	99	87	104
500-146110-2 MSD	W-180529-PS-02	98	80	98
500-146110-3	W-180529-PS-03	103	90	118
500-146110-4	W-180529-PS-04	100	89	112
LCS 500-434899/2-A	Lab Control Sample	104	82	105
MB 500-434899/1-A	Method Blank	107	89	110

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)
		TFE2
Lab Sample ID	Client Sample ID	(60-140)
500-146110-1	W-180529-PS-01	92
500-146110-2	W-180529-PS-02	92
500-146110-2 MS	W-180529-PS-02	86
500-146110-2 MSD	W-180529-PS-02	83
500-146110-3	W-180529-PS-03	91
500-146110-4	W-180529-PS-04	92
LCS 240-330033/5	Lab Control Sample	88
MB 240-330033/4	Method Blank	93

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

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)**
500-146110-1	W-180529-PS-01	60
500-146110-2	W-180529-PS-02	61
500-146110-2 MS	W-180529-PS-02	68
500-146110-2 MSD	W-180529-PS-02	45
500-146110-3	W-180529-PS-03	56
500-146110-4	W-180529-PS-04	58
LCS 500-434908/2-A	Lab Control Sample	65
MB 500-434908/1-A	Method Blank	60

Surrogate Legend

DCPAA = DCAA

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

Lab Sample ID: MB 500-435124/6
Matrix: Water
Analysis Batch: 435124

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			06/04/18 10:42	1
Toluene	<0.15		0.50	0.15	ug/L			06/04/18 10:42	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/04/18 10:42	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/04/18 10:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/04/18 10:42*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/04/18 10:42*	*1*
4-Bromofluorobenzene (Surr)	*89*		*72 - 124*		*06/04/18 10:42*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*06/04/18 10:42*	*1*

Lab Sample ID: LCS 500-435124/4
Matrix: Water
Analysis Batch: 435124

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	47.8		ug/L		96	70 - 120		
Toluene			50.0	49.3		ug/L		99	70 - 125		
Ethylbenzene			50.0	51.0		ug/L		102	70 - 120		
Xylenes, Total			100	95.1		ug/L		95	70 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 126*
Toluene-d8 (Surr)	*95*		*75 - 120*
4-Bromofluorobenzene (Surr)	*90*		*72 - 124*
Dibromofluoromethane	*95*		*75 - 120*

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 435124

Client Sample ID: W-180529-PS-02
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	47.9		ug/L		96	70 - 120		
Toluene	<0.15		50.0	45.8		ug/L		92	70 - 125		
Ethylbenzene	<0.18		50.0	47.4		ug/L		95	70 - 120		
Xylenes, Total	<0.22		100	89.8		ug/L		90	70 - 125		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 126*
Toluene-d8 (Surr)	*90*		*75 - 120*
4-Bromofluorobenzene (Surr)	*89*		*72 - 124*
Dibromofluoromethane	*100*		*75 - 120*

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

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 435124

Client Sample ID: W-180529-PS-02
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	48.9		ug/L		98	70 - 120	2	20
Toluene	<0.15		50.0	47.0		ug/L		94	70 - 125	3	20
Ethylbenzene	<0.18		50.0	47.6		ug/L		95	70 - 120	0	20
Xylenes, Total	<0.22		100	90.2		ug/L		90	70 - 125	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 126*
Toluene-d8 (Surr)	*92*		*75 - 120*
4-Bromofluorobenzene (Surr)	*89*		*72 - 124*
Dibromofluoromethane	*101*		*75 - 120*

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

Lab Sample ID: MB 500-434899/1-A
Matrix: Water
Analysis Batch: 434943

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 434899

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		06/01/18 09:11	06/01/18 17:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*107*		*36 - 120*	*06/01/18 09:11*	*06/01/18 17:27*	*1*
2-Fluorobiphenyl (Surr)	*89*		*34 - 110*	*06/01/18 09:11*	*06/01/18 17:27*	*1*
Terphenyl-d14 (Surr)	*110*		*40 - 145*	*06/01/18 09:11*	*06/01/18 17:27*	*1*

Lab Sample ID: LCS 500-434899/2-A
Matrix: Water
Analysis Batch: 434943

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 434899

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene			32.0	23.2		ug/L		72	36 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*104*		*36 - 120*
2-Fluorobiphenyl (Surr)	*82*		*34 - 110*
Terphenyl-d14 (Surr)	*105*		*40 - 145*

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 434915

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA
Prep Batch: 434899

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	<0.24		33.6	23.5		ug/L		70	36 - 110

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*99*		*36 - 120*

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

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 434915

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA
Prep Batch: 434899

Surrogate	MS %Recovery	MS Qualifier	Limits
2-Fluorobiphenyl (Surr)	87		34 - 110
Terphenyl-d14 (Surr)	104		40 - 145

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 435616

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA
Prep Batch: 434899

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	<0.24		32.4	22.0		ug/L		68	36 - 110	6	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Nitrobenzene-d5 (Surr)	98		36 - 120
2-Fluorobiphenyl (Surr)	80		34 - 110
Terphenyl-d14 (Surr)	98		40 - 145

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-330033/4
Matrix: Water
Analysis Batch: 330033

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			06/05/18 08:29	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	93		60 - 140		06/05/18 08:29	1

Lab Sample ID: LCS 240-330033/5
Matrix: Water
Analysis Batch: 330033

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			285	232		ug/L		81	80 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,1,1-Trifluoroethane	88		60 - 140

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 330033

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
1,1,1-Trifluoroethane	86		60 - 140

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 330033

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,1,1-Trifluoroethane	83		60 - 140

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-434908/1-A
Matrix: Water
Analysis Batch: 434895

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 434908

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/01/18 10:20	06/02/18 05:23	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	60		25 - 130	06/01/18 10:20	06/02/18 05:23	1

Lab Sample ID: LCS 500-434908/2-A
Matrix: Water
Analysis Batch: 434895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 434908

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Pentachlorophenol			2.53	1.43		ug/L		57	40 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	65		25 - 130

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 434895

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA
Prep Batch: 434908

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Pentachlorophenol	<0.094		2.62	1.60		ug/L		61	40 - 122		

Surrogate	MS %Recovery	MS Qualifier	Limits
DCAA	68		25 - 130

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 434895

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA
Prep Batch: 434908

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	<0.094		2.66	0.601	F1 F2	ug/L		23	40 - 122	91	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
DCAA	45		25 - 130

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-434625/1-A
Matrix: Water
Analysis Batch: 434887

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 434625

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		05/30/18 15:30	05/31/18 18:37	1
Copper	<0.50		2.0	0.50	ug/L		05/30/18 15:30	05/31/18 18:37	1
Iron	<46.7		100	46.7	ug/L		05/30/18 15:30	05/31/18 18:37	1
Manganese	<0.79		2.5	0.79	ug/L		05/30/18 15:30	05/31/18 18:37	1
Zinc	<6.9		20.0	6.9	ug/L		05/30/18 15:30	05/31/18 18:37	1

Lab Sample ID: LCS 500-434625/2-A
Matrix: Water
Analysis Batch: 434887

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 434625

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	98.13		ug/L		98	80 - 120
Copper	250	252.6		ug/L		101	80 - 120
Iron	1000	1034		ug/L		103	80 - 120
Manganese	500	506.6		ug/L		101	80 - 120
Zinc	500	507.8		ug/L		102	80 - 120

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 434887

Client Sample ID: W-180529-PS-02
Prep Type: Dissolved
Prep Batch: 434625

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	<0.23		100	97.57		ug/L		98	75 - 125
Copper	0.81	J	250	247.9		ug/L		99	75 - 125
Iron	<46.7		1000	960.6		ug/L		96	75 - 125
Manganese	<0.79		500	477.0		ug/L		95	75 - 125
Zinc	7.4	J	500	497.9		ug/L		98	75 - 125

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 434887

Client Sample ID: W-180529-PS-02
Prep Type: Dissolved
Prep Batch: 434625

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	<0.23		100	97.24		ug/L		97	75 - 125	0	20
Copper	0.81	J	250	246.6		ug/L		98	75 - 125	1	20
Iron	<46.7		1000	963.6		ug/L		96	75 - 125	0	20
Manganese	<0.79		500	471.5		ug/L		94	75 - 125	1	20
Zinc	7.4	J	500	498.4		ug/L		98	75 - 125	0	20

Lab Sample ID: 500-146110-2 DU
Matrix: Water
Analysis Batch: 434887

Client Sample ID: W-180529-PS-02
Prep Type: Dissolved
Prep Batch: 434625

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	<0.23		<0.23		ug/L		NC	20
Copper	0.81	J	0.650	J F5	ug/L		22	20
Iron	<46.7		<46.7		ug/L		NC	20
Manganese	<0.79		<0.79		ug/L		NC	20
Zinc	7.4	J	<6.9		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-434769/23
Matrix: Water
Analysis Batch: 434769

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			05/30/18 10:32	1
Nitrate as N	<0.068		0.20	0.068	mg/L			05/30/18 10:32	1
Sulfate	<0.095		0.20	0.095	mg/L			05/30/18 10:32	1

Lab Sample ID: LCS 500-434769/34
Matrix: Water
Analysis Batch: 434769

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	2.98		mg/L		99	90 - 110
Nitrate as N	2.00	1.97		mg/L		99	90 - 110
Sulfate	5.00	4.81		mg/L		96	90 - 110

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 434769

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.0		1.00	2.10		mg/L		106	80 - 120
Nitrate as N	0.88		1.00	1.85		mg/L		97	80 - 120
Sulfate	2.3		2.50	4.79		mg/L		98	80 - 120

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 434769

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.0		1.00	2.10		mg/L		106	80 - 120	0	20
Nitrate as N	0.88		1.00	1.90		mg/L		102	80 - 120	2	20
Sulfate	2.3		2.50	4.76		mg/L		97	80 - 120	1	20

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

Lab Sample ID: MB 500-435215/4
Matrix: Water
Analysis Batch: 435215

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			06/03/18 15:44	1

Lab Sample ID: LCS 500-435215/5
Matrix: Water
Analysis Batch: 435215

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	9.52		mg/L		95	80 - 120

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

Lab Sample ID: 500-146110-2 MS
Matrix: Water
Analysis Batch: 435215

Client Sample ID: W-180529-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon - Duplicates	0.75	J	10.0	9.83		mg/L		91	75 - 125		

Lab Sample ID: 500-146110-2 MSD
Matrix: Water
Analysis Batch: 435215

Client Sample ID: W-180529-PS-02
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	0.75	J	10.0	9.91		mg/L		92	75 - 125	1	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-435732/3
Matrix: Water
Analysis Batch: 435732

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			06/06/18 10:26	1

Lab Sample ID: LCS 500-435732/4
Matrix: Water
Analysis Batch: 435732

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			100	100.2		mg/L		100	85 - 115		

Lab Sample ID: 500-146110-1 DU
Matrix: Water
Analysis Batch: 435732

Client Sample ID: W-180529-PS-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	109	F2		58.21	F3	mg/L				61	20

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-01

Lab Sample ID: 500-146110-1

Date Collected: 05/29/18 10:40

Matrix: Water

Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435124	06/04/18 11:38	EMA	TAL CHI
Total/NA	Prep	3510C			434899	06/01/18 09:11	NKG	TAL CHI
Total/NA	Analysis	8270D		1	434915	06/01/18 18:31	WDS	TAL CHI
Total/NA	Analysis	RSK-175		1	330033	06/05/18 11:20	SEM	TAL CAN
Total/NA	Prep	8151A			434908	06/01/18 10:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	434895	06/04/18 08:32	JBJ	TAL CHI
Dissolved	Prep	3005A			434625	05/30/18 15:30	BDE	TAL CHI
Dissolved	Analysis	6020A		1	434887	05/31/18 18:44	FXG	TAL CHI
Total/NA	Prep	3010A			434624	05/30/18 15:29	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	434873	06/01/18 08:14	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434769	05/30/18 17:24	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 18:12	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:07	SMO	TAL CHI

Client Sample ID: W-180529-PS-02

Lab Sample ID: 500-146110-2

Date Collected: 05/29/18 11:52

Matrix: Water

Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435124	06/04/18 12:07	EMA	TAL CHI
Total/NA	Prep	3510C			434899	06/01/18 09:11	NKG	TAL CHI
Total/NA	Analysis	8270D		1	434915	06/01/18 18:56	WDS	TAL CHI
Total/NA	Analysis	RSK-175		1	330033	06/05/18 11:38	SEM	TAL CAN
Total/NA	Prep	8151A			434908	06/01/18 10:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	434895	06/04/18 08:56	JBJ	TAL CHI
Dissolved	Prep	3005A			434625	05/30/18 15:30	BDE	TAL CHI
Dissolved	Analysis	6020A		1	434887	05/31/18 18:48	FXG	TAL CHI
Total/NA	Prep	3010A			434624	05/30/18 15:29	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	434873	06/01/18 08:14	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434769	05/30/18 17:49	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 19:30	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:19	SMO	TAL CHI

Client Sample ID: W-180529-PS-03

Lab Sample ID: 500-146110-3

Date Collected: 05/29/18 12:02

Matrix: Water

Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435124	06/04/18 12:36	EMA	TAL CHI
Total/NA	Prep	3510C			434899	06/01/18 09:11	NKG	TAL CHI
Total/NA	Analysis	8270D		1	434915	06/01/18 19:20	WDS	TAL CHI
Total/NA	Analysis	RSK-175		1	330033	06/05/18 12:29	SEM	TAL CAN

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146110-1

Client Sample ID: W-180529-PS-03

Lab Sample ID: 500-146110-3
Matrix: Water
Date Collected: 05/29/18 12:02
Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8151A			434908	06/01/18 10:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	434895	06/04/18 10:09	JBJ	TAL CHI
Dissolved	Prep	3005A			434625	05/30/18 15:30	BDE	TAL CHI
Dissolved	Analysis	6020A		1	434887	05/31/18 19:07	FXG	TAL CHI
Total/NA	Prep	3010A			434624	05/30/18 15:29	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	434873	06/01/18 08:14	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434769	05/30/18 19:05	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 19:05	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:26	SMO	TAL CHI

Client Sample ID: W-180529-PS-04

Lab Sample ID: 500-146110-4
Matrix: Water
Date Collected: 05/29/18 13:27
Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435124	06/04/18 13:04	EMA	TAL CHI
Total/NA	Prep	3510C			434899	06/01/18 09:11	NKG	TAL CHI
Total/NA	Analysis	8270D		1	434915	06/01/18 19:44	WDS	TAL CHI
Total/NA	Analysis	RSK-175		1	330033	06/05/18 13:03	SEM	TAL CAN
Total/NA	Prep	8151A			434908	06/01/18 10:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	434895	06/04/18 10:34	JBJ	TAL CHI
Dissolved	Prep	3005A			434625	05/30/18 15:30	BDE	TAL CHI
Dissolved	Analysis	6020A		1	434887	05/31/18 19:10	FXG	TAL CHI
Total/NA	Prep	3010A			434624	05/30/18 15:29	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	434873	06/01/18 08:14	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434769	05/30/18 19:56	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 19:23	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:32	SMO	TAL CHI

Client Sample ID: Trip Blank-001

Lab Sample ID: 500-146110-5
Matrix: Water
Date Collected: 05/29/18 15:00
Date Received: 05/30/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435124	06/04/18 11:10	EMA	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 086165-04

TestAmerica Job ID: 500-146110-1

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	08-31-18

The following analytes are included in this report, but are not accredited/certified under this accreditation/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	06-30-18 *
Illinois	NELAP	5	200004	07-31-18 *
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	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
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.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

(optional)
Report To
Contact: GRANT ANDERSON
Company:
Address:
Address:
Phone: 651-639-0913
Fax:
E-Mail:

(optional)
Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

AS 5/30/18

Chain of Custody Record

Lab Job #: 500-136146110
Chain of Custody Number: 180529
Page 1 of 1 0.9 → 2.4
Temperature °C of Cooler: 0.2 → 1.7

Client: GHD
Client Project #: 086165
Project Name: PENTAWOOD
Project Location/State: SIREN, WI
Lab Project #:
Sampler: P. STURLIE / T. BRAUN
Lab PM:

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative	N	D	D	A	N	A	N	N	S
							Parameter	2320B Alkalinity	2340C Hardness as CaCO3	6010 Metals Filtered	8260B RSK-175 Methane	300.0-28D Nitrate, Chloride, Sulfate	8260B BTEX	8270C Naphthalene	8151 PCP	9060 TOC
1		W-180529-PS-01	5/29/18	10:40	15	W		X	X	X	X	X	X	X	X	X
2	X	W-180529-PS-02		10:52	30	W		X	X	X	X	X	X	X	X	X
3		W-180529-PS-03		12:02	15	W		X	X	X	X	X	X	X	X	X
4		W-180529-PS-04		13:27	15	W		X	X	X	X	X	X	X	X	X
5		TRIP BLANK-001	5/29/18	15:00	1	W							X			

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Comments

500-146110 COC

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
T. Braun	GHD	5/29/18	15:00			05/30/18	0945

Lab Courier
Shipped FX Priority
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:

TAL-4124 500-2709

6/12/2018

FedEx Express — Package US Airbill

FedEx Tracking Number 8100 2372 3839

Form ID No. 0215

MUR4

1 From

Date 5/24/2018

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sami

Company Tes

Address 24

We cannot deliver to P.O. boxes or P.O.

Address

Use this line for the HOLD location addi

City Univers

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.
- [x] 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
- [x] Other

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

fedex.com 180

500-146110 Waybill

FedEx Express — Package US Airbill

FedEx Tracking Number 8100 2372 3840

Form ID No. 0215

MUR4

1 From

Date 5/24/2018

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3840

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.
- [x] 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
- [x] 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.

- [x] 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. [ ]

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

Total Packages 1 Total Weight 5 lbs. Credit Card Auth.

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

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fedex.com 1800.GoFedEx 1800.463.3339

TestAmerica Chicago 0.6|C0.7
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: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-105101.1
Client Contact: Shipping/Receiving	Phone:	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		Job #: 500-146110-1
Address: 4101 Shuffel Street NW, .	Due Date Requested: 6/12/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ (MOD) Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
W-180529-PS-01 (500-146110-1)	5/29/18	10:40 Central		Water			X	3	WI
W-180529-PS-02 (500-146110-2)	5/29/18	11:52 Central		Water			X	3	WI
W-180529-PS-02 (500-146110-2MS)	5/29/18	11:52 Central	MS	Water			X	3	WI
W-180529-PS-02 (500-146110-2MSD)	5/29/18	11:52 Central	MSD	Water			X	3	WI
W-180529-PS-03 (500-146110-3)	5/29/18	12:02 Central		Water			X	3	WI
W-180529-PS-04 (500-146110-4)	5/29/18	13:27 Central		Water			X	3	WI

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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company	Received by:	Date/Time	Company
Relinquished by:	05/30/18 1630	TA		5/31/18 1030	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client TA Chicago Site Name _____ Cooler unpacked by: SL

Cooler Received on 5/31/18 Opened on 5/31/18

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 +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #36 (CF +0.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
   ~~IR GUN # 627 (CF -1.3°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# **HC740840**
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:

Did not Receive PS-02-2MS, 3 vials on Chain, not in Cooler

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: 500-146110-1

Login Number: 146110
List Number: 1
Creator: Sanchez, Ariel M

List Source: TestAmerica Chicago

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	1.7, 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.	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: 500-146179-1
Client Project/Site: Penta Wood 086165-04

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

Attn: Mr. Grant Anderson

Authorized for release by:
6/15/2018 7:55:04 AM

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Case Narrative

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Narrative

Job Narrative
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Comments
No additional comments.

Receipt
The samples were received on 5/31/2018 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.0º C, 2.3º C and 2.8º C.

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

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

Metals
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 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-05 — Lab Sample ID: 500-146179-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.57	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	0.88	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	84.1		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	9.5		0.40	0.34	mg/L	2		300.0	Total/NA
Nitrate as N	1.2		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	5.0	B	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.67	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	73.2		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180530-PS-06 — Lab Sample ID: 500-146179-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.48	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.4	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	0.84	J	2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	65.6		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	74.7		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	1.7		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	6.6	B	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.89	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	32.9		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180530-PS-07 — Lab Sample ID: 500-146179-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.58	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.2	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	133		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	26.1		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.0		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	5.4	B	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	104		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180530-PS-08 — Lab Sample ID: 500-146179-4

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	1.7	J	2.0	0.50	ug/L	1		6020A	Dissolved

Client Sample ID: Trip Blank-002 — Lab Sample ID: 500-146179-5

No Detections.

Client Sample ID: W-180530-PS-09 — Lab Sample ID: 500-146179-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.79	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.3	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	216		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	257		1.3	0.66	mg/L	1		SM 2340B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Client Sample ID: W-180530-PS-09 (Continued) — Lab Sample ID: 500-146179-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Chloride	10.5		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.58		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	76.4	B	2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	1.6		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	183	F2	5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180530-PS-10 — Lab Sample ID: 500-146179-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.52	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	2.2		2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	2.3	J	2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	34.9		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	5.0		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	4.0	B	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	1.5		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	34.1		5.0	3.7	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

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 086165-04

TestAmerica Job ID: 500-146179-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-146179-1	W-180530-PS-05	Water	05/30/18 09:11	05/31/18 09:50
500-146179-2	W-180530-PS-06	Water	05/30/18 10:30	05/31/18 09:50
500-146179-3	W-180530-PS-07	Water	05/30/18 12:15	05/31/18 09:50
500-146179-4	W-180530-PS-08	Water	05/30/18 12:45	05/31/18 09:50
500-146179-5	Trip Blank-002	Water	05/30/18 15:00	05/31/18 09:50
500-146179-6	W-180530-PS-09	Water	05/30/18 14:16	05/31/18 09:50
500-146179-7	W-180530-PS-10	Water	05/30/18 14:41	05/31/18 09:50

Client Sample ID: W-180530-PS-05

Date Collected: 05/30/18 09:11
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-1

Matrix: Water

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			06/06/18 18:34	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 18:34	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 18:34	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 18:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/06/18 18:34*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/06/18 18:34*	*1*
4-Bromofluorobenzene (Surr)	*101*		*72 - 124*		*06/06/18 18:34*	*1*
Dibromofluoromethane	*99*		*75 - 120*		*06/06/18 18:34*	*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		06/04/18 07:30	06/04/18 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*116*		*36 - 120*	*06/04/18 07:30*	*06/04/18 17:06*	*1*
2-Fluorobiphenyl (Surr)	*97*		*34 - 110*	*06/04/18 07:30*	*06/04/18 17:06*	*1*
Terphenyl-d14 (Surr)	*112*		*40 - 145*	*06/04/18 07:30*	*06/04/18 17:06*	*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			06/06/18 15:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/06/18 15:03*	*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		06/05/18 11:20	06/07/18 00:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*56*		*25 - 130*	*06/05/18 11:20*	*06/07/18 00:13*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.57**	**J**	1.0	0.23	ug/L		05/31/18 15:41	06/01/18 13:44	1
Copper	**0.88**	**J**	2.0	0.50	ug/L		05/31/18 15:41	06/01/18 13:44	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 13:44	1
Manganese	<0.79		2.5	0.79	ug/L		05/31/18 15:41	06/01/18 13:44	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 13:44	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	**84.1**		1.3	0.66	mg/L		05/31/18 15:43	06/04/18 08:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**9.5**		0.40	0.34	mg/L			06/12/18 03:28	2
Nitrate as N	**1.2**		0.20	0.068	mg/L			05/31/18 12:53	1
Sulfate	**5.0**	**B**	0.20	0.095	mg/L			05/31/18 12:53	1
Total Organic Carbon - Duplicates	**0.67**	**J**	1.0	0.47	mg/L			06/03/18 19:58	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-05
Date Collected: 05/30/18 09:11
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-1
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	73.2		5.0	3.7	mg/L			06/06/18 12:39	1

Client Sample ID: W-180530-PS-06

Date Collected: 05/30/18 10:30
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-2

Matrix: Water

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			06/06/18 19:04	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 19:04	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 19:04	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 19:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 126*		*06/06/18 19:04*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*06/06/18 19:04*	*1*
4-Bromofluorobenzene (Surr)	*100*		*72 - 124*		*06/06/18 19:04*	*1*
Dibromofluoromethane	*99*		*75 - 120*		*06/06/18 19:04*	*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		06/04/18 07:30	06/04/18 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*112*		*36 - 120*	*06/04/18 07:30*	*06/04/18 17:33*	*1*
2-Fluorobiphenyl (Surr)	*95*		*34 - 110*	*06/04/18 07:30*	*06/04/18 17:33*	*1*
Terphenyl-d14 (Surr)	*111*		*40 - 145*	*06/04/18 07:30*	*06/04/18 17:33*	*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			06/06/18 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/06/18 15:20*	*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		06/05/18 11:20	06/07/18 00:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*52*		*25 - 130*	*06/05/18 11:20*	*06/07/18 00:38*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.48**	**J**	1.0	0.23	ug/L		05/31/18 15:41	06/01/18 13:48	1
Copper	**1.4**	**J**	2.0	0.50	ug/L		05/31/18 15:41	06/01/18 13:48	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 13:48	1
Manganese	**0.84**	**J**	2.5	0.79	ug/L		05/31/18 15:41	06/01/18 13:48	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 13:48	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		05/31/18 15:43	06/04/18 08:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**74.7**		2.0	1.7	mg/L			05/31/18 13:56	10
Nitrate as N	**1.7**		0.20	0.068	mg/L			05/31/18 13:44	1
Sulfate	**6.6**	**B**	0.20	0.095	mg/L			05/31/18 13:44	1
Total Organic Carbon - Duplicates	**0.89**	**J**	1.0	0.47	mg/L			06/03/18 20:16	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-06
Date Collected: 05/30/18 10:30
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-2
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	32.9		5.0	3.7	mg/L			06/06/18 12:44	1

Client Sample ID: W-180530-PS-07

Date Collected: 05/30/18 12:15
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-3

Matrix: Water

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			06/06/18 19:34	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 19:34	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 19:34	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/06/18 19:34*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/06/18 19:34*	*1*
4-Bromofluorobenzene (Surr)	*100*		*72 - 124*		*06/06/18 19:34*	*1*
Dibromofluoromethane	*101*		*75 - 120*		*06/06/18 19:34*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.26		0.83	0.26	ug/L		06/04/18 07:30	06/04/18 18:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*115*		*36 - 120*	*06/04/18 07:30*	*06/04/18 18:01*	*1*
2-Fluorobiphenyl (Surr)	*92*		*34 - 110*	*06/04/18 07:30*	*06/04/18 18:01*	*1*
Terphenyl-d14 (Surr)	*115*		*40 - 145*	*06/04/18 07:30*	*06/04/18 18:01*	*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			06/06/18 15:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/06/18 15:37*	*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		06/05/18 11:20	06/07/18 01:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*57*		*25 - 130*	*06/05/18 11:20*	*06/07/18 01:02*	*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		05/31/18 15:41	06/01/18 13:52	1
Copper	**1.2**	**J**	2.0	0.50	ug/L		05/31/18 15:41	06/01/18 13:52	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 13:52	1
Manganese	<0.79		2.5	0.79	ug/L		05/31/18 15:41	06/01/18 13:52	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 13:52	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	**133**		1.3	0.66	mg/L		05/31/18 15:43	06/04/18 08:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.1**		2.0	1.7	mg/L			05/31/18 14:22	10
Nitrate as N	**2.0**		0.20	0.068	mg/L			05/31/18 14:09	1
Sulfate	**5.4**	**B**	0.20	0.095	mg/L			05/31/18 14:09	1
Total Organic Carbon - Duplicates	**0.78**	**J**	1.0	0.47	mg/L			06/03/18 20:34	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-07
Date Collected: 05/30/18 12:15
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-3
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	104		5.0	3.7	mg/L			06/11/18 18:29	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-08
Date Collected: 05/30/18 12:45
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-4
Matrix: Water

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			06/06/18 20:03	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 20:03	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 20:03	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 20:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/06/18 20:03*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/06/18 20:03*	*1*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*06/06/18 20:03*	*1*
Dibromofluoromethane	*99*		*75 - 120*		*06/06/18 20:03*	*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		06/04/18 07:30	06/04/18 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*84*		*36 - 120*	*06/04/18 07:30*	*06/04/18 18:28*	*1*
2-Fluorobiphenyl (Surr)	*69*		*34 - 110*	*06/04/18 07:30*	*06/04/18 18:28*	*1*
Terphenyl-d14 (Surr)	*114*		*40 - 145*	*06/04/18 07:30*	*06/04/18 18:28*	*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		06/05/18 11:20	06/07/18 01:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*63*		*25 - 130*	*06/05/18 11:20*	*06/07/18 01:26*	*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		05/31/18 15:41	06/01/18 13:56	1
Copper	**1.7**	**J**	2.0	0.50	ug/L		05/31/18 15:41	06/01/18 13:56	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 13:56	1
Manganese	<0.79		2.5	0.79	ug/L		05/31/18 15:41	06/01/18 13:56	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 13:56	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: Trip Blank-002
Date Collected: 05/30/18 15:00
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-5
Matrix: Water

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			06/06/18 20:33	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 20:33	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 20:33	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/06/18 20:33*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/06/18 20:33*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/06/18 20:33*	*1*
Dibromofluoromethane	*100*		*75 - 120*		*06/06/18 20:33*	*1*

Client Sample ID: W-180530-PS-09

Date Collected: 05/30/18 14:16
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-6

Matrix: Water

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			06/06/18 16:59	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 16:59	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 16:59	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 16:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 126*		*06/06/18 16:59*	*1*
Toluene-d8 (Surr)	*99*		*75 - 120*		*06/06/18 16:59*	*1*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*		*06/06/18 16:59*	*1*
Dibromofluoromethane	*93*		*75 - 120*		*06/06/18 16:59*	*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		06/04/18 07:30	06/04/18 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*110*		*36 - 120*	*06/04/18 07:30*	*06/04/18 18:56*	*1*
2-Fluorobiphenyl (Surr)	*91*		*34 - 110*	*06/04/18 07:30*	*06/04/18 18:56*	*1*
Terphenyl-d14 (Surr)	*108*		*40 - 145*	*06/04/18 07:30*	*06/04/18 18:56*	*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			06/06/18 15:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/06/18 15:54*	*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		06/05/18 11:20	06/07/18 01:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*62*		*25 - 130*	*06/05/18 11:20*	*06/07/18 01:51*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.79**	**J**	1.0	0.23	ug/L		05/31/18 15:41	06/01/18 14:00	1
Copper	**1.3**	**J**	2.0	0.50	ug/L		05/31/18 15:41	06/01/18 14:00	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 14:00	1
Manganese	**216**		2.5	0.79	ug/L		05/31/18 15:41	06/01/18 14:00	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 14:00	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	**257**		1.3	0.66	mg/L		05/31/18 15:43	06/04/18 08:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10.5**		2.0	1.7	mg/L			05/31/18 14:47	10
Nitrate as N	**0.58**		0.20	0.068	mg/L			05/31/18 14:34	1
Sulfate	**76.4**	**B**	2.0	0.95	mg/L			05/31/18 14:47	10
Total Organic Carbon - Duplicates	**1.6**		1.0	0.47	mg/L			06/03/18 20:52	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-09
Date Collected: 05/30/18 14:16
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-6
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	183	F2	5.0	3.7	mg/L			06/11/18 18:36	1

Client Sample ID: W-180530-PS-10

Date Collected: 05/30/18 14:41
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-7

Matrix: Water

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			06/06/18 16:08	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 16:08	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 16:08	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 126*		*06/06/18 16:08*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/06/18 16:08*	*1*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*		*06/06/18 16:08*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/06/18 16:08*	*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		06/04/18 07:30	06/04/18 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*106*		*36 - 120*	*06/04/18 07:30*	*06/04/18 19:23*	*1*
2-Fluorobiphenyl (Surr)	*91*		*34 - 110*	*06/04/18 07:30*	*06/04/18 19:23*	*1*
Terphenyl-d14 (Surr)	*102*		*40 - 145*	*06/04/18 07:30*	*06/04/18 19:23*	*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			06/06/18 16:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/06/18 16:11*	*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		06/05/18 11:20	06/07/18 02:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*48*		*25 - 130*	*06/05/18 11:20*	*06/07/18 02:15*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.52**	**J**	1.0	0.23	ug/L		05/31/18 15:41	06/01/18 14:05	1
Copper	**2.2**		2.0	0.50	ug/L		05/31/18 15:41	06/01/18 14:05	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 14:05	1
Manganese	**2.3**	**J**	2.5	0.79	ug/L		05/31/18 15:41	06/01/18 14:05	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 14:05	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	**34.9**		1.3	0.66	mg/L		05/31/18 15:43	06/04/18 08:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**5.0**		0.20	0.17	mg/L			05/31/18 15:00	1
Nitrate as N	**0.71**		0.20	0.068	mg/L			05/31/18 15:00	1
Sulfate	**4.0**	**B**	0.20	0.095	mg/L			05/31/18 15:00	1
Total Organic Carbon - Duplicates	**1.5**		1.0	0.47	mg/L			06/03/18 21:11	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-10
Date Collected: 05/30/18 14:41
Date Received: 05/31/18 09:50

Lab Sample ID: 500-146179-7
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	34.1		5.0	3.7	mg/L			06/11/18 18:50	1

Qualifiers

Metals

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

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.
F2	MS/MSD RPD exceeds control limits
F3	Duplicate RPD exceeds the control limit

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)

GC/MS VOA

Analysis Batch: 435556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-6	W-180530-PS-09	Total/NA	Water	8260B	
500-146179-7	W-180530-PS-10	Total/NA	Water	8260B	
MB 500-435556/8	Method Blank	Total/NA	Water	8260B	
LCS 500-435556/5	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 435594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	8260B	
500-146179-2	W-180530-PS-06	Total/NA	Water	8260B	
500-146179-3	W-180530-PS-07	Total/NA	Water	8260B	
500-146179-4	W-180530-PS-08	Total/NA	Water	8260B	
500-146179-5	Trip Blank-002	Total/NA	Water	8260B	
MB 500-435594/6	Method Blank	Total/NA	Water	8260B	
LCS 500-435594/4	Lab Control Sample	Total/NA	Water	8260B	
500-146179-4 MS	W-180530-PS-08	Total/NA	Water	8260B	
500-146179-4 MSD	W-180530-PS-08	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 435135

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	3510C	
500-146179-2	W-180530-PS-06	Total/NA	Water	3510C	
500-146179-3	W-180530-PS-07	Total/NA	Water	3510C	
500-146179-4	W-180530-PS-08	Total/NA	Water	3510C	
500-146179-6	W-180530-PS-09	Total/NA	Water	3510C	
500-146179-7	W-180530-PS-10	Total/NA	Water	3510C	
MB 500-435135/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-435135/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 500-435135/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 435219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	8270D	435135
500-146179-2	W-180530-PS-06	Total/NA	Water	8270D	435135
500-146179-3	W-180530-PS-07	Total/NA	Water	8270D	435135
500-146179-4	W-180530-PS-08	Total/NA	Water	8270D	435135
500-146179-6	W-180530-PS-09	Total/NA	Water	8270D	435135
500-146179-7	W-180530-PS-10	Total/NA	Water	8270D	435135
MB 500-435135/1-A	Method Blank	Total/NA	Water	8270D	435135
LCS 500-435135/2-A	Lab Control Sample	Total/NA	Water	8270D	435135
LCSD 500-435135/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	435135

GC VOA

Analysis Batch: 330285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	RSK-175	
500-146179-2	W-180530-PS-06	Total/NA	Water	RSK-175	
500-146179-3	W-180530-PS-07	Total/NA	Water	RSK-175	

GC VOA (Continued)

Analysis Batch: 330285 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-6	W-180530-PS-09	Total/NA	Water	RSK-175	
500-146179-7	W-180530-PS-10	Total/NA	Water	RSK-175	
MB 240-330285/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-330285/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 240-330285/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 435386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	8151A	
500-146179-2	W-180530-PS-06	Total/NA	Water	8151A	
500-146179-3	W-180530-PS-07	Total/NA	Water	8151A	
500-146179-4	W-180530-PS-08	Total/NA	Water	8151A	
500-146179-6	W-180530-PS-09	Total/NA	Water	8151A	
500-146179-7	W-180530-PS-10	Total/NA	Water	8151A	
MB 500-435386/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-435386/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-435386/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 435593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	8151A	435386
500-146179-2	W-180530-PS-06	Total/NA	Water	8151A	435386
500-146179-3	W-180530-PS-07	Total/NA	Water	8151A	435386
500-146179-4	W-180530-PS-08	Total/NA	Water	8151A	435386
500-146179-6	W-180530-PS-09	Total/NA	Water	8151A	435386
500-146179-7	W-180530-PS-10	Total/NA	Water	8151A	435386
MB 500-435386/1-A	Method Blank	Total/NA	Water	8151A	435386
LCS 500-435386/2-A	Lab Control Sample	Total/NA	Water	8151A	435386
LCSD 500-435386/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	435386

Metals

Prep Batch: 434805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Dissolved	Water	3005A	
500-146179-2	W-180530-PS-06	Dissolved	Water	3005A	
500-146179-3	W-180530-PS-07	Dissolved	Water	3005A	
500-146179-4	W-180530-PS-08	Dissolved	Water	3005A	
500-146179-6	W-180530-PS-09	Dissolved	Water	3005A	
500-146179-7	W-180530-PS-10	Dissolved	Water	3005A	
MB 500-434805/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-434805/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 434806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	3010A	
500-146179-2	W-180530-PS-06	Total/NA	Water	3010A	
500-146179-3	W-180530-PS-07	Total/NA	Water	3010A	

Metals (Continued)

Prep Batch: 434806 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-6	W-180530-PS-09	Total/NA	Water	3010A	
500-146179-7	W-180530-PS-10	Total/NA	Water	3010A	

Analysis Batch: 435149

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	SM 2340B	434806
500-146179-2	W-180530-PS-06	Total/NA	Water	SM 2340B	434806
500-146179-3	W-180530-PS-07	Total/NA	Water	SM 2340B	434806
500-146179-6	W-180530-PS-09	Total/NA	Water	SM 2340B	434806
500-146179-7	W-180530-PS-10	Total/NA	Water	SM 2340B	434806

Analysis Batch: 435154

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Dissolved	Water	6020A	434805
500-146179-2	W-180530-PS-06	Dissolved	Water	6020A	434805
500-146179-3	W-180530-PS-07	Dissolved	Water	6020A	434805
500-146179-4	W-180530-PS-08	Dissolved	Water	6020A	434805
500-146179-6	W-180530-PS-09	Dissolved	Water	6020A	434805
500-146179-7	W-180530-PS-10	Dissolved	Water	6020A	434805
MB 500-434805/1-A	Method Blank	Total Recoverable	Water	6020A	434805
LCS 500-434805/2-A	Lab Control Sample	Total Recoverable	Water	6020A	434805

General Chemistry

Analysis Batch: 434795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	300.0	
500-146179-2	W-180530-PS-06	Total/NA	Water	300.0	
500-146179-2	W-180530-PS-06	Total/NA	Water	300.0	
500-146179-3	W-180530-PS-07	Total/NA	Water	300.0	
500-146179-3	W-180530-PS-07	Total/NA	Water	300.0	
500-146179-6	W-180530-PS-09	Total/NA	Water	300.0	
500-146179-6	W-180530-PS-09	Total/NA	Water	300.0	
500-146179-7	W-180530-PS-10	Total/NA	Water	300.0	
MB 500-434795/8	Method Blank	Total/NA	Water	300.0	
LCS 500-434795/9	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 435215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	9060A	
500-146179-2	W-180530-PS-06	Total/NA	Water	9060A	
500-146179-3	W-180530-PS-07	Total/NA	Water	9060A	
500-146179-6	W-180530-PS-09	Total/NA	Water	9060A	
500-146179-7	W-180530-PS-10	Total/NA	Water	9060A	
MB 500-435215/4	Method Blank	Total/NA	Water	9060A	
LCS 500-435215/5	Lab Control Sample	Total/NA	Water	9060A	

Analysis Batch: 435732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 435732 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-2	W-180530-PS-06	Total/NA	Water	SM 2320B	
MB 500-435732/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-435732/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 436465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-3	W-180530-PS-07	Total/NA	Water	SM 2320B	
500-146179-6	W-180530-PS-09	Total/NA	Water	SM 2320B	
500-146179-7	W-180530-PS-10	Total/NA	Water	SM 2320B	
MB 500-436465/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-436465/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-146179-6 DU	W-180530-PS-09	Total/NA	Water	SM 2320B	

Analysis Batch: 436509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146179-1	W-180530-PS-05	Total/NA	Water	300.0	
MB 500-436509/3	Method Blank	Total/NA	Water	300.0	
LCS 500-436509/9	Lab Control Sample	Total/NA	Water	300.0	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-146179-1	W-180530-PS-05	92	94	101	99
500-146179-2	W-180530-PS-06	93	95	100	99
500-146179-3	W-180530-PS-07	92	94	100	101
500-146179-4	W-180530-PS-08	92	94	99	99
500-146179-4 MS	W-180530-PS-08	85	97	92	89
500-146179-4 MSD	W-180530-PS-08	86	96	93	91
500-146179-5	Trip Blank-002	92	93	98	100
500-146179-6	W-180530-PS-09	96	99	97	93
500-146179-7	W-180530-PS-10	104	96	97	96
LCS 500-435556/5	Lab Control Sample	95	94	94	97
LCS 500-435594/4	Lab Control Sample	84	98	93	89
MB 500-435556/8	Method Blank	95	97	93	93
MB 500-435594/6	Method Blank	91	94	98	97

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-146179-1	W-180530-PS-05	116	97	112
500-146179-2	W-180530-PS-06	112	95	111
500-146179-3	W-180530-PS-07	115	92	115
500-146179-4	W-180530-PS-08	84	69	114
500-146179-6	W-180530-PS-09	110	91	108
500-146179-7	W-180530-PS-10	106	91	102
LCS 500-435135/2-A	Lab Control Sample	115	87	114
LCSD 500-435135/3-A	Lab Control Sample Dup	99	79	105
MB 500-435135/1-A	Method Blank	116	91	116

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)
		TFE2
Lab Sample ID	Client Sample ID	(60-140)
500-146179-1	W-180530-PS-05	91
500-146179-2	W-180530-PS-06	92
500-146179-3	W-180530-PS-07	92

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFE2 (60-140)
500-146179-6	W-180530-PS-09	91
500-146179-7	W-180530-PS-10	91
LCS 240-330285/5	Lab Control Sample	92
LCSD 240-330285/6	Lab Control Sample Dup	92
MB 240-330285/4	Method Blank	94

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)
500-146179-1	W-180530-PS-05	56
500-146179-2	W-180530-PS-06	52
500-146179-3	W-180530-PS-07	57
500-146179-4	W-180530-PS-08	63
500-146179-6	W-180530-PS-09	62
500-146179-7	W-180530-PS-10	48
LCS 500-435386/2-A	Lab Control Sample	56
LCSD 500-435386/3-A	Lab Control Sample Dup	56
MB 500-435386/1-A	Method Blank	54

Surrogate Legend

DCPAA = DCAA

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

Lab Sample ID: MB 500-435556/8
Matrix: Water
Analysis Batch: 435556

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			06/06/18 13:03	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 13:03	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 13:03	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 13:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*		*06/06/18 13:03*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/06/18 13:03*	*1*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*		*06/06/18 13:03*	*1*
Dibromofluoromethane	*93*		*75 - 120*		*06/06/18 13:03*	*1*

Lab Sample ID: LCS 500-435556/5
Matrix: Water
Analysis Batch: 435556

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	47.6		ug/L		95	70 - 120
Toluene	50.0	46.1		ug/L		92	70 - 125
Ethylbenzene	50.0	46.4		ug/L		93	70 - 120
Xylenes, Total	100	93.4		ug/L		93	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*
Toluene-d8 (Surr)	*94*		*75 - 120*
4-Bromofluorobenzene (Surr)	*94*		*72 - 124*
Dibromofluoromethane	*97*		*75 - 120*

Lab Sample ID: MB 500-435594/6
Matrix: Water
Analysis Batch: 435594

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			06/06/18 12:06	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 12:06	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 12:06	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 12:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*06/06/18 12:06*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/06/18 12:06*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/06/18 12:06*	*1*
Dibromofluoromethane	*97*		*75 - 120*		*06/06/18 12:06*	*1*

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

Lab Sample ID: LCS 500-435594/4
Matrix: Water
Analysis Batch: 435594

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	47.0		ug/L		94	70 - 120
Toluene	50.0	53.7		ug/L		107	70 - 125
Ethylbenzene	50.0	53.5		ug/L		107	70 - 120
Xylenes, Total	100	107		ug/L		107	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 126*
Toluene-d8 (Surr)	*98*		*75 - 120*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*
Dibromofluoromethane	*89*		*75 - 120*

Lab Sample ID: 500-146179-4 MS
Matrix: Water
Analysis Batch: 435594

Client Sample ID: W-180530-PS-08
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	49.8		ug/L		100	70 - 120
Toluene	<0.15		50.0	56.1		ug/L		112	70 - 125
Ethylbenzene	<0.18		50.0	55.6		ug/L		111	70 - 120
Xylenes, Total	<0.22		100	111		ug/L		111	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*
Toluene-d8 (Surr)	*97*		*75 - 120*
4-Bromofluorobenzene (Surr)	*92*		*72 - 124*
Dibromofluoromethane	*89*		*75 - 120*

Lab Sample ID: 500-146179-4 MSD
Matrix: Water
Analysis Batch: 435594

Client Sample ID: W-180530-PS-08
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	47.3		ug/L		95	70 - 120	5	20
Toluene	<0.15		50.0	52.7		ug/L		105	70 - 125	6	20
Ethylbenzene	<0.18		50.0	52.9		ug/L		106	70 - 120	5	20
Xylenes, Total	<0.22		100	104		ug/L		104	70 - 125	7	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 126*
Toluene-d8 (Surr)	*96*		*75 - 120*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*
Dibromofluoromethane	*91*		*75 - 120*

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

Lab Sample ID: MB 500-435135/1-A
Matrix: Water
Analysis Batch: 435219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435135

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		06/04/18 07:30	06/04/18 16:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*116*		*36 - 120*	*06/04/18 07:30*	*06/04/18 16:38*	*1*
2-Fluorobiphenyl (Surr)	*91*		*34 - 110*	*06/04/18 07:30*	*06/04/18 16:38*	*1*
Terphenyl-d14 (Surr)	*116*		*40 - 145*	*06/04/18 07:30*	*06/04/18 16:38*	*1*

Lab Sample ID: LCS 500-435135/2-A
Matrix: Water
Analysis Batch: 435219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435135

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Naphthalene			32.0	24.4		ug/L		76	36 - 110		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*115*		*36 - 120*
2-Fluorobiphenyl (Surr)	*87*		*34 - 110*
Terphenyl-d14 (Surr)	*114*		*40 - 145*

Lab Sample ID: LCSD 500-435135/3-A
Matrix: Water
Analysis Batch: 435219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435135

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			32.0	21.8		ug/L		68	36 - 110	11	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*99*		*36 - 120*
2-Fluorobiphenyl (Surr)	*79*		*34 - 110*
Terphenyl-d14 (Surr)	*105*		*40 - 145*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-330285/4
Matrix: Water
Analysis Batch: 330285

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			06/06/18 12:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*94*		*60 - 140*		*06/06/18 12:30*	*1*

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 240-330285/5
Matrix: Water
Analysis Batch: 330285

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			285	247		ug/L		86	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,1,1-Trifluoroethane	*92*		*60 - 140*

Lab Sample ID: LCSD 240-330285/6
Matrix: Water
Analysis Batch: 330285

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			285	249		ug/L		87	80 - 120	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,1,1-Trifluoroethane	*92*		*60 - 140*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-435386/1-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435386

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/05/18 11:20	06/06/18 19:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*54*		*25 - 130*	*06/05/18 11:20*	*06/06/18 19:45*	*1*

Lab Sample ID: LCS 500-435386/2-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435386

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	*56*		*25 - 130*

Lab Sample ID: LCSD 500-435386/3-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435386

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol			2.53	1.46		ug/L		58	40 - 122	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*56*		*25 - 130*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-434805/1-A
Matrix: Water
Analysis Batch: 435154

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 434805

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		05/31/18 15:41	06/01/18 12:30	1
Copper	<0.50		2.0	0.50	ug/L		05/31/18 15:41	06/01/18 12:30	1
Iron	<46.7		100	46.7	ug/L		05/31/18 15:41	06/01/18 12:30	1
Manganese	<0.79		2.5	0.79	ug/L		05/31/18 15:41	06/01/18 12:30	1
Zinc	<6.9		20.0	6.9	ug/L		05/31/18 15:41	06/01/18 12:30	1

Lab Sample ID: LCS 500-434805/2-A
Matrix: Water
Analysis Batch: 435154

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 434805

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	99.22		ug/L		99	80 - 120
Copper	250	259.8		ug/L		104	80 - 120
Iron	1000	1039		ug/L		104	80 - 120
Manganese	500	506.7		ug/L		101	80 - 120
Zinc	500	508.9		ug/L		102	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-434795/8
Matrix: Water
Analysis Batch: 434795

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			05/31/18 10:59	1
Nitrate as N	<0.068		0.20	0.068	mg/L			05/31/18 10:59	1
Sulfate	0.0976	J	0.20	0.095	mg/L			05/31/18 10:59	1

Lab Sample ID: LCS 500-434795/9
Matrix: Water
Analysis Batch: 434795

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	3.00		mg/L		100	90 - 110
Nitrate as N	2.00	1.98		mg/L		99	90 - 110
Sulfate	5.00	4.97		mg/L		99	90 - 110

Lab Sample ID: MB 500-436509/3
Matrix: Water
Analysis Batch: 436509

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			06/11/18 21:05	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 500-436509/9
Matrix: Water
Analysis Batch: 436509

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	3.08		mg/L		103	90 - 110

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

Lab Sample ID: MB 500-435215/4
Matrix: Water
Analysis Batch: 435215

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			06/03/18 15:44	1

Lab Sample ID: LCS 500-435215/5
Matrix: Water
Analysis Batch: 435215

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	9.52		mg/L		95	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-435732/3
Matrix: Water
Analysis Batch: 435732

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			06/06/18 10:26	1

Lab Sample ID: LCS 500-435732/4
Matrix: Water
Analysis Batch: 435732

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	100.2		mg/L		100	85 - 115

Lab Sample ID: MB 500-436465/3
Matrix: Water
Analysis Batch: 436465

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			06/11/18 16:03	1

Lab Sample ID: LCS 500-436465/4
Matrix: Water
Analysis Batch: 436465

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.86		mg/L		100	85 - 115

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 500-146179-6 DU
Matrix: Water
Analysis Batch: 436465

Client Sample ID: W-180530-PS-09
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	183	F2		275.6	F3	mg/L				40	20

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146179-1

Client Sample ID: W-180530-PS-05

Lab Sample ID: 500-146179-1

Date Collected: 05/30/18 09:11

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435594	06/06/18 18:34	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI
Total/NA	Analysis	8270D		1	435219	06/04/18 17:06	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 15:03	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 00:13	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 13:44	FXG	TAL CHI
Total/NA	Prep	3010A			434806	05/31/18 15:43	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435149	06/04/18 08:22	PJ1	TAL CHI
Total/NA	Analysis	300.0		2	436509	06/12/18 03:28	EAT	TAL CHI
Total/NA	Analysis	300.0		1	434795	05/31/18 12:53	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 19:58	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:39	SMO	TAL CHI

Client Sample ID: W-180530-PS-06

Lab Sample ID: 500-146179-2

Date Collected: 05/30/18 10:30

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435594	06/06/18 19:04	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI
Total/NA	Analysis	8270D		1	435219	06/04/18 17:33	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 15:20	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 00:38	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 13:48	FXG	TAL CHI
Total/NA	Prep	3010A			434806	05/31/18 15:43	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435149	06/04/18 08:22	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434795	05/31/18 13:44	EAT	TAL CHI
Total/NA	Analysis	300.0		10	434795	05/31/18 13:56	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 20:16	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	435732	06/06/18 12:44	SMO	TAL CHI

Client Sample ID: W-180530-PS-07

Lab Sample ID: 500-146179-3

Date Collected: 05/30/18 12:15

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435594	06/06/18 19:34	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI

Client Sample ID: W-180530-PS-07

Lab Sample ID: 500-146179-3

Date Collected: 05/30/18 12:15

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D		1	435219	06/04/18 18:01	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 15:37	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 01:02	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 13:52	FXG	TAL CHI
Total/NA	Prep	3010A			434806	05/31/18 15:43	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435149	06/04/18 08:22	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434795	05/31/18 14:09	EAT	TAL CHI
Total/NA	Analysis	300.0		10	434795	05/31/18 14:22	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 20:34	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 18:29	SMO	TAL CHI

Client Sample ID: W-180530-PS-08

Lab Sample ID: 500-146179-4

Date Collected: 05/30/18 12:45

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435594	06/06/18 20:03	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI
Total/NA	Analysis	8270D		1	435219	06/04/18 18:28	GES	TAL CHI
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 01:26	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 13:56	FXG	TAL CHI

Client Sample ID: Trip Blank-002

Lab Sample ID: 500-146179-5

Date Collected: 05/30/18 15:00

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435594	06/06/18 20:33	EMA	TAL CHI

Client Sample ID: W-180530-PS-09

Lab Sample ID: 500-146179-6

Date Collected: 05/30/18 14:16

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435556	06/06/18 16:59	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI
Total/NA	Analysis	8270D		1	435219	06/04/18 18:56	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 15:54	SEM	TAL CAN

Client Sample ID: W-180530-PS-09

Lab Sample ID: 500-146179-6

Date Collected: 05/30/18 14:16

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 01:51	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 14:00	FXG	TAL CHI
Total/NA	Prep	3010A			434806	05/31/18 15:43	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435149	06/04/18 08:22	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434795	05/31/18 14:34	EAT	TAL CHI
Total/NA	Analysis	300.0		10	434795	05/31/18 14:47	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 20:52	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 18:36	SMO	TAL CHI

Client Sample ID: W-180530-PS-10

Lab Sample ID: 500-146179-7

Date Collected: 05/30/18 14:41

Matrix: Water

Date Received: 05/31/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435556	06/06/18 16:08	EMA	TAL CHI
Total/NA	Prep	3510C			435135	06/04/18 07:30	NKG	TAL CHI
Total/NA	Analysis	8270D		1	435219	06/04/18 19:23	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 16:11	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 02:15	JBJ	TAL CHI
Dissolved	Prep	3005A			434805	05/31/18 15:41	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435154	06/01/18 14:05	FXG	TAL CHI
Total/NA	Prep	3010A			434806	05/31/18 15:43	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435149	06/04/18 08:22	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	434795	05/31/18 15:00	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435215	06/03/18 21:11	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 18:50	SMO	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 086165-04

TestAmerica Job ID: 500-146179-1

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	08-31-18

The following analytes are included in this report, but are not accredited/certified under this accreditation/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	06-30-18 *
Illinois	NELAP	5	200004	07-31-18 *
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	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
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.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

(optional)
Report To
Contact: GRANT ANDERSON
Company: GHD
Address:
Address:
Phone: 651-639-0313
Fax:
E-Mail:

(optional)
Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax: 500-146179 COC
PO#/Reference#

Chain of Custody Record

Lab Job #: 500-146179
Chain of Custody Number: 180530
Page 1 of 1 (2.8 - 2.3)
Temperature °C of Cooler (1.3 - 2.8) (2.0)

Client: GHD
Client Project #: 086165
Project Name: PENTAGOOD
Project Location/State:
Lab Project #:
Sampler: P STURLIE / T. BRAUN
Lab PM:

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative	N	D	D	A	S	N	A	N	N	Comments
							Parameter	2320B Alkalinity	2340C Hardness As CaCO3	6010 Metals (Filtered)	8260B, RSK-175 Methane	9060 TOC	300.0-28D Nitrate/Nitrite, Sulfate	8260B BTEX	8270 Naphthalene	515 GCP	
1		W-180530-PS-05	5/30/18	9:11	15	W		X	X	X	X	X	X	X	X	X	
2		06	5/30/18	10:30	15	W		X	X	X	X	X	X	X	X	X	
3		07	5/30/18	12:15	15	W		X	X	X	X	X	X	X	X	X	
4		08	5/30/18	12:45	8	W				X				X	X	X	
5		TRIPBLANK-002	5/30/18	15:00	1	W								X			
6		W-180530-PS-09	5/30/18	14:16	15	W		X	X	X	X	X	X	X	X	X	
7		W-180530-PS-10	5/30/18	14:41	15	W		X	X	X	X	X	X	X	X	X	
		~~TRIPBLANK-TB~~															

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
T. Braun	GHD	5/30/18	15:00		TA	05/31/18	0950
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier
Shipped ✓
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:

TAL-4124-500(1209)

500-146179 Waybill

039

076

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3817

MUR4

Form ID No. 0215

48 qt

1 From

Date 5/30/18

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St.

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3817

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	2 or 3 Business Days
☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
☑ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.	☐ 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 7 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 53 lbs.

Credit Card Auth.

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

611

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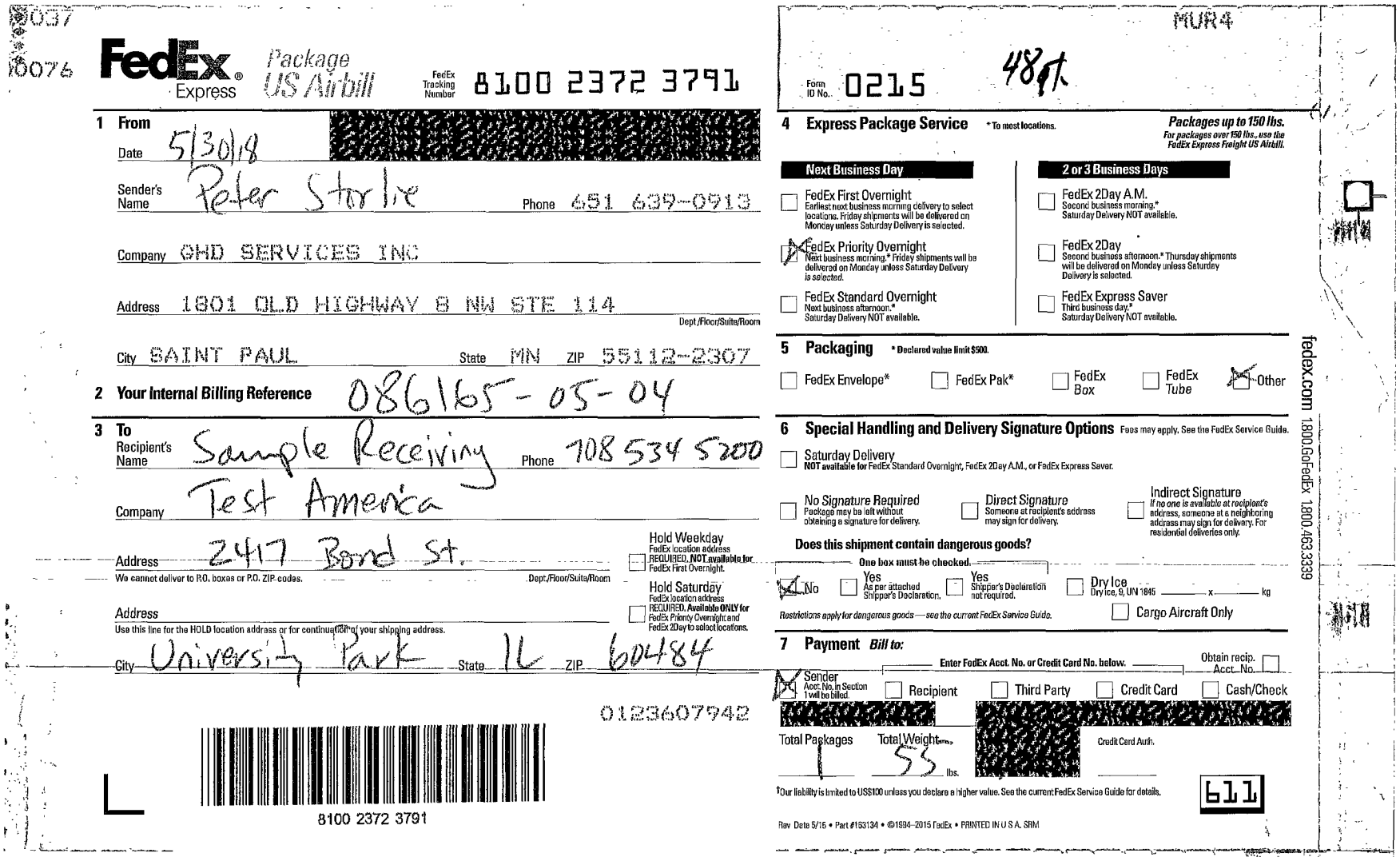
fedex.com 1.800.GoFedEx 1.800.463.3339



037
6076

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3791

MUR4

Form ID No. 0215

48¢

1 From

Date 5/30/18

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534 5200

Company Test America

Address 2417 Bond St. Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3791

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.
- [X] 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 | [X] 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.

[X] 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.

[X] Sender Acct. No. in Section 1 will be billed | Recipient | Third Party | Credit Card | Cash/Check

Total Packages 1 Total Weight 55 lbs. Credit Card Auth.

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

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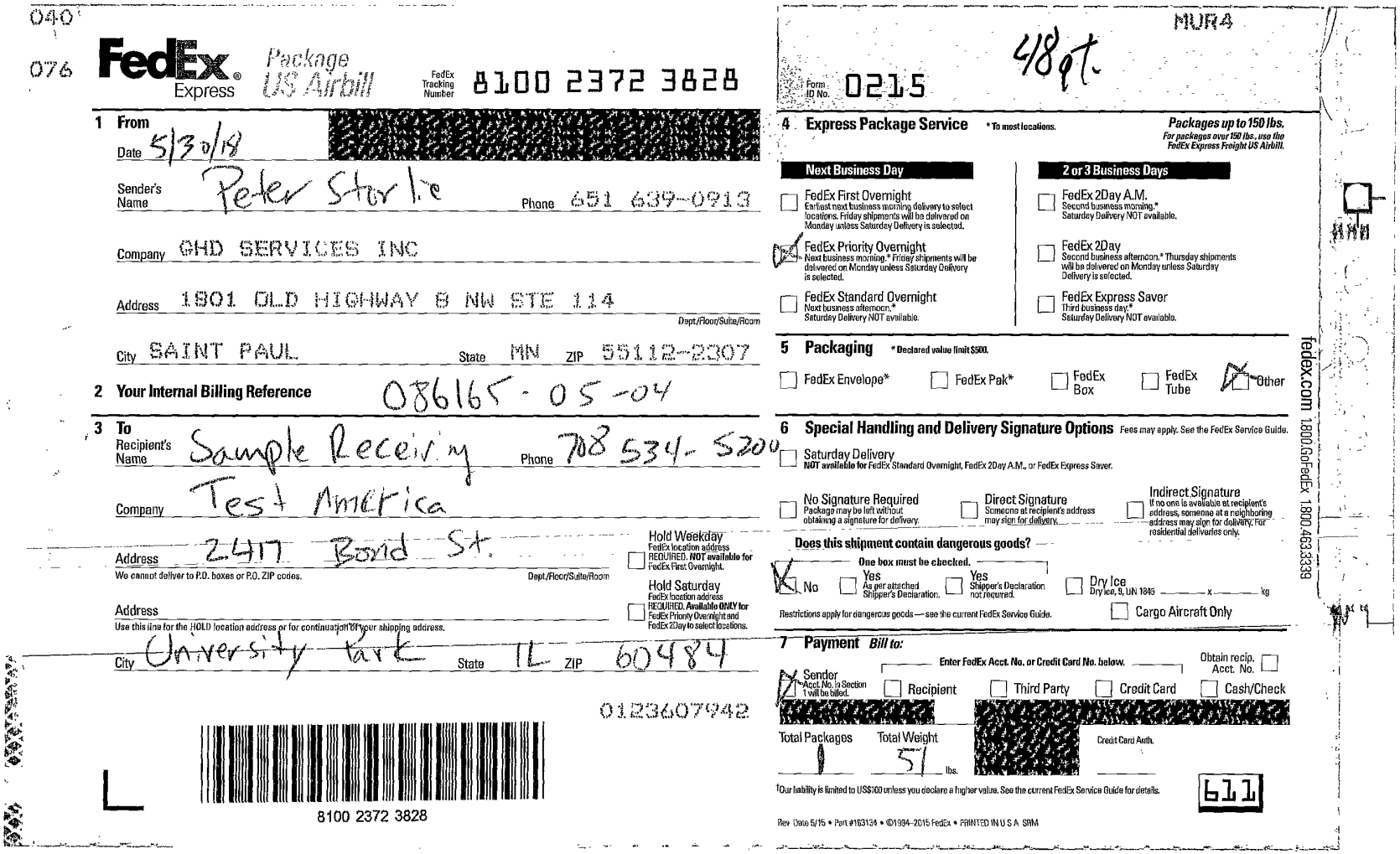
fedex.com 1.800.GoFedEx 1.800.463.3339



040
076

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3828

MUR4

Form ID No. 0215

48 qt.

1 From

Date 5/30/18

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1901 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St. Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3828

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 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 5 lbs. Credit Card Auth.

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

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fedex.com 1.800.GoFedEx 1.800.463.3339

2.2/2-3

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: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-105154.1
Client Contact: Shipping/Receiving	Phone:	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		Job #: 500-146179-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 6/13/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Analysis Requested

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, 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)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ (MOD) Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:						RSK
W-180530-PS-05 (500-146179-1)	5/30/18	09:11 Central		Water			X	3	WI
W-180530-PS-06 (500-146179-2)	5/30/18	10:30 Central		Water			X	3	WI
W-180530-PS-07 (500-146179-3)	5/30/18	12:15 Central		Water			X	3	WI
W-180530-PS-09 (500-146179-6)	5/30/18	14:16 Central		Water			X	3	WI
W-180530-PS-10 (500-146179-7)	5/30/18	14:41 Central		Water			X	3	WI

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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 05/31/18 1630	Company TA	Received by:	Date/Time: 6-1-18 1010	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Chicago Site Name _____ Cooler unpacked by:

Cooler Received on 6-6-18 Opened on 6-6-18

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

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

TestAmerica Cooler # _____ 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 +0.1 °C) Observed Cooler Temp. 2-2 °C Corrected Cooler Temp. 2-3 °C

IR GUN #36 (CF +0.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

~~IR GUN # 627 (CF -1.3°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# **HC740840**
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: 500-146179-1

Login Number: 146179
List Number: 1
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago

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	(2.3)(2.8)(2.0)c
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.	True	

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: 500-146260-1
Client Project/Site: Penta Wood 086165-04

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

Attn: Mr. Grant Anderson

Authorized for release by:
6/15/2018 4:51:05 PM

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

Table of Contents

Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Job ID: 500-146260-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-146260-1

Comments
No additional comments.

Receipt
The samples were received on 6/1/2018 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.9º C, 2.0º C, 3.2º C and 3.3º C.
Received some double containers labeled W-180531-PS-16 & 17. Per communication with GHD, these are duplicate samples and are to be divided up to make a full set of samples each for W-180531-PS-16 and W-180531-PS-17.
Received a Total Metals bottle for sample W-180531-PS-18. Chain of Custody is checked for Dissolved Metals. Total metals analyzed and reported.

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

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described 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-180531-PS-13 (500-146260-3). 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 IC8 continuing calibration verification (CCV) associated with batch 500-436508 recovered above the upper control limit for Chloride. The samples associated with this CCV were batch QC which met acceptance criteria for the affected analyte; therefore, the data have been reported. The following samples are impacted: (LCS 500-436508/34) and (MB 500-436508/23).

Method(s) 300.0: The IC8 continuing calibration blank (CCB) for analytical batch 500-436508 contained Chloride above the reporting limit (RL). The samples associated with this CCB were batch QC which met acceptance criteria for the target compound; therefore, re-analysis of samples was not performed.

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 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-11 — Lab Sample ID: 500-146260-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.79	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.7	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	311		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	14.9	F1	2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	3.3		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	98.2	F1 B	2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	0.77	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	194		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-12 — Lab Sample ID: 500-146260-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.28	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.3	J	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	123		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	12.5		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.4		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	6.0	B	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	112		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-13 — Lab Sample ID: 500-146260-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.39	J	1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	1.7		0.81	0.25	ug/L	1		8270D	Total/NA
Pentachlorophenol	630		200	180	ug/L	2000		8151A	Total/NA
Copper	1.1	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	23.3		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	69.1		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	0.66		0.20	0.17	mg/L	1		300.0	Total/NA
Nitrate as N	1.6		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	3.7	B	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	1.7		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	67.3		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-14 — Lab Sample ID: 500-146260-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.2		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	0.79	J	2.0	0.50	ug/L	1		6020A	Dissolved
Manganese	3.1		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	143		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	16.4		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	1.7		0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	6.3	B	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.71	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	585		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-15 — Lab Sample ID: 500-146260-5

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-15 (Continued) — Lab Sample ID: 500-146260-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	300		1.0	0.17	ug/L	1		RSK-175	Total/NA
Arsenic	1.1		1.0	0.23	ug/L	1		6020A	Dissolved
Iron	149		100	46.7	ug/L	1		6020A	Dissolved
Manganese	38.6		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	145		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	47.9		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.096	J	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	14.1		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	0.85	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	76.8		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-16 — Lab Sample ID: 500-146260-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	2.5		1.0	0.17	ug/L	1		RSK-175	Total/NA
Arsenic	0.36	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	0.87	J	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	2600		100	46.7	ug/L	1		6020A	Dissolved
Manganese	124		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	10.2	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	202		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	9.0		0.40	0.34	mg/L	2		300.0	Total/NA
Nitrate as N	13.0		2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	49.5	B	2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	3.4		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	137		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180531-PS-17 — Lab Sample ID: 500-146260-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	2.4		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	0.12		0.11	0.099	ug/L	1		8151A	Total/NA
Arsenic	0.35	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.2	J	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	2690		100	46.7	ug/L	1		6020A	Dissolved
Manganese	126		2.5	0.79	ug/L	1		6020A	Dissolved
Zinc	10.2	J	20.0	6.9	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	204		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	8.9		0.40	0.34	mg/L	2		300.0	Total/NA
Nitrate as N	13.4		2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	51.7	B	2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	3.4		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	137		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: TRIPBLANK-003 — Lab Sample ID: 500-146260-8

No Detections.

Client Sample ID: W-180531-PS-18 — Lab Sample ID: 500-146260-9

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-18 (Continued) — Lab Sample ID: 500-146260-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	11.7	B	2.0	0.50	ug/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

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 086165-04

TestAmerica Job ID: 500-146260-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-146260-1	W-180531-PS-11	Water	05/31/18 08:14	06/01/18 10:20
500-146260-2	W-180531-PS-12	Water	05/31/18 08:59	06/01/18 10:20
500-146260-3	W-180531-PS-13	Water	05/31/18 10:08	06/01/18 10:20
500-146260-4	W-180531-PS-14	Water	05/31/18 11:25	06/01/18 10:20
500-146260-5	W-180531-PS-15	Water	05/31/18 12:17	06/01/18 10:20
500-146260-6	W-180531-PS-16	Water	05/31/18 13:52	06/01/18 10:20
500-146260-7	W-180531-PS-17	Water	05/31/18 14:02	06/01/18 10:20
500-146260-8	TRIPBLANK-003	Water	05/31/18 15:00	06/01/18 10:20
500-146260-9	W-180531-PS-18	Water	05/31/18 14:45	06/01/18 10:20

Client Sample ID: W-180531-PS-11

Date Collected: 05/31/18 08:14
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-1

Matrix: Water

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			06/06/18 16:34	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 16:34	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 16:34	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 16:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 126*		*06/06/18 16:34*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*06/06/18 16:34*	*1*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*06/06/18 16:34*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*06/06/18 16:34*	*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		06/06/18 07:27	06/11/18 19:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*76*		*36 - 120*	*06/06/18 07:27*	*06/11/18 19:17*	*1*
2-Fluorobiphenyl (Surr)	*68*		*34 - 110*	*06/06/18 07:27*	*06/11/18 19:17*	*1*
Terphenyl-d14 (Surr)	*88*		*40 - 145*	*06/06/18 07:27*	*06/11/18 19:17*	*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			06/06/18 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/06/18 16:28*	*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		06/05/18 11:20	06/07/18 02:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*53*		*25 - 130*	*06/05/18 11:20*	*06/07/18 02:40*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.79**	**J**	1.0	0.23	ug/L		06/01/18 15:25	06/04/18 18:09	1
Copper	**1.7**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:09	1
Iron	<46.7		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:09	1
Manganese	<0.79		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:09	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:09	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	**311**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**14.9**	**F1**	2.0	1.7	mg/L			06/01/18 23:15	10
Nitrate as N	**3.3**		0.20	0.068	mg/L			06/01/18 23:02	1
Sulfate	**98.2**	**F1 B**	2.0	0.95	mg/L			06/01/18 23:15	10
Total Organic Carbon - Duplicates	**0.77**	**J**	1.0	0.47	mg/L			06/04/18 20:05	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-11
Date Collected: 05/31/18 08:14
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-1
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	194		5.0	3.7	mg/L			06/11/18 18:57	1

Client Sample ID: W-180531-PS-12

Date Collected: 05/31/18 08:59
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-2

Matrix: Water

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			06/07/18 01:29	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 01:29	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 01:29	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 01:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/07/18 01:29*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/07/18 01:29*	*1*
4-Bromofluorobenzene (Surr)	*95*		*72 - 124*		*06/07/18 01:29*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/07/18 01:29*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.26		0.84	0.26	ug/L		06/06/18 07:27	06/11/18 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*82*		*36 - 120*	*06/06/18 07:27*	*06/11/18 19:44*	*1*
2-Fluorobiphenyl (Surr)	*79*		*34 - 110*	*06/06/18 07:27*	*06/11/18 19:44*	*1*
Terphenyl-d14 (Surr)	*99*		*40 - 145*	*06/06/18 07:27*	*06/11/18 19:44*	*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			06/06/18 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/06/18 17:02*	*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		06/05/18 11:20	06/07/18 03:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*60*		*25 - 130*	*06/05/18 11:20*	*06/07/18 03:04*	*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		06/01/18 15:25	06/04/18 18:38	1
Copper	**1.3**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:38	1
Iron	<46.7		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:38	1
Manganese	<0.79		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:38	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:38	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	**123**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**12.5**		2.0	1.7	mg/L			06/02/18 00:31	10
Nitrate as N	**2.4**		0.20	0.068	mg/L			06/02/18 00:18	1
Sulfate	**6.0**	**B**	0.20	0.095	mg/L			06/02/18 00:18	1
Total Organic Carbon - Duplicates	**1.1**		1.0	0.47	mg/L			06/04/18 20:25	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-12
Date Collected: 05/31/18 08:59
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-2
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	112		5.0	3.7	mg/L			06/11/18 19:06	1

Client Sample ID: W-180531-PS-13

Date Collected: 05/31/18 10:08
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-3

Matrix: Water

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			06/07/18 01:55	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 01:55	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 01:55	1
Xylenes, Total	**0.39**	**J**	1.0	0.22	ug/L			06/07/18 01:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 126*		*06/07/18 01:55*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/07/18 01:55*	*1*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*06/07/18 01:55*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/07/18 01:55*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**1.7**		0.81	0.25	ug/L		06/06/18 07:27	06/11/18 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*87*		*36 - 120*	*06/06/18 07:27*	*06/11/18 20:11*	*1*
2-Fluorobiphenyl (Surr)	*77*		*34 - 110*	*06/06/18 07:27*	*06/11/18 20:11*	*1*
Terphenyl-d14 (Surr)	*104*		*40 - 145*	*06/06/18 07:27*	*06/11/18 20:11*	*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			06/06/18 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/06/18 17:19*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**630**		200	180	ug/L		06/05/18 11:20	06/12/18 22:44	2000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*0*	*D*	*25 - 130*	*06/05/18 11:20*	*06/12/18 22:44*	*2000*

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		06/01/18 15:25	06/04/18 18:42	1
Copper	**1.1**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:42	1
Iron	<46.7		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:42	1
Manganese	**23.3**		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:42	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:42	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	**69.1**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**0.66**		0.20	0.17	mg/L			06/02/18 01:09	1
Nitrate as N	**1.6**		0.20	0.068	mg/L			06/02/18 01:09	1
Sulfate	**3.7**	**B**	0.20	0.095	mg/L			06/02/18 01:09	1
Total Organic Carbon - Duplicates	**1.7**		1.0	0.47	mg/L			06/04/18 20:45	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-13
Date Collected: 05/31/18 10:08
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-3
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	67.3		5.0	3.7	mg/L			06/11/18 19:12	1

Client Sample ID: W-180531-PS-14

Date Collected: 05/31/18 11:25
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-4

Matrix: Water

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			06/07/18 02:21	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 02:21	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 02:21	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 02:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 126*		*06/07/18 02:21*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/07/18 02:21*	*1*
4-Bromofluorobenzene (Surr)	*96*		*72 - 124*		*06/07/18 02:21*	*1*
Dibromofluoromethane	*91*		*75 - 120*		*06/07/18 02:21*	*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		06/06/18 07:27	06/11/18 20:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*90*		*36 - 120*	*06/06/18 07:27*	*06/11/18 20:38*	*1*
2-Fluorobiphenyl (Surr)	*83*		*34 - 110*	*06/06/18 07:27*	*06/11/18 20:38*	*1*
Terphenyl-d14 (Surr)	*105*		*40 - 145*	*06/06/18 07:27*	*06/11/18 20:38*	*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			06/06/18 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*89*		*60 - 140*		*06/06/18 17:36*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.093		0.10	0.093	ug/L		06/05/18 11:20	06/07/18 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*49*		*25 - 130*	*06/05/18 11:20*	*06/07/18 04:41*	*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		06/01/18 15:25	06/04/18 18:46	1
Copper	**0.79**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:46	1
Iron	<46.7		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:46	1
Manganese	**3.1**		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:46	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:46	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	**143**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**16.4**		2.0	1.7	mg/L			06/02/18 01:47	10
Nitrate as N	**1.7**		0.20	0.068	mg/L			06/02/18 01:34	1
Sulfate	**6.3**	**B**	0.20	0.095	mg/L			06/02/18 01:34	1
Total Organic Carbon - Duplicates	**0.71**	**J**	1.0	0.47	mg/L			06/04/18 21:25	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-14
Date Collected: 05/31/18 11:25
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-4
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	585		5.0	3.7	mg/L			06/14/18 14:18	1

Client Sample ID: W-180531-PS-15

Date Collected: 05/31/18 12:17
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-5

Matrix: Water

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			06/07/18 02:46	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 02:46	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 02:46	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 02:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 126*		*06/07/18 02:46*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/07/18 02:46*	*1*
4-Bromofluorobenzene (Surr)	*94*		*72 - 124*		*06/07/18 02:46*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/07/18 02:46*	*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		06/06/18 07:27	06/11/18 21:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*82*		*36 - 120*	*06/06/18 07:27*	*06/11/18 21:05*	*1*
2-Fluorobiphenyl (Surr)	*76*		*34 - 110*	*06/06/18 07:27*	*06/11/18 21:05*	*1*
Terphenyl-d14 (Surr)	*96*		*40 - 145*	*06/06/18 07:27*	*06/11/18 21:05*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**300**		1.0	0.17	ug/L			06/06/18 17:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/06/18 17:53*	*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		06/05/18 11:20	06/07/18 05:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*51*		*25 - 130*	*06/05/18 11:20*	*06/07/18 05:06*	*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		06/01/18 15:25	06/04/18 18:50	1
Copper	<0.50		2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:50	1
Iron	**149**		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:50	1
Manganese	**38.6**		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:50	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:50	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	**145**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**47.9**		2.0	1.7	mg/L			06/02/18 02:12	10
Nitrate as N	**0.096**	**J**	0.20	0.068	mg/L			06/02/18 01:59	1
Sulfate	**14.1**		0.40	0.19	mg/L			06/12/18 03:37	2
Total Organic Carbon - Duplicates	**0.85**	**J**	1.0	0.47	mg/L			06/04/18 21:45	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-15
Date Collected: 05/31/18 12:17
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-5
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	76.8		5.0	3.7	mg/L			06/14/18 14:25	1

Client Sample ID: W-180531-PS-16

Date Collected: 05/31/18 13:52
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-6

Matrix: Water

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			06/07/18 03:12	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 03:12	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 03:12	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 03:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/07/18 03:12*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/07/18 03:12*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/07/18 03:12*	*1*
Dibromofluoromethane	*94*		*75 - 120*		*06/07/18 03:12*	*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		06/06/18 07:27	06/11/18 21:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*86*		*36 - 120*	*06/06/18 07:27*	*06/11/18 21:32*	*1*
2-Fluorobiphenyl (Surr)	*83*		*34 - 110*	*06/06/18 07:27*	*06/11/18 21:32*	*1*
Terphenyl-d14 (Surr)	*100*		*40 - 145*	*06/06/18 07:27*	*06/11/18 21:32*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**2.5**		1.0	0.17	ug/L			06/06/18 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*88*		*60 - 140*		*06/06/18 18:11*	*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		06/05/18 11:20	06/07/18 05:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*49*		*25 - 130*	*06/05/18 11:20*	*06/07/18 05:30*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.36**	**J**	1.0	0.23	ug/L		06/01/18 15:25	06/04/18 18:54	1
Copper	**0.87**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:54	1
Iron	**2600**		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:54	1
Manganese	**124**		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:54	1
Zinc	**10.2**	**J**	20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:54	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	**202**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**9.0**		0.40	0.34	mg/L			06/12/18 04:15	2
Nitrate as N	**13.0**		2.0	0.68	mg/L			06/02/18 02:37	10
Sulfate	**49.5**	**B**	2.0	0.95	mg/L			06/02/18 02:37	10
Total Organic Carbon - Duplicates	**3.4**		1.0	0.47	mg/L			06/04/18 22:26	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-16
Date Collected: 05/31/18 13:52
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-6
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	137		5.0	3.7	mg/L			06/14/18 13:58	1

Client Sample ID: W-180531-PS-17

Date Collected: 05/31/18 14:02
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-7

Matrix: Water

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			06/07/18 03:37	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 03:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 03:37	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 03:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/07/18 03:37*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*06/07/18 03:37*	*1*
4-Bromofluorobenzene (Surr)	*96*		*72 - 124*		*06/07/18 03:37*	*1*
Dibromofluoromethane	*91*		*75 - 120*		*06/07/18 03:37*	*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		06/06/18 07:27	06/11/18 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*85*		*36 - 120*	*06/06/18 07:27*	*06/11/18 21:59*	*1*
2-Fluorobiphenyl (Surr)	*79*		*34 - 110*	*06/06/18 07:27*	*06/11/18 21:59*	*1*
Terphenyl-d14 (Surr)	*98*		*40 - 145*	*06/06/18 07:27*	*06/11/18 21:59*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**2.4**		1.0	0.17	ug/L			06/06/18 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/06/18 18:28*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**0.12**		0.11	0.099	ug/L		06/07/18 11:55	06/12/18 21:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*68*		*25 - 130*	*06/07/18 11:55*	*06/12/18 21:56*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.35**	**J**	1.0	0.23	ug/L		06/01/18 15:25	06/04/18 18:58	1
Copper	**1.2**	**J**	2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:58	1
Iron	**2690**		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:58	1
Manganese	**126**		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:58	1
Zinc	**10.2**	**J**	20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:58	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	**204**		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**8.9**		0.40	0.34	mg/L			06/12/18 04:28	2
Nitrate as N	**13.4**		2.0	0.68	mg/L			06/02/18 03:02	10
Sulfate	**51.7**	**B**	2.0	0.95	mg/L			06/02/18 03:02	10
Total Organic Carbon - Duplicates	**3.4**		1.0	0.47	mg/L			06/04/18 22:46	1

Client Sample ID: W-180531-PS-17
Date Collected: 05/31/18 14:02
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-7
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	137		5.0	3.7	mg/L			06/14/18 14:05	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: TRIPBLANK-003
Date Collected: 05/31/18 15:00
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-8
Matrix: Water

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			06/07/18 04:02	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 04:02	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 04:02	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 04:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 126*		*06/07/18 04:02*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/07/18 04:02*	*1*
4-Bromofluorobenzene (Surr)	*96*		*72 - 124*		*06/07/18 04:02*	*1*
Dibromofluoromethane	*94*		*75 - 120*		*06/07/18 04:02*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-18
Date Collected: 05/31/18 14:45
Date Received: 06/01/18 10:20

Lab Sample ID: 500-146260-9
Matrix: Water

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			06/06/18 19:41	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 19:41	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 19:41	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 19:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*		*06/06/18 19:41*	*1*
Toluene-d8 (Surr)	*101*		*75 - 120*		*06/06/18 19:41*	*1*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*		*06/06/18 19:41*	*1*
Dibromofluoromethane	*88*		*75 - 120*		*06/06/18 19:41*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.31		0.99	0.31	ug/L		06/06/18 07:27	06/11/18 22:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*87*		*36 - 120*	*06/06/18 07:27*	*06/11/18 22:26*	*1*
2-Fluorobiphenyl (Surr)	*80*		*34 - 110*	*06/06/18 07:27*	*06/11/18 22:26*	*1*
Terphenyl-d14 (Surr)	*103*		*40 - 145*	*06/06/18 07:27*	*06/11/18 22:26*	*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		06/07/18 11:55	06/12/18 22:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*63*		*25 - 130*	*06/07/18 11:55*	*06/12/18 22:20*	*1*

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:31	1
Copper	**11.7**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:31	1
Iron	<46.7		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:31	1
Manganese	<0.79		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:31	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:31	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	<0.66		1.3	0.66	mg/L		06/01/18 15:26	06/04/18 15:07	1

Qualifiers

GC/MS VOA

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

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
F1	MS and/or MSD Recovery is outside acceptance limits.
B	Compound was found in the blank and sample.
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)

GC/MS VOA

Analysis Batch: 435556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	8260B	
500-146260-9	W-180531-PS-18	Total/NA	Water	8260B	
MB 500-435556/8	Method Blank	Total/NA	Water	8260B	
LCS 500-435556/5	Lab Control Sample	Total/NA	Water	8260B	
500-146260-9 MS	W-180531-PS-18	Total/NA	Water	8260B	
500-146260-9 MSD	W-180531-PS-18	Total/NA	Water	8260B	

Analysis Batch: 435692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-2	W-180531-PS-12	Total/NA	Water	8260B	
500-146260-3	W-180531-PS-13	Total/NA	Water	8260B	
500-146260-4	W-180531-PS-14	Total/NA	Water	8260B	
500-146260-5	W-180531-PS-15	Total/NA	Water	8260B	
500-146260-6	W-180531-PS-16	Total/NA	Water	8260B	
500-146260-7	W-180531-PS-17	Total/NA	Water	8260B	
500-146260-8	TRIPBLANK-003	Total/NA	Water	8260B	
MB 500-435692/5	Method Blank	Total/NA	Water	8260B	
LCS 500-435692/29	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 435552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	3510C	
500-146260-2	W-180531-PS-12	Total/NA	Water	3510C	
500-146260-3	W-180531-PS-13	Total/NA	Water	3510C	
500-146260-4	W-180531-PS-14	Total/NA	Water	3510C	
500-146260-5	W-180531-PS-15	Total/NA	Water	3510C	
500-146260-6	W-180531-PS-16	Total/NA	Water	3510C	
500-146260-7	W-180531-PS-17	Total/NA	Water	3510C	
500-146260-9	W-180531-PS-18	Total/NA	Water	3510C	
MB 500-435552/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-435552/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 500-435552/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 436325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	8270D	435552
500-146260-2	W-180531-PS-12	Total/NA	Water	8270D	435552
500-146260-3	W-180531-PS-13	Total/NA	Water	8270D	435552
500-146260-4	W-180531-PS-14	Total/NA	Water	8270D	435552
500-146260-5	W-180531-PS-15	Total/NA	Water	8270D	435552
500-146260-6	W-180531-PS-16	Total/NA	Water	8270D	435552
500-146260-7	W-180531-PS-17	Total/NA	Water	8270D	435552
500-146260-9	W-180531-PS-18	Total/NA	Water	8270D	435552

Analysis Batch: 436393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-435552/1-A	Method Blank	Total/NA	Water	8270D	435552
LCS 500-435552/2-A	Lab Control Sample	Total/NA	Water	8270D	435552

GC/MS Semi VOA (Continued)

Analysis Batch: 436393 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 500-435552/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	435552

GC VOA

Analysis Batch: 330285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	RSK-175	
500-146260-2	W-180531-PS-12	Total/NA	Water	RSK-175	
500-146260-3	W-180531-PS-13	Total/NA	Water	RSK-175	
500-146260-4	W-180531-PS-14	Total/NA	Water	RSK-175	
500-146260-5	W-180531-PS-15	Total/NA	Water	RSK-175	
500-146260-6	W-180531-PS-16	Total/NA	Water	RSK-175	
500-146260-7	W-180531-PS-17	Total/NA	Water	RSK-175	
MB 240-330285/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-330285/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 240-330285/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 435386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	8151A	
500-146260-2	W-180531-PS-12	Total/NA	Water	8151A	
500-146260-3	W-180531-PS-13	Total/NA	Water	8151A	
500-146260-4	W-180531-PS-14	Total/NA	Water	8151A	
500-146260-5	W-180531-PS-15	Total/NA	Water	8151A	
500-146260-6	W-180531-PS-16	Total/NA	Water	8151A	
MB 500-435386/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-435386/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-435386/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 435593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	8151A	435386
500-146260-2	W-180531-PS-12	Total/NA	Water	8151A	435386
500-146260-4	W-180531-PS-14	Total/NA	Water	8151A	435386
500-146260-5	W-180531-PS-15	Total/NA	Water	8151A	435386
500-146260-6	W-180531-PS-16	Total/NA	Water	8151A	435386
MB 500-435386/1-A	Method Blank	Total/NA	Water	8151A	435386
LCS 500-435386/2-A	Lab Control Sample	Total/NA	Water	8151A	435386
LCSD 500-435386/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	435386

Prep Batch: 435861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-7	W-180531-PS-17	Total/NA	Water	8151A	
500-146260-9	W-180531-PS-18	Total/NA	Water	8151A	
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

GC Semi VOA (Continued)

Analysis Batch: 436495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-3	W-180531-PS-13	Total/NA	Water	8151A	435386
500-146260-7	W-180531-PS-17	Total/NA	Water	8151A	435861
500-146260-9	W-180531-PS-18	Total/NA	Water	8151A	435861
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	435861
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	435861
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	435861

Metals

Prep Batch: 434984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Dissolved	Water	3005A	
500-146260-2	W-180531-PS-12	Dissolved	Water	3005A	
500-146260-3	W-180531-PS-13	Dissolved	Water	3005A	
500-146260-4	W-180531-PS-14	Dissolved	Water	3005A	
500-146260-5	W-180531-PS-15	Dissolved	Water	3005A	
500-146260-6	W-180531-PS-16	Dissolved	Water	3005A	
500-146260-7	W-180531-PS-17	Dissolved	Water	3005A	
MB 500-434984/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-434984/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-146260-1 MS	W-180531-PS-11	Dissolved	Water	3005A	
500-146260-1 MSD	W-180531-PS-11	Dissolved	Water	3005A	
500-146260-1 DU	W-180531-PS-11	Dissolved	Water	3005A	

Prep Batch: 434985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	3010A	
500-146260-2	W-180531-PS-12	Total/NA	Water	3010A	
500-146260-3	W-180531-PS-13	Total/NA	Water	3010A	
500-146260-4	W-180531-PS-14	Total/NA	Water	3010A	
500-146260-5	W-180531-PS-15	Total/NA	Water	3010A	
500-146260-6	W-180531-PS-16	Total/NA	Water	3010A	
500-146260-7	W-180531-PS-17	Total/NA	Water	3010A	
500-146260-9	W-180531-PS-18	Total/NA	Water	3010A	

Prep Batch: 435137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-9	W-180531-PS-18	Total Recoverable	Water	3005A	
MB 500-435137/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-435137/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 435248

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	SM 2340B	434985
500-146260-2	W-180531-PS-12	Total/NA	Water	SM 2340B	434985
500-146260-3	W-180531-PS-13	Total/NA	Water	SM 2340B	434985
500-146260-4	W-180531-PS-14	Total/NA	Water	SM 2340B	434985
500-146260-5	W-180531-PS-15	Total/NA	Water	SM 2340B	434985
500-146260-6	W-180531-PS-16	Total/NA	Water	SM 2340B	434985
500-146260-7	W-180531-PS-17	Total/NA	Water	SM 2340B	434985

Metals (Continued)

Analysis Batch: 435248 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-9	W-180531-PS-18	Total/NA	Water	SM 2340B	434985

Analysis Batch: 435356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Dissolved	Water	6020A	434984
500-146260-2	W-180531-PS-12	Dissolved	Water	6020A	434984
500-146260-3	W-180531-PS-13	Dissolved	Water	6020A	434984
500-146260-4	W-180531-PS-14	Dissolved	Water	6020A	434984
500-146260-5	W-180531-PS-15	Dissolved	Water	6020A	434984
500-146260-6	W-180531-PS-16	Dissolved	Water	6020A	434984
500-146260-7	W-180531-PS-17	Dissolved	Water	6020A	434984
500-146260-9	W-180531-PS-18	Total Recoverable	Water	6020A	435137
MB 500-434984/1-A	Method Blank	Total Recoverable	Water	6020A	434984
MB 500-435137/1-A	Method Blank	Total Recoverable	Water	6020A	435137
LCS 500-434984/2-A	Lab Control Sample	Total Recoverable	Water	6020A	434984
LCS 500-435137/2-A	Lab Control Sample	Total Recoverable	Water	6020A	435137
500-146260-1 MS	W-180531-PS-11	Dissolved	Water	6020A	434984
500-146260-1 MSD	W-180531-PS-11	Dissolved	Water	6020A	434984
500-146260-1 DU	W-180531-PS-11	Dissolved	Water	6020A	434984

General Chemistry

Analysis Batch: 435021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	300.0	
500-146260-1	W-180531-PS-11	Total/NA	Water	300.0	
500-146260-2	W-180531-PS-12	Total/NA	Water	300.0	
500-146260-2	W-180531-PS-12	Total/NA	Water	300.0	
500-146260-3	W-180531-PS-13	Total/NA	Water	300.0	
500-146260-4	W-180531-PS-14	Total/NA	Water	300.0	
500-146260-4	W-180531-PS-14	Total/NA	Water	300.0	
500-146260-5	W-180531-PS-15	Total/NA	Water	300.0	
500-146260-5	W-180531-PS-15	Total/NA	Water	300.0	
500-146260-6	W-180531-PS-16	Total/NA	Water	300.0	
500-146260-7	W-180531-PS-17	Total/NA	Water	300.0	
MB 500-435021/40	Method Blank	Total/NA	Water	300.0	
LCS 500-435021/41	Lab Control Sample	Total/NA	Water	300.0	
500-146260-1 MS	W-180531-PS-11	Total/NA	Water	300.0	
500-146260-1 MS	W-180531-PS-11	Total/NA	Water	300.0	
500-146260-1 MSD	W-180531-PS-11	Total/NA	Water	300.0	
500-146260-1 MSD	W-180531-PS-11	Total/NA	Water	300.0	

Analysis Batch: 435345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	9060A	
500-146260-2	W-180531-PS-12	Total/NA	Water	9060A	
500-146260-3	W-180531-PS-13	Total/NA	Water	9060A	
500-146260-4	W-180531-PS-14	Total/NA	Water	9060A	
500-146260-5	W-180531-PS-15	Total/NA	Water	9060A	
500-146260-6	W-180531-PS-16	Total/NA	Water	9060A	

General Chemistry (Continued)

Analysis Batch: 435345 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-7	W-180531-PS-17	Total/NA	Water	9060A	
MB 500-435345/4	Method Blank	Total/NA	Water	9060A	
LCS 500-435345/5	Lab Control Sample	Total/NA	Water	9060A	
500-146260-5 MS	W-180531-PS-15	Total/NA	Water	9060A	
500-146260-5 MSD	W-180531-PS-15	Total/NA	Water	9060A	

Analysis Batch: 436465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-1	W-180531-PS-11	Total/NA	Water	SM 2320B	
500-146260-2	W-180531-PS-12	Total/NA	Water	SM 2320B	
500-146260-3	W-180531-PS-13	Total/NA	Water	SM 2320B	
MB 500-436465/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-436465/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 436508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-5	W-180531-PS-15	Total/NA	Water	300.0	
500-146260-6	W-180531-PS-16	Total/NA	Water	300.0	
500-146260-7	W-180531-PS-17	Total/NA	Water	300.0	
MB 500-436508/23	Method Blank	Total/NA	Water	300.0	
LCS 500-436508/34	Lab Control Sample	Total/NA	Water	300.0	
500-146260-5 MS	W-180531-PS-15	Total/NA	Water	300.0	
500-146260-5 MSD	W-180531-PS-15	Total/NA	Water	300.0	

Analysis Batch: 437084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146260-4	W-180531-PS-14	Total/NA	Water	SM 2320B	
500-146260-5	W-180531-PS-15	Total/NA	Water	SM 2320B	
500-146260-6	W-180531-PS-16	Total/NA	Water	SM 2320B	
500-146260-7	W-180531-PS-17	Total/NA	Water	SM 2320B	
MB 500-437084/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-437084/5	Lab Control Sample	Total/NA	Water	SM 2320B	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-146260-1	W-180531-PS-11	99	98	99	95
500-146260-2	W-180531-PS-12	85	96	95	90
500-146260-3	W-180531-PS-13	86	96	99	90
500-146260-4	W-180531-PS-14	86	93	96	91
500-146260-5	W-180531-PS-15	84	96	94	90
500-146260-6	W-180531-PS-16	87	93	98	94
500-146260-7	W-180531-PS-17	87	95	96	91
500-146260-8	TRIPBLANK-003	84	97	96	94
500-146260-9	W-180531-PS-18	95	101	97	88
500-146260-9 MS	W-180531-PS-18	99	101	97	94
500-146260-9 MSD	W-180531-PS-18	98	99	99	94
LCS 500-435556/5	Lab Control Sample	95	94	94	97
LCS 500-435692/29	Lab Control Sample	81	95	90	89
MB 500-435556/8	Method Blank	95	97	93	93
MB 500-435692/5	Method Blank	85	95	95	90

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-146260-1	W-180531-PS-11	76	68	88
500-146260-2	W-180531-PS-12	82	79	99
500-146260-3	W-180531-PS-13	87	77	104
500-146260-4	W-180531-PS-14	90	83	105
500-146260-5	W-180531-PS-15	82	76	96
500-146260-6	W-180531-PS-16	86	83	100
500-146260-7	W-180531-PS-17	85	79	98
500-146260-9	W-180531-PS-18	87	80	103
LCS 500-435552/2-A	Lab Control Sample	107	105	120
LCSD 500-435552/3-A	Lab Control Sample Dup	91	88	103
MB 500-435552/1-A	Method Blank	98	93	122

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TPHL = Terphenyl-d14 (Surr)

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

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)								
500-146260-1	W-180531-PS-11	90								
500-146260-2	W-180531-PS-12	90								
500-146260-3	W-180531-PS-13	90								
500-146260-4	W-180531-PS-14	89								
500-146260-5	W-180531-PS-15	90								
500-146260-6	W-180531-PS-16	88								
500-146260-7	W-180531-PS-17	90								
LCS 240-330285/5	Lab Control Sample	92								
LCSD 240-330285/6	Lab Control Sample Dup	92								
MB 240-330285/4	Method Blank	94								

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)								
500-146260-1	W-180531-PS-11	53								
500-146260-2	W-180531-PS-12	60								
500-146260-3	W-180531-PS-13	0 D								
500-146260-4	W-180531-PS-14	49								
500-146260-5	W-180531-PS-15	51								
500-146260-6	W-180531-PS-16	49								
500-146260-7	W-180531-PS-17	68								
500-146260-9	W-180531-PS-18	63								
LCS 500-435386/2-A	Lab Control Sample	56								
LCS 500-435861/2-A	Lab Control Sample	65								
LCSD 500-435386/3-A	Lab Control Sample Dup	56								
LCSD 500-435861/3-A	Lab Control Sample Dup	67								
MB 500-435386/1-A	Method Blank	54								
MB 500-435861/1-A	Method Blank	70								

Surrogate Legend

DCPAA = DCAA

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

Lab Sample ID: MB 500-435556/8
Matrix: Water
Analysis Batch: 435556

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			06/06/18 13:03	1
Toluene	<0.15		0.50	0.15	ug/L			06/06/18 13:03	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/06/18 13:03	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/06/18 13:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*		*06/06/18 13:03*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/06/18 13:03*	*1*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*		*06/06/18 13:03*	*1*
Dibromofluoromethane	*93*		*75 - 120*		*06/06/18 13:03*	*1*

Lab Sample ID: LCS 500-435556/5
Matrix: Water
Analysis Batch: 435556

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	47.6		ug/L		95	70 - 120
Toluene	50.0	46.1		ug/L		92	70 - 125
Ethylbenzene	50.0	46.4		ug/L		93	70 - 120
Xylenes, Total	100	93.4		ug/L		93	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 126*
Toluene-d8 (Surr)	*94*		*75 - 120*
4-Bromofluorobenzene (Surr)	*94*		*72 - 124*
Dibromofluoromethane	*97*		*75 - 120*

Lab Sample ID: 500-146260-9 MS
Matrix: Water
Analysis Batch: 435556

Client Sample ID: W-180531-PS-18
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	47.9		ug/L		96	70 - 120
Toluene	<0.15		50.0	49.9		ug/L		100	70 - 125
Ethylbenzene	<0.18		50.0	48.2		ug/L		96	70 - 120
Xylenes, Total	<0.22		100	97.1		ug/L		97	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 126*
Toluene-d8 (Surr)	*101*		*75 - 120*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*
Dibromofluoromethane	*94*		*75 - 120*

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

Lab Sample ID: 500-146260-9 MSD
Matrix: Water
Analysis Batch: 435556

Client Sample ID: W-180531-PS-18
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	47.0		ug/L		94	70 - 120	2	20
Toluene	<0.15		50.0	50.0		ug/L		100	70 - 125	0	20
Ethylbenzene	<0.18		50.0	47.8		ug/L		96	70 - 120	1	20
Xylenes, Total	<0.22		100	95.9		ug/L		96	70 - 125	1	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 126*
Toluene-d8 (Surr)	*99*		*75 - 120*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*
Dibromofluoromethane	*94*		*75 - 120*

Lab Sample ID: MB 500-435692/5
Matrix: Water
Analysis Batch: 435692

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			06/07/18 00:38	1
Toluene	<0.15		0.50	0.15	ug/L			06/07/18 00:38	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/07/18 00:38	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/07/18 00:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/07/18 00:38*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*06/07/18 00:38*	*1*
4-Bromofluorobenzene (Surr)	*95*		*72 - 124*		*06/07/18 00:38*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/07/18 00:38*	*1*

Lab Sample ID: LCS 500-435692/29
Matrix: Water
Analysis Batch: 435692

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	47.8		ug/L		96	70 - 120		
Toluene			50.0	47.3		ug/L		95	70 - 125		
Ethylbenzene			50.0	48.8		ug/L		98	70 - 120		
Xylenes, Total			100	91.0		ug/L		91	70 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 126*
Toluene-d8 (Surr)	*95*		*75 - 120*
4-Bromofluorobenzene (Surr)	*90*		*72 - 124*
Dibromofluoromethane	*89*		*75 - 120*

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

Lab Sample ID: MB 500-435552/1-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435552

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		06/06/18 07:27	06/11/18 23:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*98*		*36 - 120*	*06/06/18 07:27*	*06/11/18 23:45*	*1*
2-Fluorobiphenyl (Surr)	*93*		*34 - 110*	*06/06/18 07:27*	*06/11/18 23:45*	*1*
Terphenyl-d14 (Surr)	*122*		*40 - 145*	*06/06/18 07:27*	*06/11/18 23:45*	*1*

Lab Sample ID: LCS 500-435552/2-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435552

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	23.6		ug/L		74	36 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*107*		*36 - 120*
2-Fluorobiphenyl (Surr)	*105*		*34 - 110*
Terphenyl-d14 (Surr)	*120*		*40 - 145*

Lab Sample ID: LCSD 500-435552/3-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435552

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	32.0	19.9		ug/L		62	36 - 110	17	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*91*		*36 - 120*
2-Fluorobiphenyl (Surr)	*88*		*34 - 110*
Terphenyl-d14 (Surr)	*103*		*40 - 145*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-330285/4
Matrix: Water
Analysis Batch: 330285

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			06/06/18 12:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*94*		*60 - 140*		*06/06/18 12:30*	*1*

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 240-330285/5
Matrix: Water
Analysis Batch: 330285

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			285	247		ug/L		86	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,1,1-Trifluoroethane	*92*		*60 - 140*

Lab Sample ID: LCSD 240-330285/6
Matrix: Water
Analysis Batch: 330285

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			285	249		ug/L		87	80 - 120	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,1,1-Trifluoroethane	*92*		*60 - 140*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-435386/1-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435386

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/05/18 11:20	06/06/18 19:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*54*		*25 - 130*	*06/05/18 11:20*	*06/06/18 19:45*	*1*

Lab Sample ID: LCS 500-435386/2-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435386

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	*56*		*25 - 130*

Lab Sample ID: LCSD 500-435386/3-A
Matrix: Water
Analysis Batch: 435593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435386

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol			2.53	1.46		ug/L		58	40 - 122	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*56*		*25 - 130*

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

Lab Sample ID: MB 500-435861/1-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435861

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/07/18 11:55	06/12/18 20:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*70*		*25 - 130*	*06/07/18 11:55*	*06/12/18 20:42*	*1*

Lab Sample ID: LCS 500-435861/2-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435861

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	2.53	1.57		ug/L		62	40 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCAA	*65*		*25 - 130*

Lab Sample ID: LCSD 500-435861/3-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435861

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	2.53	1.67		ug/L		66	40 - 122	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*67*		*25 - 130*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-434984/1-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 434984

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		06/01/18 15:25	06/04/18 18:01	1
Copper	<0.50		2.0	0.50	ug/L		06/01/18 15:25	06/04/18 18:01	1
Iron	<46.7		100	46.7	ug/L		06/01/18 15:25	06/04/18 18:01	1
Manganese	<0.79		2.5	0.79	ug/L		06/01/18 15:25	06/04/18 18:01	1
Zinc	<6.9		20.0	6.9	ug/L		06/01/18 15:25	06/04/18 18:01	1

Lab Sample ID: LCS 500-434984/2-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 434984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.89		ug/L		97	80 - 120
Copper	250	249.6		ug/L		100	80 - 120
Iron	1000	1162		ug/L		116	80 - 120
Manganese	500	523.0		ug/L		105	80 - 120

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

Lab Sample ID: LCS 500-434984/2-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 434984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	500	496.6		ug/L		99	80 - 120

Lab Sample ID: MB 500-435137/1-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 435137

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:23	1
Copper	1.08	J	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:23	1
Iron	<46.7		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:23	1
Manganese	<0.79		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:23	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:23	1

Lab Sample ID: LCS 500-435137/2-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 435137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.28		ug/L		96	80 - 120
Copper	250	250.5		ug/L		100	80 - 120
Iron	1000	1101		ug/L		110	80 - 120
Manganese	500	534.1		ug/L		107	80 - 120
Zinc	500	494.5		ug/L		99	80 - 120

Lab Sample ID: 500-146260-1 MS
Matrix: Water
Analysis Batch: 435356

Client Sample ID: W-180531-PS-11
Prep Type: Dissolved
Prep Batch: 434984

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.79	J	100	98.26		ug/L		97	75 - 125
Copper	1.7	J	250	243.9		ug/L		97	75 - 125
Iron	<46.7		1000	990.2		ug/L		99	75 - 125
Manganese	<0.79		500	468.8		ug/L		94	75 - 125
Zinc	<6.9		500	485.8		ug/L		97	75 - 125

Lab Sample ID: 500-146260-1 MSD
Matrix: Water
Analysis Batch: 435356

Client Sample ID: W-180531-PS-11
Prep Type: Dissolved
Prep Batch: 434984

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.79	J	100	98.37		ug/L		98	75 - 125	0	20
Copper	1.7	J	250	243.8		ug/L		97	75 - 125	0	20
Iron	<46.7		1000	1005		ug/L		101	75 - 125	2	20
Manganese	<0.79		500	471.6		ug/L		94	75 - 125	1	20
Zinc	<6.9		500	488.0		ug/L		98	75 - 125	0	20

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

Lab Sample ID: 500-146260-1 DU
Matrix: Water
Analysis Batch: 435356

Client Sample ID: W-180531-PS-11
Prep Type: Dissolved
Prep Batch: 434984

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	0.79	J	0.831	J	ug/L		6	20
Copper	1.7	J	2.00		ug/L		14	20
Iron	<46.7		101.4		ug/L		NC	20
Manganese	<0.79		<0.79		ug/L		NC	20
Zinc	<6.9		<6.9		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-435021/40
Matrix: Water
Analysis Batch: 435021

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			06/01/18 22:37	1
Nitrate as N	<0.068		0.20	0.068	mg/L			06/01/18 22:37	1
Sulfate	0.0951	J	0.20	0.095	mg/L			06/01/18 22:37	1

Lab Sample ID: LCS 500-435021/41
Matrix: Water
Analysis Batch: 435021

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	3.02		mg/L		101	90 - 110
Nitrate as N	2.00	1.99		mg/L		100	90 - 110
Sulfate	5.00	5.04		mg/L		101	90 - 110

Lab Sample ID: 500-146260-1 MS
Matrix: Water
Analysis Batch: 435021

Client Sample ID: W-180531-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	3.3		1.00	4.33		mg/L		102	80 - 120

Lab Sample ID: 500-146260-1 MS
Matrix: Water
Analysis Batch: 435021

Client Sample ID: W-180531-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	14.9	F1	10.0	35.14	F1	mg/L		202	80 - 120
Sulfate	98.2	F1 B	25.0	107.0	F1	mg/L		35	80 - 120

Lab Sample ID: 500-146260-1 MSD
Matrix: Water
Analysis Batch: 435021

Client Sample ID: W-180531-PS-11
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	3.3		1.00	4.29		mg/L		98	80 - 120	1	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-146260-1 MSD — **Client Sample ID: W-180531-PS-11**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435021

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	14.9	F1	10.0	33.64	F1	mg/L		187	80 - 120	4	20
Sulfate	98.2	F1 B	25.0	111.3	F1	mg/L		52	80 - 120	4	20

Lab Sample ID: MB 500-436508/23 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436508

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.17		0.20	0.17	mg/L			06/11/18 21:55	1
Sulfate	<0.095		0.20	0.095	mg/L			06/11/18 21:55	1

Lab Sample ID: LCS 500-436508/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436508

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.95		mg/L		98	90 - 110
Sulfate	5.00	4.90		mg/L		98	90 - 110

Lab Sample ID: 500-146260-5 MS — **Client Sample ID: W-180531-PS-15**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436508

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	14.1		5.00	20.05		mg/L		120	80 - 120

Lab Sample ID: 500-146260-5 MSD — **Client Sample ID: W-180531-PS-15**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436508

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	14.1		5.00	20.08		mg/L		120	80 - 120	0	20

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

Lab Sample ID: MB 500-435345/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435345

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			06/04/18 14:24	1

Lab Sample ID: LCS 500-435345/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435345

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	10.0	9.49		mg/L		95	80 - 120

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

Lab Sample ID: 500-146260-5 MS
Matrix: Water
Analysis Batch: 435345

Client Sample ID: W-180531-PS-15
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	0.85	J	10.0	10.11		mg/L		93	75 - 125

Lab Sample ID: 500-146260-5 MSD
Matrix: Water
Analysis Batch: 435345

Client Sample ID: W-180531-PS-15
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	0.85	J	10.0	10.08		mg/L		92	75 - 125	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-436465/3
Matrix: Water
Analysis Batch: 436465

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			06/11/18 16:03	1

Lab Sample ID: LCS 500-436465/4
Matrix: Water
Analysis Batch: 436465

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	99.86		mg/L		100	85 - 115

Lab Sample ID: MB 500-437084/3
Matrix: Water
Analysis Batch: 437084

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			06/14/18 11:10	1

Lab Sample ID: LCS 500-437084/5
Matrix: Water
Analysis Batch: 437084

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	101.2		mg/L		101	85 - 115

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-11

Lab Sample ID: 500-146260-1

Date Collected: 05/31/18 08:14

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435556	06/06/18 16:34	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 19:17	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 16:28	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 02:40	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:09	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435021	06/01/18 23:02	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/01/18 23:15	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 20:05	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 18:57	SMO	TAL CHI

Client Sample ID: W-180531-PS-12

Lab Sample ID: 500-146260-2

Date Collected: 05/31/18 08:59

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 01:29	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 19:44	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 17:02	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 03:04	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:38	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435021	06/02/18 00:18	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/02/18 00:31	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 20:25	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 19:06	SMO	TAL CHI

Client Sample ID: W-180531-PS-13

Lab Sample ID: 500-146260-3

Date Collected: 05/31/18 10:08

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 01:55	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI

Client Sample ID: W-180531-PS-13

Lab Sample ID: 500-146260-3

Date Collected: 05/31/18 10:08

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D		1	436325	06/11/18 20:11	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 17:19	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		2000	436495	06/12/18 22:44	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:42	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435021	06/02/18 01:09	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 20:45	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	436465	06/11/18 19:12	SMO	TAL CHI

Client Sample ID: W-180531-PS-14

Lab Sample ID: 500-146260-4

Date Collected: 05/31/18 11:25

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 02:21	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 20:38	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 17:36	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 04:41	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:46	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435021	06/02/18 01:34	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/02/18 01:47	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 21:25	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 14:18	SMO	TAL CHI

Client Sample ID: W-180531-PS-15

Lab Sample ID: 500-146260-5

Date Collected: 05/31/18 12:17

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 02:46	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 21:05	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 17:53	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI

Client Sample ID: W-180531-PS-15

Lab Sample ID: 500-146260-5

Date Collected: 05/31/18 12:17

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8151A		1	435593	06/07/18 05:06	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:50	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435021	06/02/18 01:59	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/02/18 02:12	EAT	TAL CHI
Total/NA	Analysis	300.0		2	436508	06/12/18 03:37	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 21:45	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 14:25	SMO	TAL CHI

Client Sample ID: W-180531-PS-16

Lab Sample ID: 500-146260-6

Date Collected: 05/31/18 13:52

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 03:12	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 21:32	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 18:11	SEM	TAL CAN
Total/NA	Prep	8151A			435386	06/05/18 11:20	NKG	TAL CHI
Total/NA	Analysis	8151A		1	435593	06/07/18 05:30	JBJ	TAL CHI
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:54	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/02/18 02:37	EAT	TAL CHI
Total/NA	Analysis	300.0		2	436508	06/12/18 04:15	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 22:26	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 13:58	SMO	TAL CHI

Client Sample ID: W-180531-PS-17

Lab Sample ID: 500-146260-7

Date Collected: 05/31/18 14:02

Matrix: Water

Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 03:37	JDD	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 21:59	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	330285	06/06/18 18:28	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/12/18 21:56	JBJ	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146260-1

Client Sample ID: W-180531-PS-17

Lab Sample ID: 500-146260-7
Matrix: Water
Date Collected: 05/31/18 14:02
Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			434984	06/01/18 15:25	BDE	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 18:58	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	TAL CHI
Total/NA	Analysis	300.0		10	435021	06/02/18 03:02	EAT	TAL CHI
Total/NA	Analysis	300.0		2	436508	06/12/18 04:28	EAT	TAL CHI
Total/NA	Analysis	9060A		1	435345	06/04/18 22:46	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 14:05	SMO	TAL CHI

Client Sample ID: TRIPBLANK-003

Lab Sample ID: 500-146260-8
Matrix: Water
Date Collected: 05/31/18 15:00
Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435692	06/07/18 04:02	JDD	TAL CHI

Client Sample ID: W-180531-PS-18

Lab Sample ID: 500-146260-9
Matrix: Water
Date Collected: 05/31/18 14:45
Date Received: 06/01/18 10:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	435556	06/06/18 19:41	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 22:26	GES	TAL CHI
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/12/18 22:20	JBJ	TAL CHI
Total Recoverable	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Total Recoverable	Analysis	6020A		1	435356	06/04/18 19:31	FXG	TAL CHI
Total/NA	Prep	3010A			434985	06/01/18 15:26	BDE	TAL CHI
Total/NA	Analysis	SM 2340B		1	435248	06/04/18 15:07	PJ1	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 086165-04

TestAmerica Job ID: 500-146260-1

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	08-31-18

The following analytes are included in this report, but are not accredited/certified under this accreditation/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	06-30-18 *
Illinois	NELAP	5	200004	07-31-18 *
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	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
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.

TestAmerica

THE LEADER IN ENVIRONMENTAL

2417 Bond Street, University Park, IL 60
Phone: 708.534.5200 Fax: 708.534

500-146260 COC

Chain of Custody Record

Lab Job #: 500-146260

Chain of Custody Number: 080531

Page 1 of 1

Temperature °C of Cooler: 0.5→2.0, 1.7→3.2, 1.8→3.3, 0.4→1.8 6/1/18

Report To (optional)	Bill To (optional)
Contact: Grant Anderson	Contact:
Company: GHD	Company:
Address:	Address:
Address:	Address:
Phone: 651-639-0913	Phone:
Fax:	Fax:
E-Mail:	PO#/Reference#:

Client	Client Project #	Preservative
GHD	086165	
Project Name: PENTAIWOOD		Parameter
Project Location/State	Lab Project #	
Sampler	Lab PM	

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	N 2320B Alkalinity	D 2340C Hardness as CaCO3 (calc)	D 6020 Metals (Fe,Mn)	D 8260B, RSK-175 Methane	A 9060 TOC	S 300.0-28D N (Nitrate, Chloride, Sulfate)	N 8260B BTEX	A 8270 NAPHTHALENE	N 6151 DCP	Comments
1		W-180531-PS-11	5/31/18	8:14	15	W	X	X	X	X	X	X	X	X	X	
2		12		8:59	15	W	X	X	X	X	X	X	X	X	X	
3		13		10:08	15	W	X	X	X	X	X	X	X	X	X	
4		14		11:25	15	W	X	X	X	X	X	X	X	X	X	
5		15		12:17	15	W	X	X	X	X	X	X	X	X	X	
6		16		13:52	15	W	X	X	X	X	X	X	X	X	X	
7		17		14:02	15	W	X	X	X	X	X	X	X	X	X	
8		TRIPBLANK-003	5/31/18	15:00	1	W							X			
9		W-180531-PS-18	5/31/18	14:45	8	W			X				X	X	X	

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
T. Brann	GHD	5/31/18		[illegible]	TA-CRL	6/1/18	1020
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier:
Shipped: Fed-X
Hand Delivered:

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments:

Lab Comments:

TAL-4124-500 (1209)

500-146260 Waybill

0035
0076

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3770

MUR4

Form ID No. 0215

1 From

Date 5/31/18

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St.

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3770

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	2 or 3 Business Days
☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.	☐ 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 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 56 lbs. Credit Card Auth.

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

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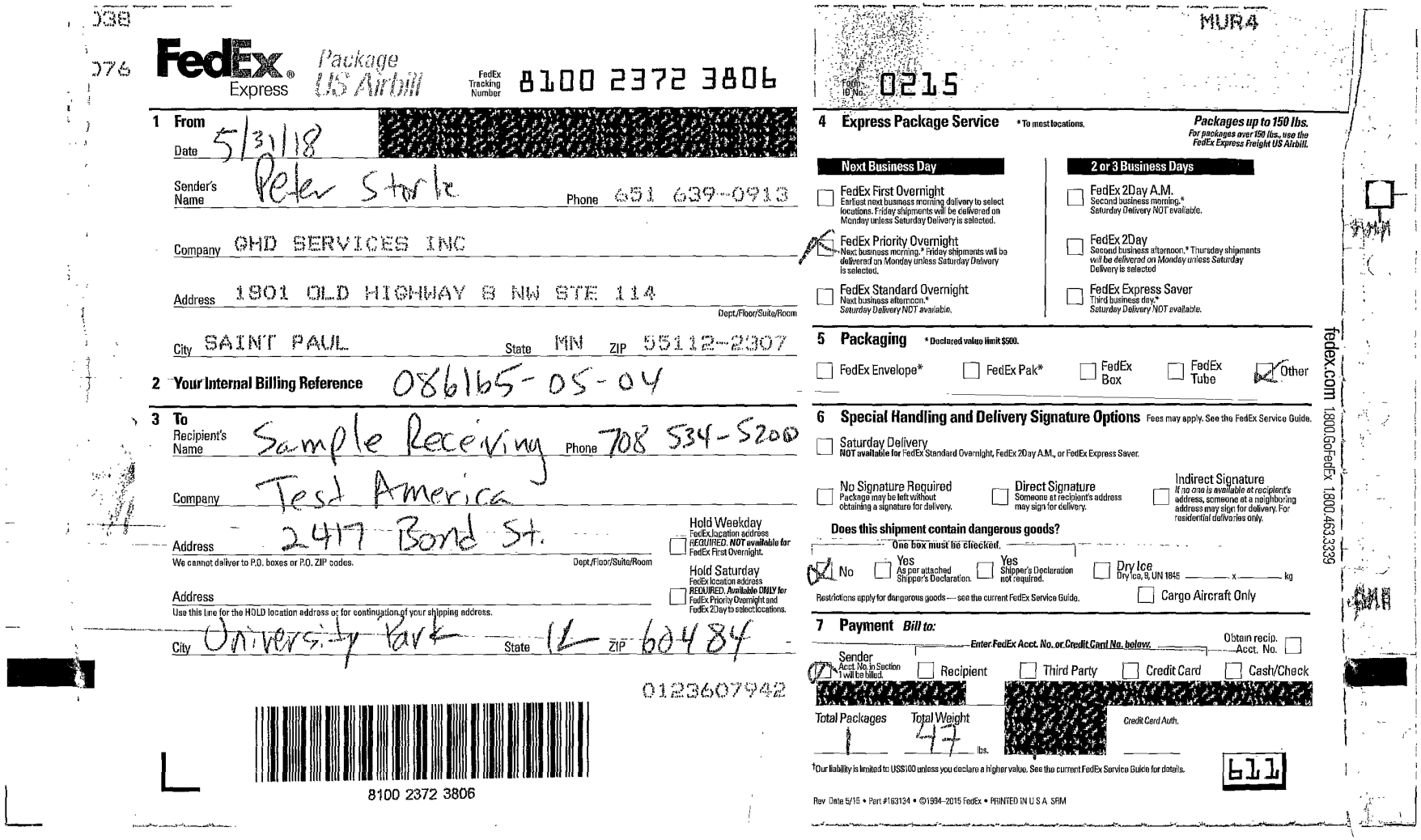
fedex.com 1.800.GoFedEx 1.800.463.3339



FedEx Express — Package US Airbill

FedEx Tracking Number: 8100 2372 3806

MUR4

Form ID No. 0215

1 From

Date: 5/31/18

Sender's Name: Peter Starle — Phone: 651 639-0913

Company: GHD SERVICES INC

Address: 1801 OLD HIGHWAY 8 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: Sample Receiving — Phone: 708 534-5200

Company: Test America

Address: 2417 Bond St. — We cannot deliver to P.O. boxes or P.O. ZIP codes. — Dept./Floor/Suite/Room

Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: University Park — State: IL — ZIP: 60484

0123607942

8100 2372 3806

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	2 or 3 Business Days
☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
☑ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.	☐ 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 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages: 1 — Total Weight: 47 lbs. — Credit Card Auth.

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

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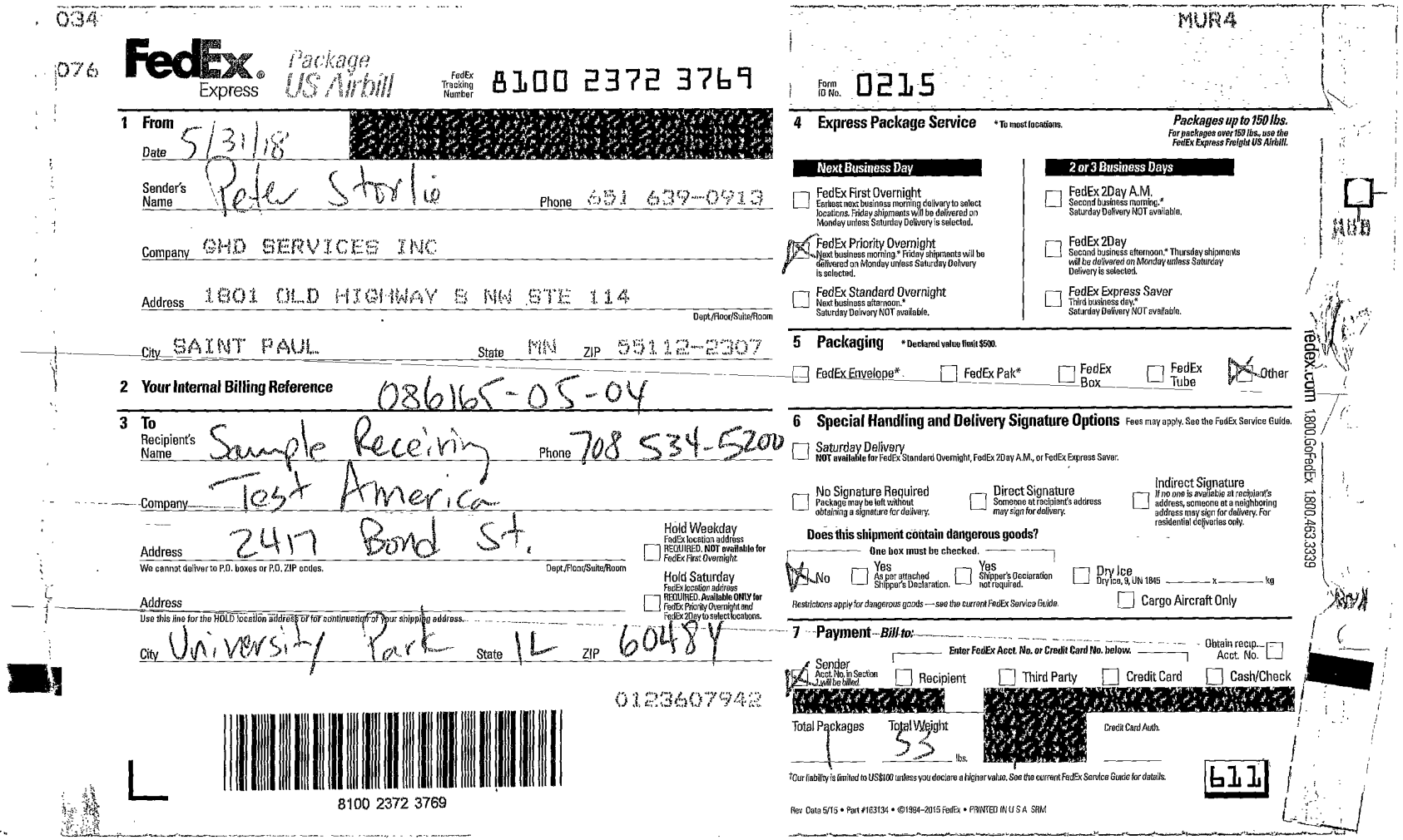

034

076

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3769

MUR4

Form ID No. 0215

1 From

Date 5/31/18

Sender's Name Pete Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St. Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

0123607942

8100 2372 3769

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	2 or 3 Business Days
☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.	☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.	☐ 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 1 will be billed ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 55 lbs. Credit Card Auth.

611

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

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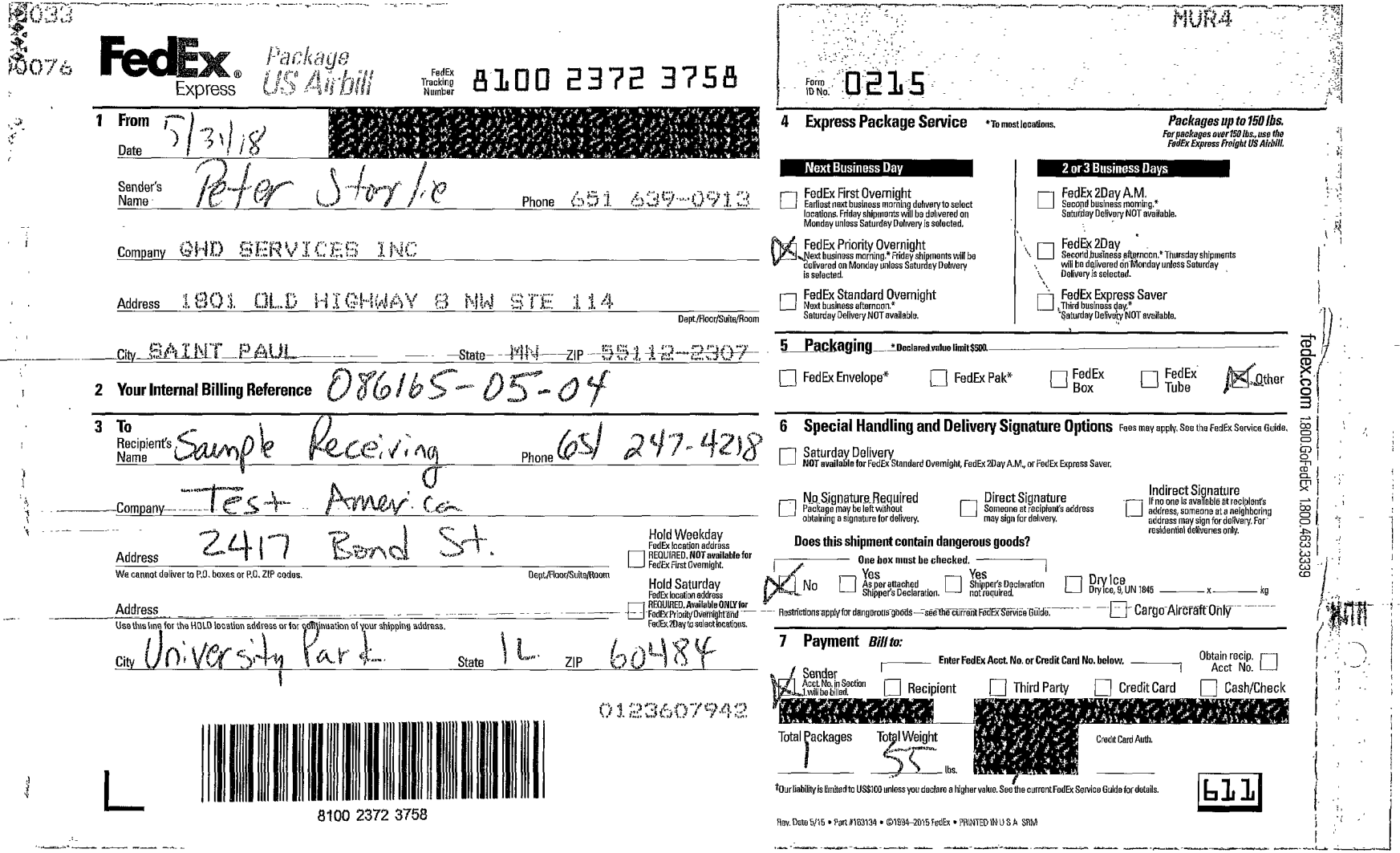
fedex.com 1.800.GoFedEx 1.800.463.3339



FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3758

MUR4

Form ID No. 0215

1 From

Date 5/31/18

Sender's Name Peter Storlie Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 651 247-4218

Company Test America

Address 2417 Bond St.

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3758

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.
- [X] 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
- [X] 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.

- [X] 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. [ ]

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

Total Packages 1 Total Weight 55 lbs. Credit Card Auth.

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

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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

20/C2.1

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-105224.1
Client Contact: Shipping/Receiving	Phone:	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		Job #: 500-146260-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 6/14/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

RSK

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ (MOD) Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
W-180531-PS-11 (500-146260-1)	5/31/18	08:14 Central		Water			X	3	WI
W-180531-PS-12 (500-146260-2)	5/31/18	08:59 Central		Water			X	3	WI
W-180531-PS-13 (500-146260-3)	5/31/18	10:08 Central		Water			X	3	WI
W-180531-PS-14 (500-146260-4)	5/31/18	11:25 Central		Water			X	3	WI
W-180531-PS-15 (500-146260-5)	5/31/18	12:17 Central		Water			X	3	WI
W-180531-PS-16 (500-146260-6)	5/31/18	13:52 Central		Water			X	3	WI
W-180531-PS-17 (500-146260-7)	5/31/18	14:02 Central		Water			X	3	WI

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/tests/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	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	06/01/18 @ 1630	TA		6-2-18 935	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

6/15/2018

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Chicago Site Name _____ Cooler unpacked by:

Cooler Received on 6-2-18 Opened on 6-4-18

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

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

TestAmerica Cooler # _____ 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 **+0.1** °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C

IR GUN #36 (CF **+0.3**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

~~IR GUN # 627 (CF **-1.3**°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# **HC740840**
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: 500-146260-1

Login Number: 146260
List Number: 1
Creator: Scott, Sherri L

List Source: TestAmerica Chicago

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	2.0,3.2,3.3,1.9
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.	False	
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: 500-146327-1
Client Project/Site: Penta Wood 086165-04

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

Attn: Mr. Grant Anderson

Authorized for release by:
6/18/2018 5:06:27 PM

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

Table of Contents

Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Job ID: 500-146327-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-146327-1

Receipt
The samples were received on 6/2/2018 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 2.4º C, 3.0º C, 4.2º C and 4.8º C.

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

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

GC VOA
Method(s) RSK-175: The following volatile sample was analyzed with significant headspace in the sample container(s): W-180601-PS-25 (500-146327-8). Significant headspace is defined as a bubble greater than 6 mm in diameter.

Method(s) RSK-175: Surrogate recovery is below limit but is reported. The surrogate is not specified in the method for the CCVL. (CCVL 240-331071/3)

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 samples required a dilution due to the nature of the sample matrix: W-180601-PS-21 (500-146327-2), W-180601-PS-23 (500-146327-4) and W-180601-PS-24 (500-146327-5). 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
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 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-20 — Lab Sample ID: 500-146327-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.74	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	0.90	J B	2.0	0.50	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	256		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	42.3		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	2.0	F1 B	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	8.8	F1	0.20	0.095	mg/L	1		300.0	Total/NA
Total Organic Carbon - Duplicates	0.81	J	1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	194		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180601-PS-21 — Lab Sample ID: 500-146327-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.0		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	0.93		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	13		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	19		0.77	0.24	ug/L	1		8270D	Total/NA
Methane	24		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	6000		2600	2300	ug/L	25000		8151A	Total/NA
Arsenic	14.9		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	3.6	B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	13400		100	46.7	ug/L	1		6020A	Dissolved
Manganese	2540		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	253		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	34.2		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.085	J B	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	13.6		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	33.8		2.0	0.94	mg/L	2		9060A	Total/NA
Alkalinity	271		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180601-PS-22 — Lab Sample ID: 500-146327-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.25		0.10	0.092	ug/L	1		8151A	Total/NA
Arsenic	0.24	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	2.7	B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	242		100	46.7	ug/L	1		6020A	Dissolved
Manganese	74.7		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	127		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	10.6		0.40	0.34	mg/L	2		300.0	Total/NA
Nitrate as N	13.2	B	2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	36.3		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	3.3		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	53.5		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180601-PS-23 — Lab Sample ID: 500-146327-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.5		0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	1.4		0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	10		1.0	0.22	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Chicago

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-23 (Continued) — Lab Sample ID: 500-146327-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	24		0.80	0.25	ug/L	1		8270D	Total/NA
Methane	23		1.0	0.17	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	2500		1000	920	ug/L	10000		8151A	Total/NA
Arsenic	1.0		1.0	0.23	ug/L	1		6020A	Dissolved
Copper	3.6	B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	796		100	46.7	ug/L	1		6020A	Dissolved
Manganese	951		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	197		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	27.6		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.084	J B	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	19.9		1.0	0.48	mg/L	5		300.0	Total/NA
Total Organic Carbon - Duplicates	2.1		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	470		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: W-180601-PS-24 — Lab Sample ID: 500-146327-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.22	J	0.50	0.15	ug/L	1		8260B	Total/NA
Ethylbenzene	0.42	J	0.50	0.18	ug/L	1		8260B	Total/NA
Xylenes, Total	5.2		1.0	0.22	ug/L	1		8260B	Total/NA
Naphthalene	11		0.74	0.23	ug/L	1		8270D	Total/NA
Pentachlorophenol	1500		970	870	ug/L	10000		8151A	Total/NA
Arsenic	0.91	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	5.2	B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	1010		100	46.7	ug/L	1		6020A	Dissolved
Manganese	2880		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	456		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	69.8		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	0.083	J B	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	39.7		2.0	0.95	mg/L	10		300.0	Total/NA
Total Organic Carbon - Duplicates	5.5		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	322		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Trip Blank-004 — Lab Sample ID: 500-146327-6

No Detections.

Client Sample ID: W-180601-PS-19 — Lab Sample ID: 500-146327-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.25		0.098	0.088	ug/L	1		8151A	Total/NA
Arsenic	0.29	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	1.7	J B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	50.6	J	100	46.7	ug/L	1		6020A	Dissolved
Manganese	9.4		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	246		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	31.5		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	1.9	B	0.20	0.068	mg/L	1		300.0	Total/NA
Sulfate	10.8		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	1.2		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	698		5.0	3.7	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-25 — Lab Sample ID: 500-146327-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.37	J	1.0	0.23	ug/L	1		6020A	Dissolved
Copper	3.1	B	2.0	0.50	ug/L	1		6020A	Dissolved
Iron	58.6	J	100	46.7	ug/L	1		6020A	Dissolved
Manganese	4.7		2.5	0.79	ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	320		1.3	0.66	mg/L	1		SM 2340B	Total/NA
Chloride	14.1		2.0	1.7	mg/L	10		300.0	Total/NA
Nitrate as N	11.6	B	2.0	0.68	mg/L	10		300.0	Total/NA
Sulfate	11.9		0.40	0.19	mg/L	2		300.0	Total/NA
Total Organic Carbon - Duplicates	2.3		1.0	0.47	mg/L	1		9060A	Total/NA
Alkalinity	250		5.0	3.7	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

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 086165-04

TestAmerica Job ID: 500-146327-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-146327-1	W-180601-PS-20	Water	06/01/18 09:00	06/02/18 10:10
500-146327-2	W-180601-PS-21	Water	06/01/18 09:37	06/02/18 10:10
500-146327-3	W-180601-PS-22	Water	06/01/18 10:32	06/02/18 10:10
500-146327-4	W-180601-PS-23	Water	06/01/18 11:24	06/02/18 10:10
500-146327-5	W-180601-PS-24	Water	06/01/18 12:10	06/02/18 10:10
500-146327-6	Trip Blank-004	Water	06/01/18 13:00	06/02/18 10:10
500-146327-7	W-180601-PS-19	Water	06/01/18 07:57	06/02/18 10:10
500-146327-8	W-180601-PS-25	Water	06/01/18 12:45	06/02/18 10:10

Client Sample ID: W-180601-PS-20

Date Collected: 06/01/18 09:00
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-1

Matrix: Water

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			06/12/18 01:38	1
Toluene	<0.15		0.50	0.15	ug/L			06/12/18 01:38	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/12/18 01:38	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/12/18 01:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/12/18 01:38*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/12/18 01:38*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/12/18 01:38*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*06/12/18 01:38*	*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		06/06/18 07:27	06/11/18 22:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*88*		*36 - 120*	*06/06/18 07:27*	*06/11/18 22:53*	*1*
2-Fluorobiphenyl (Surr)	*83*		*34 - 110*	*06/06/18 07:27*	*06/11/18 22:53*	*1*
Terphenyl-d14 (Surr)	*109*		*40 - 145*	*06/06/18 07:27*	*06/11/18 22:53*	*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			06/11/18 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/11/18 15:45*	*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		06/07/18 11:55	06/13/18 00:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*67*		*25 - 130*	*06/07/18 11:55*	*06/13/18 00:22*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.74**	**J**	1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:35	1
Copper	**0.90**	**J B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:35	1
Iron	<46.7		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:35	1
Manganese	<0.79		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:35	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:35	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	**256**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**42.3**		2.0	1.7	mg/L			06/02/18 16:34	10
Nitrate as N	**2.0**	**F1 B**	0.20	0.068	mg/L			06/02/18 15:56	1
Sulfate	**8.8**	**F1**	0.20	0.095	mg/L			06/02/18 15:56	1
Total Organic Carbon - Duplicates	**0.81**	**J**	1.0	0.47	mg/L			06/14/18 01:21	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-20
Date Collected: 06/01/18 09:00
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-1
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	194		5.0	3.7	mg/L			06/14/18 14:32	1

Client Sample ID: W-180601-PS-21

Date Collected: 06/01/18 09:37
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-2

Matrix: Water

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			06/12/18 02:07	1
Toluene	**1.0**		0.50	0.15	ug/L			06/12/18 02:07	1
Ethylbenzene	**0.93**		0.50	0.18	ug/L			06/12/18 02:07	1
Xylenes, Total	**13**		1.0	0.22	ug/L			06/12/18 02:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 126*		*06/12/18 02:07*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*06/12/18 02:07*	*1*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*		*06/12/18 02:07*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*06/12/18 02:07*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**19**		0.77	0.24	ug/L		06/06/18 07:27	06/11/18 23:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*85*		*36 - 120*	*06/06/18 07:27*	*06/11/18 23:20*	*1*
2-Fluorobiphenyl (Surr)	*61*		*34 - 110*	*06/06/18 07:27*	*06/11/18 23:20*	*1*
Terphenyl-d14 (Surr)	*107*		*40 - 145*	*06/06/18 07:27*	*06/11/18 23:20*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**24**		1.0	0.17	ug/L			06/11/18 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*92*		*60 - 140*		*06/11/18 16:02*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**6000**		2600	2300	ug/L		06/07/18 11:55	06/13/18 00:46	25000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*0*	*D*	*25 - 130*	*06/07/18 11:55*	*06/13/18 00:46*	*25000*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**14.9**		1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:39	1
Copper	**3.6**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:39	1
Iron	**13400**		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:39	1
Manganese	**2540**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:39	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:39	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	**253**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**34.2**		2.0	1.7	mg/L			06/02/18 17:50	10
Nitrate as N	**0.085**	**J B**	0.20	0.068	mg/L			06/02/18 17:12	1
Sulfate	**13.6**		0.40	0.19	mg/L			06/16/18 15:08	2
Total Organic Carbon - Duplicates	**33.8**		2.0	0.94	mg/L			06/13/18 02:22	2

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-21
Date Collected: 06/01/18 09:37
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-2
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	271		5.0	3.7	mg/L			06/14/18 11:34	1

Client Sample ID: W-180601-PS-22

Date Collected: 06/01/18 10:32
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-3

Matrix: Water

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			06/12/18 02:37	1
Toluene	<0.15		0.50	0.15	ug/L			06/12/18 02:37	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/12/18 02:37	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/12/18 02:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/12/18 02:37*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*06/12/18 02:37*	*1*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*06/12/18 02:37*	*1*
Dibromofluoromethane	*94*		*75 - 120*		*06/12/18 02:37*	*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		06/06/18 07:27	06/11/18 23:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*89*		*36 - 120*	*06/06/18 07:27*	*06/11/18 23:47*	*1*
2-Fluorobiphenyl (Surr)	*82*		*34 - 110*	*06/06/18 07:27*	*06/11/18 23:47*	*1*
Terphenyl-d14 (Surr)	*105*		*40 - 145*	*06/06/18 07:27*	*06/11/18 23:47*	*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			06/11/18 16:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/11/18 16:20*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**0.25**		0.10	0.092	ug/L		06/07/18 11:55	06/13/18 01:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*58*		*25 - 130*	*06/07/18 11:55*	*06/13/18 01:11*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.24**	**J**	1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:43	1
Copper	**2.7**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:43	1
Iron	**242**		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:43	1
Manganese	**74.7**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:43	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:43	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	**127**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10.6**		0.40	0.34	mg/L			06/16/18 15:20	2
Nitrate as N	**13.2**	**B**	2.0	0.68	mg/L			06/02/18 18:15	10
Sulfate	**36.3**		2.0	0.95	mg/L			06/02/18 18:15	10
Total Organic Carbon - Duplicates	**3.3**		1.0	0.47	mg/L			06/14/18 01:40	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-22
Date Collected: 06/01/18 10:32
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-3
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	53.5		5.0	3.7	mg/L			06/14/18 14:38	1

Client Sample ID: W-180601-PS-23

Date Collected: 06/01/18 11:24
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-4

Matrix: Water

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			06/12/18 03:07	1
Toluene	**1.5**		0.50	0.15	ug/L			06/12/18 03:07	1
Ethylbenzene	**1.4**		0.50	0.18	ug/L			06/12/18 03:07	1
Xylenes, Total	**10**		1.0	0.22	ug/L			06/12/18 03:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/12/18 03:07*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/12/18 03:07*	*1*
4-Bromofluorobenzene (Surr)	*93*		*72 - 124*		*06/12/18 03:07*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/12/18 03:07*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**24**		0.80	0.25	ug/L		06/06/18 07:27	06/12/18 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*87*		*36 - 120*	*06/06/18 07:27*	*06/12/18 00:14*	*1*
2-Fluorobiphenyl (Surr)	*34*		*34 - 110*	*06/06/18 07:27*	*06/12/18 00:14*	*1*
Terphenyl-d14 (Surr)	*98*		*40 - 145*	*06/06/18 07:27*	*06/12/18 00:14*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**23**		1.0	0.17	ug/L			06/11/18 16:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*93*		*60 - 140*		*06/11/18 16:37*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**2500**		1000	920	ug/L		06/07/18 11:55	06/13/18 01:35	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*0*	*D*	*25 - 130*	*06/07/18 11:55*	*06/13/18 01:35*	*10000*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.0**		1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:47	1
Copper	**3.6**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:47	1
Iron	**796**		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:47	1
Manganese	**951**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:47	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:47	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	**197**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27.6**		2.0	1.7	mg/L			06/02/18 18:40	10
Nitrate as N	**0.084**	**J B**	0.20	0.068	mg/L			06/02/18 18:28	1
Sulfate	**19.9**		1.0	0.48	mg/L			06/16/18 15:33	5
Total Organic Carbon - Duplicates	**2.1**		1.0	0.47	mg/L			06/13/18 03:02	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-23
Date Collected: 06/01/18 11:24
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-4
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	470		5.0	3.7	mg/L			06/14/18 11:50	1

Client Sample ID: W-180601-PS-24

Date Collected: 06/01/18 12:10
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-5

Matrix: Water

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			06/12/18 03:36	1
Toluene	**0.22**	**J**	0.50	0.15	ug/L			06/12/18 03:36	1
Ethylbenzene	**0.42**	**J**	0.50	0.18	ug/L			06/12/18 03:36	1
Xylenes, Total	**5.2**		1.0	0.22	ug/L			06/12/18 03:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/12/18 03:36*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*06/12/18 03:36*	*1*
4-Bromofluorobenzene (Surr)	*94*		*72 - 124*		*06/12/18 03:36*	*1*
Dibromofluoromethane	*95*		*75 - 120*		*06/12/18 03:36*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**11**		0.74	0.23	ug/L		06/06/18 07:27	06/12/18 00:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*87*		*36 - 120*	*06/06/18 07:27*	*06/12/18 00:41*	*1*
2-Fluorobiphenyl (Surr)	*65*		*34 - 110*	*06/06/18 07:27*	*06/12/18 00:41*	*1*
Terphenyl-d14 (Surr)	*88*		*40 - 145*	*06/06/18 07:27*	*06/12/18 00:41*	*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			06/11/18 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*90*		*60 - 140*		*06/11/18 16:54*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**1500**		970	870	ug/L		06/07/18 11:55	06/13/18 01:59	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*0*	*D*	*25 - 130*	*06/07/18 11:55*	*06/13/18 01:59*	*10000*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.91**	**J**	1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:51	1
Copper	**5.2**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:51	1
Iron	**1010**		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:51	1
Manganese	**2880**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:51	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:51	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	**456**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**69.8**		2.0	1.7	mg/L			06/02/18 19:06	10
Nitrate as N	**0.083**	**J B**	0.20	0.068	mg/L			06/02/18 18:53	1
Sulfate	**39.7**		2.0	0.95	mg/L			06/02/18 19:06	10
Total Organic Carbon - Duplicates	**5.5**		1.0	0.47	mg/L			06/13/18 03:21	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-24
Date Collected: 06/01/18 12:10
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-5
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	322		5.0	3.7	mg/L			06/14/18 11:41	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: Trip Blank-004
Date Collected: 06/01/18 13:00
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-6
Matrix: Water

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			06/12/18 04:06	1
Toluene	<0.15		0.50	0.15	ug/L			06/12/18 04:06	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/12/18 04:06	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/12/18 04:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 126*		*06/12/18 04:06*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/12/18 04:06*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/12/18 04:06*	*1*
Dibromofluoromethane	*96*		*75 - 120*		*06/12/18 04:06*	*1*

Client Sample ID: W-180601-PS-19

Date Collected: 06/01/18 07:57
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-7

Matrix: Water

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			06/12/18 04:36	1
Toluene	<0.15		0.50	0.15	ug/L			06/12/18 04:36	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/12/18 04:36	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/12/18 04:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/12/18 04:36*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/12/18 04:36*	*1*
4-Bromofluorobenzene (Surr)	*98*		*72 - 124*		*06/12/18 04:36*	*1*
Dibromofluoromethane	*97*		*75 - 120*		*06/12/18 04:36*	*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		06/06/18 07:27	06/12/18 01:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*88*		*36 - 120*	*06/06/18 07:27*	*06/12/18 01:08*	*1*
2-Fluorobiphenyl (Surr)	*82*		*34 - 110*	*06/06/18 07:27*	*06/12/18 01:08*	*1*
Terphenyl-d14 (Surr)	*105*		*40 - 145*	*06/06/18 07:27*	*06/12/18 01:08*	*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			06/11/18 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/11/18 17:12*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	**0.25**		0.098	0.088	ug/L		06/07/18 11:55	06/13/18 02:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*64*		*25 - 130*	*06/07/18 11:55*	*06/13/18 02:24*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.29**	**J**	1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:55	1
Copper	**1.7**	**J B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:55	1
Iron	**50.6**	**J**	100	46.7	ug/L		06/04/18 07:54	06/04/18 19:55	1
Manganese	**9.4**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:55	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:55	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	**246**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**31.5**		2.0	1.7	mg/L			06/02/18 19:31	10
Nitrate as N	**1.9**	**B**	0.20	0.068	mg/L			06/02/18 19:18	1
Sulfate	**10.8**		0.40	0.19	mg/L			06/16/18 15:45	2
Total Organic Carbon - Duplicates	**1.2**		1.0	0.47	mg/L			06/14/18 01:59	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-19
Date Collected: 06/01/18 07:57
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-7
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	698		5.0	3.7	mg/L			06/14/18 15:01	1

Client Sample ID: W-180601-PS-25

Date Collected: 06/01/18 12:45
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-8

Matrix: Water

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			06/12/18 05:06	1
Toluene	<0.15		0.50	0.15	ug/L			06/12/18 05:06	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/12/18 05:06	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/12/18 05:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*06/12/18 05:06*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/12/18 05:06*	*1*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*		*06/12/18 05:06*	*1*
Dibromofluoromethane	*98*		*75 - 120*		*06/12/18 05:06*	*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		06/06/18 07:27	06/12/18 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*86*		*36 - 120*	*06/06/18 07:27*	*06/12/18 01:34*	*1*
2-Fluorobiphenyl (Surr)	*84*		*34 - 110*	*06/06/18 07:27*	*06/12/18 01:34*	*1*
Terphenyl-d14 (Surr)	*95*		*40 - 145*	*06/06/18 07:27*	*06/12/18 01:34*	*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			06/11/18 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1-Trifluoroethane	*91*		*60 - 140*		*06/11/18 17:29*	*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		06/07/18 11:55	06/13/18 02:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*60*		*25 - 130*	*06/07/18 11:55*	*06/13/18 02:48*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.37**	**J**	1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:59	1
Copper	**3.1**	**B**	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:59	1
Iron	**58.6**	**J**	100	46.7	ug/L		06/04/18 07:54	06/04/18 19:59	1
Manganese	**4.7**		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:59	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:59	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	**320**		1.3	0.66	mg/L		06/04/18 07:57	06/05/18 09:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**14.1**		2.0	1.7	mg/L			06/02/18 20:22	10
Nitrate as N	**11.6**	**B**	2.0	0.68	mg/L			06/02/18 20:22	10
Sulfate	**11.9**		0.40	0.19	mg/L			06/16/18 15:57	2
Total Organic Carbon - Duplicates	**2.3**		1.0	0.47	mg/L			06/13/18 04:41	1

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-25
Date Collected: 06/01/18 12:45
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-8
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	250		5.0	3.7	mg/L			06/14/18 15:08	1

Qualifiers

GC/MS VOA

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

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
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.
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.

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)

GC/MS VOA

Analysis Batch: 436355

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	8260B	
500-146327-2	W-180601-PS-21	Total/NA	Water	8260B	
500-146327-3	W-180601-PS-22	Total/NA	Water	8260B	
500-146327-4	W-180601-PS-23	Total/NA	Water	8260B	
500-146327-5	W-180601-PS-24	Total/NA	Water	8260B	
500-146327-6	Trip Blank-004	Total/NA	Water	8260B	
500-146327-7	W-180601-PS-19	Total/NA	Water	8260B	
500-146327-8	W-180601-PS-25	Total/NA	Water	8260B	
MB 500-436355/6	Method Blank	Total/NA	Water	8260B	
LCS 500-436355/4	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 435552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	3510C	
500-146327-2	W-180601-PS-21	Total/NA	Water	3510C	
500-146327-3	W-180601-PS-22	Total/NA	Water	3510C	
500-146327-4	W-180601-PS-23	Total/NA	Water	3510C	
500-146327-5	W-180601-PS-24	Total/NA	Water	3510C	
500-146327-7	W-180601-PS-19	Total/NA	Water	3510C	
500-146327-8	W-180601-PS-25	Total/NA	Water	3510C	
MB 500-435552/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-435552/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 500-435552/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 436325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	8270D	435552
500-146327-2	W-180601-PS-21	Total/NA	Water	8270D	435552
500-146327-3	W-180601-PS-22	Total/NA	Water	8270D	435552
500-146327-4	W-180601-PS-23	Total/NA	Water	8270D	435552
500-146327-5	W-180601-PS-24	Total/NA	Water	8270D	435552
500-146327-7	W-180601-PS-19	Total/NA	Water	8270D	435552
500-146327-8	W-180601-PS-25	Total/NA	Water	8270D	435552

Analysis Batch: 436393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-435552/1-A	Method Blank	Total/NA	Water	8270D	435552
LCS 500-435552/2-A	Lab Control Sample	Total/NA	Water	8270D	435552
LCSD 500-435552/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	435552

GC VOA

Analysis Batch: 331014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	RSK-175	
500-146327-2	W-180601-PS-21	Total/NA	Water	RSK-175	
500-146327-3	W-180601-PS-22	Total/NA	Water	RSK-175	
500-146327-4	W-180601-PS-23	Total/NA	Water	RSK-175	

GC VOA (Continued)

Analysis Batch: 331014 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-5	W-180601-PS-24	Total/NA	Water	RSK-175	
500-146327-7	W-180601-PS-19	Total/NA	Water	RSK-175	
500-146327-8	W-180601-PS-25	Total/NA	Water	RSK-175	
MB 240-331014/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-331014/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 240-331014/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 435861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	8151A	
500-146327-2	W-180601-PS-21	Total/NA	Water	8151A	
500-146327-3	W-180601-PS-22	Total/NA	Water	8151A	
500-146327-4	W-180601-PS-23	Total/NA	Water	8151A	
500-146327-5	W-180601-PS-24	Total/NA	Water	8151A	
500-146327-7	W-180601-PS-19	Total/NA	Water	8151A	
500-146327-8	W-180601-PS-25	Total/NA	Water	8151A	
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 436495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	8151A	435861
500-146327-2	W-180601-PS-21	Total/NA	Water	8151A	435861
500-146327-3	W-180601-PS-22	Total/NA	Water	8151A	435861
500-146327-4	W-180601-PS-23	Total/NA	Water	8151A	435861
500-146327-5	W-180601-PS-24	Total/NA	Water	8151A	435861
500-146327-7	W-180601-PS-19	Total/NA	Water	8151A	435861
500-146327-8	W-180601-PS-25	Total/NA	Water	8151A	435861
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	435861
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	435861
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	435861

Metals

Prep Batch: 435137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Dissolved	Water	3005A	
500-146327-2	W-180601-PS-21	Dissolved	Water	3005A	
500-146327-3	W-180601-PS-22	Dissolved	Water	3005A	
500-146327-4	W-180601-PS-23	Dissolved	Water	3005A	
500-146327-5	W-180601-PS-24	Dissolved	Water	3005A	
500-146327-7	W-180601-PS-19	Dissolved	Water	3005A	
500-146327-8	W-180601-PS-25	Dissolved	Water	3005A	
MB 500-435137/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-435137/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 435138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	3010A	
500-146327-2	W-180601-PS-21	Total/NA	Water	3010A	
500-146327-3	W-180601-PS-22	Total/NA	Water	3010A	
500-146327-4	W-180601-PS-23	Total/NA	Water	3010A	
500-146327-5	W-180601-PS-24	Total/NA	Water	3010A	
500-146327-7	W-180601-PS-19	Total/NA	Water	3010A	
500-146327-8	W-180601-PS-25	Total/NA	Water	3010A	

Analysis Batch: 435349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	SM 2340B	435138
500-146327-2	W-180601-PS-21	Total/NA	Water	SM 2340B	435138
500-146327-3	W-180601-PS-22	Total/NA	Water	SM 2340B	435138
500-146327-4	W-180601-PS-23	Total/NA	Water	SM 2340B	435138
500-146327-5	W-180601-PS-24	Total/NA	Water	SM 2340B	435138
500-146327-7	W-180601-PS-19	Total/NA	Water	SM 2340B	435138
500-146327-8	W-180601-PS-25	Total/NA	Water	SM 2340B	435138

Analysis Batch: 435356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Dissolved	Water	6020A	435137
500-146327-2	W-180601-PS-21	Dissolved	Water	6020A	435137
500-146327-3	W-180601-PS-22	Dissolved	Water	6020A	435137
500-146327-4	W-180601-PS-23	Dissolved	Water	6020A	435137
500-146327-5	W-180601-PS-24	Dissolved	Water	6020A	435137
500-146327-7	W-180601-PS-19	Dissolved	Water	6020A	435137
500-146327-8	W-180601-PS-25	Dissolved	Water	6020A	435137
MB 500-435137/1-A	Method Blank	Total Recoverable	Water	6020A	435137
LCS 500-435137/2-A	Lab Control Sample	Total Recoverable	Water	6020A	435137

General Chemistry

Analysis Batch: 435196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	300.0	
500-146327-1	W-180601-PS-20	Total/NA	Water	300.0	
500-146327-2	W-180601-PS-21	Total/NA	Water	300.0	
500-146327-2	W-180601-PS-21	Total/NA	Water	300.0	
500-146327-3	W-180601-PS-22	Total/NA	Water	300.0	
500-146327-4	W-180601-PS-23	Total/NA	Water	300.0	
500-146327-4	W-180601-PS-23	Total/NA	Water	300.0	
500-146327-5	W-180601-PS-24	Total/NA	Water	300.0	
500-146327-5	W-180601-PS-24	Total/NA	Water	300.0	
500-146327-7	W-180601-PS-19	Total/NA	Water	300.0	
500-146327-7	W-180601-PS-19	Total/NA	Water	300.0	
500-146327-8	W-180601-PS-25	Total/NA	Water	300.0	
MB 500-435196/23	Method Blank	Total/NA	Water	300.0	
LCS 500-435196/30	Lab Control Sample	Total/NA	Water	300.0	
500-146327-1 MS	W-180601-PS-20	Total/NA	Water	300.0	
500-146327-1 MS	W-180601-PS-20	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 435196 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1 MSD	W-180601-PS-20	Total/NA	Water	300.0	
500-146327-1 MSD	W-180601-PS-20	Total/NA	Water	300.0	

Analysis Batch: 436811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-2	W-180601-PS-21	Total/NA	Water	9060A	
500-146327-4	W-180601-PS-23	Total/NA	Water	9060A	
500-146327-5	W-180601-PS-24	Total/NA	Water	9060A	
500-146327-8	W-180601-PS-25	Total/NA	Water	9060A	
MB 500-436811/4	Method Blank	Total/NA	Water	9060A	
LCS 500-436811/5	Lab Control Sample	Total/NA	Water	9060A	

Analysis Batch: 436914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	9060A	
500-146327-3	W-180601-PS-22	Total/NA	Water	9060A	
500-146327-7	W-180601-PS-19	Total/NA	Water	9060A	
MB 500-436914/4	Method Blank	Total/NA	Water	9060A	
LCS 500-436914/5	Lab Control Sample	Total/NA	Water	9060A	

Analysis Batch: 437084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-1	W-180601-PS-20	Total/NA	Water	SM 2320B	
500-146327-2	W-180601-PS-21	Total/NA	Water	SM 2320B	
500-146327-3	W-180601-PS-22	Total/NA	Water	SM 2320B	
500-146327-4	W-180601-PS-23	Total/NA	Water	SM 2320B	
500-146327-5	W-180601-PS-24	Total/NA	Water	SM 2320B	
500-146327-7	W-180601-PS-19	Total/NA	Water	SM 2320B	
500-146327-8	W-180601-PS-25	Total/NA	Water	SM 2320B	
MB 500-437084/29	Method Blank	Total/NA	Water	SM 2320B	
MB 500-437084/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-437084/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 500-437084/5	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 437329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146327-2	W-180601-PS-21	Total/NA	Water	300.0	
500-146327-3	W-180601-PS-22	Total/NA	Water	300.0	
500-146327-4	W-180601-PS-23	Total/NA	Water	300.0	
500-146327-7	W-180601-PS-19	Total/NA	Water	300.0	
500-146327-8	W-180601-PS-25	Total/NA	Water	300.0	
MB 500-437329/3	Method Blank	Total/NA	Water	300.0	
LCS 500-437329/47	Lab Control Sample	Total/NA	Water	300.0	

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-146327-1	W-180601-PS-20	87	96	98	95
500-146327-2	W-180601-PS-21	86	95	93	95
500-146327-3	W-180601-PS-22	85	94	99	94
500-146327-4	W-180601-PS-23	85	96	93	96
500-146327-5	W-180601-PS-24	85	95	94	95
500-146327-6	Trip Blank-004	88	93	98	96
500-146327-7	W-180601-PS-19	87	96	98	97
500-146327-8	W-180601-PS-25	92	93	99	98
LCS 500-436355/4	Lab Control Sample	84	97	92	89
MB 500-436355/6	Method Blank	94	93	97	102

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-146327-1	W-180601-PS-20	88	83	109
500-146327-2	W-180601-PS-21	85	61	107
500-146327-3	W-180601-PS-22	89	82	105
500-146327-4	W-180601-PS-23	87	34	98
500-146327-5	W-180601-PS-24	87	65	88
500-146327-7	W-180601-PS-19	88	82	105
500-146327-8	W-180601-PS-25	86	84	95
LCS 500-435552/2-A	Lab Control Sample	107	105	120
LCSD 500-435552/3-A	Lab Control Sample Dup	91	88	103
MB 500-435552/1-A	Method Blank	98	93	122

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)
		TFE2
Lab Sample ID	Client Sample ID	(60-140)
500-146327-1	W-180601-PS-20	92
500-146327-2	W-180601-PS-21	92
500-146327-3	W-180601-PS-22	91
500-146327-4	W-180601-PS-23	93
500-146327-5	W-180601-PS-24	90

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFE2 (60-140)
500-146327-7	W-180601-PS-19	91
500-146327-8	W-180601-PS-25	91
LCS 240-331014/5	Lab Control Sample	95
LCSD 240-331014/6	Lab Control Sample Dup	94
MB 240-331014/4	Method Blank	94

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)
500-146327-1	W-180601-PS-20	67
500-146327-2	W-180601-PS-21	0 D
500-146327-3	W-180601-PS-22	58
500-146327-4	W-180601-PS-23	0 D
500-146327-5	W-180601-PS-24	0 D
500-146327-7	W-180601-PS-19	64
500-146327-8	W-180601-PS-25	60
LCS 500-435861/2-A	Lab Control Sample	65
LCSD 500-435861/3-A	Lab Control Sample Dup	67
MB 500-435861/1-A	Method Blank	70

Surrogate Legend

DCPAA = DCAA

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

Lab Sample ID: MB 500-436355/6
Matrix: Water
Analysis Batch: 436355

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			06/11/18 22:39	1
Toluene	<0.15		0.50	0.15	ug/L			06/11/18 22:39	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/11/18 22:39	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/11/18 22:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 126*		*06/11/18 22:39*	*1*
Toluene-d8 (Surr)	*93*		*75 - 120*		*06/11/18 22:39*	*1*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*		*06/11/18 22:39*	*1*
Dibromofluoromethane	*102*		*75 - 120*		*06/11/18 22:39*	*1*

Lab Sample ID: LCS 500-436355/4
Matrix: Water
Analysis Batch: 436355

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	45.8		ug/L		92	70 - 120
Toluene	50.0	51.5		ug/L		103	70 - 125
Ethylbenzene	50.0	52.2		ug/L		104	70 - 120
Xylenes, Total	100	102		ug/L		102	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)	*92*		*72 - 124*
Dibromofluoromethane	*89*		*75 - 120*

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

Lab Sample ID: MB 500-435552/1-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435552

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		06/06/18 07:27	06/11/18 23:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*98*		*36 - 120*	*06/06/18 07:27*	*06/11/18 23:45*	*1*
2-Fluorobiphenyl (Surr)	*93*		*34 - 110*	*06/06/18 07:27*	*06/11/18 23:45*	*1*
Terphenyl-d14 (Surr)	*122*		*40 - 145*	*06/06/18 07:27*	*06/11/18 23:45*	*1*

Lab Sample ID: LCS 500-435552/2-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435552

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	23.6		ug/L		74	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	107		36 - 120
2-Fluorobiphenyl (Surr)	105		34 - 110
Terphenyl-d14 (Surr)	120		40 - 145

Lab Sample ID: LCSD 500-435552/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436393 — **Prep Batch: 435552**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			32.0	19.9		ug/L		62	36 - 110	17	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Nitrobenzene-d5 (Surr)	91		36 - 120
2-Fluorobiphenyl (Surr)	88		34 - 110
Terphenyl-d14 (Surr)	103		40 - 145

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-331014/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 331014

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.17		1.0	0.17	ug/L			06/11/18 13:44	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	94		60 - 140		06/11/18 13:44	1

Lab Sample ID: LCS 240-331014/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 331014

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			285	244		ug/L		85	80 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,1,1-Trifluoroethane	95		60 - 140

Lab Sample ID: LCSD 240-331014/6 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 331014

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane			285	242		ug/L		85	80 - 120	1	35

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,1,1-Trifluoroethane	94		60 - 140

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-435861/1-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435861

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/07/18 11:55	06/12/18 20:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*70*		*25 - 130*	*06/07/18 11:55*	*06/12/18 20:42*	*1*

Lab Sample ID: LCS 500-435861/2-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435861

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	2.53	1.57		ug/L		62	40 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCAA	*65*		*25 - 130*

Lab Sample ID: LCSD 500-435861/3-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435861

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	2.53	1.67		ug/L		66	40 - 122	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*67*		*25 - 130*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-435137/1-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 435137

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.23		1.0	0.23	ug/L		06/04/18 07:54	06/04/18 19:23	1
Copper	1.08	J	2.0	0.50	ug/L		06/04/18 07:54	06/04/18 19:23	1
Iron	<46.7		100	46.7	ug/L		06/04/18 07:54	06/04/18 19:23	1
Manganese	<0.79		2.5	0.79	ug/L		06/04/18 07:54	06/04/18 19:23	1
Zinc	<6.9		20.0	6.9	ug/L		06/04/18 07:54	06/04/18 19:23	1

Lab Sample ID: LCS 500-435137/2-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 435137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.28		ug/L		96	80 - 120
Copper	250	250.5		ug/L		100	80 - 120
Iron	1000	1101		ug/L		110	80 - 120
Manganese	500	534.1		ug/L		107	80 - 120

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

Lab Sample ID: LCS 500-435137/2-A
Matrix: Water
Analysis Batch: 435356

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 435137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	500	494.5		ug/L		99	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-435196/23
Matrix: Water
Analysis Batch: 435196

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			06/02/18 15:18	1
Nitrate as N	0.0717	J	0.20	0.068	mg/L			06/02/18 15:18	1
Sulfate	<0.095		0.20	0.095	mg/L			06/02/18 15:18	1

Lab Sample ID: LCS 500-435196/30
Matrix: Water
Analysis Batch: 435196

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	3.03		mg/L		101	90 - 110
Nitrate as N	2.00	1.99		mg/L		99	90 - 110
Sulfate	5.00	5.02		mg/L		100	90 - 110

Lab Sample ID: 500-146327-1 MS
Matrix: Water
Analysis Batch: 435196

Client Sample ID: W-180601-PS-20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.0	F1 B	1.00	2.19	F1	mg/L		21	80 - 120
Sulfate	8.8	F1	2.50	7.55	F1	mg/L		-50	80 - 120

Lab Sample ID: 500-146327-1 MS
Matrix: Water
Analysis Batch: 435196

Client Sample ID: W-180601-PS-20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	42.3		10.0	54.45	4	mg/L		122	80 - 120

Lab Sample ID: 500-146327-1 MSD
Matrix: Water
Analysis Batch: 435196

Client Sample ID: W-180601-PS-20
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	2.0	F1 B	1.00	2.21	F1	mg/L		23	80 - 120	1	20
Sulfate	8.8	F1	2.50	7.50	F1	mg/L		-52	80 - 120	1	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 500-146327-1 MSD
Matrix: Water
Analysis Batch: 435196

Client Sample ID: W-180601-PS-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	42.3		10.0	54.47	4	mg/L		122	80 - 120	0	20

Lab Sample ID: MB 500-437329/3
Matrix: Water
Analysis Batch: 437329

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			06/16/18 12:27	1
Sulfate	<0.095		0.20	0.095	mg/L			06/16/18 12:27	1

Lab Sample ID: LCS 500-437329/47
Matrix: Water
Analysis Batch: 437329

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	3.20		mg/L		107	90 - 110
Sulfate	5.00	5.05		mg/L		101	90 - 110

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

Lab Sample ID: MB 500-436811/4
Matrix: Water
Analysis Batch: 436811

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			06/12/18 21:02	1

Lab Sample ID: LCS 500-436811/5
Matrix: Water
Analysis Batch: 436811

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	10.0		mg/L		100	80 - 120

Lab Sample ID: MB 500-436914/4
Matrix: Water
Analysis Batch: 436914

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			06/13/18 21:42	1

Lab Sample ID: LCS 500-436914/5
Matrix: Water
Analysis Batch: 436914

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	9.89		mg/L		99	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-437084/29
Matrix: Water
Analysis Batch: 437084

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			06/14/18 14:44	1

Lab Sample ID: MB 500-437084/3
Matrix: Water
Analysis Batch: 437084

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			06/14/18 11:10	1

Lab Sample ID: LCS 500-437084/30
Matrix: Water
Analysis Batch: 437084

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	107.8		mg/L		108	85 - 115

Lab Sample ID: LCS 500-437084/5
Matrix: Water
Analysis Batch: 437084

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	101.2		mg/L		101	85 - 115

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-20

Lab Sample ID: 500-146327-1

Date Collected: 06/01/18 09:00

Matrix: Water

Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 01:38	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 22:53	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 15:45	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 00:22	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:35	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435196	06/02/18 15:56	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 16:34	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436914	06/14/18 01:21	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 14:32	SMO	TAL CHI

Client Sample ID: W-180601-PS-21

Lab Sample ID: 500-146327-2

Date Collected: 06/01/18 09:37

Matrix: Water

Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 02:07	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 23:20	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 16:02	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		25000	436495	06/13/18 00:46	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:39	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		2	437329	06/16/18 15:08	EAT	TAL CHI
Total/NA	Analysis	300.0		1	435196	06/02/18 17:12	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 17:50	EAT	TAL CHI
Total/NA	Analysis	9060A		2	436811	06/13/18 02:22	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 11:34	SMO	TAL CHI

Client Sample ID: W-180601-PS-22

Lab Sample ID: 500-146327-3

Date Collected: 06/01/18 10:32

Matrix: Water

Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 02:37	EMA	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 23:47	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 16:20	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 01:11	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:43	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		2	437329	06/16/18 15:20	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 18:15	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436914	06/14/18 01:40	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 14:38	SMO	TAL CHI

Client Sample ID: W-180601-PS-23

Date Collected: 06/01/18 11:24
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 03:07	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/12/18 00:14	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 16:37	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		10000	436495	06/13/18 01:35	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:47	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		5	437329	06/16/18 15:33	EAT	TAL CHI
Total/NA	Analysis	300.0		1	435196	06/02/18 18:28	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 18:40	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436811	06/13/18 03:02	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 11:50	SMO	TAL CHI

Client Sample ID: W-180601-PS-24

Date Collected: 06/01/18 12:10
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 03:36	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/12/18 00:41	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 16:54	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		10000	436495	06/13/18 01:59	JBJ	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-24

Lab Sample ID: 500-146327-5

Date Collected: 06/01/18 12:10
Matrix: Water
Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:51	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		1	435196	06/02/18 18:53	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 19:06	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436811	06/13/18 03:21	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 11:41	SMO	TAL CHI

Client Sample ID: Trip Blank-004

Lab Sample ID: 500-146327-6

Date Collected: 06/01/18 13:00
Matrix: Water
Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 04:06	EMA	TAL CHI

Client Sample ID: W-180601-PS-19

Lab Sample ID: 500-146327-7

Date Collected: 06/01/18 07:57
Matrix: Water
Date Received: 06/02/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 04:36	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/12/18 01:08	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 17:12	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 02:24	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:55	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		2	437329	06/16/18 15:45	EAT	TAL CHI
Total/NA	Analysis	300.0		1	435196	06/02/18 19:18	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 19:31	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436914	06/14/18 01:59	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 15:01	SMO	TAL CHI

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-04

TestAmerica Job ID: 500-146327-1

Client Sample ID: W-180601-PS-25

Date Collected: 06/01/18 12:45
Date Received: 06/02/18 10:10

Lab Sample ID: 500-146327-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436355	06/12/18 05:06	EMA	TAL CHI
Total/NA	Prep	3510C			435552	06/06/18 07:27	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/12/18 01:34	GES	TAL CHI
Total/NA	Analysis	RSK-175		1	331014	06/11/18 17:29	SEM	TAL CAN
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 02:48	JBJ	TAL CHI
Dissolved	Prep	3005A			435137	06/04/18 07:54	SAH	TAL CHI
Dissolved	Analysis	6020A		1	435356	06/04/18 19:59	FXG	TAL CHI
Total/NA	Prep	3010A			435138	06/04/18 07:57	SAH	TAL CHI
Total/NA	Analysis	SM 2340B		1	435349	06/05/18 09:01	PJ1	TAL CHI
Total/NA	Analysis	300.0		2	437329	06/16/18 15:57	EAT	TAL CHI
Total/NA	Analysis	300.0		10	435196	06/02/18 20:22	EAT	TAL CHI
Total/NA	Analysis	9060A		1	436811	06/13/18 04:41	HMW	TAL CHI
Total/NA	Analysis	SM 2320B		1	437084	06/14/18 15:08	SMO	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 086165-04

TestAmerica Job ID: 500-146327-1

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	08-31-18

The following analytes are included in this report, but are not accredited/certified under this accreditation/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	06-30-18 *
Illinois	NELAP	5	200004	07-31-18 *
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	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
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.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

(optional)
Report To
Contact: GRANT ANDERSON
Company: GHD
Address:
Address:
Phone: 651-639-0913
Fax:
E-Mail:

(optional)
Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

500-146327 COC

Chain of Custody Record

Lab Job #: 500-146327
Chain of Custody Number: 180601
Page 1 of 1
Temperature °C of Cooler: (4.8)(4.2)(3.0)(2.4)

Client: GHD
Client Project #: 086165
Project Name: PENTAWOOD
Project Location/State: SPOKANE, WA
Lab Project #:
Sampler:
Lab PM:

Preservative / Parameter

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	N 2320B Alkalinity	D 2340C Hardness by Calc	D 6020 Metals (Filtered)	A 8260B, RSK-175 Methane	S 9060 TOC	N 300.0-28D Nitrate, Chloride, Sulfate	F 8260B BTEX	N 8270 Naphthalene	N 8151 PCP	Comments
1		W-180601-PS-20	6/1/18	9:00	15	W	X	X	X	X	X	X	X	X	X	
2		21		9:37	15	W	X	X	X	X	X	X	X	X	X	
3		22		10:32	15	W	X	X	X	X	X	X	X	X	X	
4		23		11:24	15	W	X	X	X	X	X	X	X	X	X	
5		24		12:10	15	W	X	X	X	X	X	X	X	X	X	
6		TRIP BLANK-004	6/1/18	13:00	1	W							X			
7		W-180601-PS-19	6/1/18	7:57	15	W	X	X	X	X	X	X	X	X	X	
8		25	6/1/18	12:45	15	W	X	X	X	X	X	X	X	X	X	

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
T. BRAUN	GHD	6/1/18	19:00		TA	06/02/18	1010
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier
Shipped ✓
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:

TAL-4124-500 (1208)

6/18/2018

500-146327 Waybill

4867.

FedEx Express Package US Airbill

FedEx Tracking Number 8100 2372 3780

MUR4

Form ID No 0215

1 From Date 6/1/18

Sender's Name Peter Starlz Phone 651 639-0913

Company GHD SERVICES INC

Address 1801 OLD HIGHWAY 8 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 Sample Receiving Phone 708 534-5200

Company Test America

Address 2417 Bond St.

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City University Park State IL ZIP 60484

Hold Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0123607942

8100 2372 3780

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.
- [X] 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 | [X] Other

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

[X] 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.

[X] 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.

[X] Sender Acct. No. in Section 1 will be billed. | Recipient | Third Party | Credit Card | Cash/Check

Total Packages 1 Total Weight 46 lbs. Credit Card Auth.

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

611

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fedex.com 1.800.GoFedEx 1.800.463.3339

48 oz.

00187

00400

FedEx Express *Package US Airbill*

FedEx Tracking Number 8130 2266 4357

Form ID No. 0215

MUR1

1 From

Date 6/[redacted]/18 [redacted]

Sender's Name Peter Storlie Phone 651 247-4218

Company GHD

Address 1801 Old Hwy 8

Dept./Floor/Suite/Room

City St. Paul State MN ZIP 55112

2 Your Internal Billing Reference 086165-05-03

3 To

Recipient's Name SAMPLE RECEIPT Phone 708 534-5200

Company TESTAMERICA CHICAGO LAB

Address 2417 BOND ST

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

- [ ] 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 60484-3101

0130294096

8130 2266 4357

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.
- [x] 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
- [x] Other

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

- [x] 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.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration.
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Restrictions apply for dangerous goods — see the current FedEx Service Guide.

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below.

Obtain recip. Acct. No. [ ]

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

[redacted]

Total Packages 1 Total Weight 45 lbs. [redacted] Credit Card Auth.

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

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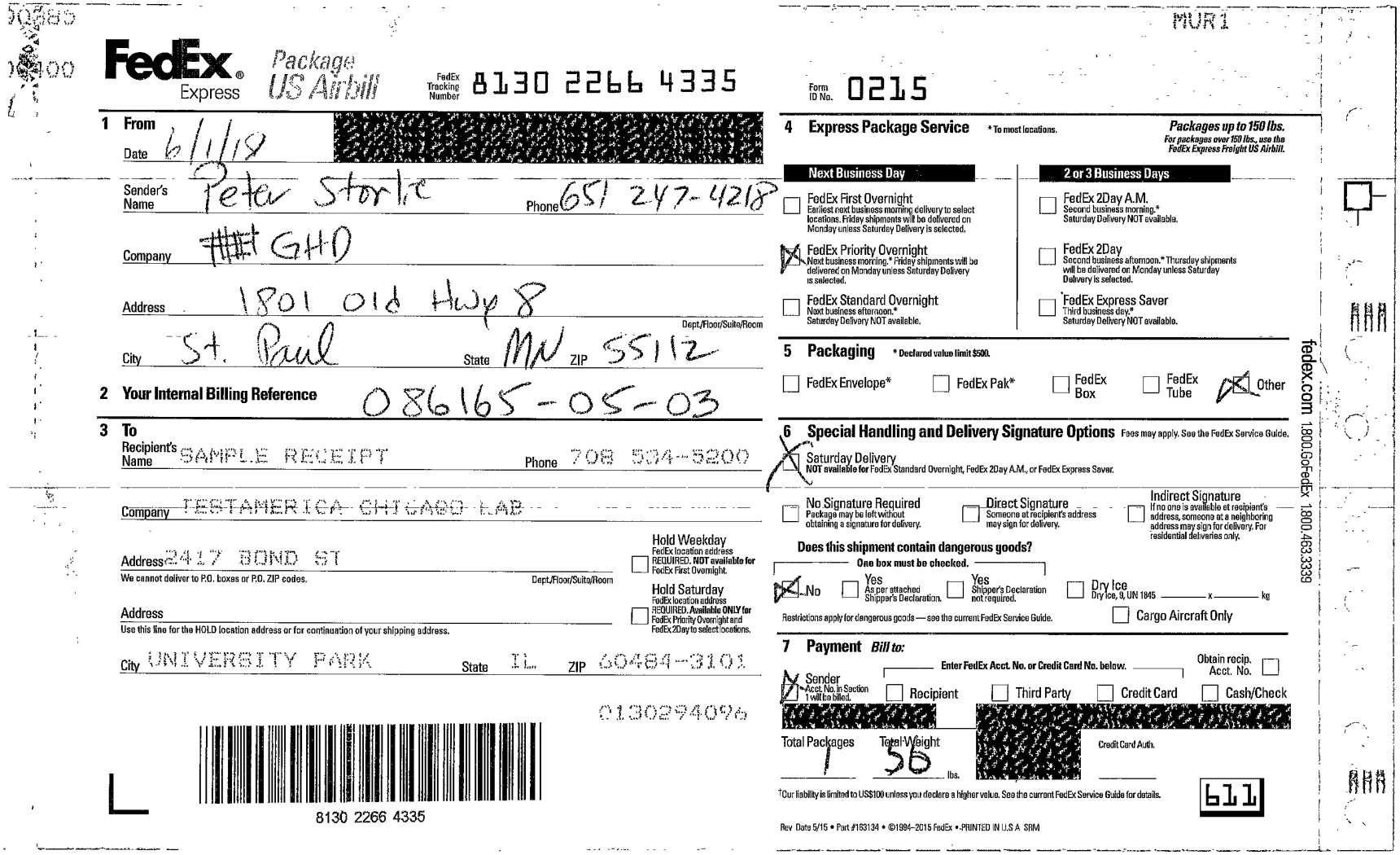
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

48 lbs.



FedEx Express — Package US Airbill

FedEx Tracking Number 8130 2266 4335

Form ID No. 0215

MUR 1

1 From

Date 6/1/18

Sender's Name Peter Storlie Phone 651 247-4218

Company GHD

Address 1801 Old Hwy 8 Dept./Floor/Suite/Room

City St. Paul State MN ZIP 55112

2 Your Internal Billing Reference 086165-05-03

3 To

Recipient's Name SAMPLE RECEIPT Phone 708 534-5200

Company TESTAMERICA CHICAGO LAB

Address 2417 BOND ST

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City UNIVERSITY PARK State IL ZIP 60484-3101

Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

01302940%

8130 2266 4335

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 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 56 lbs. Credit Card Auth.

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

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fedex.com 1.800.GoFedEx 1.800.463.3339

48 ct.

MUR 1

FedEx Express Package US Airbill

FedEx Tracking Number 8130 2266 4346

Form ID No. 0215

1 From

Date 6/1/18

Sender's Name Peter Storle Phone 651 247-4218

Company GHD

Address 1801 Old Hwy 8 Dept./Floor/Suite/Room

City St. Paul State MN ZIP 55112

2 Your Internal Billing Reference 086165-05-03

3 To

Recipient's Name SAMPLE RECEIPT Phone 708 534-5200

Company TESTAMERICA CHICAGO LAB

Address 2417 BOND ST

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City UNIVERSITY PARK State IL ZIP 60484-3101

Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

0130294096

8130 2266 4346

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 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages 1 Total Weight 54 lbs. Credit Card Auth.

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

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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

0-8-10-9

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-105256.1
Client Contact: Shipping/Receiving	Phone:	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		Job #: 500-146327-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 6/15/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ (MOD) Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:						RSK
W-180601-PS-20 (500-146327-1)	6/1/18	09:00 Central		Water			X	3	WI
W-180601-PS-21 (500-146327-2)	6/1/18	09:37 Central		Water			X	3	WI
W-180601-PS-22 (500-146327-3)	6/1/18	10:32 Central		Water			X	3	WI
W-180601-PS-23 (500-146327-4)	6/1/18	11:24 Central		Water			X	3	WI
W-180601-PS-24 (500-146327-5)	6/1/18	12:10 Central		Water			X	3	WI
W-180601-PS-19 (500-146327-7)	6/1/18	07:57 Central		Water			X	3	WI
W-180601-PS-25 (500-146327-8)	6/1/18	12:45 Central		Water			X	3	WI

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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Glenn Scott	6/4/18 1345	TA-CHI		6/5/18 9:30	TAC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

6/18/2018

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client TA Chicago Site Name _____ Cooler unpacked by: SC
Cooler Received on 6/5/18 Opened on 6/5/18
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 **+0.1** °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 0.9 °C
   IR GUN #36 (CF **+0.3**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
   ~~IR GUN # 627 (CF **-1.3**°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# **HC740840**
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: 500-146327-1

Login Number: 146327
List Number: 1
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago

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	(4.8)(4.2)(3.0)(2.4)c
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.	True	

Appendix C
Residential Well and Onsite Supply Well Water Sample Laboratory Report and Data Validation

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: 500-144041-1
Client Project/Site: Penta Wood 086165-05-05

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

Attn: Mr. Grant Anderson

Authorized for release by:
5/2/2018 12:13:45 PM

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

Table of Contents

Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Job ID: 500-144041-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-144041-1

Comments
No additional comments.

Receipt
The samples were received on 4/19/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperatures of the 3 coolers at receipt time were 2.3º C, 3.1º C and 3.6º C.
Lab sample 8 taken off hold 4/20/18.

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

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

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

Organic Prep
Method(s) 8151A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 180-243014.

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

Detection Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-01 — Lab Sample ID: 500-144041-1

No Detections.

Client Sample ID: R-180417-PS-02 — Lab Sample ID: 500-144041-2

No Detections.

Client Sample ID: R-180417-PS-03 — Lab Sample ID: 500-144041-3

No Detections.

Client Sample ID: R-180417-PS-04 — Lab Sample ID: 500-144041-4

No Detections.

Client Sample ID: R-180417-PS-05 — Lab Sample ID: 500-144041-5

No Detections.

Client Sample ID: R-180417-PS-06 — Lab Sample ID: 500-144041-6

No Detections.

Client Sample ID: R-180417-PS-07 — Lab Sample ID: 500-144041-7

No Detections.

Client Sample ID: R-180417-PS-08 — Lab Sample ID: 500-144041-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Toluene	1.5		0.50	0.15	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK-001 — Lab Sample ID: 500-144041-9

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
8151A	Herbicides (GC)	SW846	TAL PIT
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CHI
5030B	Purge and Trap	SW846	TAL CHI
8151A	Extraction (Herbicides)	SW846	TAL PIT

Protocol References:

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

Laboratory References:

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

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-144041-1	R-180417-PS-01	Water	04/17/18 10:05	04/19/18 09:15
500-144041-2	R-180417-PS-02	Water	04/17/18 10:10	04/19/18 09:15
500-144041-3	R-180417-PS-03	Water	04/17/18 10:50	04/19/18 09:15
500-144041-4	R-180417-PS-04	Water	04/17/18 10:51	04/19/18 09:15
500-144041-5	R-180417-PS-05	Water	04/17/18 11:15	04/19/18 09:15
500-144041-6	R-180417-PS-06	Water	04/17/18 11:45	04/19/18 09:15
500-144041-7	R-180417-PS-07	Water	04/17/18 13:30	04/19/18 09:15
500-144041-8	R-180417-PS-08	Water	04/17/18 13:40	04/19/18 09:15
500-144041-9	TRIP BLANK-001	Water	04/17/18 00:00	04/19/18 09:15

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-01
Date Collected: 04/17/18 10:05
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-1
Matrix: Water

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			04/28/18 13:19	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 13:19	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 13:19	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 126*		*04/28/18 13:19*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*04/28/18 13:19*	*1*
4-Bromofluorobenzene (Surr)	*108*		*72 - 124*		*04/28/18 13:19*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*04/28/18 13:19*	*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		04/20/18 07:28	04/21/18 01:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*92*		*36 - 120*	*04/20/18 07:28*	*04/21/18 01:27*	*1*
2-Fluorobiphenyl (Surr)	*85*		*34 - 110*	*04/20/18 07:28*	*04/21/18 01:27*	*1*
Terphenyl-d14 (Surr)	*112*		*40 - 145*	*04/20/18 07:28*	*04/21/18 01:27*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/21/18 08:10	04/24/18 19:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*45*		*20 - 100*	*04/21/18 08:10*	*04/24/18 19:20*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-02

Date Collected: 04/17/18 10:10
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-2

Matrix: Water

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			04/28/18 13:44	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 13:44	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 13:44	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 13:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 126*		*04/28/18 13:44*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*04/28/18 13:44*	*1*
4-Bromofluorobenzene (Surr)	*108*		*72 - 124*		*04/28/18 13:44*	*1*
Dibromofluoromethane	*89*		*75 - 120*		*04/28/18 13:44*	*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		04/20/18 07:28	04/21/18 01:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*94*		*36 - 120*	*04/20/18 07:28*	*04/21/18 01:56*	*1*
2-Fluorobiphenyl (Surr)	*84*		*34 - 110*	*04/20/18 07:28*	*04/21/18 01:56*	*1*
Terphenyl-d14 (Surr)	*113*		*40 - 145*	*04/20/18 07:28*	*04/21/18 01:56*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/21/18 08:10	04/24/18 20:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*58*		*20 - 100*	*04/21/18 08:10*	*04/24/18 20:38*	*1*

Client Sample ID: R-180417-PS-03

Date Collected: 04/17/18 10:50
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-3

Matrix: Water

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			04/28/18 14:09	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 14:09	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 14:09	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 126*		*04/28/18 14:09*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*04/28/18 14:09*	*1*
4-Bromofluorobenzene (Surr)	*110*		*72 - 124*		*04/28/18 14:09*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*04/28/18 14:09*	*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		04/20/18 07:28	04/21/18 02:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*92*		*36 - 120*	*04/20/18 07:28*	*04/21/18 02:25*	*1*
2-Fluorobiphenyl (Surr)	*79*		*34 - 110*	*04/20/18 07:28*	*04/21/18 02:25*	*1*
Terphenyl-d14 (Surr)	*111*		*40 - 145*	*04/20/18 07:28*	*04/21/18 02:25*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/21/18 08:10	04/24/18 21:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*50*		*20 - 100*	*04/21/18 08:10*	*04/24/18 21:04*	*1*

Client Sample ID: R-180417-PS-04

Date Collected: 04/17/18 10:51
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-4

Matrix: Water

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			04/28/18 14:35	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 14:35	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 14:35	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*04/28/18 14:35*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*04/28/18 14:35*	*1*
4-Bromofluorobenzene (Surr)	*108*		*72 - 124*		*04/28/18 14:35*	*1*
Dibromofluoromethane	*91*		*75 - 120*		*04/28/18 14:35*	*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		04/20/18 07:28	04/21/18 02:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*87*		*36 - 120*	*04/20/18 07:28*	*04/21/18 02:53*	*1*
2-Fluorobiphenyl (Surr)	*78*		*34 - 110*	*04/20/18 07:28*	*04/21/18 02:53*	*1*
Terphenyl-d14 (Surr)	*108*		*40 - 145*	*04/20/18 07:28*	*04/21/18 02:53*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/21/18 08:10	04/24/18 21:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*49*		*20 - 100*	*04/21/18 08:10*	*04/24/18 21:31*	*1*

Client Sample ID: R-180417-PS-05

Date Collected: 04/17/18 11:15
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-5

Matrix: Water

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			04/28/18 15:00	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 15:00	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 15:00	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 126*		*04/28/18 15:00*	*1*
Toluene-d8 (Surr)	*99*		*75 - 120*		*04/28/18 15:00*	*1*
4-Bromofluorobenzene (Surr)	*111*		*72 - 124*		*04/28/18 15:00*	*1*
Dibromofluoromethane	*89*		*75 - 120*		*04/28/18 15:00*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.28		0.92	0.28	ug/L		04/20/18 07:28	04/21/18 03:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*78*		*36 - 120*	*04/20/18 07:28*	*04/21/18 03:22*	*1*
2-Fluorobiphenyl (Surr)	*70*		*34 - 110*	*04/20/18 07:28*	*04/21/18 03:22*	*1*
Terphenyl-d14 (Surr)	*102*		*40 - 145*	*04/20/18 07:28*	*04/21/18 03:22*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/24/18 16:30	04/30/18 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*80*		*20 - 100*	*04/24/18 16:30*	*04/30/18 17:06*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-06

Date Collected: 04/17/18 11:45
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-6

Matrix: Water

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			04/28/18 15:25	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 15:25	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 15:25	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 126*		*04/28/18 15:25*	*1*
Toluene-d8 (Surr)	*94*		*75 - 120*		*04/28/18 15:25*	*1*
4-Bromofluorobenzene (Surr)	*108*		*72 - 124*		*04/28/18 15:25*	*1*
Dibromofluoromethane	*92*		*75 - 120*		*04/28/18 15:25*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.26		0.84	0.26	ug/L		04/20/18 07:28	04/21/18 03:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*92*		*36 - 120*	*04/20/18 07:28*	*04/21/18 03:50*	*1*
2-Fluorobiphenyl (Surr)	*82*		*34 - 110*	*04/20/18 07:28*	*04/21/18 03:50*	*1*
Terphenyl-d14 (Surr)	*111*		*40 - 145*	*04/20/18 07:28*	*04/21/18 03:50*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.025	0.011	ug/L		04/24/18 16:30	04/30/18 17:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*58*		*20 - 100*	*04/24/18 16:30*	*04/30/18 17:32*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-07
Date Collected: 04/17/18 13:30
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-7
Matrix: Water

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			04/28/18 15:51	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 15:51	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 15:51	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 126*		*04/28/18 15:51*	*1*
Toluene-d8 (Surr)	*103*		*75 - 120*		*04/28/18 15:51*	*1*
4-Bromofluorobenzene (Surr)	*110*		*72 - 124*		*04/28/18 15:51*	*1*
Dibromofluoromethane	*89*		*75 - 120*		*04/28/18 15:51*	*1*

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

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.26		0.83	0.26	ug/L		04/20/18 07:28	04/21/18 04:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*97*		*36 - 120*	*04/20/18 07:28*	*04/21/18 04:19*	*1*
2-Fluorobiphenyl (Surr)	*86*		*34 - 110*	*04/20/18 07:28*	*04/21/18 04:19*	*1*
Terphenyl-d14 (Surr)	*111*		*40 - 145*	*04/20/18 07:28*	*04/21/18 04:19*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/24/18 16:30	04/30/18 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*59*		*20 - 100*	*04/24/18 16:30*	*04/30/18 17:58*	*1*

Client Sample ID: R-180417-PS-08

Date Collected: 04/17/18 13:40
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-8

Matrix: Water

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			04/28/18 16:16	1
Toluene	**1.5**		0.50	0.15	ug/L			04/28/18 16:16	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 16:16	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 16:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*04/28/18 16:16*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*04/28/18 16:16*	*1*
4-Bromofluorobenzene (Surr)	*109*		*72 - 124*		*04/28/18 16:16*	*1*
Dibromofluoromethane	*93*		*75 - 120*		*04/28/18 16:16*	*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		04/22/18 08:36	04/23/18 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*104*		*36 - 120*	*04/22/18 08:36*	*04/23/18 18:24*	*1*
2-Fluorobiphenyl (Surr)	*95*		*34 - 110*	*04/22/18 08:36*	*04/23/18 18:24*	*1*
Terphenyl-d14 (Surr)	*114*		*40 - 145*	*04/22/18 08:36*	*04/23/18 18:24*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.011		0.024	0.011	ug/L		04/24/18 16:30	04/30/18 18:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*58*		*20 - 100*	*04/24/18 16:30*	*04/30/18 18:25*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: TRIP BLANK-001
Date Collected: 04/17/18 00:00
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-9
Matrix: Water

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			04/28/18 16:41	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 16:41	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 16:41	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 126*		*04/28/18 16:41*	*1*
Toluene-d8 (Surr)	*99*		*75 - 120*		*04/28/18 16:41*	*1*
4-Bromofluorobenzene (Surr)	*110*		*72 - 124*		*04/28/18 16:41*	*1*
Dibromofluoromethane	*91*		*75 - 120*		*04/28/18 16:41*	*1*

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 086165-05-05

TestAmerica Job ID: 500-144041-1

GC/MS VOA

Analysis Batch: 429833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1	R-180417-PS-01	Total/NA	Water	8260B	
500-144041-2	R-180417-PS-02	Total/NA	Water	8260B	
500-144041-3	R-180417-PS-03	Total/NA	Water	8260B	
500-144041-4	R-180417-PS-04	Total/NA	Water	8260B	
500-144041-5	R-180417-PS-05	Total/NA	Water	8260B	
500-144041-6	R-180417-PS-06	Total/NA	Water	8260B	
500-144041-7	R-180417-PS-07	Total/NA	Water	8260B	
500-144041-8	R-180417-PS-08	Total/NA	Water	8260B	
500-144041-9	TRIP BLANK-001	Total/NA	Water	8260B	
MB 500-429833/6	Method Blank	Total/NA	Water	8260B	
LCS 500-429833/4	Lab Control Sample	Total/NA	Water	8260B	
500-144041-1 MS	R-180417-PS-01	Total/NA	Water	8260B	
500-144041-1 MSD	R-180417-PS-01	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 428706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1	R-180417-PS-01	Total/NA	Water	3510C	
500-144041-2	R-180417-PS-02	Total/NA	Water	3510C	
500-144041-3	R-180417-PS-03	Total/NA	Water	3510C	
500-144041-4	R-180417-PS-04	Total/NA	Water	3510C	
500-144041-5	R-180417-PS-05	Total/NA	Water	3510C	
500-144041-6	R-180417-PS-06	Total/NA	Water	3510C	
500-144041-7	R-180417-PS-07	Total/NA	Water	3510C	
MB 500-428706/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-428706/2-A	Lab Control Sample	Total/NA	Water	3510C	
500-144041-1 MS	R-180417-PS-01	Total/NA	Water	3510C	
500-144041-1 MSD	R-180417-PS-01	Total/NA	Water	3510C	

Analysis Batch: 428837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1	R-180417-PS-01	Total/NA	Water	8270D	428706
500-144041-2	R-180417-PS-02	Total/NA	Water	8270D	428706
500-144041-3	R-180417-PS-03	Total/NA	Water	8270D	428706
500-144041-4	R-180417-PS-04	Total/NA	Water	8270D	428706
500-144041-5	R-180417-PS-05	Total/NA	Water	8270D	428706
500-144041-6	R-180417-PS-06	Total/NA	Water	8270D	428706
500-144041-7	R-180417-PS-07	Total/NA	Water	8270D	428706
MB 500-428706/1-A	Method Blank	Total/NA	Water	8270D	428706
LCS 500-428706/2-A	Lab Control Sample	Total/NA	Water	8270D	428706
500-144041-1 MS	R-180417-PS-01	Total/NA	Water	8270D	428706

Prep Batch: 428871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-8	R-180417-PS-08	Total/NA	Water	3510C	
MB 500-428871/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-428871/2-A	Lab Control Sample	Total/NA	Water	3510C	

GC/MS Semi VOA (Continued)

Analysis Batch: 429017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-8	R-180417-PS-08	Total/NA	Water	8270D	428871
MB 500-428871/1-A	Method Blank	Total/NA	Water	8270D	428871
LCS 500-428871/2-A	Lab Control Sample	Total/NA	Water	8270D	428871

Analysis Batch: 429554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1 MSD	R-180417-PS-01	Total/NA	Water	8270D	428706

GC Semi VOA

Prep Batch: 242760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1	R-180417-PS-01	Total/NA	Water	8151A	
500-144041-2	R-180417-PS-02	Total/NA	Water	8151A	
500-144041-3	R-180417-PS-03	Total/NA	Water	8151A	
500-144041-4	R-180417-PS-04	Total/NA	Water	8151A	
MB 180-242760/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-242760/2-A	Lab Control Sample	Total/NA	Water	8151A	
500-144041-1 MS	R-180417-PS-01	Total/NA	Water	8151A	
500-144041-1 MSD	R-180417-PS-01	Total/NA	Water	8151A	

Analysis Batch: 242996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-1	R-180417-PS-01	Total/NA	Water	8151A	242760
500-144041-2	R-180417-PS-02	Total/NA	Water	8151A	242760
500-144041-3	R-180417-PS-03	Total/NA	Water	8151A	242760
500-144041-4	R-180417-PS-04	Total/NA	Water	8151A	242760
MB 180-242760/1-A	Method Blank	Total/NA	Water	8151A	242760
LCS 180-242760/2-A	Lab Control Sample	Total/NA	Water	8151A	242760
500-144041-1 MS	R-180417-PS-01	Total/NA	Water	8151A	242760
500-144041-1 MSD	R-180417-PS-01	Total/NA	Water	8151A	242760

Prep Batch: 243014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-5	R-180417-PS-05	Total/NA	Water	8151A	
500-144041-6	R-180417-PS-06	Total/NA	Water	8151A	
500-144041-7	R-180417-PS-07	Total/NA	Water	8151A	
500-144041-8	R-180417-PS-08	Total/NA	Water	8151A	
MB 180-243014/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-243014/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 180-243014/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 243523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-144041-5	R-180417-PS-05	Total/NA	Water	8151A	243014
500-144041-6	R-180417-PS-06	Total/NA	Water	8151A	243014
500-144041-7	R-180417-PS-07	Total/NA	Water	8151A	243014
500-144041-8	R-180417-PS-08	Total/NA	Water	8151A	243014
MB 180-243014/1-A	Method Blank	Total/NA	Water	8151A	243014
LCS 180-243014/2-A	Lab Control Sample	Total/NA	Water	8151A	243014

GC Semi VOA (Continued)

Analysis Batch: 243523 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 180-243014/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	243014

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-144041-1	R-180417-PS-01	89	96	108	90
500-144041-1 MS	R-180417-PS-01	90	104	97	93
500-144041-1 MSD	R-180417-PS-01	90	103	101	92
500-144041-2	R-180417-PS-02	88	98	108	89
500-144041-3	R-180417-PS-03	90	97	110	90
500-144041-4	R-180417-PS-04	91	98	108	91
500-144041-5	R-180417-PS-05	89	99	111	89
500-144041-6	R-180417-PS-06	92	94	108	92
500-144041-7	R-180417-PS-07	89	103	110	89
500-144041-8	R-180417-PS-08	91	95	109	93
500-144041-9	TRIP BLANK-001	91	99	110	91
LCS 500-429833/4	Lab Control Sample	84	107	97	89
MB 500-429833/6	Method Blank	90	95	107	90

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-144041-1	R-180417-PS-01	92	85	112
500-144041-1 MS	R-180417-PS-01	94	87	109
500-144041-1 MSD	R-180417-PS-01	99	89	108
500-144041-2	R-180417-PS-02	94	84	113
500-144041-3	R-180417-PS-03	92	79	111
500-144041-4	R-180417-PS-04	87	78	108
500-144041-5	R-180417-PS-05	78	70	102
500-144041-6	R-180417-PS-06	92	82	111
500-144041-7	R-180417-PS-07	97	86	111
500-144041-8	R-180417-PS-08	104	95	114
LCS 500-428706/2-A	Lab Control Sample	86	77	105
LCS 500-428871/2-A	Lab Control Sample	104	93	117
MB 500-428706/1-A	Method Blank	90	77	112
MB 500-428871/1-A	Method Blank	112	101	125

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TPHL = Terphenyl-d14 (Surr)

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Method: 8151A - Herbicides (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	DCPAA1 (20-100)	DCPAA2 (20-100)								
500-144041-1	R-180417-PS-01	41	45								
500-144041-1 MS	R-180417-PS-01	47	49								
500-144041-1 MSD	R-180417-PS-01	48	50								
500-144041-2	R-180417-PS-02	54	58								
500-144041-3	R-180417-PS-03	46	50								
500-144041-4	R-180417-PS-04	45	49								
500-144041-5	R-180417-PS-05	74	80								
500-144041-6	R-180417-PS-06	49	58								
500-144041-7	R-180417-PS-07	51	59								
500-144041-8	R-180417-PS-08	49	58								
LCS 180-242760/2-A	Lab Control Sample	36	39								
LCS 180-243014/2-A	Lab Control Sample	51	52								
LCSD 180-243014/3-A	Lab Control Sample Dup	34	39								
MB 180-242760/1-A	Method Blank	80	85								
MB 180-243014/1-A	Method Blank	21	23								

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid

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

Lab Sample ID: MB 500-429833/6
Matrix: Water
Analysis Batch: 429833

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			04/28/18 12:54	1
Toluene	<0.15		0.50	0.15	ug/L			04/28/18 12:54	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			04/28/18 12:54	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			04/28/18 12:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 126*		*04/28/18 12:54*	*1*
Toluene-d8 (Surr)	*95*		*75 - 120*		*04/28/18 12:54*	*1*
4-Bromofluorobenzene (Surr)	*107*		*72 - 124*		*04/28/18 12:54*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*04/28/18 12:54*	*1*

Lab Sample ID: LCS 500-429833/4
Matrix: Water
Analysis Batch: 429833

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	44.1		ug/L		88	70 - 120		
Toluene			50.0	50.7		ug/L		101	70 - 125		
Ethylbenzene			50.0	45.4		ug/L		91	70 - 120		
Xylenes, Total			100	90.7		ug/L		91	70 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 126*
Toluene-d8 (Surr)	*107*		*75 - 120*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*
Dibromofluoromethane	*89*		*75 - 120*

Lab Sample ID: 500-144041-1 MS
Matrix: Water
Analysis Batch: 429833

Client Sample ID: R-180417-PS-01
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	46.3		ug/L		93	70 - 120		
Toluene	<0.15		50.0	51.1		ug/L		102	70 - 125		
Ethylbenzene	<0.18		50.0	45.2		ug/L		90	70 - 120		
Xylenes, Total	<0.22		100	90.9		ug/L		91	70 - 125		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 126*
Toluene-d8 (Surr)	*104*		*75 - 120*
4-Bromofluorobenzene (Surr)	*97*		*72 - 124*
Dibromofluoromethane	*93*		*75 - 120*

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

Lab Sample ID: 500-144041-1 MSD
Matrix: Water
Analysis Batch: 429833

Client Sample ID: R-180417-PS-01
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	44.6		ug/L		89	70 - 120	4	20
Toluene	<0.15		50.0	48.9		ug/L		98	70 - 125	4	20
Ethylbenzene	<0.18		50.0	43.8		ug/L		88	70 - 120	3	20
Xylenes, Total	<0.22		100	88.0		ug/L		88	70 - 125	3	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 126*
Toluene-d8 (Surr)	*103*		*75 - 120*
4-Bromofluorobenzene (Surr)	*101*		*72 - 124*
Dibromofluoromethane	*92*		*75 - 120*

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

Lab Sample ID: MB 500-428706/1-A
Matrix: Water
Analysis Batch: 428837

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428706

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		04/20/18 07:28	04/20/18 22:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*90*		*36 - 120*	*04/20/18 07:28*	*04/20/18 22:06*	*1*
2-Fluorobiphenyl (Surr)	*77*		*34 - 110*	*04/20/18 07:28*	*04/20/18 22:06*	*1*
Terphenyl-d14 (Surr)	*112*		*40 - 145*	*04/20/18 07:28*	*04/20/18 22:06*	*1*

Lab Sample ID: LCS 500-428706/2-A
Matrix: Water
Analysis Batch: 428837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428706

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene			32.0	17.4		ug/L		54	36 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*86*		*36 - 120*
2-Fluorobiphenyl (Surr)	*77*		*34 - 110*
Terphenyl-d14 (Surr)	*105*		*40 - 145*

Lab Sample ID: 500-144041-1 MS
Matrix: Water
Analysis Batch: 428837

Client Sample ID: R-180417-PS-01
Prep Type: Total/NA
Prep Batch: 428706

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	<0.23		33.5	15.5		ug/L		46	36 - 110

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Nitrobenzene-d5 (Surr)	*94*		*36 - 120*

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

Lab Sample ID: 500-144041-1 MS
Matrix: Water
Analysis Batch: 428837

Client Sample ID: R-180417-PS-01
Prep Type: Total/NA
Prep Batch: 428706

Surrogate	MS %Recovery	MS Qualifier	Limits
2-Fluorobiphenyl (Surr)	87		34 - 110
Terphenyl-d14 (Surr)	109		40 - 145

Lab Sample ID: 500-144041-1 MSD
Matrix: Water
Analysis Batch: 429554

Client Sample ID: R-180417-PS-01
Prep Type: Total/NA
Prep Batch: 428706

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	<0.23		30.3	16.8		ug/L		55	36 - 110	8	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Nitrobenzene-d5 (Surr)	99		36 - 120
2-Fluorobiphenyl (Surr)	89		34 - 110
Terphenyl-d14 (Surr)	108		40 - 145

Lab Sample ID: MB 500-428871/1-A
Matrix: Water
Analysis Batch: 429017

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428871

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		04/22/18 08:36	04/23/18 17:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	112		36 - 120	04/22/18 08:36	04/23/18 17:26	1
2-Fluorobiphenyl (Surr)	101		34 - 110	04/22/18 08:36	04/23/18 17:26	1
Terphenyl-d14 (Surr)	125		40 - 145	04/22/18 08:36	04/23/18 17:26	1

Lab Sample ID: LCS 500-428871/2-A
Matrix: Water
Analysis Batch: 429017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428871

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	23.3		ug/L		73	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	104		36 - 120
2-Fluorobiphenyl (Surr)	93		34 - 110
Terphenyl-d14 (Surr)	117		40 - 145

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-242760/1-A
Matrix: Water
Analysis Batch: 242996

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 242760

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.012		0.025	0.012	ug/L		04/21/18 08:10	04/24/18 18:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	85		20 - 100	04/21/18 08:10	04/24/18 18:28	1

Lab Sample ID: LCS 180-242760/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 242996 — **Prep Batch: 242760**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	1.00	0.736		ug/L		74	34 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4-Dichlorophenylacetic acid	39		20 - 100

Lab Sample ID: 500-144041-1 MS — **Client Sample ID: R-180417-PS-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 242996 — **Prep Batch: 242760**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	<0.011		0.952	0.697		ug/L		73	34 - 150

Surrogate	MS %Recovery	MS Qualifier	Limits
2,4-Dichlorophenylacetic acid	49		20 - 100

Lab Sample ID: 500-144041-1 MSD — **Client Sample ID: R-180417-PS-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 242996 — **Prep Batch: 242760**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	<0.011		0.952	0.716		ug/L		75	34 - 150	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2,4-Dichlorophenylacetic acid	50		20 - 100

Lab Sample ID: MB 180-243014/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 243523 — **Prep Batch: 243014**

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.012		0.025	0.012	ug/L		04/24/18 16:30	04/30/18 15:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	23		20 - 100	04/24/18 16:30	04/30/18 15:47	1

Lab Sample ID: LCS 180-243014/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 243523 — **Prep Batch: 243014**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	1.00	0.933		ug/L		93	34 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4-Dichlorophenylacetic acid	52		20 - 100

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

Lab Sample ID: LCSD 180-243014/3-A
Matrix: Water
Analysis Batch: 243523

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 243014

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol			1.00	0.766		ug/L		77	34 - 150	20	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*39*		*20 - 100*

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-01
Date Collected: 04/17/18 10:05
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 13:19	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 01:27	WDS	TAL CHI
Total/NA	Prep	8151A			242760	04/21/18 08:10	CBY	TAL PIT
Total/NA	Analysis	8151A		1	242996	04/24/18 19:20	JBF	TAL PIT

Client Sample ID: R-180417-PS-02
Date Collected: 04/17/18 10:10
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 13:44	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 01:56	WDS	TAL CHI
Total/NA	Prep	8151A			242760	04/21/18 08:10	CBY	TAL PIT
Total/NA	Analysis	8151A		1	242996	04/24/18 20:38	JBF	TAL PIT

Client Sample ID: R-180417-PS-03
Date Collected: 04/17/18 10:50
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 14:09	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 02:25	WDS	TAL CHI
Total/NA	Prep	8151A			242760	04/21/18 08:10	CBY	TAL PIT
Total/NA	Analysis	8151A		1	242996	04/24/18 21:04	JBF	TAL PIT

Client Sample ID: R-180417-PS-04
Date Collected: 04/17/18 10:51
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 14:35	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 02:53	WDS	TAL CHI
Total/NA	Prep	8151A			242760	04/21/18 08:10	CBY	TAL PIT
Total/NA	Analysis	8151A		1	242996	04/24/18 21:31	JBF	TAL PIT

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: R-180417-PS-05

Lab Sample ID: 500-144041-5

Date Collected: 04/17/18 11:15
Matrix: Water
Date Received: 04/19/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 15:00	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 03:22	WDS	TAL CHI
Total/NA	Prep	8151A			243014	04/24/18 16:30	CBY	TAL PIT
Total/NA	Analysis	8151A		1	243523	04/30/18 17:06	JBF	TAL PIT

Client Sample ID: R-180417-PS-06

Lab Sample ID: 500-144041-6

Date Collected: 04/17/18 11:45
Matrix: Water
Date Received: 04/19/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 15:25	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 03:50	WDS	TAL CHI
Total/NA	Prep	8151A			243014	04/24/18 16:30	CBY	TAL PIT
Total/NA	Analysis	8151A		1	243523	04/30/18 17:32	JBF	TAL PIT

Client Sample ID: R-180417-PS-07

Lab Sample ID: 500-144041-7

Date Collected: 04/17/18 13:30
Matrix: Water
Date Received: 04/19/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 15:51	PMF	TAL CHI
Total/NA	Prep	3510C			428706	04/20/18 07:28	NKG	TAL CHI
Total/NA	Analysis	8270D		1	428837	04/21/18 04:19	WDS	TAL CHI
Total/NA	Prep	8151A			243014	04/24/18 16:30	CBY	TAL PIT
Total/NA	Analysis	8151A		1	243523	04/30/18 17:58	JBF	TAL PIT

Client Sample ID: R-180417-PS-08

Lab Sample ID: 500-144041-8

Date Collected: 04/17/18 13:40
Matrix: Water
Date Received: 04/19/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 16:16	PMF	TAL CHI
Total/NA	Prep	3510C			428871	04/22/18 08:36	JP1	TAL CHI
Total/NA	Analysis	8270D		1	429017	04/23/18 18:24	WDS	TAL CHI
Total/NA	Prep	8151A			243014	04/24/18 16:30	CBY	TAL PIT
Total/NA	Analysis	8151A		1	243523	04/30/18 18:25	JBF	TAL PIT

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-05

TestAmerica Job ID: 500-144041-1

Client Sample ID: TRIP BLANK-001

Date Collected: 04/17/18 00:00
Date Received: 04/19/18 09:15

Lab Sample ID: 500-144041-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	429833	04/28/18 16:41	PMF	TAL CHI

Laboratory References:

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

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: GHD Services Inc. TestAmerica Job ID: 500-144041-1
Project/Site: Penta Wood 086165-05-05

Laboratory: TestAmerica Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	999580010	08-31-18

Laboratory: TestAmerica Pittsburgh

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	998027800	08-31-18

CHAIN OF CUSTODY RECORD

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 Northwest, Suite 114
St. Paul, Minnesota 55112 United States
Phone: (651) 639-0913 Fax: (651) 639-0923

COC NO.: SP-02606
PAGE 1 OF 1
(See Reverse Side for Instructions)

500-144041

Project No/ Phase/Task Code: 086165-05-02	**Laboratory Name:** TA-Chi	**Lab Location:** CHI	**SSOW ID:**
Project Name: Penta Wood	**Contact:**	**Lab Quote No:**	**Cooler No:**
Project Location: Siren, WI			**Carrier:** FedEx
Chemistry Contact: Grant Anderson 500-144041 COC			**Airbill No:**
Sampler(s): Matt Barnes / P. Storlie			**Date Shipped:**

Item	SAMPLE IDENTIFICATION (Containers for each sample may be combined on one line)	DATE (mm/dd/yy)	TIME (hh:mm)	Matrix Code (see back of COC)	Grab (G) or Comp (C)	CONTAINER QUANTITY & PRESERVATION: Unpreserved	HCl	HNO_3	H_2SO_4	NaOH	Methanol/Water (Soil VOC)	EnCores 3x5-g, 1x25-g	Other:	Total Containers/Sample	ANALYSIS REQUESTED (See Back of COC for Definitions): BTEX	PCP-8151	NAP-8270	MS/MSD Request	COMMENTS/ SPECIAL INSTRUCTIONS:
1	R-180417-PS-01	4/17/18	10:05	WG	G	4	3							7	X	X	X	X	
2	02		10:10			4	3							7	X	X	X		
3	03		10:50			4	3							7	X	X	X		Call Grant
4	04		10:51			4	3							7	X	X	X		Anderson
5	05		11:15			4	3							7	X	X	X		w/ Questions
6	06		11:45			4	3							7	X	X	X		
7	07		13:30			4	3							7	X	X	X		
8	08	↓	13:40	↓	↓	4	3							7	X	X	X		On Hold
9	TRIP BLANK-001	—	—				2							2	X	X	X		
10																			
11																			
12																			
13																			
14																			
15																			

TAT Required in business days (use separate COCs for different TATs):
☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 1 Week ☒ 2 Week ☐ Other:

Total Number of Containers: 58

All Samples in Cooler must be on COC

Notes/ Special Requirements: 1,6 → 3,1, 3,6, 0,8 → 23

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
1.	GHD	4/18/18	16:00	1.	TA-CHI	4/19/18	0915
2.				2.			
3.				3.			

THE CHAIN OF CUSTODY IS A LEGAL DOCUMENT – ALL FIELDS MUST BE COMPLETED ACCURATELY

Distribution: WHITE – Fully Executed Copy (CRA) YELLOW – Receiving Laboratory Copy PINK – Shipper GOLDENROD – Sampling Crew CRA Form: COC-10A (20110804)

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: 18APR18
ACTWGT: 50.00 LB
CAD: 9292115/INET3980
DIMS: 26x14x14 IN

BILL SENDER

TO SAMPLE/RECIEVING
TEST AMERICA - CHICAGO
2417 BOND STREET

UNIVERSITY PARK IL 60484
(708) 534-5200
INV:
PO

REF: 086165-05-03 M.BARNES/P.STORLI
DEPT

500-144041 Waybill

FedEx Express

THU - 19 APR 10:30A
PRIORITY OVERNIGHT

3 of 3
MPS# 7720 3050 2523
0263
Mstr# 7720 3050 1961

0201

60484
ORD
IL-US

NA JOTA

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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ST. PAUL FRONT DESK
GHD SERVICES INC.
1801 OLD HIGHWAY 8 NW
SUITE 114
SAINT PAUL, MN 55112
UNITED STATES US

SHIP DATE: 18APR18
ACTWGT: 50.00 LB
CAD: 9292115/INET3980
DIMS: 26x14x14 IN

BILL SENDER

TO **SAMPLE/RECIEVING**
TEST AMERICA - CHICAGO
2417 BOND STREET

UNIVERSITY PARK IL 60484
(708) 534-5200 REF: 096165-05-03 M BARNES/P.STORLI
INV:
PO: DEPT:

552J/9132/DCA5

FedEx Express

THU - 19 APR 10:30A
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2 of 3
MPS# 0263 **7720 3050 2225**
Mstr# 7720 3050 1961
0201

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GHD SERVICES INC
1801 OLD HIGHWAY 8 NW
SUITE 114
SAINT PAUL, MN 55112
UNITED STATES US

SHIP DATE: 18APR18
ACTWGT: 50.00 LB
CAD: 9292115/INET3980
DIMS: 26x14x14 IN

BILL SENDER

TO SAMPLE/RECIEVING
TEST AMERICA - CHICAGO
2417 BOND STREET

UNIVERSITY PARK IL 60484
(708) 534-5200 REF: 086165-05-03 M.BARNES/P.STORLI
INV:
PO: DEPT

552J1/9132/DCA5

FedEx Express

THU - 19 APR 10:30A
PRIORITY OVERNIGHT

1 of 3

TRK# 0201 7720 3050 1961

MASTER

NA JOTA

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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: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-103355.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: richard.wright@testamericainc.com	State of Origin: Wisconsin	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Wisconsin		Job #: 500-144041-1
Address: 301 Alpha Drive, RIDC Park,	Due Date Requested: 5/1/2018			
City: Pittsburgh	TAT Requested (days):			
State, Zip: PA, 15238				
Phone: 412-963-7058(Tel) 412-963-2468(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, 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)

500-144041 Chain of Custody

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8151A/8151A_AP (MOD) Pentachlorophenol	Total	Special Instructions/Note:
			Preservation Code:						
R-180417-PS-01 (500-144041-1)	4/17/18	10:05 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-01 (500-144041-1MS)	4/17/18	10:05 Central	MS	Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-01 (500-144041-1MSD)	4/17/18	10:05 Central	MSD	Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-02 (500-144041-2)	4/17/18	10:10 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-03 (500-144041-3)	4/17/18	10:50 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-04 (500-144041-4)	4/17/18	10:51 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-05 (500-144041-5)	4/17/18	11:15 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-06 (500-144041-6)	4/17/18	11:45 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution
R-180417-PS-07 (500-144041-7)	4/17/18	13:30 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution

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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		04/19/18 1630	TA		4-20-18	TAL-K
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 900	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

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: Wright, Richard C	Carrier Tracking No(s):	COC No: 500-103355.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: richard.wright@testamericainc.com	State of Origin: Wisconsin	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Wisconsin		Job #: 500-144041-1
Address: 301 Alpha Drive, RIDC Park,	Due Date Requested: 5/1/2018			
City: Pittsburgh	TAT Requested (days):			
State, Zip: PA, 15238				
Phone: 412-963-7058(Tel) 412-963-2468(Fax)	PO #:			
Email:	WO #:			
Project Name: Penta Wood 086165-04	Project #: 50013796			
Site:	SSOW#:			

Analysis Requested

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, 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)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Wwater, Ssolid, Oowipe/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8151A/8151A_AP (MOD) Pentachlorophenol	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
R-180417-PS-08 (500-144041-8)	4/17/18	13:40 Central		Water			X	2	WI Use 200 ul spike; and x4 dilution

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.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 04/19/18 1630	Company: TA	Received by: D Watson	Date/Time: 4-20-18 900	Company: TAPIT		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

5/2/2018

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-144041-1

Login Number: 144041
List Number: 1
Creator: Scott, Sherri L

List Source: TestAmerica Chicago

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	3.1,3.6,2.3
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").	False	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-144041-1

Login Number: 144041
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 04/20/18 01:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
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	
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	
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	

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-144041-1

Login Number: 144041
List Number: 3
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 04/21/18 04:00 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
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	
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: 500-146482-1
Client Project/Site: Penta Wood 086165-05-03

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

Attn: Mr. Grant Anderson

Authorized for release by:
6/20/2018 1:45:18 PM

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

Table of Contents

Case Narrative

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

Job ID: 500-146482-1

Laboratory: TestAmerica Chicago

Narrative

Job Narrative
500-146482-1

Comments
No additional comments.

Receipt
The samples were received on 6/6/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3º C.

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

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

GC Semi VOA
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 086165-05-03

TestAmerica Job ID: 500-146482-1

Client Sample ID: RW-180605-PS-10 — Lab Sample ID: 500-146482-1

No Detections.

Client Sample ID: RW-180605-PS-11 — Lab Sample ID: 500-146482-2

No Detections.

Client Sample ID: Trip Blank 006 — Lab Sample ID: 500-146482-3

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CHI
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CHI
8151A	Herbicides (GC)	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:

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

Laboratory References:

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 086165-05-03

TestAmerica Job ID: 500-146482-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-146482-1	RW-180605-PS-10	Water	06/05/18 11:15	06/06/18 09:15
500-146482-2	RW-180605-PS-11	Water	06/05/18 12:25	06/06/18 09:15
500-146482-3	Trip Blank 006	Water	06/05/18 13:00	06/06/18 09:15

Client Sample Results

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

Client Sample ID: RW-180605-PS-10

Date Collected: 06/05/18 11:15
Date Received: 06/06/18 09:15

Lab Sample ID: 500-146482-1

Matrix: Water

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			06/15/18 02:40	1
Toluene	<0.15		0.50	0.15	ug/L			06/15/18 02:40	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/15/18 02:40	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/15/18 02:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 126*		*06/15/18 02:40*	*1*
Toluene-d8 (Surr)	*98*		*75 - 120*		*06/15/18 02:40*	*1*
4-Bromofluorobenzene (Surr)	*104*		*72 - 124*		*06/15/18 02:40*	*1*
Dibromofluoromethane	*87*		*75 - 120*		*06/15/18 02:40*	*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		06/07/18 07:25	06/11/18 18:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*70*		*36 - 120*	*06/07/18 07:25*	*06/11/18 18:23*	*1*
2-Fluorobiphenyl (Surr)	*75*		*34 - 110*	*06/07/18 07:25*	*06/11/18 18:23*	*1*
Terphenyl-d14 (Surr)	*95*		*40 - 145*	*06/07/18 07:25*	*06/11/18 18:23*	*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		06/07/18 11:55	06/13/18 03:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*70*		*25 - 130*	*06/07/18 11:55*	*06/13/18 03:37*	*1*

Client Sample ID: RW-180605-PS-11

Date Collected: 06/05/18 12:25
Date Received: 06/06/18 09:15

Lab Sample ID: 500-146482-2

Matrix: Water

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			06/15/18 03:07	1
Toluene	<0.15		0.50	0.15	ug/L			06/15/18 03:07	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/15/18 03:07	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/15/18 03:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/15/18 03:07*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/15/18 03:07*	*1*
4-Bromofluorobenzene (Surr)	*102*		*72 - 124*		*06/15/18 03:07*	*1*
Dibromofluoromethane	*88*		*75 - 120*		*06/15/18 03:07*	*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		06/07/18 07:25	06/11/18 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*90*		*36 - 120*	*06/07/18 07:25*	*06/11/18 18:50*	*1*
2-Fluorobiphenyl (Surr)	*74*		*34 - 110*	*06/07/18 07:25*	*06/11/18 18:50*	*1*
Terphenyl-d14 (Surr)	*89*		*40 - 145*	*06/07/18 07:25*	*06/11/18 18:50*	*1*

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.086		0.095	0.086	ug/L		06/07/18 11:55	06/13/18 04:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*66*		*25 - 130*	*06/07/18 11:55*	*06/13/18 04:01*	*1*

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

Client Sample ID: Trip Blank 006
Date Collected: 06/05/18 13:00
Date Received: 06/06/18 09:15

Lab Sample ID: 500-146482-3
Matrix: Water

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			06/15/18 03:34	1
Toluene	<0.15		0.50	0.15	ug/L			06/15/18 03:34	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/15/18 03:34	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/15/18 03:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 126*		*06/15/18 03:34*	*1*
Toluene-d8 (Surr)	*96*		*75 - 120*		*06/15/18 03:34*	*1*
4-Bromofluorobenzene (Surr)	*102*		*72 - 124*		*06/15/18 03:34*	*1*
Dibromofluoromethane	*89*		*75 - 120*		*06/15/18 03:34*	*1*

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 086165-05-03

TestAmerica Job ID: 500-146482-1

GC/MS VOA

Analysis Batch: 436945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146482-1	RW-180605-PS-10	Total/NA	Water	8260B	
500-146482-2	RW-180605-PS-11	Total/NA	Water	8260B	
500-146482-3	Trip Blank 006	Total/NA	Water	8260B	
MB 500-436945/7	Method Blank	Total/NA	Water	8260B	
LCS 500-436945/5	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 435769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146482-1	RW-180605-PS-10	Total/NA	Water	3510C	
500-146482-2	RW-180605-PS-11	Total/NA	Water	3510C	
MB 500-435769/1-A	Method Blank	Total/NA	Water	3510C	
LCS 500-435769/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 436325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146482-1	RW-180605-PS-10	Total/NA	Water	8270D	435769
500-146482-2	RW-180605-PS-11	Total/NA	Water	8270D	435769

Analysis Batch: 436393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-435769/1-A	Method Blank	Total/NA	Water	8270D	435769
LCS 500-435769/2-A	Lab Control Sample	Total/NA	Water	8270D	435769

GC Semi VOA

Prep Batch: 435861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146482-1	RW-180605-PS-10	Total/NA	Water	8151A	
500-146482-2	RW-180605-PS-11	Total/NA	Water	8151A	
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 436495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-146482-1	RW-180605-PS-10	Total/NA	Water	8151A	435861
500-146482-2	RW-180605-PS-11	Total/NA	Water	8151A	435861
MB 500-435861/1-A	Method Blank	Total/NA	Water	8151A	435861
LCS 500-435861/2-A	Lab Control Sample	Total/NA	Water	8151A	435861
LCSD 500-435861/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	435861

Surrogate Summary

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(75-126)	(75-120)	(72-124)	(75-120)
500-146482-1	RW-180605-PS-10	84	98	104	87
500-146482-2	RW-180605-PS-11	85	97	102	88
500-146482-3	Trip Blank 006	87	96	102	89
LCS 500-436945/5	Lab Control Sample	83	98	99	90
MB 500-436945/7	Method Blank	85	97	106	90

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)		
		NBZ	FBP	TPHL
Lab Sample ID	Client Sample ID	(36-120)	(34-110)	(40-145)
500-146482-1	RW-180605-PS-10	70	75	95
500-146482-2	RW-180605-PS-11	90	74	89
LCS 500-435769/2-A	Lab Control Sample	102	103	118
MB 500-435769/1-A	Method Blank	96	93	117

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA2
Lab Sample ID	Client Sample ID	(25-130)
500-146482-1	RW-180605-PS-10	70
500-146482-2	RW-180605-PS-11	66
LCS 500-435861/2-A	Lab Control Sample	65
LCSD 500-435861/3-A	Lab Control Sample Dup	67
MB 500-435861/1-A	Method Blank	70

Surrogate Legend

DCPAA = DCAA

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

Lab Sample ID: MB 500-436945/7
Matrix: Water
Analysis Batch: 436945

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			06/14/18 20:43	1
Toluene	<0.15		0.50	0.15	ug/L			06/14/18 20:43	1
Ethylbenzene	<0.18		0.50	0.18	ug/L			06/14/18 20:43	1
Xylenes, Total	<0.22		1.0	0.22	ug/L			06/14/18 20:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 126*		*06/14/18 20:43*	*1*
Toluene-d8 (Surr)	*97*		*75 - 120*		*06/14/18 20:43*	*1*
4-Bromofluorobenzene (Surr)	*106*		*72 - 124*		*06/14/18 20:43*	*1*
Dibromofluoromethane	*90*		*75 - 120*		*06/14/18 20:43*	*1*

Lab Sample ID: LCS 500-436945/5
Matrix: Water
Analysis Batch: 436945

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	47.9		ug/L		96	70 - 120
Toluene	50.0	51.6		ug/L		103	70 - 125
Ethylbenzene	50.0	51.1		ug/L		102	70 - 120
Xylenes, Total	100	98.7		ug/L		99	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 126*
Toluene-d8 (Surr)	*98*		*75 - 120*
4-Bromofluorobenzene (Surr)	*99*		*72 - 124*
Dibromofluoromethane	*90*		*75 - 120*

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

Lab Sample ID: MB 500-435769/1-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435769

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.25		0.80	0.25	ug/L		06/07/18 07:25	06/12/18 00:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*96*		*36 - 120*	*06/07/18 07:25*	*06/12/18 00:30*	*1*
2-Fluorobiphenyl (Surr)	*93*		*34 - 110*	*06/07/18 07:25*	*06/12/18 00:30*	*1*
Terphenyl-d14 (Surr)	*117*		*40 - 145*	*06/07/18 07:25*	*06/12/18 00:30*	*1*

Lab Sample ID: LCS 500-435769/2-A
Matrix: Water
Analysis Batch: 436393

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	32.0	23.2		ug/L		73	36 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	102		36 - 120
2-Fluorobiphenyl (Surr)	103		34 - 110
Terphenyl-d14 (Surr)	118		40 - 145

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-435861/1-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435861

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.090		0.10	0.090	ug/L		06/07/18 11:55	06/12/18 20:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	70		25 - 130	06/07/18 11:55	06/12/18 20:42	1

Lab Sample ID: LCS 500-435861/2-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435861

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Pentachlorophenol			2.53	1.57		ug/L		62	40 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	65		25 - 130

Lab Sample ID: LCSD 500-435861/3-A
Matrix: Water
Analysis Batch: 436495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 435861

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol			2.53	1.67		ug/L		66	40 - 122	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCAA	67		25 - 130

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Penta Wood 086165-05-03

TestAmerica Job ID: 500-146482-1

Client Sample ID: RW-180605-PS-10

Lab Sample ID: 500-146482-1

Date Collected: 06/05/18 11:15

Matrix: Water

Date Received: 06/06/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436945	06/15/18 02:40	JJH	TAL CHI
Total/NA	Prep	3510C			435769	06/07/18 07:25	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 18:23	GES	TAL CHI
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 03:37	JBJ	TAL CHI

Client Sample ID: RW-180605-PS-11

Lab Sample ID: 500-146482-2

Date Collected: 06/05/18 12:25

Matrix: Water

Date Received: 06/06/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436945	06/15/18 03:07	JJH	TAL CHI
Total/NA	Prep	3510C			435769	06/07/18 07:25	DX	TAL CHI
Total/NA	Analysis	8270D		1	436325	06/11/18 18:50	GES	TAL CHI
Total/NA	Prep	8151A			435861	06/07/18 11:55	DX	TAL CHI
Total/NA	Analysis	8151A		1	436495	06/13/18 04:01	JBJ	TAL CHI

Client Sample ID: Trip Blank 006

Lab Sample ID: 500-146482-3

Date Collected: 06/05/18 13:00

Matrix: Water

Date Received: 06/06/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	436945	06/15/18 03:34	JJH	TAL CHI

Laboratory References:

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 086165-05-03

TestAmerica Job ID: 500-146482-1

Laboratory: TestAmerica Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	999580010	08-31-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

Chain of Custody Record

Lab Job #: 500 - 146482

Chain of Custody Number:

Page _____ of _____

Temperature °C of Cooler: 1.8 → 3.3

500-146482 COC

(optional) Report To	(optional) Bill To
Contact: GRANT Anderson	Contact:
Company:	Company:
Address:	Address:
Address:	Address:
Phone:	Phone:
Fax:	Fax:
E-Mail:	PO#/Reference#

Client: GHD	Client Project #: 086165-05-03
Project Name: Penta Wood	
Project Location/State: Siren WI	Lab Project #
Sampler: P. Storlie	Lab PM

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative	Parameter: PCP-8151	Parameter: Naphthalene 8270	Parameter: BTEX	Comments
1		RW-180605-PS-10	6-5-18	1115	7	W	HCL	X	X	X	PW-10
2		RW-180605-B-11	↓	1225	7	W		X	X	X	RW-01
3		TRIP BLANK 006	↓	1300	2	W				X	

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days Standard ___ Other
Requested Due Date _____

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
	GHD	6-5-18	1600		TA	06/06/18	0915
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier ☐ Shipped ✓ Hand Delivered ☐

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments

Lab Comments:

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 500-146482-1

Login Number: 146482
List Number: 1
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago

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	3.3c
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	

Memorandum

June 21, 2018

To:	Tim Ree, GHD	Ref. No.:	086165-05-05
From:	Grant Anderson/sb/7	Tel:	651-639-0913
CC:	Tim Braun, GHD		

Subject: **Analytical Results and Reduced Validation**
Residential Water Sampling Events
Penta Wood Products Superfund Site
Siren, Wisconsin
April and June 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 April and June 2018. Samples were submitted to TestAmerica Laboratories, Inc. (TA) located in University Park, Illinois. Benzene, toluene, ethylbenzene, xylenes (total) (BTEX) and naphthalene analyses were performed at TA's University Park laboratory. The April pentachlorophenol analyses were performed at TA's Pittsburgh, Pennsylvania laboratory. The June pentachlorophenol analyses were performed at TA's University Park laboratory. 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 forms, 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 documents 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 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 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 two trip blank samples, 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, two trip blank samples were 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. Non-detect results were presented as non-detect at the MDL 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 Events
Penta Wood Site
Siren, Wisconsin
April and June 2018

					Analysis/Parameters			
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**BTEX**	**Naphthalene**	**Pentachlorophenol**	**Comments**
R-180417-PS-01	RW05	water	04/17/2018	10:05	X	X	X	MS/MSD
R-180417-PS-02	RW05	water	04/17/2018	10:10	X	X	X	duplicate (PS-01)
R-180417-PS-03	RW02	water	04/17/2018	10:50	X	X	X	
R-180417-PS-04	RW02	water	04/17/2018	10:51	X	X	X	field blank
R-180417-PS-05	RW04	water	04/17/2018	11:15	X	X	X	
R-180417-PS-06	RW03	water	04/17/2018	11:45	X	X	X	
R-180417-PS-07	RW06	water	04/17/2018	13:30	X	X	X	
R-180417-PS-08	RW06 Shop	water	04/17/2018	13:40	X	X	X	
TRIP BLANK-001	Lab	water	04/17/2018	00:00	X	-	-	trip blank
RW-180605-PS-10	DW01	water	06/05/2018	11:15	X	X	X	
RW-180605-PS-11	RW01	water	06/05/2018	12:25	X	X	X	
Trip Blank 006	Lab	water	06/05/2018	13:00	X	-	-	trip blank

Notes:

MS/MSD - Matrix spike/matrix spike duplicate
BTEX - Benzene, toluene, ethylbenzene, and xylenes (total)

Table 2

Validated Analytical Results Summary
Residential Water Sampling Events
Penta Wood Site
Siren, Wisconsin
April and June 2018

Location ID:		DW01	RW01	RW02	RW03	RW04
Sample Name:		RW-180605-PS-10	RW-180605-PS-11	R-180417-PS-03	R-180417-PS-06	R-180417-PS-05
Sample Date:		06/05/2018	06/05/2018	04/17/2018	04/17/2018	04/17/2018
Parameters	**Unit**					
Volatile Organic Compounds						
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	0.77 U	0.75 U	0.79 U	0.84 U	0.92 U
Herbicides						
Pentachlorophenol	µg/L	0.095 U	0.095 U	0.024 U	0.025 U	0.024 U

Table 2

Validated Analytical Results Summary
Residential Water Sampling Events
Penta Wood Site
Siren, Wisconsin
April and June 2018

Location ID:		RW05	RW05	RW06	RW06 Shop
Sample Name:		R-180417-PS-01	R-180417-PS-02	R-180417-PS-07	R-180417-PS-08
Sample Date:		04/17/2018	04/17/2018 duplicate	04/17/2018	04/17/2018
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	µg/L	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
Toluene	µg/L	0.50 U	0.50 U	0.50 U	1.5
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Semivolatile Organic Compounds					
Naphthalene	µg/L	0.75 U	0.75 U	0.83 U	0.79 U
Herbicides					
Pentachlorophenol	µg/L	0.024 U	0.024 U	0.024 U	0.024 U

Note:

U - Not detected at the associated reporting limit

Table 3

Analytical Methods and Holding Time Criteria
Residential Water Sampling Events
Penta Wood Site
Siren, Wisconsin
April and June 2018

			Holding Time	
			Collection to Extraction	Collection or Extraction to Analysis
Parameter	**Method**	**Matrix**	**(Days)**	**(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

Appendix D
Site Inspection Forms

Well Inspection Form
Penta Wood Products Superfund Site
Siren, Wisconsin

086165

Monitoring Wells

	Protective Casing	Lock & Cover	J-Plug	Well Casing	Ground Surface	Notes
MW1	✓	✓	✓	✓	✓	
MW2	↓	↓	↓	↓	↓	
MW3	↓	↓	↓	↓	↓	
MW4	↓	↓	↓	↓	↓	
MW5	↓	↓	↓	↓	↓	
MW6	↓	↓	↓	↓	↓	
MW6S	↓	↓	↓	↓	↓	
MW7	↓	↓	↓	↓	↓	
MW8	↓	↓	↓	↓	↓	
MW9	↓	↓	↓	↓	↓	
MW10	↓	✓	↓	↓	↓	
MW10S	↓	✓	↓	↓	↓	LOCK STUCK, REPLACED
MW11	↓	✓	↓	↓	↓	
MW12	↓	↓	↓	↓	↓	
MW13	↓	↓	↓	↓	↓	
MW14	↓	↓	↓	↓	↓	
MW15	↓	↓	↓	↓	↓	
MW16	↓	↓	↓	↓	↓	
MW17	↓	↓	↓	↓	↓	
MW18	↓	↓	↓	↓	↓	
MW19	↓	↓	↓	↓	↓	
MW20	↓	↓	↓	↓	↓	
MW21	↓	↓	↓	↓	↓	
MW22	↓	↓	↓	↓	↓	
MW23	↓	↓	↓	↓	↓	
MW24	↓	↓	↓	↓	↓	
MW25	↓	↓	↓	↓	↓	
MW26	↓	↓	↓	↓	↓	
MW27	↓	↓	↓	↓	↓	
MW28	↓	↓	↓	↓	↓	
MW29	↓	↓	↓	↓	↓	
MW30	↓	↓	↓	↓	↓	
MW31	↓	↓	↓	↓	↓	

Extraction Wells

	Vault & Cover	Well Casings	Ground Surface	Notes
EW2	✓	✓	✓	
EW3	↓	↓	↓	
EW4	↓	↓	↓	
EW5	↓	↓	↓	
EW6	↓	↓	↓	
EW7	↓	↓	↓	
EW10	↓	↓	↓	
EW12	↓	↓	↓	
EW13	↓	↓	↓	
EW14	↓	↓	↓	

Gas Probes

	Protective Casing	Lock & Cover	Ground Surface	Inner Casing/Tubing	Notes
SG-04DIS	✓	✓	✓	✓	
SG-05DIS	↓	↓	↓	↓	
SG-06DIS	↓	↓	↓	↓	
SG-07DIS	↓	↓	↓	↓	
SG-22	↓	↓	↓	↓	
SG-23	↓	↓	↓	↓	
SG-24	↓	↓	↓	↓	
SG-25	↓	↓	↓	↓	
SG-26	↓	↓	↓	↓	

Inspected By: TIM BRAUN

Date: 5/24 & 5/25/2018

Additonal 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 satifactory 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 occuring		
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: _____ (Tim Brann)

Date: 5/24 & 5/25/2018

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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