State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Notice: Use this form to request **a written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This from should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do not use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located.

   See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf"

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name	First	MI	Organization/ Business Name		
Wahl	Scott		Tyco Fire Products LP		
Mailing Address			City	State	ZIP Code
2700 Industrial Parkway South			Marinette	WI	54143
Phone # (include area code)	Fax # (include area code)		Email		

The requester listed above: (select all that apply)

- [x] Is currently the owner
- [ ] Is considering selling the Property
- [ ] Is renting or leasing the Property
- [ ] Is considering acquiring the Property
- [ ] Is a lender with a mortgagee interest in the Property
- [ ] Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

☐ Select if same as requester

Contact Last Name	First	MI	Organization/ Business Name		
Bedard	Mike		Arcadis		
Mailing Address			City	State	ZIP Code
126 N Jefferson Street, Suite 400			Milwaukee	WI	53202
Phone # (include area code)	Fax # (include area code)		Email		
(267) 685-1821			Michael.Bedard@arcadis.com		

Environmental Consultant (if applicable)

Contact Last Name	First	MI	Organization/ Business Name		
Bedard	Mike		Arcadis		
Mailing Address			City	State	ZIP Code
126 N Jefferson Street, Suite 400			Milwaukee	WI	53202
Phone # (include area code)	Fax # (include area code)		Email		
(267) 685-1821			Michael.Bedard@arcadis.com		

Section 2. Property Information

Property Name			FID No. (if known)		
Tyco Fire Technology Center - PFCs			438005590		
BRRTS No. (if known)			Parcel Identification Number		
0238580694					
Street Address			City	State	ZIP Code
2700 Industrial Parkway South			Marinette	WI	54143
County	Municipality where the Property is located		Property is composed of:		Property Size Acres
Marinette	◉ City ◯ Town ◯ Village of Marinette		◯ Single tax parcel ◯ Multiple tax parcels		380

1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

◉ No ○ Yes

Date requested by: _____

Reason:

_____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

◉ No. **Include the fee that is required for your request in Section 3, 4 or 5.**

○ Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:
Section 3. Technical Assistance or Post-Closure Modifications;
Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [**Numbers in brackets are for WI DNR Use]**

☐ No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of $350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.

☐ Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of $700.**

☐ Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of $1050.**

☐ Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of $1050.**

☐ Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of $1050.**

☒ Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of $1050.**

☐ Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of $350**

☐ Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of $425.**

☐ Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of $425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

☐ Schedule a Technical Assistance Meeting - **Include a fee of $700.**

☐ Hazardous Waste Determination - **Include a fee of $700.**

☐ Other Technical Assistance - **Include a fee of $700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

☐ Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of $1050, and:**

☐ Include a fee of $300 for sites with residual soil contamination; and

☐ Include a fee of $350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this fo

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

☐ Phase I Environmental Site Assessment Report - Date: _____

☐ Phase II Environmental Site Assessment Report - Date: _____

☐ Legal Description of Property (required for all liability requests and specialized agreements)

☐ Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

☐ Groundwater ☐ Soil ☐ Sediment ☐ Other medium - Describe: _____

Date of Collection: _____

☐ A copy of the closure letter and submittal materials

☐ Draft tax cancellation agreement

☐ Draft agreement for assignment of tax foreclosure judgment

☒ Other report(s) or information - Describe: Soil Interim Remedial Action Design Report; WDNR Fee Check #: 313301

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

◯ Yes - Date (if known): _____

◯ No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at: dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

☐ I am the person submitting this request (requester)

☒ I prepared this request for: Scott Wahl
Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Signature

3/8/2021
Date Signed

Project Environmental Specialist
Title

(312) 575-3732
Telephone Number (include area code)

Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a DNR regional brownfields specialist with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf.

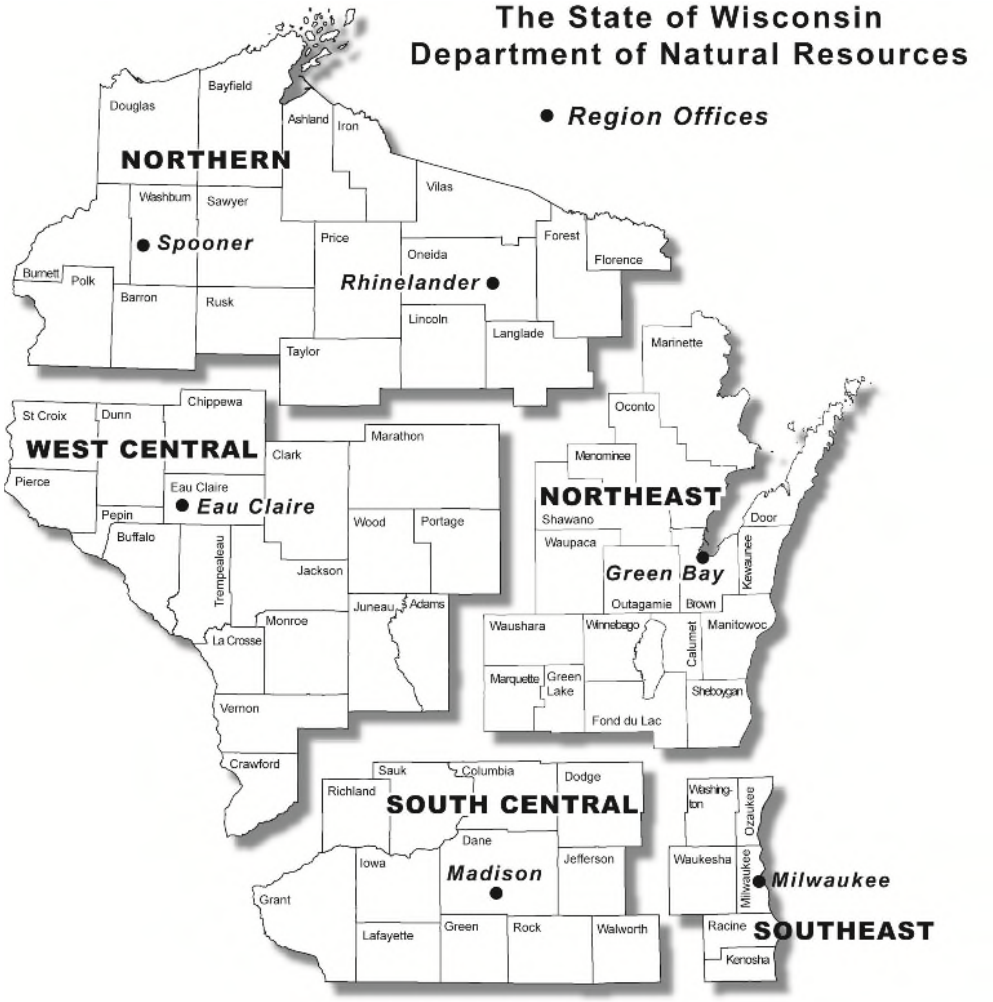
DNR NORTHERN REGION
Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer	Comments		
Fee Enclosed? ◯ Yes ◯ No	Fee Amount $	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

Tyco Fire Products LP

Soil Interim Remedial Action Design Report

Tyco Fire Technology Center
Marinette, Wisconsin
BRRTS No. 02-38-580694

March 2021

Soil Interim Remedial Action Design Report

Tyco Fire Technology Center – Marinette, Wisconsin
BRRTS No. 02-38-580694

March 15, 2021

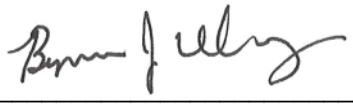
Prepared By:
Arcadis U.S., Inc.
126 North Jefferson Street, Suite 400
Milwaukee
Wisconsin 53202
Phone: 414 276 7742
Fax: 414 276 7603

Prepared For:
Tyco Fire Products LP
2700 Industrial Parkway South
Marinette
Wisconsin 54143

Our Ref:
30075729

Krista Hankins Mastrocola
Senior Civil Specialist

Paul Bracken
Principal Environmental Specialist



Benjamin J. Verburg, PE
Principal Engineer

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Acronyms and Abbreviations

AFFF	aqueous film-forming foam
Aggregated PFAS Mass	Localized areas that represent a significant proportion of the PFOA and PFOS mass in soils
Arcadis	Arcadis U.S., Inc.
ARTF	Advanced Research and Training Facility
bgs	below ground surface
CSM	conceptual site model
DC	direct contact
ECP	erosion control plan
FTC	Fire Technology Center
GETS	groundwater extraction and treatment system
GP	general permit
Interim SIR	Interim Site Investigation Report
IRA	Interim Remedial Action
µg/kg	micrograms per kilogram
OTA	Outdoor Testing/Training Area
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
R&D	research and development
RADR	Remedial Action Design Report
RCL	residual contaminant level
Site	Fire Technology Center, 2700 Industrial Parkway South, Marinette, Wisconsin
Tyco	Tyco Fire Products LP
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WDNR	Wisconsin Department of Natural Resources
Wis. Adm. Code	Wisconsin Administrative Code
WPDES	Wisconsin Pollutant Discharge Elimination System

Executive Summary

This Soil Interim Remedial Action Design Report describes and presents the proposed interim remedial action to address on-site soils impacted with per- and poly-fluoroalkyl substances (PFAS) related to the Fire Technology Center located at 2700 Industrial Parkway South in Marinette, Wisconsin (the Site). Submittal of this design report is in accordance with the requirements contained in Chapters NR 708 (Immediate and Interim Actions) and 724 (Remedial and Interim Action Design, Implementation, Operation, Maintenance, and Monitoring Requirements) of the Wisconsin Administrative Code.

The Site is a fire suppressant training, testing, research, and development facility built in the early 1960s. The Site encompasses approximately 380 acres with approximately 9 acres used as the Outdoor Testing/Training Area (OTA). The Site lies approximately 1 mile west of the Green Bay shoreline and 1.6 miles south of the Menominee River, which is the border with Michigan. Aqueous film-forming foam (AFFF) historically has been used at the OTA as part of research and development, quality testing, and firefighting training activities. PFAS is not manufactured at the Site and PFAS-containing foam has not been tested outdoors at the OTA since 2017.

The primary objectives of the proposed soil interim remedial action are to voluntarily and proactively excavate soils with aggregated PFAS mass and dispose of these soils along with soil, concrete, and debris excavated during construction of the Advanced Research and Training Facility and currently stockpiled on the Site. Based on analytical testing of unsaturated soils within the area, 99.2 percent of soil samples were identified at concentrations below the Non-Industrial Direct Contact Residual Contaminant Level (DC RCL) of 1,260 micrograms per kilogram (µg/kg) for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Only one sample location, SS-101 with PFOA at 1,300 µg/kg, had a concentration slightly above the Non-Industrial DC RCL. Interpretation of the Site investigation data indicates that relatively higher concentrations of PFOA and PFOS are aggregated in limited areas at the Site, referred to herein as “aggregated PFAS mass areas.” The remedial excavation of these aggregated soils will result in a reduction of the residual unsaturated PFAS mass at the Site. All soil, concrete, and debris will be disposed of at the Waste Management facility in Arlington, Oregon.

The remedial excavation of the aggregated areas and the material loadout of the Site soils, concrete, and debris will be performed in conjunction with the Groundwater Extraction and Treatment System (GETS) interim remedy that focuses on groundwater impacted with PFAS. As detailed in the GETS interim remedial design report, the primary objectives of the GETS interim remedy are to reduce PFAS groundwater plume upwelling into Ditch B, treat PFAS mass existing in the recovered groundwater, and significantly reduce PFAS mass flux throughout the groundwater plume (Arcadis 2021).

1 Introduction

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) has prepared this Soil Interim Remedial Action Design Report (RADR) to present the proposed remedial design to address select soils impacted with per- and poly-fluoroalkyl substances (PFAS) at the Fire Technology Center (FTC) located at 2700 Industrial Parkway South in Marinette, Wisconsin (the Site; **Figure 1**).

The objective of this proposed Interim Remedial Action (IRA) is to voluntarily and proactively remove unsaturated soils in localized areas that contain relatively higher concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) than other on-site soils. Based on analytical testing of unsaturated soils within the area, 99.2 percent of soil samples were identified at concentrations below the Non-Industrial Direct Contact Residual Contaminant Level (DC RCL) of 1,260 micrograms per kilogram (µg/kg) for PFOA and PFOS. Only one sample location, SS-101 with PFOA at 1,300 µg/kg, had a concentration slightly above the Non-Industrial DC RCL. Interpretation of the data indicates that relatively higher concentrations of PFOA and PFOS are aggregated in limited areas at the Site, referred to herein as “aggregated PFAS mass areas.” The remedial excavation of these aggregated soils will result in a reduction of the residual unsaturated PFAS mass at the Site. Soil associated with this proposed IRA along with soil, concrete, and debris from construction of the Advanced Research and Training Facility (ARTF) will be disposed of off-site.

Submittal of this RADR is in accordance with the requirements contained in Chapters NR 708 (Immediate and Interim Actions) and 724 (Remedial and Interim Action Design, Implementation, Operation, Maintenance, and Monitoring Requirements) of the Wisconsin Administrative Code (Wis. Adm. Code).

The remainder of this report is organized in the following sections:

- **Section 2. Site History and Background –** This section presents a brief description of the Site, regional and site-specific geology and hydrogeology, and previous investigation activities.
- **Section 3. Pre-Construction Activities** – This section describes the pre-construction activities performed to collect additional information prior to implementation of the proposed IRA.
- **Section 4. Proposed Interim Remedial Action –** This section presents a brief basis of design and discussion of the public health and environmental laws and standards applicable to the proposed IRA.
- **Section 5. Proposed Interim Remedial Action Activities –** This section describes the planned field activities associated with the proposed IRA.
- **Section 6. Permitting Requirements –** This section outlines the permitting requirements to complete the proposed IRA.
- **Section 7. Monitoring Plan –** This section provides details on the monitoring requirements for the proposed IRA. Soils will be removed and disposed of off-site as part of this proposed IRA; therefore, no long-term monitoring nor operation and maintenance is required in accordance with § NR 724.09 (9), Wis. Adm. Code.
- **Section 8. Implementation Schedule –** This section outlines the proposed project schedule.
- **Section 9. References –** This section presents the references utilized during the preparation of this RADR.
- **Section 10. Certification** – This section provides certification in accordance with § NR 712.09, Wis. Adm. Code.

2 Site History and Background

This section provides a brief description of the Site in accordance with § NR 724.09 (2), Wis. Adm. Code, regional and site-specific geology and hydrogeology, and previous investigation activities.

2.1 Site Description and Setting

The FTC is a fire suppressant training, testing, and research and development (R&D) facility, occupying approximately 380 acres in southern Marinette. The Site lies approximately 1 mile west of the Green Bay shoreline and 1.6 miles south of the Menominee River. The developed area of the Site is contained within an approximately 60-acre central campus comprising 10 buildings and a 9-acre plot referred to as the Outdoor Testing/Training Area (OTA). **Figure 2** shows the Site layout. The OTA includes a Firefighting School area (where firefighting scenarios are simulated) and the R&D area (where product testing occurs). The training area is an open gravel lot containing concrete and clay pads and steel pans, some with props where a contained fire is started and extinguished to test the performance of the fire suppression products. The Site buildings support training, R&D, quality testing activities, and warehousing. The area of the Site outside the central campus comprises more than 300 acres of undeveloped forest and wetlands.

2.1.1 Area Land Use

The Site is bordered by industrial and commercial properties to the west, and industrial, commercial, and Marinette School District property to the north. Agricultural land, a cemetery, a community recreational center, and undeveloped land owned by the University of Wisconsin Board of Regents and private owners border the Site to the east and south.

2.1.2 Site History

The FTC was constructed on previously undeveloped land in the early 1960s for testing, demonstrations, and training of a range of fire suppressants. Historical aerial photographs indicate that the Site was undeveloped and sparsely forested in 1954, but that the land had been cleared in the location of the OTA in 1958.

Aqueous film-forming foam (AFFF) historically has been used at the OTA as part of R&D, quality testing, and firefighting training activities. A detailed history of the use of AFFF at the OTA was provided in Tyco's response letter to the Additional Information Request from the Wisconsin Department of Natural Resources (WDNR), submitted March 12, 2018. While the presence of multiple PFAS compounds has been included in historical and recent investigation analyses, the primary focus of the recent Site investigation was on PFOA and PFOS, which have been present in various formulations of these foams. PFAS is not manufactured at the Site and PFAS-containing foam has not been used at the OTA since 2017.

2.2 Geology and Hydrogeology

The surficial geology in the Marinette area was mapped by the United States Geological Survey as glacial lake deposits, consisting mainly of clay, silt, and sand, overlying Ordovician dolomite bedrock (Oakes and Hamilton 1973). Based on previous investigations and publicly available construction reports for wells near the Site, there is a generally consistent sequence in shallow soils as follows:

- A sand unit, consisting of brown fine to medium sand interbedded with silt or silty-sand, extending from the ground surface to between 30 and 90 feet below ground surface (bgs).
- A confining unit, consisting of lake-deposited silt and clay overlying glacial till (typically composed of silt, sand, and gravel), that is approximately 12 feet thick at the Site and 8 feet thick south of the Site; however, it thickens eastward.

Data and publicly available construction reports for wells located at the Site and off-site show that the bedrock surface slopes southeastward toward Green Bay. Bedrock may be as shallow as 35 feet bgs beneath portions of the Site but deepens to approximately 100 feet bgs along the Green Bay shoreline.

The regional groundwater flow direction in the Marinette area is generally east toward Green Bay (Oakes and Hamilton 1973). The water table depth in the area is typically shallow; at the Site, the depth to water is normally less than 5 feet bgs. Historical water levels measured in the Site monitoring well network indicate flow toward the east or northeast.

2.3 FTC Soil Investigations

Investigations completed by Tyco have evaluated multiple environmental media for the potential presence of PFAS. The Interim Site Investigation Report (Interim SIR; Arcadis 2020a) describes the completed scope of investigations and analytical results for each medium directly evaluated to date. The Conceptual Site Model (CSM; Arcadis 2020b) summarizes the current understanding of relationships among sources, nature and extent, fate and transport, and exposures and receptors at the Site.

A Supplemental Site Investigation was conducted in fall 2020 to further evaluate PFAS in soils at the Site, and the data were presented to the WDNR in a Sample Results Notification letter (Arcadis 2020c). This section provides an overview of the previously submitted documents regarding the nature and extent of aggregated PFAS mass in soil.

2.3.1 Interim Site Investigation Report

An Interim SIR was submitted to the WDNR in May 2020 and identified the nature and extent of PFAS in environmental media. The Interim SIR presented the results of historical PFAS soil sampling conducted prior to July 2019. As reported in the Interim SIR, delineation of soil with PFAS concentrations exceeding the WDNR Non-Industrial and Industrial DC RCLs is complete (Arcadis 2020a).

All PFAS detections were less than the Industrial DC RCL (16,400 µg/kg) for PFOA or PFOS. Only one sample slightly exceeded the Non-Industrial DC RCL (1,260 µg/kg) for PFOA (SS-101) with a concentration of 1,300 µg/kg. Soil sample locations and data results are presented on **Figure 3** and **Figure 4,** respectively. The analytical data are provided in **Table 1.**

2.3.2 Conceptual Site Model

The CSM further evaluates the data presented in the Interim SIR and develops a Site-Specific RCL for PFOS and PFOA in soil (Arcadis 2020b). Soil samples were bracketed into groups based on PFOS and PFOA detections. The groupings were not based on any regulatory target but were by order of magnitude of concentration. Combined PFOS and PFOA concentrations greater than 100 µg/kg (i.e., the highest detections) are concentrated in the following locations, which are associated with historical AFFF outdoor releases (**Figure 4**):

- Within the fire suppressant training and testing area of OTA (e.g., sample locations SS-105 and SS-135)
- Along the paved foam testing pad (near sample locations FTC-71, FTC-72, and FTC-77)
- Along depressions that convey surface water runoff to the southwest of the OTA (near sample locations SS-133 and FTC-82) and the northeast of the OTA (SS-122 and SS-139).

Less than 150 feet outside of the OTA in multiple directions (i.e., SS-123, SS-124, SS-127, and SS-138 to the north/northwest, SS-119 and SS-120 to the north/northeast, SS-130 to the west, SS-115 and SS-116 to the east, and SS-134 to the southeast), concentrations are orders of magnitude lower than the aggregated PFAS mass areas and closer to background concentrations of 2 µg/kg (Arcadis 2020b).

2.3.3 2020 Site Investigation of PFAS in Soils

As discussed above, soil samples were collected from the OTA during multiple site investigations. These data were collected in phases, building on findings, to determine the magnitude and extents of PFAS concentrations in soils. As indicated previously, all PFAS detections were less than the Industrial DC RCL for PFOA or PFOS. One sample slightly exceeded the Non-Industrial DC RCL for PFOA (SS-101). These data were supplemented with 42 additional soil borings (46 soil samples including duplicates) in fall 2020. Collectively, these soil samples delineate the magnitude and extent of PFAS in soils associated with the OTA.

Soil samples were collected from the ground surface to the groundwater table and analyzed for PFAS by Modified Method 537, 36-analyte list (**Figure 3**). None of the 46 samples collected in fall 2020 exceeded the Non-Industrial DC RCLs for PFOA or PFOS. Results of the sampling identified soil with PFOA and PFOS concentrations ranging from 1.3 µg/kg (SS-156) to 74.6 µg/kg (SS-169), with the majority of the concentrations less than 5 µg/kg. Results from the fall 2020 event are presented on **Figure 4** and in **Table 2.**

3 Pre-Construction Activities

This section describes the pre-construction activities that were implemented to complete the proposed IRA in accordance with § NR 724.09 (5), Wis. Adm. Code.

3.1 Advanced Research and Testing Facility – Soil, Concrete, and Debris Stockpiles

Characterization sampling was performed between July and November 2020 on soil and debris managed from construction of the ARTF. Soil and debris generated during construction was transported and placed within a temporary material staging area in stockpiles based on visual inspections and photoionization detector (PID) readings (**Figure 2**). Soil and debris were visually inspected and screened with a PID in 30-cubic-yard increments. Soil with PID detections above 10 parts per million and unexpected debris were stockpiled separately for characterization purposes.

Stockpiled soil, concrete, and debris were staged on and covered with 10-mil polyethylene liners. The liners are overlapped at the edge of each stockpile by at least 1 foot and contain a 12-inch berm of clean sand around the perimeter. These stockpiles are routinely inspected to ensure the polyethylene cover remains in place over the soil piles.

3.2 Characterization Sampling Methodology and Results

Soil and debris within the material staging area were placed in 100- to 300-cubic-yard stockpiles for characterization in accordance with § NR 718.12 (1) (e), Wis. Adm. Code. Characterization samples were collected at a sample frequency of one sample per 100 cubic yards (for the first 600 cubic yards) and one sample for each additional 300 cubic yards of material per source area. Characterization samples were analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260 and PFAS by Modified Method 537, 36-analyte list.

Results were below the Industrial DC RCL for all stockpiles; however, three stockpiles (approximately 300 cubic yards) were identified to have concentrations of PFAS exceeding the Non-Industrial RCL. Analytical results for VOCs and PFAS are presented in **Table 3** and **Table 4**, respectively.

4 Proposed Interim Remedial Action

This section summarizes the proposed IRA and applicable public health and environmental laws and standards pursuant to § NR 708.11(3)(b) and NR 724.09 (4) and (7), Wis. Adm. Code.

4.1 Site Management of PFAS Mass

The proposed IRA involves the voluntary and proactive removal of aggregated PFAS mass from the ground surface to the water table. The proposed IRA will result in:

- Removal and off-site disposal of approximately 1,250 cubic yards of soil where concentrations are less than the Non-Industrial DC RCL, except for one soil sample with a concentration slightly exceeding the Non-Industrial DC RCL (SS-101; PFOA at 1,300 µg/kg) (refer to **Section 2.3**).
- Off-site disposal of approximately 5,260 cubic yards of soil and 154 tons of concrete and debris from construction of the ARTF. PFAS concentrations in these soils are less than the Industrial DC RCL. Approximately 300 cubic yards contain concentrations exceeding the Non-Industrial DC RCL (refer to **Section 3.2**).

The remedial excavation of the aggregated areas will be performed in conjunction with the Groundwater Extraction and Treatment System (GETS) interim remedy that will focus on groundwater impacted with PFAS. The removal of this soil will result in a reduction of the residual unsaturated PFAS mass at the Site, and subsequently reduce the mass flux from soils to groundwater. As described in the RADR for the GETS submitted to the WDNR on February 26, 2021 (Arcadis 2021), the groundwater beneath the OTA will ultimately be captured by the GETS after completion of this IRA.

4.2 Non-Industrial and Industrial Direct Contact Residual Contaminant Levels

The WDNR maintains a web-based spreadsheet of soil RCLs that were calculated using USEPA's regional screening level web calculator, and following the procedures in § NR 720.12, Wis. Adm. Code, for determining soil DC RCLs protective of human health. Following this procedure, the Non-Industrial DC RCL is 1,260 µg/kg for both PFOA and PFOS. The Industrial DC RCL is 16,400 µg/kg for both PFOA and PFOS.

The Site is zoned as industrial land use and will be for the foreseeable future; therefore, the Industrial DC RCL is an applicable regulatory criterion for consideration when evaluating remedial objectives. Of the 116 soil samples collected to date, there have been no exceedances of the Industrial DC RCL. Furthermore, exceedances of the Non-Industrial DC RCL of 1,260 µg/kg were identified in only one soil sample, SS-101 with a reported PFOA concentration of 1,300 µg/kg (refer to **Section 2.3.1**), and three soil stockpiles (refer to **Section 3.2**).

Although the Site is zoned for industrial use, the Non-Industrial DC RCL is a more protective criterion for evaluating direct contact with the soil. Furthermore, the remaining residual PFAS-impacted soils outside the proposed excavation areas that may leach to groundwater will be addressed through the proposed GETS that will be installed downgradient of the OTA.

5 Proposed Interim Remedial Action Activities

This section describes the components of the proposed IRA in accordance with § NR 724.09 (3) and (4), Wis. Adm. Code. The sequence of construction for the major components of the proposed IRA are as follows:

- Mobilization and site preparation
- Excavation of soils in the localized areas (between the land surface and the water table) where PFAS has aggregated
- Backfilling of excavated areas with clean fill material
- Off-site disposal of excavated soils, concrete, and debris from the PFAS-aggregated mass areas and from construction of the ARTF
- Site restoration and demobilization.

Design Drawings with specifications for execution of this proposed IRA are included in **Appendix A.**

5.1 Mobilization and Site Preparation

Mobilization and site preparation activities consist of the mobilization of equipment, materials, and supplies; utility investigation; management of traffic; surveying; and implementation of an erosion control plan (ECP).

Prior to commencement of field activities, a remediation contractor will be procured to perform the work. The remediation contractor will be required to mobilize the appropriate personnel, equipment, materials, and supplies to complete the work.

5.1.1 Equipment, Materials, and Supplies

Heavy equipment will be mobilized on an as-needed basis. The type and quantity of major heavy equipment to be utilized will be determined by the remediation contractor throughout the work.

Upon arrival on the Site, all machinery and equipment will be inspected and equipped with spill response kits and fire extinguishers. Equipment will be inspected daily when in use and decontaminated, as required. Prior to demobilization, all equipment will be decontaminated, inspected, and refueled. Decontamination solids and liquids will be properly contained and managed in accordance with the procedures outlined in **Section 5.4.**

5.1.2 Utility Investigation

Existing utilities will be verified prior to the start of work. Diggers Hotline (811 or 1-800-242-8511) will be contacted, and private utility surveys, including ground-penetrating radar, will be conducted prior to beginning intrusive activities to identify, locate, mark, or verify any utility locations. Additionally, a walkthrough will be conducted with the facility's management team to identify and confirm the locations of above- and below-grade utilities.

Identified underground utilities will be clearly marked for the duration of the work. Caution and awareness of identified utilities that remain in place will be emphasized in daily health and safety meetings. Identified/suspected utility features within the proposed excavations will be investigated by soft digging to expose the utility to better understand the exact location and depth, and to evaluate if the utility poses a risk during work. If the utility is

determined to pose a risk, the utility will be temporarily removed and replaced. These procedures will be further defined in the remediation contractor's standard operating procedure(s) for clearing utilities and abandonment.

5.1.3 Management of Traffic

A traffic control plan will be developed by the remediation contractor and will include the proposed haul routes to transfer excavated or staged material. The designated on-site haul routes will be clearly delineated using cones and barricades or an equivalent.

Tracking (decontamination) pads will be established based on the identified haul routes. Heavily traffic areas will be cleaned and wetted down using a water truck as needed to minimize dust emissions throughout the workday. Equipment and haul trucks will be properly decontaminated, as needed. Decontamination solids and liquids will be properly contained and managed in accordance with the procedures outlined in **Section 5.4.**

5.1.4 Survey

A professional land surveyor licensed in Wisconsin will perform necessary surveying including:

- A pre-construction survey of the planned excavation areas
- A post-excavation survey to document extent of excavation
- A post-construction survey establishing final grades.

During the project, progressive topographical surveys will be performed to collect and verify data relative to soil volumes and material quantities.

5.1.5 Soil Erosion and Sediment Controls

Erosion control measures will be installed as outlined in the ECP and to be developed in accordance with the Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit (GP) for Construction Site Stormwater Runoff (No. WI-S067831-5) (refer to **Section 6**). In general, ECP measures will consist of the following best management practices:

- Construction fence will be installed to identify wetlands and associated buffers that are not to be disturbed.
- Straw wattle or silt fence will be installed to prevent sediment migration from stormwater runoff.
- Stabilized construction entrances or tracking pads will be installed to control construction traffic from tracking soils on impervious surfaces or off-site.
- Tracking (decontamination) pads will be installed to prevent the tracking of soils onto impervious surfaces or off-site.

Erosion control measures will be installed prior to initiating subsurface activities. Erosion control measures will be monitored and inspected to confirm that they are functioning properly and positioned adequately to be effective during use. Contractor personnel will perform routine maintenance inspections at a minimum of one per week, as well as within 24 hours of a rain event of more than 0.5 inches. Observations will be recorded, and inspection records maintained on-site throughout the duration of the project. Deficiencies will be corrected as soon as they are noted.

5.1.6 Dust and Odor Control

A dust and odor control program will be implemented in conjunction with perimeter air monitoring (refer to **Section 7**) to ensure action levels established in the Ambient Air Monitoring Plan are not exceeded. Dust and odor controls to be implemented during the project include:

- Covering all soil/debris piles when not actively being utilized.
- Hauling soil/debris leaving the Site in covered or closed containers.
- Keeping construction equipment and vehicle speeds below 15 miles per hour on the Site.
- Applying a water spray during soil/debris handling and to unpaved vehicle access routes at the Site, as necessary.

Implementation activities that could potentially cause the release of dust or odor, such as stockpile maintenance, loading of soil/debris, transport of soil/debris, and relocation of soil/debris, will be monitored. In general, a water truck will be used to suppress dust along haul roads, and a spray nozzle and pump system will be used to suppress fugitive dust and odor within open excavations or during stockpile management. Water for dust and odor suppression will be delivered to the Site or obtained from the on-site water source, if available.

5.2 Excavation and Backfill

The areas of aggregated PFAS mass will be voluntarily and proactively excavated from the ground surface to the water table and disposed of off-site (**Figure 5**). The proposed excavation areas were established using data collected during the investigations summarized in the Interim SIR and during the 2020 Site Investigation of PFAS in Soils referenced in **Section 2.3.1** and **2.3.3,** respectively (Arcadis 2020a and 2020c). Limits will be documented through pre- and post-construction as-built surveys completed by a surveyor licensed in the State of Wisconsin. A post-excavation soil sampling program will not be conducted.

5.2.1 PFAS-Impacted Soil

The remediation contractor will use standard construction equipment to excavate to the top of the water table within the established excavation limits indicated on the Design Drawings (**Appendix A**). Soil from the proposed excavation areas will be directly loaded into containers/trucks or relocated to the temporary material staging area, which currently contains soil, concrete, and debris from construction of the ARTF, prior to off-site disposal (**Figure 5**).

Additional details pertaining to procedures and methods of excavation are presented in **Appendix A**.

5.2.2 Clean Fill

Excavation and backfill will be completed the same day to the extent practicable within the excavation limits indicated on the Design Drawings (**Appendix A**). Areas will be brought to grade in kind with imported clean fill. Clean fill will meet regulatory standards and be free of deleterious matter such as frozen materials, organics, wood, debris, or rock larger than 4 inches in diameter. Dense-graded aggregate may be used as backfill.

Clean fill will be placed in 6- to 8-inch loose lifts. Fill will then be compacted to 90 percent of the dry Standard Proctor density. Compaction testing will be performed at a rate of one test per 500 square feet per 1-foot depth

compacted lift of soil. Clean fill will be brought to within 6 inches of final grade and the surface will be restored to match current conditions (e.g., gravel, concrete and/or topsoil with vegetation).

5.3 Off-Site Disposal

Materials to be disposed of off-site include the following:

- Approximately 1,250 cubic yards of soils with aggregated PFAS mass
- Approximately 5,260 cubic yards and 154 tons of soil, concrete, and debris from construction of the ARTF.

Soils, concrete, and debris will be loaded out from the temporary material staging area for off-site disposal to the Waste Management facility in Arlington, Oregon. The Waste Management facility has an existing waste material profile established for the Site. This waste profile will be supplemented with the pre-construction characterization data collected from sampling of the soil, concrete, and debris stockpiles associated with construction of the ARTF (refer to **Section 3.2**).

Trucks transporting soil off-site will be decontaminated and manifested before leaving the Site. In addition to these materials, decontamination fluids, personal protective equipment, and associated debris will be containerized for off-site disposal.

5.4 Equipment Decontamination

During implementation of the proposed IRA, the contractor will implement specific construction procedures and methods to prevent cross-contamination. Clean equipment is key to preventing cross-contamination; therefore, pre-cleaned, disposable, or dedicated equipment for each task will be utilized to the extent feasible. In general, decontamination procedures will be implemented as follows:

- Dedicated equipment will be used for managing impacted material. Prior to moving between zones, the equipment will be decontaminated.
- Equipment will be decontaminated in bulk by scrubbing all visible sediment from the equipment using brooms and shovels within the excavation area.
- After bulk decontamination, equipment will be relocated to the temporary material staging area for final decontamination with water and a pressure washer, if necessary.

Decontamination water will be collected and containerized within a storage tank for waste characterization sampling and subsequent on-site treatment or off-site disposal. Following decontamination, all equipment will be inspected to confirm it is clean and suitable for use in restoration activities or demobilization.

5.5 Final Grade

Final surface restoration will match current conditions to the extent feasible as presented in the Design Drawings (**Appendix A**). There will be no increase in coverage of impervious surfaces and a net cut/fill of zero within the excavation footprints.

Wetlands disturbed in association with excavation activities will be restored in accordance with the United States Army Corps of Engineers (USACE) Nationwide Permit and Wetland General Permit for Commercial, Residential, and Industrial Activities (WDNR-GP1-2017).

6 Permitting Requirements

This section identifies the applicable local, state, and federal permits, licenses, and approvals required to construct and implement the proposed IRA in accordance with § NR 724.09 (6), Wis. Adm. Code. The permitting requirements for the proposed IRA are as follows:

- WPDES GP for Construction Site Stormwater Runoff (GP No. WI-S067831-5)
- USACE Nationwide Permit and Wetland General Permit for Commercial, Residential, and Industrial Activities (WDNR-GP1-2017).

6.1 WPDES for Construction Site Stormwater Runoff

There is a need for managing stormwater runoff associated with the proposed IRA; therefore, a WPDES GP for Construction Site Stormwater Runoff (No. WI-S067831-5) will be obtained prior to any land disturbance associated with this proposed IRA.

A Notice of Intent to request coverage under the WPDES GP for Construction Site Stormwater Runoff (No. WI-S067831-5) will be submitted 14 days prior to mobilization. The WDNR considers the permit approved within 14 days of submittal.

6.2 Wetland General Permit for Commercial, Residential, and Industrial Activities

Two proposed excavation areas are within delineated wetlands (**Figure 5**). These wetlands have been delineated by WDNR-approved Assured Wetland Delineators and verified by the WDNR wetland identification staff.

In addition to the WPDES GP, a USACE Nationwide Permit and WDNR GP will be filed since the proposed excavation areas are anticipated to disturb approximately 1,430 square feet of wetlands. These permits will be submitted and approved prior to any disturbance within the regulated wetlands.

7 Monitoring Plan

The purpose of this section is to provide details of the performance and compliance monitoring for the proposed IRA in accordance with § NR 724.09 (8), Wis. Adm. Code. Specifically, this section outlines air monitoring to be performed to provide for construction worker and public health and safety during implementation of the proposed IRA. Once the proposed Soil IRA is implemented and completed, no further monitoring will be proposed.

During excavation activities, perimeter air monitoring will be conducted to quantify airborne concentrations of VOCs and dust at the boundary of the work area. Perimeter air monitoring data will be collected using direct-reading air sampling devices. Real-time portable aerosol monitors (DataRAMS or equivalent) will be used to monitor dust levels and PIDs will be used to monitor VOCs at both upwind and downwind air monitoring stations. Should real-time data indicate that concentrations exceed action levels established in the Ambient Air Monitoring Plan for VOCs or particulate matter, work will halt until action levels exceedances have been mitigated.

8 Implementation Schedule

The implementation schedule identifies the timing for initiation and completion of all tasks associated with implementation of the proposed Soil IRA in accordance with § NR 724.09 (10), Wis. Adm. Code. A detailed schedule showing these tasks, their approximate starting dates, and durations is provided in **Appendix B**. The timeframes for major work scope elements are as follows:

- **IRA Permitting**, including construction-related permitting and permit variances: March through July 2021
- **IRA Bidding/Contracting**, including bidding and identifying a contractor to perform the proposed IRA for soil: March through June 2021
- **IRA Implementation**, including excavation: July through September 2021.

The proposed IRA is estimated to be completed by fall 2021.

9 References

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Arcadis. 2020b. Conceptual Site Model. Tyco Fire Technology Center, Marinette, Wisconsin. 2700 Industrial Parkway, Marinette, Wisconsin. BRRTS No. 02-38-580694. May 26.

Arcadis. 2020c. Sample Results Notification. Tyco Fire Technology Center, Marinette, Wisconsin. 2700 Industrial Parkway, Marinette, Wisconsin. BRRTS No. 02-38-580694. November 6.

Arcadis. 2021. Groundwater Extraction and Treatment System Interim Remedial Action Design Report. Tyco Fire Technology Center – PFCS, Marinette, Wisconsin. 2700 Industrial Parkway, Marinette, Wisconsin. BRRTS No. 02-38-580694. February.

Oakes, E.L., & L.J. Hamilton. 1973. Water resources of Wisconsin: Menominee-Oconto-Peshtigo River basin (No. 470). US Geological Survey.

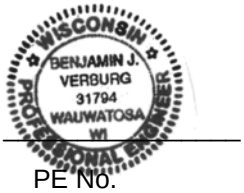
WDNR. 2003. Guidance on the Use of Leaching Tests for Unsaturated Contaminated Soils to Determine Groundwater Contamination Potential PUBL RR-523-03. October 7.

WDNR. 2014. Soil Residual Contaminant Level Determinations Using the U.S. EPA Regional Screening Level Web Calculator. PUB-RR-890. January 23.

10 Certification

§ NR 712.09, Wis. Adm. Code.

I, Benjamin J. Verburg, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



Benjamin J. Verburg, PE
Principal Engineer

PE No.

Tables

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	FTC-59	FTC-60	FTC-62	FTC-71	FTC-72	FTC-77	FTC-82	FTC-83	SS-097		SS-098	SS-099	SS-100	SS-101
		Sample Date	10/23/2013	10/23/2013	10/23/2013	10/23/2013	10/23/2013	10/23/2013	4/21/2014	4/21/2014	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016
		Depth (feet)	0	0	0	0	0	0	0	0	3	8	3	3	3	3
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		Unit														
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	<10	<12	<5.3	<25	<4.9	<4.8	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	<10	<12	<5.3	<25	<4.9	<4.8	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	<10	<12	<5.3	<25	<4.9	**47.3**	<6.9	<6.6	NA	NA	NA	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	<10	<12	<5.3	<25	<4.9	**18.2**	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	<10	<12	<5.3	<25	<4.9	<4.8	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	<10	<12	<5.3	<25	**16.4**	<4.8	**5.8 J**	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	<10	<12	<5.3	<25	<4.9	<4.8	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	<10	<12	<5.3	<25	**12.6**	**11.4 J**	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	<10	<12	<5.3	<25	**5.4 J**	<4.8	**113**	<6.0	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	<10	**19.1 J**	<5.3	**308**	**13.5**	**580**	**234**	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	**35.6**	**122**	**84.9**	<25	**35.8**	**17.6**	**14.8**	**5.3 J**	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	<10	<12	<5.3	<25	<4.9	**6 J**	<5.4	<5.2	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	<10	<12	<5.3	<25	<4.9	**17.6**	<6.9	<6.6	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	<10	<12	**6.7 J**	<25	<4.9	**61.2**	**10.3 J**	<7.9	NA	NA	NA	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**62**	**31**	**10**	**110**	**44**	**24**
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**16**	**2.7**	**3.9**	**130**	**130**	**39**
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**0.20 JBF1**	**0.19 JB**	**0.23 B**	**0.27 B**	**0.15 JB**	**0.35 B**
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**1.4**	**1.3**	**1.1**	**1.9**	**0.25**	**5.7**
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	<0.082 U	<0.089 U	<0.082 U	<0.098 U	**0.17 J**	<0.093 U
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**3.1**	**0.21 J**	**0.29**	**5.0**	**0.90**	**11**
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	<0.14 U	<0.15 U	<0.14 U	<0.16 U	**0.97**	**0.27**
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	<0.13 U	<0.15 U	<0.14 U	**0.27**	<0.14 U	<0.15 U
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	1	NA	NA	NA	NA	NA	**2.3**	**1.4**	**0.55**	**3.6**	**0.28**	**16**
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**0.75**	**0.30**	**0.20 J**	**1.4**	**0.19 J**	**1.6**
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**4.7**	**3.5**	**1.1**	**8.5**	**0.85**	**41**
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**2.1**	**0.36**	<0.095 U	**3.9**	**0.18 J**	**4.9**
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**38**	**3.3**	**2.4**	**46**	**7.2**	**17**
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**29**	**2.4**	**1.5**	**34**	**1.4**	**17**
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**15 F1**	**3.4**	**35**	**250**	**25**	**1300**
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**5.8**	**5.5**	**0.60**	**3.2**	**0.26**	**20**
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	<0.066 U	<0.072 U	<0.066 U	<0.079 U	**0.079 J**	<0.075 U
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	<0.11 U	<0.11 U	<0.11 U	<0.12 U	**5.1**	<0.12 U
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	**0.84**	**0.41**	<0.12 U	**0.47**	**1.7**	**1.4**
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes on Page 2.

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		Sample Date	10/23/2013	10/23/2013	10/23/2013	10/23/2013	10/23/2013	10/23/2013	4/21/2014	4/21/2014	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016
		Depth (feet)	0	0	0	0	0	0	0	0	3	8	3	3	3	3
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		Unit														
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-102	SS-103	SS-104	SS-105	SS-106		SS-107	SS-108	SS-109	SS-110	SS-113		SS-114	
		Sample Date	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	6/28/2018	6/28/2018	6/28/2018	6/28/2018
		Depth (feet)	3	3	3	2	1	8	3	3	3	3	0-0.5	7.5-8	0-0.5	7.5-8
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		Unit														
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	**53**	<0.46 U	**57**	**13**	**2.1 J**	**7.7**	**59**	**39**	**49**	**37**	NA	NA	NA	NA
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	**54**	<0.80 U	**100**	**120 J**	**30**	**4.0**	**210**	**80**	**8.8**	**64**	NA	NA	NA	NA
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.59 J**	**1.2 J**	**0.98 J**	**4.4**
WS-LC-0025	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.47 U	<0.49 U	<0.45 U	<0.51 U
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	**0.16 JB**	**0.17 JB**	**0.17 JB**	**0.17 JB**	**0.19 JB**	**0.18 JB**	**0.24 B**	**0.20 JB**	**0.18 JB**	**0.21 JB**	<0.030 U	**0.052 J**	<0.029 U	<0.033 U
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	**0.20 J**	**0.18 J**	**0.32**	**0.22**	**0.15 J**	**0.22 J**	**0.40**	**0.30**	**0.23 J**	**0.29**	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	<0.086 U	<0.085 U	**0.27**	<0.077 U	<0.091 U	<0.097 U	<0.083 U	**0.21 J**	<0.096 U	**0.27**	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	**0.27**	**0.10 J**	**0.70**	**11**	**4.0**	**0.12 J**	**21**	**1.9**	**0.37**	**2.5**	**4.5**	**4.3**	**5.0**	**1.0**
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	**0.20 J**	<0.14 U	<0.14 U	<0.13 U	<0.15 U	<0.16 U	<0.14 U	**4.1**	<0.16 U	**5.5**	**0.65**	**0.16 J**	**0.11 J**	<0.087 U
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	<0.14 U	<0.14 U	<0.14 U	<0.13 U	<0.15 U	<0.16 U	**0.15 J**	<0.16 U	**0.17 J**	<0.16 U	NA	NA	NA	NA
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	<0.10 U	**0.37**	**0.90**	**1.3**	**0.31**	**0.30**	**0.93**	**0.65**	**1.5**	**0.82**	**0.76**	**2.7**	**1.7**	**0.92**
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	<0.14 U	**0.21 J**	**0.26**	**0.23**	<0.15 U	<0.16 U	**1.8**	**0.23 J**	**0.23 J**	**0.24 J**	**0.46**	**2.2**	**0.52**	**0.18 J**
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	**0.54**	**0.32**	**1.5**	**1.2**	**0.81**	**1.1**	**3.5**	**1.5**	**0.92**	**1.7**	**1.3**	**3.9**	**1.2**	**0.79**
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	<0.099 U	**1.0**	**0.66**	**0.34**	**0.35**	<0.11 U	**0.88**	**1.5**	**15**	**2.9**	**2.0**	**1.6**	**5.3**	**0.21 J**
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	**0.40**	**0.15 J**	**260**	**87**	**19**	**2.7**	**110**	**22**	**1.7**	**6.3**	NA	NA	NA	NA
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	**0.22 J**	**2.8**	**14**	**380**	**8.8**	**1.3**	**190**	**11**	**45**	**19**	**85 D**	**9.0**	**21**	**2.2**
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	**0.73**	**1.4**	**80**	**73**	**5.9**	**2.0**	**75**	**25**	**23**	**33**	**3.7**	**19**	**6.5**	**5.1**
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	**0.20 J**	**0.31**	**0.60**	**0.54**	**0.24 J**	**0.69**	**0.82**	**0.76**	**0.83**	**0.68**	NA	NA	NA	NA
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	<0.069 U	<0.069 U	<0.069 U	<0.062 U	<0.073 U	<0.078 U	<0.067 U	**1.3**	<0.077 U	<0.077 U	**0.24**	<0.067 U	<0.062 U	<0.070 U
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	<0.11 U	<0.11 U	**0.37**	<0.098 U	<0.12 U	<0.12 U	<0.11 U	**6.5**	<0.12 U	**4.7**	<0.061 U	<0.064 U	<0.059 U	<0.066 U
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	**0.20 J**	<0.13 U	**0.46**	**7.5**	**6.2**	**0.77**	**7.8**	**2.7**	<0.14 U	**3.4**	**3.2**	**2.4**	**2.0**	**0.29**
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-102	SS-103	SS-104	SS-105	SS-106		SS-107	SS-108	SS-109	SS-110	SS-113		SS-114	
		Sample Date	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	6/28/2018	6/28/2018	6/28/2018	6/28/2018
		Depth (feet)	3	3	3	2	1	8	3	3	3	3	0-0.5	7.5-8	0-0.5	7.5-8
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		Unit														
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 1
Historical Soil Analytical Results
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Marinette, Wisconsin

Method	Chemical Name	Location	SS-115		SS-116		SS-117			SS-118		SS-119		SS-120	
		Sample Date	6/28/2018	6/28/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	7/23/2018	7/23/2018	6/29/2018	6/29/2018
		Depth (feet)	0-0.5	1-1.5	0-0.5	3-4	0-0.5	3-4	3-4	0-1	7-8	0-1	7-8	0-1	7-8
		Sample Type	N	N	N	N	N	N	FD	N	N	N	N	N	N
		Unit													
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	<0.39 U	**0.51 J**	**0.92 J**	<0.42 U	**2.2 J**	<0.42 U	<0.42 U	**0.41 J**	<0.45 U	<0.45 U	<0.44 U	<0.47 U	<0.46 U
WS-LC-0025	N-Methylperfluorooctane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	<0.41 U	<0.45 U	<0.43 U	<0.44 U	<0.46 U	<0.45 U	<0.44 U	<0.43 U	<0.48 U	<0.47 U	<0.47 U	<0.49 U	<0.48 U
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.026 U	<0.029 U	<0.028 U	<0.028 U	<0.029 U	<0.029 U	<0.028 U	<0.028 U	<0.031 U	<0.030 U	<0.030 U	<0.032 U	<0.031 U
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	**0.80**	**0.61**	**1.4**	**0.72**	**6.9**	**0.41**	**0.84**	**1.8**	**0.15 J**	**0.88**	<0.026 U	**1.5**	<0.027 U
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	**0.92**	**2.8**	**0.34**	**0.39 J**	**1.1**	<0.077 U	**0.10 J**	**0.27**	<0.082 U	**0.083 J**	<0.080 U	**0.22 J**	<0.083 U
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	**0.25**	**0.16 J**	**0.50**	**0.37**	**1.4**	**0.080 J**	**0.071 J**	**0.47**	**2.4**	**2.1**	**0.11 J**	**1.3**	**0.26**
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**0.095 J**	**0.039 J**	<0.034 U	**0.045 J**	**0.35**	<0.036 U	<0.035 U	**0.18 J**	**0.54**	**0.13 J**	<0.037 U	**0.51**	**0.038 J**
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	**0.40**	**0.24**	**0.63**	**0.32**	**1.5**	**0.15 J**	**0.16 J**	**0.84**	**9.5**	**1.7**	**0.83 J**	**2.1**	**0.65**
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	**0.24**	**0.11 J**	**0.54**	**0.26**	**2.1**	**0.16 J**	**0.33**	**0.66**	**0.68**	**5.2**	**0.12 J**	**3.2**	**0.22 J**
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	**0.22 J**	**0.72**	**0.67**	**0.41 J**	**11**	<0.23 U	**1.4**	**7.9**	**1.2**	**2.3**	<0.24 U	**1.4**	<0.25 U
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	**1.0**	**8.6**	**1.3**	**0.97**	**4.1**	**0.12 J**	**0.20 J**	**7.0**	**5.4**	**1.6**	**0.12 J**	**4.2**	**0.36**
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	**0.56**	**0.24**	**0.11 J**	<0.061 U	**0.34**	<0.062 U	<0.061 U	**0.091 J**	<0.066 U	<0.065 U	<0.065 U	**0.082 J**	<0.067 U
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	**1.6**	**3.0**	<0.056 U	<0.057 UJ	<0.060 U	<0.058 U	**0.064 J**	<0.057 U	<0.063 U	**0.14 J**	<0.061 U	**0.25**	<0.063 U
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	**1.2**	**1.9**	**0.83**	**0.86**	**8.6**	**0.17 J**	**0.32**	**1.9**	<0.044 U	**0.37**	<0.043 U	**0.88**	<0.045 U
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	N-Methylperfluorooctane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 1
Historical Soil Analytical Results
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Method	Chemical Name	Location	SS-115		SS-116		SS-117			SS-118		SS-119		SS-120	
		Sample Date	6/28/2018	6/28/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	7/23/2018	7/23/2018	6/29/2018	6/29/2018
		Depth (feet)	0-0.5	1-1.5	0-0.5	3-4	0-0.5	3-4	3-4	0-1	7-8	0-1	7-8	0-1	7-8
		Sample Type	N	N	N	N	N	N	FD	N	N	N	N	N	N
		Unit													
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-121		SS-122		SS-123		SS-124			SS-125		SS-126	
		Sample Date	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	7/23/2018	7/23/2018	7/23/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018
		Depth (feet)	0-1	7-8	0-0.5	7-8	0-1	7-8	0-1	7-8	7-8	0-1	7-8	0-1	7-8
		Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N
		Unit													
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	<0.41 U	<0.46 U	<0.47 U	<0.46 U	<0.39 U	<0.44 U	**0.49 J**	<0.46 U	<0.46 U	<0.44 U	<0.46 U	<0.44 U	<0.44 U
WS-LC-0025	N-Methylperfluorooctane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	<0.43 U	<0.48 U	<0.50 U	<0.48 U	<0.41 U	<0.46 U	<0.45 U	<0.49 U	<0.48 U	<0.46 U	<0.48 U	<0.47 U	<0.46 U
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.027 U	<0.031 U	<0.032 U	<0.031 U	<0.026 U	<0.029 U	<0.029 U	<0.031 U	<0.031 U	<0.030 U	<0.031 U	<0.030 U	<0.030 U
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	**7.6**	**1.0**	**80 D**	**2.6**	**2.0**	**0.44**	**1.5**	**0.055 J**	**0.068 J**	**1.7**	**0.052 J**	**1.4**	**0.071 J**
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	**1.8**	<0.083 U	**4.8**	<0.083 U	**1.4**	<0.079 U	**0.35**	<0.083 U	<0.082 U	**0.23 J**	<0.083 U	**0.12 J**	<0.079 U
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	**0.92**	**0.44**	**11**	**1.6**	**0.53**	**0.11 J**	**2.3**	**1.3**	**1.4**	**2.1**	**0.062 J**	**0.75**	**0.24**
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**0.12 J**	**0.080 J**	**5.1**	**3.9**	<0.033 U	<0.037 U	**0.24**	**0.13 J**	**0.11 J**	**0.31**	<0.038 U	**0.062 J**	<0.037 U
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	**1.7**	**0.50**	**12**	**1.8**	**3.1**	**1.2**	**3.6**	**3.8**	**3.8**	**3.2**	**0.37**	**1.4**	**0.33**
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	**2.0**	**1.0**	**41 D**	**4.4**	**0.53**	**0.25**	**1.9**	**0.068 J**	**0.093 J**	**7.8**	<0.044 U	**2.9**	**0.49**
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	**4.4**	**19**	**28 D**	**12**	**0.41 J**	**0.60**	**5.4**	**2.7**	**2.3**	**6.5**	<0.25 U	**5.8**	**6.9**
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	**27 D**	**7.8**	**440 D**	**12**	**2.0**	**0.15 J**	**4.1**	**7.2**	**5.8**	**5.0**	<0.11 U	**1.4**	**0.41**
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	**0.73**	<0.067 U	**2.3**	<0.067 U	**0.60**	<0.064 U	**0.093 J**	<0.067 U	<0.066 U	**0.068 J**	<0.067 U	<0.065 U	<0.064 U
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	<0.056 U	<0.063 U	**61 D**	**0.097 J**	**0.56**	<0.060 U	**0.65**	<0.063 U	<0.063 U	**0.31**	<0.063 U	<0.061 U	<0.060 U
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	**5.4**	**0.14 J**	**99 D**	**2.2**	**2.1**	<0.042 U	**1.7**	**0.050 J**	**0.098 J**	**0.97**	<0.044 U	**0.43**	<0.043 U
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	N-Methylperfluorooctane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-121		SS-122		SS-123		SS-124			SS-125		SS-126	
		Sample Date	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018	7/23/2018	7/23/2018	7/23/2018	6/29/2018	6/29/2018	6/29/2018	6/29/2018
		Depth (feet)	0-1	7-8	0-0.5	7-8	0-1	7-8	0-1	7-8	7-8	0-1	7-8	0-1	7-8
		Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N
		Unit													
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-127		SS-128		SS-129	SS-130	SS-131	SS-132	SS-133	SS-134	SS-135	SS-136
		Sample Date	6/29/2018	6/29/2018	7/23/2018	7/23/2018	7/23/2018	7/17/2019	7/17/2019	7/16/2019	7/30/2019	7/17/2019	7/17/2019	7/17/2019
		Depth (feet)	0-0.5	7-8	7-8	7-8	2-3	0.5-1.5	0.5-2	0.75-1	0.8-1.39	0.8-1.7	0.69-1.6	0.6-2
		Sample Type	N	N	N	FD	N	N	N	N	N	N	N	N
		Unit												
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	<0.39 U	<0.44 U	<0.47 U	<0.45 U	**240 D**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	<0.41 U	<0.47 U	<0.50 U	<0.47 U	**0.71 J**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.027 U	<0.030 U	<0.032 U	<0.030 U	<0.026 U	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	**0.56**	**0.11 J**	**1.1**	**0.79**	**12**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	**0.74**	<0.080 U	<0.086 U	<0.081 U	**0.16 J**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	**0.46**	**0.49**	**3.9**	**5.6**	**2.1**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**0.091 J**	<0.037 U	**0.86**	**0.73**	**1.3**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	**0.89**	**0.72**	**4.9 J**	**8.3 J**	**2.3**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	**0.34**	**0.26**	**1.1**	**1.2**	**0.59**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	**0.38 J**	**0.33 J**	**4.5**	**3.2**	**450 D**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	**1.8**	**0.35**	**66 DJ**	**190 DJ**	**87 D**	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	**0.27**	<0.065 U	<0.069 U	<0.065 U	<0.056 UJ	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	<0.054 U	<0.061 U	<0.065 U	<0.061 U	<0.053 U	NA	NA	NA	NA	NA	NA	NA
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	**1.4**	**0.053 J**	**1.5 J**	**0.20 J**	**0.12 J**	NA	NA	NA	NA	NA	NA	NA
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA	NA	NA	<0.48 U	<0.44 U	**1.3 J**	**12**	<0.41 U	**190 DJ**	<0.47 U
PFC_IDA	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA	NA	NA	<0.51 U	<0.47 U	<0.45 U	**0.83 J**	<0.43 U	**1.0 J**	<0.50 U
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA	NA	NA	<0.033 U	<0.030 U	<0.029 U	**0.031 J**	<0.028 U	<0.026 U	<0.032 U

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Table 1
Historical Soil Analytical Results
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Marinette, Wisconsin

Method	Chemical Name	Location	SS-127		SS-128		SS-129	SS-130	SS-131	SS-132	SS-133	SS-134	SS-135	SS-136
		Sample Date	6/29/2018	6/29/2018	7/23/2018	7/23/2018	7/23/2018	7/17/2019	7/17/2019	7/16/2019	7/30/2019	7/17/2019	7/17/2019	7/17/2019
		Depth (feet)	0-0.5	7-8	7-8	7-8	2-3	0.5-1.5	0.5-2	0.75-1	0.8-1.39	0.8-1.7	0.69-1.6	0.6-2
		Sample Type	N	N	N	FD	N	N	N	N	N	N	N	N
		Unit												
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA	NA	NA	**0.12 J**	**7.5**	**0.54**	**55 D**	**0.14 J**	**42**	**1.8**
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA	NA	NA	<0.088 U	<0.081 U	**0.27**	**13**	<0.075 U	**0.077 J**	**0.39**
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA	NA	NA	**0.38**	**0.45**	**0.30**	**6.4 J-**	**0.24**	**1.4**	**0.14 J**
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA	NA	NA	**0.081 J**	**0.72**	**0.053 J**	**9.3**	**0.078 J**	**0.49**	**0.12 J**
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA	NA	NA	**0.37**	**0.57**	**0.33**	**14**	**0.27**	**2.5**	**0.46**
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA	NA	NA	**1.4**	**0.30**	**0.44**	**31 D**	**1.1**	**1.2**	**0.83**
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA	NA	NA	**3.1**	**18**	**17**	**800 D**	**8.3**	**210 D**	**14**
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA	NA	NA	**0.56**	**1.6**	**10 J**	**32 D**	**0.88**	**110**	**3.7**
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA	NA	NA	<0.071 U	<0.065 U	<0.062 U	**5.4 J-**	<0.060 U	<0.056 U	<0.069 U
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA	NA	NA	<0.067 U	<0.061 U	**0.096 J**	**31 D**	<0.057 U	<0.053 U	**0.33**
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA	NA	NA	**0.086 J**	**1.4**	**0.91**	**72 D**	<0.040 U	**0.14 J**	**5.0**

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-137	SS-138	SS-139
		Sample Date	7/16/2019	7/16/2019	7/16/2019
		Depth (feet)	0.5-1.2	0.5-1.5	0.5-1.2
		Sample Type	N	N	N
		Unit			
PFASs	Perfluorobutane Sulfonate (PFBS)	µg/kg	NA	NA	NA
PFASs	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA
PFASs	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA
PFASs	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA
PFASs	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA
PFASs	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA
PFASs	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA
PFASs	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA
PFASs	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA
PFASs	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA
PFASs	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA
PFASs	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA
PFASs	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA
PFASs	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA
WS-LC-0025	6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	µg/kg	NA	NA	NA
WS-LC-0025	8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	µg/kg	NA	NA	NA
WS-LC-0025	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	NA	NA	NA
WS-LC-0025	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorobutane sulfonic acid (PFBS)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorobutanoic acid (PFBA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorodecanesulfonic acid (PFDS)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorodecanoic acid (PFDA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorododecanoic acid (PFDoA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluoroheptanesulfonic Acid (PFHpS)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluoroheptanoic acid (PFHpA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorohexanoic acid (PFHxA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorononanoic acid (PFNA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorooctane Sulfonamide (PFOSA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorooctanesulfonic acid (PFOS)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorooctanoic acid (PFOA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluoropentanoic acid (PFPeA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorotetradecanoic acid (PFTeA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluorotridecanoic acid (PFTrDA)	µg/kg	NA	NA	NA
WS-LC-0025	Perfluoroundecanoic acid (PFUdA)	µg/kg	NA	NA	NA
PFC_IDA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	µg/kg	<0.48 U	<0.44 U	<44 U
PFC_IDA	N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	µg/kg	<0.51 U	<0.46 U	<46 U
PFC_IDA	Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.033 U	<0.029 U	<3.0 U

Notes on Page 12.

Table 1
Historical Soil Analytical Results
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Method	Chemical Name	Location	SS-137	SS-138	SS-139
		Sample Date	7/16/2019	7/16/2019	7/16/2019
		Depth (feet)	0.5-1.2	0.5-1.5	0.5-1.2
		Sample Type	N	N	N
		Unit			
PFC_IDA	Perfluorodecanoic acid (PFDA)	µg/kg	**3.3**	**0.045 J**	**42**
PFC_IDA	Perfluorododecanoic acid (PFDoA)	µg/kg	**0.14 J**	<0.079 U	<8.0 U
PFC_IDA	Perfluoroheptanoic acid (PFHpA)	µg/kg	**0.66**	**0.85**	**25**
PFC_IDA	Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**0.13 J**	<0.036 U	<3.7 U
PFC_IDA	Perfluorohexanoic acid (PFHxA)	µg/kg	**1.8**	**0.46**	**33**
PFC_IDA	Perfluorononanoic acid (PFNA)	µg/kg	**3.7**	**0.52**	**63**
PFC_IDA	Perfluorooctanesulfonic acid (PFOS)	µg/kg	**5.2**	**0.59**	<24 U
PFC_IDA	Perfluorooctanoic acid (PFOA)	µg/kg	**2.0**	**0.82**	**1100**
PFC_IDA	Perfluorotetradecanoic acid (PFTeA)	µg/kg	<0.071 U	<0.064 U	<6.4 U
PFC_IDA	Perfluorotridecanoic acid (PFTrDA)	µg/kg	<0.067 U	<0.060 U	<6.1 U
PFC_IDA	Perfluoroundecanoic acid (PFUdA)	µg/kg	**0.75**	<0.042 U	**83**

Notes:
Detections are in bold.
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type
NA = not analyzed

Laboratory Qualifiers:
B = Compound was found in the blank and sample.
D = Concentration is based on a diluted sample analysis.
F1 = Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 2.
Soil Analytical Results - Fall 2020
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Chemical Name	Location	SS-140	SS-141	SS-142	SS-143		SS-144	SS-145	SS-146	SS-147	SS-148	SS-149	SS-150	SS-151	SS-152	SS-153		SS-154
	Sample Date	10/7/2020	10/7/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020
	Depth (feet)	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
	Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	FD	N
	Unit																	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	**0.37**	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**1.2**	<0.21 U	<0.20 U	**0.067 J**	<0.22 U	<0.22 U	**1.4**	<0.22 U	<0.20 U	<0.21 U	**0.16 J**
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	µg/kg	<0.28 U	<0.26 U	<0.27 U	<0.25 U	<0.25 U	<0.26 U	<0.45 U	<0.27 U	<0.25 U	<0.28 U	<0.28 U	<0.27 U	<0.27 U	<0.27 U	<0.25 U	<0.27 U	<0.26 U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
4:2 Fluorotelomer sulfonate	µg/kg	<2.3 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<2.1 U	<3.6 U	<2.1 U	<2.0 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.0 U	<2.1 U	<2.1 U
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	µg/kg	**0.22 J-**	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<2.1 U	**0.98 J-**	<2.1 U	<2.0 U	**37 D**	**0.47 J-**	**0.46 J-**	**1.1 J-**	**0.78 J**	**0.46 J-**	**0.37 J**	**2.7 J-**
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	µg/kg	**0.64 J**	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<2.1 U	**4.8 J-**	<2.1 U	<2.0 U	**1.9 J-**	**1.5 J-**	<2.2 U	<2.2 U	<2.2 U	<2.0 U	<2.1 U	**4.9 J-**
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (F-53 Major)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
N-Ethyl perfluorooctane sulfonamide (N-EtFOSA)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
N-Ethyl perfluorooctane sulfonamide ethanol (N-EtFOSE)	µg/kg	**0.18 J**	**0.064 J**	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.47**	<0.21 U	<0.20 U	**0.052 J**	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	<2.3 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<2.1 U	<3.6 U	<2.1 U	<2.0 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.0 U	<2.1 U	<2.1 U
N-Methyl perfluorooctane sulfonamide (N-MeFOSA)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	µg/kg	<2.3 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<2.1 U	<3.6 U	<2.1 U	<2.0 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.2 U	<2.0 U	<2.1 U	<2.1 U
Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorobutanoic acid (PFBA)	µg/kg	**0.27**	**0.22**	<0.21 UB	<0.23 UB	<0.22 UB	<0.21 UB	**0.55**	**0.64**	<0.33 UB	**1.4**	**0.27**	**1.6**	**0.68**	<0.22 UB	**3.2**	**2.4**	<0.30 UB
Perfluorodecane sulfonic acid (PFDS)	µg/kg	<0.23 U	<0.20 UJ-	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.10 J**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorodecanoic acid (PFDA)	µg/kg	**2.2**	**0.31**	<0.21 U	**0.24**	**0.13 J**	**0.35**	**6.4**	**0.12 J**	**0.31**	**1.0**	**0.097 JN**	**0.79**	**2.4**	<0.22 U	**0.14 J**	**0.055 J**	**0.97**
Perfluorododecane sulfonic acid (PFDOS)	µg/kg	<0.23 U	<0.20 UJ-	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorododecanoic acid (PFDoA)	µg/kg	**0.18 J**	<0.20 UJ	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**1.7**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	**0.11 J**
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	**0.072 J**	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.11 J**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluoroheptanoic acid (PFHpA)	µg/kg	**1.4**	**0.42**	**0.19 J**	**0.22**	**0.23**	**0.12 J**	**3.0**	**0.57**	**0.24**	**0.99**	**0.37**	**1.8**	**1.9**	**0.15 J**	**4.7**	**4.5**	**0.36**
Perfluorohexadecanoic acid (PFHxDA)	µg/kg	<0.23 U	<0.20 U	**0.047 J**	**0.046 J**	<0.20 U	**0.048 J**	**0.18 J**	**0.051 J**	**0.044 J**	**0.053 J**	**0.055 J**	**0.049 J**	**0.048 J**	**0.048 J**	**0.045 J**	<0.21 U	**0.054 J**
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**1.1**	**0.076 J**	**0.039 J**	**0.030 J**	<0.20 U	**0.049 J**	**2.1**	<0.21 U	**0.033 J**	**0.069 JN**	<0.22 U	**0.055 J**	**0.33**	<0.22 U	**0.069 J**	**0.056 J**	**0.059 J**
Perfluorohexanoic acid (PFHxA)	µg/kg	**1.2**	**0.49**	**0.11 J**	**0.15 J**	**0.18 J**	**0.12 J**	**2.3**	**0.36**	**0.25**	**2.4**	**0.34**	**1.7**	**1.0**	**0.19 J**	**3.2**	**2.4**	**0.44**
Perfluorononane sulfonic acid (PFNS)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.036 J**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorononanoic acid (PFNA)	µg/kg	**3.7**	**0.91**	**0.46**	**0.59**	**0.67**	**1.6**	**6.5**	**0.38**	**0.66**	**0.55**	**2.4**	**1.3**	**3.8**	**0.41**	**0.74**	**0.57**	**0.74**
Perfluorooctadecanoic acid	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorooctane sulfonamide (PFOSA)	µg/kg	**0.23**	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.33 J**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorooctane sulfonic acid (PFOS)	µg/kg	**9.4**	**2.1**	**1.6**	**2.5**	**2.4**	**5.3**	**15**	**1.1**	**3.6**	**0.54 J**	**1.1**	**2.0**	**0.59**	**1.1**	**2.3**	**2.1**	**0.96**
Perfluorooctanoic acid (PFOA)	µg/kg	**4.9**	**0.94**	**0.37**	**0.37**	**0.36**	**0.33**	**13**	**0.32**	**0.32**	**0.81**	**0.72**	**1.1**	**3.0**	**0.57**	**2.2**	**2.5**	**0.70**
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	<0.23 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	<0.36 U	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluoropentanoic acid (PFPeA)	µg/kg	**1.0**	**0.66**	**0.14 J**	**0.29**	**0.31**	**0.14 J**	**2.2**	**1.2**	**0.50**	**5.4**	**0.75**	**3.6**	**1.8**	**0.36**	**6.8**	**4.8**	**0.57**
Perfluorotetradecanoic acid (PFTeA)	µg/kg	**0.071 J**	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**0.70**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluorotridecanoic acid (PFTrDA)	µg/kg	**0.15 J**	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.21 U	**1.1**	<0.21 U	<0.20 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.22 U	<0.20 U	<0.21 U	<0.21 U
Perfluoroundecanoic acid (PFUdA)	µg/kg	**1.9**	**0.34**	<0.21 U	**0.055 J**	**0.039 J**	**0.039 J**	**4.0**	<0.21 U	<0.20 U	**0.22**	**0.10 J**	**0.32**	**0.42**	<0.22 U	<0.20 U	<0.21 U	**1.5**

Notes:
Detections are boldfaced
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type

Laboratory Qualifier
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample
D = Dilution required for sample analysis
UJ = The compound was not detected above the reported sample method detection limit. However, the reported limit is approximate and may or may not represent the actual method detection limit.
UB = Compound considered non-detect at the listed value due to associated blank contamination.
J- = The result is an estimated quantity. The associated numerical value is expected to have a negative or low bias.
J+ = The result is an estimated quantity. The associated numerical value is expected to have a positive or high bias.
JN = The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only

Table 2.
Soil Analytical Results - Fall 2020
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Chemical Name	Location	SS-155	SS-156	SS-157	SS-158		SS-159	SS-160	SS-161	SS-162	SS-163	SS-164	SS-165	SS-166	SS-167	SS-168	SS-169	SS-170	SS-171	SS-172
	Sample Date	9/29/2020	9/29/2020	9/28/2020	9/28/2020	9/28/2020	9/28/2020	9/28/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020	9/29/2020
	Depth (feet)	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
	Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Unit																			
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	<0.19 U	**0.069 J**	<0.20 U	<0.20 U	<0.20 U	<0.21 U	**0.080 J**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.082 J**	**12**	**0.064 J**	<0.20 U	**24 D**
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	µg/kg	<0.24 U	<0.24 U	<0.25 U	<0.25 U	<0.24 U	<0.26 U	<0.25 U	<0.25 U	<0.24 U	<0.25 U	<0.26 U	<0.24 U	<0.25 U	<0.26 U	<0.26 U	<0.27 U	<0.27 U	<0.25 U	<0.26 U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
4:2 Fluorotelomer sulfonate	µg/kg	<1.9 U	<1.9 U	<2.0 U	<2.0 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<2.0 U	<2.0 U	<2.1 U	<2.1 U	<2.2 U	<2.0 U	<2.1 U
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	µg/kg	**0.98 J**	**0.19 J-**	<2.0 U	<2.0 U	<2.0 U	<2.1 U	<2.0 U	**0.37 J**	<1.9 U	<2.0 U	<2.1 U	**0.18 J**	<2.0 U	<2.0 U	**3.0**	**28 J**	**0.25 J**	**0.48 J**	**3.3 J**
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	µg/kg	**0.78 J**	**0.26 J-**	<2.0 U	**0.33 J**	<2.0 U	<2.1 U	**0.61 J**	<2.0 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<2.0 U	<2.0 U	**5.9**	**270**	**0.99 J**	**0.31 J**	**16 J**
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (F-53 Major)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
N-Ethyl perfluorooctane sulfonamide (N-EtFOSA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	**0.033 J**
N-Ethyl perfluorooctane sulfonamide ethanol (N-EtFOSE)	µg/kg	<0.19 U	<0.19 U	**0.053 J**	**0.13 J**	**0.086 J**	<0.21 U	**0.10 J**	**0.17 J**	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.046 J**	<0.21 U	**0.099 J**	<0.20 U	**0.063 J**
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	<1.9 U	<1.9 U	<2.0 U	<2.0 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<2.0 U	<2.0 U	<2.1 U	<2.1 U	<2.2 U	<2.0 U	**2.1**
N-Methyl perfluorooctane sulfonamide (N-MeFOSA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	**0.42**	**0.16 J**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	µg/kg	<1.9 U	<1.9 U	<2.0 U	<2.0 U	<2.0 U	<2.1 U	<2.0 U	<2.0 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<2.0 U	<2.0 U	<2.1 U	<2.1 U	<2.2 U	<2.0 U	<2.1 U
Perfluorobutane sulfonic acid (PFBS)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
Perfluorobutanoic acid (PFBA)	µg/kg	<0.21 UB	<0.26 UB	<0.20 UB	<0.20 U	<0.20 UB	<0.21 UB	<0.20 U	<0.20 UB	<0.19 UB	<0.20 UB	<0.21 UB	<0.19 UB	<0.20 UB	<0.20 UB	**0.52**	**1.5**	<0.22 UB	**0.47**	<0.40 UB
Perfluorodecane sulfonic acid (PFDS)	µg/kg	<0.19 U	**0.075 J**	<0.20 U	<0.20 U	**0.039 J**	**0.13 J**	**0.20**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	**0.11 J**
Perfluorodecanoic acid (PFDA)	µg/kg	**0.35**	**0.22**	**0.12 J**	**0.26**	**0.15 J**	**5.8 J+**	**0.36**	**0.14 J**	**0.11 J**	**0.19 J**	**0.32**	**0.12 J**	**1.0 J**	**2.0**	**3.0**	**9.5**	**0.99**	**1.1**	**6.4 J+**
Perfluorododecane sulfonic acid (PFDOS)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 UJ-
Perfluorododecanoic acid (PFDoA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	**0.26**	**0.094 J**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.13 J**	**0.17 J**	**0.098 J**	<0.20 U	**1.3**
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.045 J**	<0.21 U	<0.22 U	<0.20 U	<0.21 U
Perfluoroheptanoic acid (PFHpA)	µg/kg	**0.19**	**0.24**	**0.28**	**0.15 J**	**0.13 J**	**0.36**	**0.092 J**	**0.10 J**	**0.098 J**	**0.080 J**	**0.71**	**0.064 J**	**0.15 J**	**0.32**	**1.4**	**2.4**	**0.27**	**0.62**	**0.76**
Perfluorohexadecanoic acid (PFHxDA)	µg/kg	**0.046 J**	**0.044 J**	<0.20 UB	<0.20 UB	<0.20 UB	<0.21 U	<0.20 UB	<0.20 UB	<0.19 U	<0.20 UB	<0.21 UB	<0.19 U	<0.20 UB	<0.20 UB	<0.21 UB	<0.21 UB	<0.22 UB	<0.20 UB	**0.16 J**
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	**0.053 J**	**0.032 J**	**0.032 J**	**0.047 JN**	**0.034 JN**	**0.090 J**	<0.20 U	<0.20 U	<0.19 U	**0.055 J**	**0.038 J**	<0.19 U	<0.20 U	**0.037 J**	**0.33**	**0.057 JN**	**0.20 J**	<0.20 U	**0.10 J**
Perfluorohexanoic acid (PFHxA)	µg/kg	**0.22**	**0.67**	<0.26 UB	<0.20 UB	**0.18 J**	**0.63**	<0.20 UB	<0.20 UB	<0.19 UB	<0.20 UB	**0.23**	**0.16 J**	**0.40**	**0.17 J**	**0.97**	**3.6**	**0.35**	**1.3**	**0.88 J+**
Perfluorononane sulfonic acid (PFNS)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	**0.033 J**	**0.085 J**	**0.13 J**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	**0.050 J**
Perfluorononanoic acid (PFNA)	µg/kg	**0.40**	**0.63**	**0.15 J**	**0.18 J**	**0.11 J**	**0.23**	**0.086 J**	**0.090 J**	**0.15 J**	**0.11 J**	**0.28**	**0.042 J**	**0.063 J**	**1.2**	**13**	**4.1**	**1.0**	**0.29**	**2.1 J+**
Perfluorooctadecanoic acid	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	**0.035 J-**
Perfluorooctane sulfonamide (PFOSA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	**0.15 J**	**0.44**	**15**	**3.9**	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.099 J**	**0.20 J**	**0.18 J**	<0.20 U	**1.2**
Perfluorooctane sulfonic acid (PFOS)	µg/kg	**5.1**	**1.1**	**3.2**	**4.6**	**4.0**	**22 D**	**5.1**	**0.34 J**	**0.39 J**	**0.63**	**1.2**	**0.22 J**	**0.29 J**	**1.4**	**6.2**	**0.64**	**3.6**	**0.68**	**12**
Perfluorooctanoic acid (PFOA)	µg/kg	**0.30**	**0.20**	**0.57**	**1.0**	**1.0**	**29 D**	**3.2**	**0.27**	**0.28**	**0.65**	**0.43**	**2.5**	**9.1**	**0.66**	**13**	**74**	**5.9**	**7.8**	**6.2 J-**
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	<0.21 U
Perfluoropentanoic acid (PFPeA)	µg/kg	**0.28**	**0.61**	**0.34**	**0.28**	**0.18 J**	**0.21**	**0.15 J**	**0.16 J**	**0.17 J**	**0.15 J**	**0.21**	**0.13 J**	**0.17 J**	**0.12 J**	**1.2**	**2.0**	**0.76**	**1.6**	**0.66**
Perfluorotetradecanoic acid (PFTeA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	<0.21 U	<0.21 U	<0.22 U	<0.20 U	**0.46**
Perfluorotridecanoic acid (PFTrDA)	µg/kg	<0.19 U	<0.19 U	<0.20 U	<0.20 U	<0.20 U	<0.21 U	<0.20 U	<0.20 U	<0.19 U	<0.20 U	<0.21 U	<0.19 U	<0.20 U	<0.20 U	**0.094 J**	<0.21 U	**0.084 J**	<0.20 U	**0.58**
Perfluoroundecanoic acid (PFUdA)	µg/kg	**0.15 J**	**0.17 J**	**0.053 J**	**0.18 J**	**0.075 J**	**0.22**	**0.12 J**	**0.047 JN**	**0.042 J**	<0.20 U	<0.21 U	<0.19 U	**0.11 J**	<0.20 U	**1.1**	**1.9**	**0.58**	**0.16 J**	**3.3 J+**

Notes:
Detections are boldfaced
< = analyte not detected above corresponding method detection limit
FD = field duplicate sample type
µg/kg = micrograms per kilogram
N = normal sample type

Laboratory Qualifier
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample
D = Dilution required for sample analysis
UJ = The compound was not detected above the reported sample method detection limit. However, the reported limit is approximate and may or may not represent the actual method detection limit.
UB = Compound considered non-detect at the listed value due to associated blank contamination.
J- = The result is an estimated quantity. The associated numerical value is expected to have a negative or low bias.
J+ = The result is an estimated quantity. The associated numerical value is expected to have a positive or high bias.
JN = The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only

Table 3
Advanced Research and Testing Facility - Volatile Organic Compound Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Analyte	Industrial Direct Contact RCL	Soil to Groundwater Pathway RCL	Units	SP-01 7/13/2020	SP-02 7/28/2020	SP-03 7/13/2020	SP-04 7/13/2020	SP-05 7/13/2020	SP-06 7/13/2020	SP-07 7/13/2020	SP-08 7/13/2020	SP-09 7/13/2020	SP-10 7/13/2020	SP-11 7/13/2020	SP-12 7/13/2020	SP-13 7/13/2020	SP-14 7/13/2020
1,1,1,2-Tetrachloroethane	12,900	53.4	µg/kg	<44	<49	<45	<54	<52	<45	<51	<54	<45	<47	<48	<55	<50	<52
1,1,1-Trichloroethane	640,000	140.2	µg/kg	<36	<40	<37	<44	<43	<37	<42	<44	<37	<39	<39	<45	<41	<43
1,1,2,2-Tetrachloroethane	3,690	2	µg/kg	<38	<42	<39	<46	<45	<39	<44	<46	<38	<41	<41	<47	<43	<45
1,1,2-Trichloroethane	7,340	3.2	µg/kg	<33	<37	<34	<41	<40	<34	<39	<41	<34	<36	<37	<42	<38	<40
1,1-Dichloroethane	23,700	483.4	µg/kg	<39	<44	<40	<48	<46	<40	<45	<48	<40	<42	<43	<49	<44	<46
1,1-Dichloroethene	1,190,000	5	µg/kg	<37	<41	<38	<45	<44	<38	<43	<45	<38	<40	<41	<46	<42	<44
1,1-Dichloropropene	-	-	µg/kg	<28	<32	<29	<35	<34	<29	<33	<35	<29	<30	<31	<35	<32	<34
1,2,3-Trichlorobenzene	818,000	NS	µg/kg	<44	<49	<45	<53	<52	<45	<50	<53	<44	<47	<48	<54	<50	<52
1,2,3-Trichloropropane	95	51.9	µg/kg	<39	<44	<40	<48	<47	<41	<46	<48	<40	<42	<43	<49	<45	<47
1,2,4-Trichlorobenzene	98,700	408	µg/kg	<33	<36	<33	<40	<39	<33	<38	<40	<33	<35	<36	<40	<37	<39
1,2,4-Trimethylbenzene	219,000	1,382.1	µg/kg	**2,200**	<38	530	<42	<41	<35	<39	<42	<35	<37	<37	<42	<39	<41
1,2-Dibromo-3-chloropropane	99	0.2	µg/kg	<190	<210	<190	<230	<230	<190	<220	<230	<190	<200	<210	<240	<220	<230
1,2-Dibromoethane	230	0.0282	µg/kg	<37	<41	<38	<45	<44	<38	<42	<45	<37	<39	<40	<46	<42	<44
1,2-Dichlorobenzene	376,000	1,168	µg/kg	<32	<36	<32	<39	<38	<33	<37	<39	<32	<34	<35	<40	<36	<38
1,2-Dichloroethane	3,030	2.8	µg/kg	<37	<42	<38	<46	<44	<38	<43	<45	<38	<40	<41	<46	<43	<44
1,2-Dichloropropane	6,620	3.3	µg/kg	<41	<46	<42	<50	<49	<42	<47	<50	<41	<44	<44	<51	<46	<48
1,3,5-Trimethylbenzene	182,000	1,382.1	µg/kg	1,100	<40	380	<44	<43	<37	<42	<44	<37	<39	<39	<45	<41	<43
1,3-Dichlorobenzene	297,000	1,152.8	µg/kg	<38	<43	<39	<47	<45	<39	<44	<46	<39	<41	<42	<47	<43	<45
1,3-Dichloropropane	1,490,000	-	µg/kg	<34	<39	<35	<42	<41	<35	<40	<42	<35	<37	<38	<43	<39	<41
1,4-Dichlorobenzene	17,500	144	µg/kg	<35	<39	<35	<42	<41	<36	<40	<42	<35	<37	<38	<43	<39	<41
2,2-Dichloropropane	191,000	-	µg/kg	<42	<47	<43	<52	<50	<43	<49	<52	<43	<45	<46	<53	<48	<50
2-Chlorotoluene	907,000	-	µg/kg	<30	<33	<31	<37	<36	<31	<35	<36	<30	<32	<33	<37	<34	<36
4-Chlorotoluene	253,000	-	µg/kg	<33	<37	<34	<41	<40	<34	<38	<41	<34	<36	<36	<41	<38	<40
Benzene	7,410	5.1	µg/kg	<14	<16	<14	<17	<17	<14	<16	<17	<14	<15	<15	<17	<16	<17
Bromobenzene	679,000	-	µg/kg	<34	<38	<35	<41	<40	<35	<39	<41	<34	<36	<37	<42	<39	<40
Bromochloromethane	976,000	-	µg/kg	<41	<46	<42	<50	<49	<42	<47	<50	<41	<44	<44	<51	<46	<48
Bromodichloromethane	1,960	0.3	µg/kg	<35	<40	<36	<43	<42	<36	<41	<43	<36	<38	<39	<44	<40	<42
Bromoform	115,000	2.3	µg/kg	<46	<51	<47	<56	<55	<47	<53	<56	<47	<49	<50	<57	<52	<55
Bromomethane	46,000	5.1	µg/kg	<76	<85	<77	<93	<90	<78	<88	<92	<77	<81	<83	<94	<86	<90
Carbon Tetrachloride	4,250	3.9	µg/kg	<36	<41	<37	<45	<44	<38	<42	<45	<37	<39	<40	<45	<42	<43
CFC-11	1,230,000	4477.5	µg/kg	<41	<46	<42	<50	<49	<42	<47	<50	<41	<44	<44	<51	<46	<48
CFC-12	571,000	3,086.3	µg/kg	<64	<72	<66	<79	<76	<66	<74	<78	<65	<69	<70	<80	<73	<76
Chlorobenzene	761,000	135.8	µg/kg	<37	<41	<38	<45	<44	<38	<42	<45	<37	<39	<40	<46	<42	<44
Chlorodibromomethane	34,100	32	µg/kg	<46	<52	<47	<57	<55	<48	<54	<57	<47	<50	<51	<58	<53	<55
Chloroethane	2,120,000	226.6	µg/kg	<48	<54	<49	<59	<57	<49	<55	<58	<49	<52	<52	<60	<55	<57
Chloroform	2,130	3.3	µg/kg	<35	<39	<36	<43	<42	<36	<41	<43	<36	<38	<38	<44	<40	<42
Chloromethane	720,000	15.5	µg/kg	<30	<34	<31	<37	<36	<31	<35	<37	<31	<33	<33	<38	<35	<36
cis-1,2-Dichloroethene	2,040,000	41.2	µg/kg	<39	<43	<40	<48	<46	<40	<45	<47	<39	<42	<42	<48	<44	<46
cis-1,3-Dichloropropene	1,210,000	0.3	µg/kg	<40	<44	<40	<48	<47	<41	<46	<48	<40	<43	<43	<49	<45	<47
Cymene (p-Isopropyltoluene)	162,000	-	µg/kg	280	<39	130	<42	<41	<35	<40	<42	<35	<37	<38	<43	<39	<41
Dibromomethane	154,000	-	µg/kg	<26	<29	<26	<31	<31	<26	<30	<31	<26	<28	<28	<32	<29	<31
Dichloromethane	1,070,000	2.6	µg/kg	<150	<170	<160	<190	<180	<160	<180	190	<160	<170	<170	<190	<180	<180
Di-isopropyl ether	2,260,000	-	µg/kg	<26	<29	<27	<32	<31	<27	<30	<32	<27	<28	<29	<33	<30	<31
Ethylbenzene	37,000	1,570	µg/kg	300	<19	<18	<21	<21	<18	<20	<21	<18	<19	<19	<22	<20	<21
Hexachloro-1,3-butadiene	7,450	-	µg/kg	<42	<47	<43	<52	<51	<44	<49	<52	<43	<46	<46	<53	<48	<50
Isopropylbenzene	-	-	µg/kg	<36	<41	<37	<45	<44	<38	<42	<45	<37	<39	<40	<45	<42	<43
Methyl-tert-butylether	293,000	27	µg/kg	<37	<42	<38	<46	<45	<39	<43	<46	<38	<40	<41	<47	<43	<45

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Table 3
Advanced Research and Testing Facility - Volatile Organic Compound Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Analyte	Industrial Direct Contact RCL	Soil to Groundwater Pathway RCL	Units	SP-01 7/13/2020	SP-02 7/28/2020	SP-03 7/13/2020	SP-04 7/13/2020	SP-05 7/13/2020	SP-06 7/13/2020	SP-07 7/13/2020	SP-08 7/13/2020	SP-09 7/13/2020	SP-10 7/13/2020	SP-11 7/13/2020	SP-12 7/13/2020	SP-13 7/13/2020	SP-14 7/13/2020
Naphthalene	26,000	658.2	µg/kg	**1,200**	<36	51	<39	<38	<33	<37	<39	<32	<34	<35	<40	<36	41
n-Butylbenzene	108,000	-	µg/kg	<37	<41	<38	<45	<44	<38	<43	<45	<37	<40	<40	<46	<42	<44
n-Propylbenzene	264,000	-	µg/kg	210	<44	<40	<48	<47	<41	<46	<48	<40	<42	<43	<49	<45	<47
sec-Butylbenzene	145,000	-	µg/kg	180	<42	58	<46	<45	<39	<44	<46	<38	<41	<41	<47	<43	<45
Styrene (Monomer)	867,000	220.0	µg/kg	<37	<41	<38	<45	<44	<38	<42	<45	<37	<39	<40	<46	<42	<44
tert-Butylbenzene	183,000	-	µg/kg	<38	<42	<39	<46	<45	<39	<44	<46	<38	<41	<41	<47	<43	<45
Tetrachloroethene	153,000	4.5	µg/kg	<35	<39	<36	<43	<42	<36	<41	<43	<36	<38	<38	<44	<40	<42
Toluene	818,000	1,107.2	µg/kg	420	<16	27	<17	<17	<14	<16	<17	<14	<15	<15	<17	<16	<17
Total Xylenes	260,000	3,960	µg/kg	2,500	<23	250	<26	<25	<22	<24	<26	<21	<22	<23	<26	<24	<25
trans-1,2-Dichloroethene	1,850,000	62.6	µg/kg	<33	<37	<34	<41	<40	<34	<38	<41	<34	<36	<36	<41	<38	<40
trans-1,3-Dichloropropene	1,510,000	0.3	µg/kg	<34	<39	<35	<42	<41	<35	<40	<42	<35	<37	<38	<43	<39	<41
Trichloroethene	8,810	3.6	µg/kg	<16	<17	<16	<19	<19	<16	<18	<19	<16	<17	<17	<19	<18	<19
Vinyl chloride	2,030	0.1	µg/kg	<25	<28	<25	<31	<30	<26	<29	<30	<25	<27	<27	<31	<28	<30

Notes:
BOLD = Exceeds Soil to Groundwater Pathway RCL
< = analyte not detected above corresponding method detection limit
Italics = Exceeds Industrial Direct Contact RCL
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
µg/kg = micrograms per kilogram
NS = not sampled
RCL = Residual Contaminant Level
VOC = volatile organic compound

Table 3
Advanced Research and Testing Facility - Volatile Organic Compounds Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Analyte	Industrial Direct Contact RCL	Soil to Groundwater Pathway RCL	Units	SP-15 7/13/2020	SP-16 7/13/2020	SP-17 7/13/2020	SP-18 7/28/2020	SP-19 7/28/2020	SP-20 7/28/2020	SP-21 11/16/2020	SP-22 11/16/2020	SP-23 11/16/2020	SP-24 11/16/2020	SP-25 11/16/2020	SP-26 11/16/2020	BLDG-114 11/16/2020
1,1,1,2-Tetrachloroethane	12,900	53.4	µg/kg	<53	<55	<43	<45	<50	<50	<57	<52	<56	<69	<66	<130	<60
1,1,1-Trichloroethane	640,000	140.2	µg/kg	<44	<45	<35	<37	<41	<41	<57	<52	<56	<69	<66	<130	<60
1,1,2,2-Tetrachloroethane	3,690	2	µg/kg	<46	<47	<37	<39	<43	<43	<57	<52	<56	<69	<66	<130	<60
1,1,2-Trichloroethane	7,340	3.2	µg/kg	<41	<42	<33	<34	<38	<38	<57	<52	<56	<69	<66	<130	<60
1,1-Dichloroethane	23,700	483.4	µg/kg	<47	<49	<38	<40	<44	<45	<57	<52	<56	<69	<66	<130	<60
1,1-Dichloroethene	1,190,000	5	µg/kg	<45	<46	<36	<38	<42	<43	<57	<52	<56	<69	<66	<130	<60
1,1-Dichloropropene	-	-	µg/kg	<34	<36	<28	<29	<32	<33	<57	<52	<56	<69	<66	<130	<60
1,2,3-Trichlorobenzene	818,000	NS	µg/kg	<53	<55	<42	<45	<49	<50	<57	<52	<56	<69	<66	<130	<60
1,2,3-Trichloropropane	95	51.9	µg/kg	<48	<49	<38	<40	<45	<45	<110	<100	<110	<140	<130	<270	<120
1,2,4-Trichlorobenzene	98,700	408	µg/kg	<40	<41	<32	<33	<37	<37	<57	<52	<56	<69	<66	<130	<60
1,2,4-Trimethylbenzene	219,000	1,382.1	µg/kg	<41	<43	<33	<35	<39	<39	<57	<52	<56	<69	<66	<130	<60
1,2-Dibromo-3-chloropropane	99	0.2	µg/kg	<230	<240	<180	<190	<210	<220	<290	<260	<280	<340	<330	<670	<300
1,2-Dibromoethane	230	0.0282	µg/kg	<45	<46	<36	<38	<42	<42	<57	<52	<56	<69	<66	<130	<60
1,2-Dichlorobenzene	376,000	1,168	µg/kg	<39	<40	<31	<33	<36	<36	<57	<52	<56	<69	<66	<130	<60
1,2-Dichloroethane	3,030	2.8	µg/kg	<45	<47	<36	<38	<42	<43	<57	<52	<56	<69	<66	<130	<60
1,2-Dichloropropane	6,620	3.3	µg/kg	<50	<51	<40	<42	<46	<47	<57	<52	<56	<69	<66	<130	<60
1,3,5-Trimethylbenzene	182,000	1,382.1	µg/kg	<44	<45	<35	<37	<41	<41	<57	<52	<56	<69	<66	<130	<60
1,3-Dichlorobenzene	297,000	1,152.8	µg/kg	<46	<48	<37	<39	<43	<44	<57	<52	<56	<69	<66	<130	<60
1,3-Dichloropropane	1,490,000	-	µg/kg	<42	<43	<34	<35	<39	<39	<57	<52	<56	<69	<66	<130	<60
1,4-Dichlorobenzene	17,500	144	µg/kg	<42	<43	<34	<35	<39	<40	<57	<52	<56	<69	<66	<130	<60
2,2-Dichloropropane	191,000	-	µg/kg	<51	<53	<41	<43	<48	<48	<57	<52	<56	<69	<66	<130	<60
2-Chlorotoluene	907,000	-	µg/kg	<36	<37	<29	<31	<34	<34	<57	<52	<56	<69	<66	<130	<60
4-Chlorotoluene	253,000	-	µg/kg	<40	<42	<32	<34	<38	<38	<57	<52	<56	<69	<66	<130	<60
Benzene	7,410	5.1	µg/kg	<17	<17	<14	<14	<16	<16	<14	<13	<14	<17	<16	<34	<15
Bromobenzene	679,000	-	µg/kg	<41	<42	<33	<35	<38	<39	<57	<52	<56	<69	<66	<130	<60
Bromochloromethane	976,000	-	µg/kg	<50	<51	<40	<42	<46	<47	<57	<52	<56	<69	<66	<130	<60
Bromodichloromethane	1,960	0.3	µg/kg	<43	<44	<34	<36	<40	<41	<57	<52	<56	<69	<66	<130	<60
Bromoform	115,000	2.3	µg/kg	<56	<58	<45	<47	<52	<53	<57	<52	<56	<69	<66	<130	<60
Bromomethane	46,000	5.1	µg/kg	<92	<95	<74	<78	<86	<87	<170	<160	<170	<210	<200	<400	<180
Carbon Tetrachloride	4,250	3.9	µg/kg	<44	<46	<36	<37	<41	<42	<57	<52	<56	<69	<66	<130	<60
CFC-11	1,230,000	4477.5	µg/kg	<50	<51	<40	<42	<46	<47	<57	<52	<56	<69	<66	<130	<60
CFC-12	571,000	3,086.3	µg/kg	<78	<80	<62	<66	<73	<74	<170	<160	<170	<210	<200	<400	<180
Chlorobenzene	761,000	135.8	µg/kg	<45	<46	<36	<38	<42	<42	<57	<52	<56	<69	<66	<130	<60
Chlorodibromomethane	34,100	32	µg/kg	<56	<58	<45	<48	<53	<53	<57	<52	<56	<69	<66	<130	<60
Chloroethane	2,120,000	226.6	µg/kg	<58	<60	<47	<49	<54	<55	<57	<52	<56	<69	<66	<130	<60
Chloroform	2,130	3.3	µg/kg	<43	<44	<34	<36	<40	<40	<110	<100	<110	<140	<130	<270	<120
Chloromethane	720,000	15.5	µg/kg	<37	<38	<30	<31	<35	<35	<57	<52	<56	<69	<66	<130	<60
cis-1,2-Dichloroethene	2,040,000	41.2	µg/kg	<47	<49	<38	<40	<44	<45	<57	<52	<56	<69	<66	<130	<60
cis-1,3-Dichloropropene	1,210,000	0.3	µg/kg	<48	<50	<39	<41	<45	<45	<57	<52	<56	<69	<66	<130	<60
Cymene (p-Isopropyltoluene)	162,000	-	µg/kg	<42	<43	<34	<35	<39	<39	<57	<52	<56	<69	<66	<130	<60
Dibromomethane	154,000	-	µg/kg	<31	<32	<25	<26	<29	<29	<57	<52	<56	<69	<66	<130	<60
Dichloromethane	1,070,000	2.6	µg/kg	<190	<190	<150	<160	<180	<180	**250 J**	**240 J**	**260 J**	**310 J**	**290 J**	**600 J**	**280 J**
Di-isopropyl ether	2,260,000	-	µg/kg	<32	<33	<26	<27	<30	<30	<57	<52	<56	<69	<66	<130	<60
Ethylbenzene	37,000	1,570	µg/kg	<21	<22	<17	<18	<20	<20	<14	<13	<14	<17	<16	<34	<15
Hexachloro-1,3-butadiene	7,450	-	µg/kg	<52	<53	<41	<43	<48	<49	<57	<52	<56	<69	<66	<130	<60
Isopropylbenzene	-	-	µg/kg	<44	<46	<36	<37	<41	<42	<57	<52	<56	<69	<66	<130	<60
Methyl-tert-butylether	293,000	27	µg/kg	<46	<47	<37	<38	<43	<43	<57	<52	<56	<69	<66	<130	<60

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Table 3
Advanced Research and Testing Facility - Volatile Organic Compounds Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

Analyte	Industrial Direct Contact RCL	Soil to Groundwater Pathway RCL	Units	SP-15 7/13/2020	SP-16 7/13/2020	SP-17 7/13/2020	SP-18 7/28/2020	SP-19 7/28/2020	SP-20 7/28/2020	SP-21 11/16/2020	SP-22 11/16/2020	SP-23 11/16/2020	SP-24 11/16/2020	SP-25 11/16/2020	SP-26 11/16/2020	BLDG-114 11/16/2020
Naphthalene	26,000	658.2	µg/kg	<39	<40	<31	<33	<36	<36	<57	<52	<56	<69	<66	<130	<60
n-Butylbenzene	108,000	-	µg/kg	<45	<46	<36	<38	<42	<42	<57	<52	<56	<69	<66	<130	<60
n-Propylbenzene	264,000	-	µg/kg	<48	<49	<38	<40	<45	<45	<57	<52	<56	<69	<66	<130	<60
sec-Butylbenzene	145,000	-	µg/kg	<46	<47	<37	<39	<43	<43	<57	<52	<56	<69	<66	<130	<60
Styrene (Monomer)	867,000	220.0	µg/kg	<45	<46	<36	<38	<42	<42	<57	<52	<56	<69	<66	<130	<60
tert-Butylbenzene	183,000	-	µg/kg	<46	<47	<37	<39	<43	<43	<57	<52	<56	<69	<66	<130	<60
Tetrachloroethene	153,000	4.5	µg/kg	<43	<44	<34	<36	<40	<40	<57	<52	<56	<69	<66	<130	<60
Toluene	818,000	1,107.2	µg/kg	<17	<18	<14	<14	53	580	<14	<13	<14	<17	<16	<34	<15
Total Xylenes	260,000	3,960	µg/kg	<25	<26	<20	<21	<24	<24	<29	<26	<28	<34	<33	<67	<30
trans-1,2-Dichloroethene	1,850,000	62.6	µg/kg	<40	<42	<32	<34	<38	<38	<57	<52	<56	<69	<66	<130	<60
trans-1,3-Dichloropropene	1,510,000	0.3	µg/kg	<42	<43	<34	<35	<39	<39	<57	<52	<56	<69	<66	<130	<60
Trichloroethene	8,810	3.6	µg/kg	<19	<20	<15	<16	<18	<18	<29	<26	<28	<34	<33	<67	<30
Vinyl chloride	2,030	0.1	µg/kg	<30	<31	<24	<26	<28	<29	<57	<52	<56	<69	<66	<130	<60

Notes:
BOLD = Exceeds Soil to Groundwater Pathway RCL
< = analyte not detected above corresponding method detection limit
Italics = Exceeds Industrial Direct Contact RCL
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
µg/kg = micrograms per kilogram
NS = not sampled
RCL = Residual Contaminant Level
VOC = volatile organic compound

Table 4
Advanced Research and Testing Facility - Per- and Poly-Fluoroalkyl Substances Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

			SP-01	SP-02	SP-03	SP-04	SP-05	SP-06	SP-07	SP-08	SP-09	SP-10	SP-11	SP-12
Analyte	Analyte	Units	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020
Perfluorobutanoic acid	PFBA	µg/kg	<22	4.0 J B	86 B	3.4 B	2.6 B	1.5 B	2.2 B	1.8 B	29 B	66 B	25 B	9.6 B
Perfluoropentanoic acid	PFPeA	µg/kg	<22	<22	12 J	3.8	4.2	1.9	2.4	3.5	12	64	5.8	12
Perfluorohexanoic acid	PFHxA	µg/kg	24	10 J	35	9.5	4.0	2.1	1.9	2.8	36	65	14	10
Perfluoroheptanoic acid	PFHpA	µg/kg	15 J	12 J	39	5.4	1.6	0.83	0.55	0.90 J	5.6 J	6.2 J	1.7 J	2.0 J
Perfluorooctanoic acid	PFOA	µg/kg	1,500.0 J	1,300	4,800	700.0	54.0	7.20	5.9	7.2	370	66 J	76.0	26.0
Perfluorononanoic acid	PFNA	µg/kg	4.4 J	7.9 J	24	2.0	1.9	1.6	0.84	1.3	2.7 J	3.3 J	2.0 J	2.1 J
Perfluorodecanoic acid	PFDA	µg/kg	18.0 J	31	69	4.0	1.7	0.98	1.0	1.4	13	12 J	6.1	3.2
Perfluoroundecanoic acid	PFUnA	µg/kg	<22	<22	<22	0.58	0.91	0.83	0.87	1.4	5.7 J	4.9 J	3.4 J	1.8 J
Perfluorododecanoic acid	PFDoA	µg/kg	<22	<22	<22	0.45	0.29	0.17 J	0.23 J	<1.1	7.6 J	7.1 J	4.2 J	1.4 J
Perfluorotridecanoic acid	PFTriA	µg/kg	<22	<22	<22	0.12 J	0.11 J	0.092 J	0.10 J	<1.1	<11	<13	<5.3	<2.7
Perfluorotetradecanoic acid	PFTeA	µg/kg	<22	<22	<22	<0.28	0.058 J	0.062 J	0.087 J	<1.1	3.6 J	<13	2.3 J	<2.7
Perflouro-n-hexadecanoic acid	PFHxDA	µg/kg	<22	<22	<22	<0.28	0.051 J	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluoro-n-octadecanoic acid	PFODA	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluorobutansulfonic acid	PFBS	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluoropentanesulfonic acid	PFPeS	µg/kg	<22	<22	<22	0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluorohexanesulfonic acid	PFHxS	µg/kg	3.7 J	7.1 J	32	3.0	0.19 J	0.11 J	0.070 J	<1.1	<11	<13	<5.3	<2.7
Perfluoroheptanesulfonic acid	PFHpS	µg/kg	5.3 J	11.0 J	74	2.2	0.11 J	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluorooctancesulfonic acid	PFOS	µg/kg	870.0 J	1,500.0 J	5,700	180.0	27.00 J	6.00 J	4.000 J	<3.8	<67	<17	<26.0	<14.0
Perfluorononanesulfonic acid	PFNS	µg/kg	<22	<22	6.1 J	0.15 J	0.047 J	0.025 J	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluorodecanesulfonic acid	PFDS	µg/kg	<22	<22	6.1 J	0.33	0.26	0.30	0.076 J	<1.1	<11	<13	<5.3	<2.7
Perfluorododecanesulfonic acid	PFDoS	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
Perfluorooctanesulfonamide	FOSA	µg/kg	230	450	1,400	57	8.3	0.88	0.75	0.84 J	22	<13	8.9	2.7
NEtFOSA	NEtFOSA	µg/kg	<22	<22	<22	0.051 J	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
NMeFOSA	NMeFOSA	µg/kg	<22	<22	<22	0.46	0.056 J	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
N-methlyperfluorooctanesulfonamidoacetic acid	NMeFOSAA	µg/kg	<220	<220	<220	<2.8	<2.0	<2.1	<2.8	<11	<110	<130	<53	<27
N-ethlyperfluorooctanesulfonamidoacetic acid	NEtFOSAA	µg/kg	<220	<220	<220	1.6 J	0.44 J	<2.1	2.80	<11	<110	<130	<53	<27
NMeFOSE	NMeFOSE	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
NEtFOSE	NEtFOSE	µg/kg	<22	<22	<22	0.12 J	0.12 J	0.058 J	0.094 J	0.86 J	<11	<13	<5.3	<2.7
4:2 FTS	4:2 FTS	µg/kg	<220	<220	<220	<2.8	<2.0	<2.1	<2.8	<11	<110	<130	<53	<27
6:2 FTS	6:2 FTS	µg/kg	25 J	31 J	78 J	22	33	29	21	37	490	620	320	130
8:2 FTS	8:2 FTS	µg/kg	<220	<220	<220	4.6	10	5.9	7.9	7.9 J	350	430	260	69
10:2 FTS	10:2 FTS	µg/kg	<22	<22	<22	0.96	1.80	1.20	2.0	2.3	170	180	130	34
4,8-Dioxa-3H-perfluorononanoic acid	DONA	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
HFPO-DA (GenX)	HFPO-DA (GenX)	µg/kg	<27	<27	<28	<0.35	<0.25	<0.26	<0.35	<1.4	<14	<16	<6.6	<3.4
F-53B Major	F-53B Major	µg/kg	<22	<22	<22	<0.28	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7
F-53B Minor	F-53B Minor	µg/kg	<22	<22	<22	<2.80	<0.20	<0.21	<0.28	<1.1	<11	<13	<5.3	<2.7

Notes:
< = analyte not detected above corresponding method detection limit
B = Compound was found in the blank and sample.
J = Reported value was between the limit of detection and the limit of quantitation.
µg/kg = micrograms per kilogram

Table 4
Advanced Research and Testing Facility - Per- and Poly-Fluoroalkyl Substances Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

			SP-13	SP-14	SP-15	SP-16	SP-17	SP-18	SP-19	SP-20	SP-21	SP-22	SP-23	SP-24
Analyte	Analyte	Units	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	7/28/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020
Perfluorobutanoic acid	PFBA	µg/kg	2.5 B	0.17 J B	39 B	1.5 B	29 B	12 B	1.6 J B	1.9 B	0.19 J	0.95	0.38	2.4
Perfluoropentanoic acid	PFPeA	µg/kg	4.7	0.22 J	7.5 J	2.9	10	<11	<2.5	2.8	0.34	3.40	1.2	4.9
Perfluorohexanoic acid	PFHxA	µg/kg	2.1	0.13 J	21	1.6	22	8.5 J	1.0 J	1.6	0.22	2.30	1.2	2.9
Perfluoroheptanoic acid	PFHpA	µg/kg	1.2	0.072 J	1.9 J	0.95	3.3 J	1.8 J	<2.5	0.85	0.23	0.58	0.48	1.5
Perfluorooctanoic acid	PFOA	µg/kg	1.50	0.21 J	9	1.20	8.0	6.2 J	1.5 J	1.4	0.20 J	3.80 J	1.10	1.7
Perfluorononanoic acid	PFNA	µg/kg	1.8	0.28	5.1 J	1.5	1.8 J	2.6 J	1.2 J	0.99	0.50	0.28	0.51	3.5
Perfluorodecanoic acid	PFDA	µg/kg	0.87	0.12 J	16	0.92	7.4	6.9 J	2.1 J	1.0	0.15 J	0.34 J	0.48	2.1
Perfluoroundecanoic acid	PFUnA	µg/kg	0.50	0.048 J	3.4 J	0.84	3.5 J	2.9 J	<2.5	0.76	0.038 J	0.10 J	0.061 J	1.8
Perfluorododecanoic acid	PFDoA	µg/kg	0.16 J	<0.23	7.0 J	0.18 J	2.9 J	3.9 J	<2.5	0.18 J	<0.21	0.14 J	<0.20	0.98
Perfluorotridecanoic acid	PFTriA	µg/kg	0.068 J	<0.23	<10	0.078 J	<5.3	<11	<2.5	0.078 J	<0.21	<0.20	<0.20	0.29
Perfluorotetradecanoic acid	PFTeA	µg/kg	0.078 J	<0.23	2.8 J	<0.24	1.4 J	<11	<2.5	<0.25	<0.21	0.056 J	<0.20	0.32
Perflouro-n-hexadecanoic acid	PFHxDA	µg/kg	0.061 J	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	0.11 J
Perfluoro-n-octadecanoic acid	PFODA	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluorobutansulfonic acid	PFBS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluoropentanesulfonic acid	PFPeS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluorohexanesulfonic acid	PFHxS	µg/kg	0.072 J	<0.23	<10	0.076 J	<5.3	<11	<2.5	0.044 J	<0.21	0.034 J	0.036 J	0.12 J
Perfluoroheptanesulfonic acid	PFHpS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluorooctancesulfonic acid	PFOS	µg/kg	4.000 J	<1.10	<26	3.100 J	<6.6	<27	<2.7	2.000 J	<0.42	2.700 J	4.100 J	3.00 J
Perfluorononanesulfonic acid	PFNS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluorodecanesulfonic acid	PFDS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	0.090 J
Perfluorododecanesulfonic acid	PFDoS	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
Perfluorooctanesulfonamide	FOSA	µg/kg	<0.26	<0.23	<10	0.11 J	<5.3	<11	<2.5	0.20 J	<0.21	0.71	<0.20	0.16 J
NEtFOSA	NEtFOSA	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
NMeFOSA	NMeFOSA	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
N-methlyperfluorooctanesulfonamidoacetic acid	NMeFOSAA	µg/kg	<2.6	<2.3	<100	<2.4	<53.0	<110	<25	<2.5	<2.1	<2.0	<2.0	<2.0
N-ethlyperfluorooctanesulfonamidoacetic acid	NEtFOSAA	µg/kg	<2.6	<2.3	<100	<2.4	<53.0	<110	<25	<2.5	<2.1	<2.0	<2.0	<2.0
NMeFOSE	NMeFOSE	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
NEtFOSE	NEtFOSE	µg/kg	0.17 J	0.23	<10	0.28	<5.3	<11	<2.5	0.46	<0.21	<0.20	<0.20	<0.20
4:2 FTS	4:2 FTS	µg/kg	<2.6	<2.3	<100	<2.4	<53.0	<110	<25	<2.5	<2.1	<2.0	<2.0	<20
6:2 FTS	6:2 FTS	µg/kg	8.4	1.2 J	570	12	460	400	38	17	2.9	12	14	44
8:2 FTS	8:2 FTS	µg/kg	4.3	0.62 J	500	4.1	370	380	89	3.5	0.78 J	14	2.6	12 J
10:2 FTS	10:2 FTS	µg/kg	0.77	0.13 J	90	1.2	64	62	7.4	1.2	<0.21	3.5	1.1	7.4
4,8-Dioxa-3H-perfluorononanoic acid	DONA	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
HFPO-DA (GenX)	HFPO-DA (GenX)	µg/kg	<0.32	<0.28	<13	<0.30	<6.6	<13	<3.1	<0.31	<0.26	<0.25	<0.24	<0.26
F-53B Major	F-53B Major	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20
F-53B Minor	F-53B Minor	µg/kg	<0.26	<0.23	<10	<0.24	<5.3	<11	<2.5	<0.25	<0.21	<0.20	<0.20	<0.20

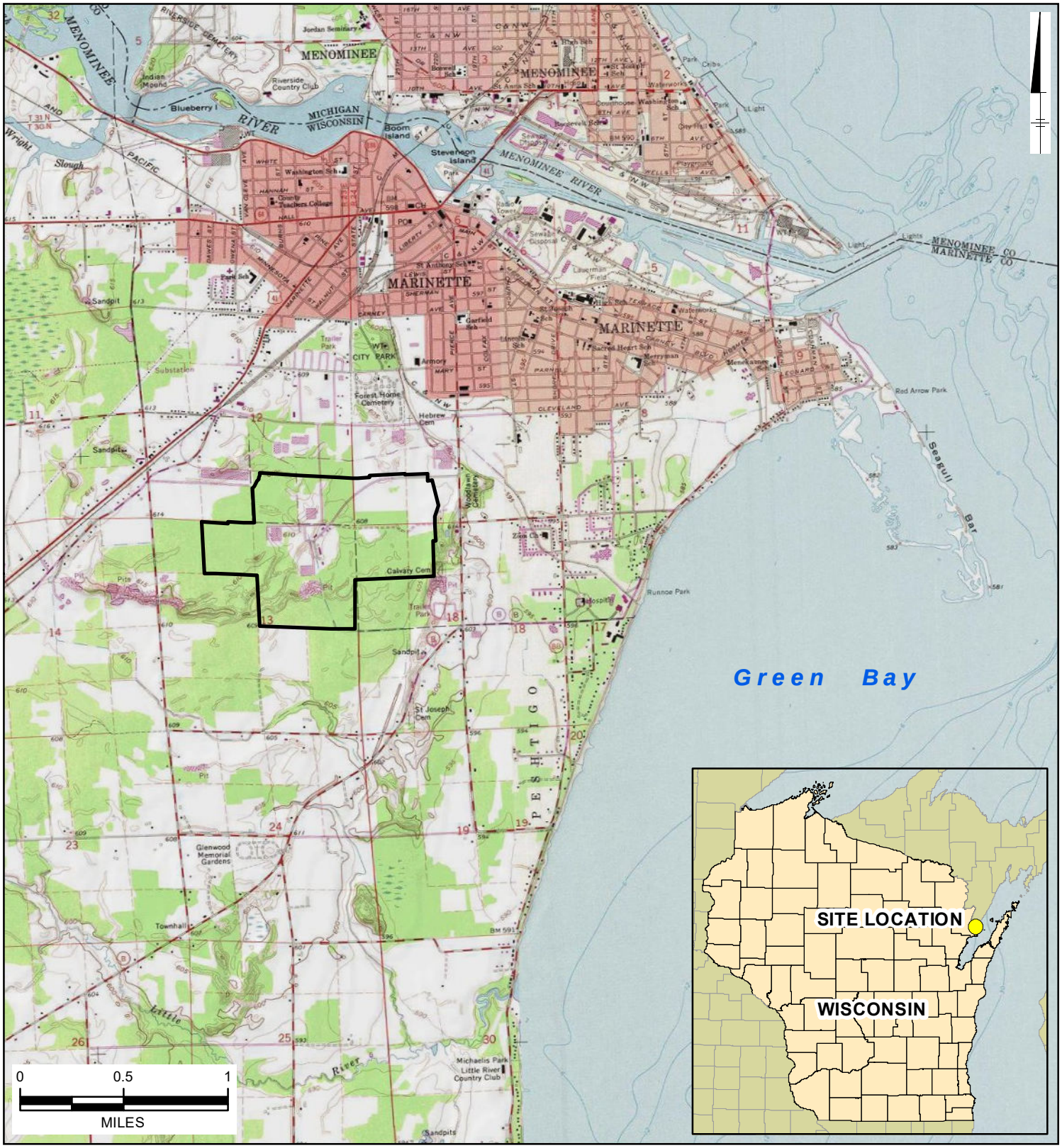
Notes:
< = analyte not detected above corresponding method detection limit
B = Compound was found in the blank and sample.
J = Reported value was between the limit of detection and the limit of quantitation.
µg/kg = micrograms per kilogram

Table 4
Advanced Research and Testing Facility - Per- and Poly-Fluoroalkyl Substances Data
Soil Interim Remedial Action Design Report
Marinette, Wisconsin

			SP-25	SP-26	Bldg 114	B115 Soil (Inside)	B115 Soil (Outside)
Analyte	Analyte	Units	11/16/2020	11/16/2020	11/16/2020	7/28/2020	7/28/2020
Perfluorobutanoic acid	PFBA	µg/kg	6.6	1.6	2.0	110 B	0.93 B
Perfluoropentanoic acid	PFPeA	µg/kg	14	4.8	0.63	97	1.3
Perfluorohexanoic acid	PFHxA	µg/kg	14	2.2	3.4	290	1.3
Perfluoroheptanoic acid	PFHpA	µg/kg	4.2	0.73	0.39	20	0.83
Perfluorooctanoic acid	PFOA	µg/kg	15.0	0.70 J	1.90	230	2.6
Perfluorononanoic acid	PFNA	µg/kg	5.0	0.20 J	0.14 J	7.9 J	7.4
Perfluorodecanoic acid	PFDA	µg/kg	9.3	0.17 J	0.89	58	0.77
Perfluoroundecanoic acid	PFUnA	µg/kg	6.8	<0.21	0.37	4.5 J	0.25
Perfluorododecanoic acid	PFDoA	µg/kg	4.7	<0.21	0.61	34	0.12 J
Perfluorotridecanoic acid	PFTriA	µg/kg	1.2	<0.21	0.18 J	<2.5	<0.054
Perfluorotetradecanoic acid	PFTeA	µg/kg	1.4	<0.21	0.37	14	<0.058
Perflouro-n-hexadecanoic acid	PFHxDA	µg/kg	0.16 J	<0.21	0.36	<2.1	<0.047
Perfluoro-n-octadecanoic acid	PFODA	µg/kg	<0.21	<0.21	0.20	<1.4	<0.030
Perfluorobutansulfonic acid	PFBS	µg/kg	<0.21	<0.21	<0.20	<1.2	<0.027
Perfluoropentanesulfonic acid	PFPeS	µg/kg	<0.21	<0.21	<0.20	<0.98	<0.021
Perfluorohexanesulfonic acid	PFHxS	µg/kg	0.38	<0.21	<0.20	<1.5	0.16 J
Perfluoroheptanesulfonic acid	PFHpS	µg/kg	0.920 J I	<0.21	<0.20	<1.7	0.12 J
Perfluorooctancesulfonic acid	PFOS	µg/kg	25.00	<1.70	<0.27	<9.4	6.5 B
Perfluorononanesulfonic acid	PFNS	µg/kg	0.058 J	<0.21	<0.20	<0.98	<0.021
Perfluorodecanesulfonic acid	PFDS	µg/kg	0.076 J	<0.21	0.068 J	<1.9	<0.042
Perfluorododecanesulfonic acid	PFDoS	µg/kg	<0.21	<0.21	<0.20	<2.9	<0.064
Perfluorooctanesulfonamide	FOSA	µg/kg	2.80	<0.21	<0.20	<4.0	<0.088
NEtFOSA	NEtFOSA	µg/kg	<0.21	<0.21	0.032 J	<1.2	<0.026
NMeFOSA	NMeFOSA	µg/kg	0.048 J	<0.21	<0.20	<2.0	<0.044
N-methlyperfluorooctanesulfonamidoacetic acid	NMeFOSAA	µg/kg	<2.1	<2.1	<2.0	<19	<0.42
N-ethlyperfluorooctanesulfonamidoacetic acid	NEtFOSAA	µg/kg	0.66 J	<2.1	0.61 J	<18	<0.39
NMeFOSE	NMeFOSE	µg/kg	<0.21	<0.21	<0.20	<3.5	<0.076
NEtFOSE	NEtFOSE	µg/kg	<0.21	<0.21	<0.20	<1.8	0.065 J
4:2 FTS	4:2 FTS	µg/kg	1.1 J	<2.1	1.1 J	<18	<0.39
6:2 FTS	6:2 FTS	µg/kg	540	5.2	110	700	5.3
8:2 FTS	8:2 FTS	µg/kg	560	1.8 J	250	600	1.2 J
10:2 FTS	10:2 FTS	µg/kg	37	0.10 J	36	82	0.12 J J
4,8-Dioxa-3H-perfluorononanoic acid	DONA	µg/kg	<0.21	<0.21	<0.20	<0.88	<0.019
HFPO-DA (GenX)	HFPO-DA (GenX)	µg/kg	<0.27	<0.26	<0.25	<5.4	0.13 J
F-53B Major	F-53B Major	µg/kg	<0.21	<0.21	<0.20	<1.3	<0.029
F-53B Minor	F-53B Minor	µg/kg	<0.21	<0.21	<0.20	<1.1	<0.023

Notes:
< = analyte not detected above corresponding method detection limit
B = Compound was found in the blank and sample.
J = Reported value was between the limit of detection and the limit of quantitation.
µg/kg = micrograms per kilogram

Figures



LEGEND:

APPROXIMATE SITE PROPERTY BOUNDARY

NOTE:

1. TOPOGRAPHIC MAP SOURCE: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED APRIL 2020.

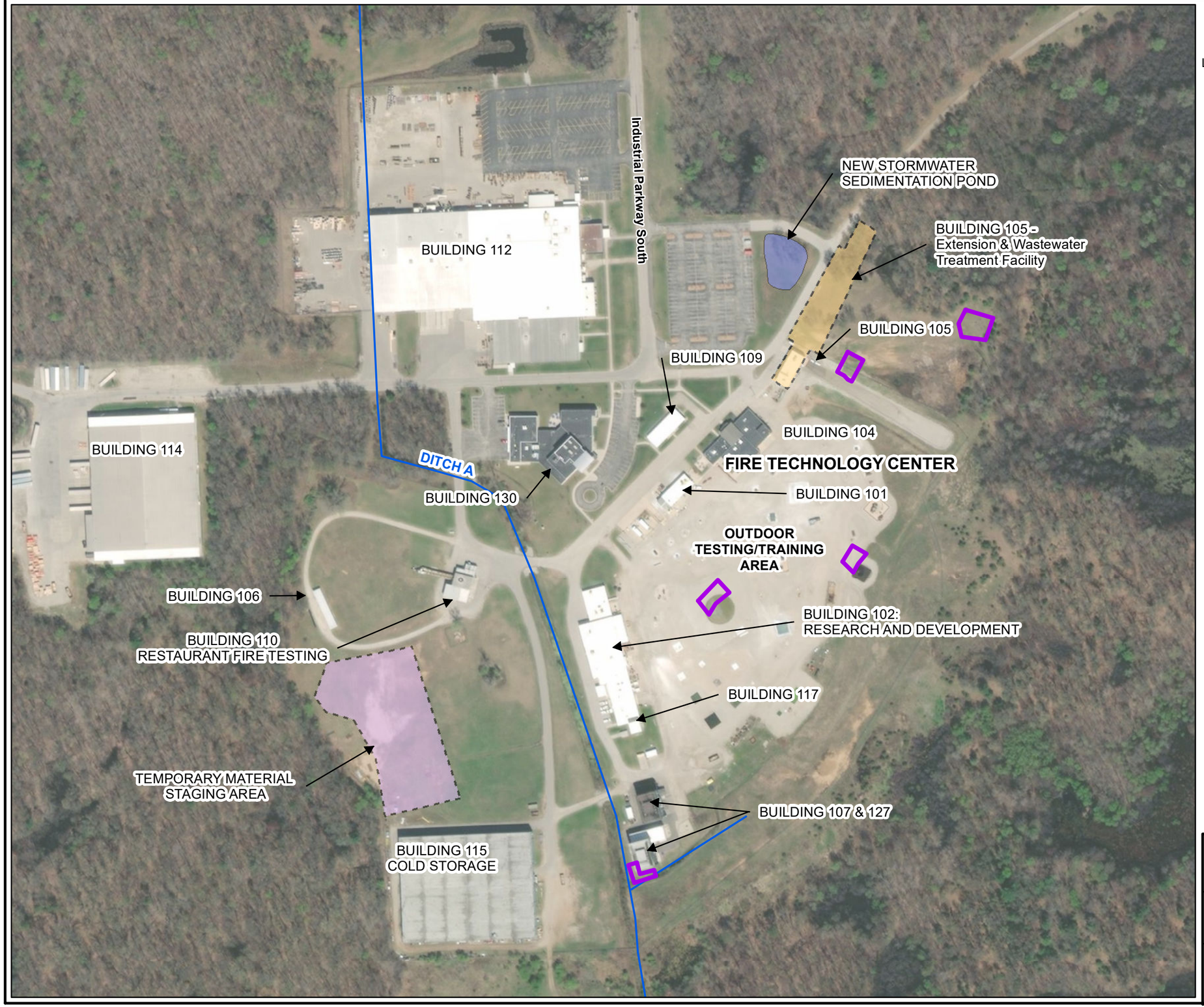
TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN

SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

SITE LOCATION

ARCADIS

FIGURE
1



LEGEND:

- DITCH/STREAM
- PROPOSED EXCAVATION AREA

NOTE:

1. IMAGERY SOURCE: 4/27/2016, DIGITALGLOBE, VIVID - USA.

0 225 450

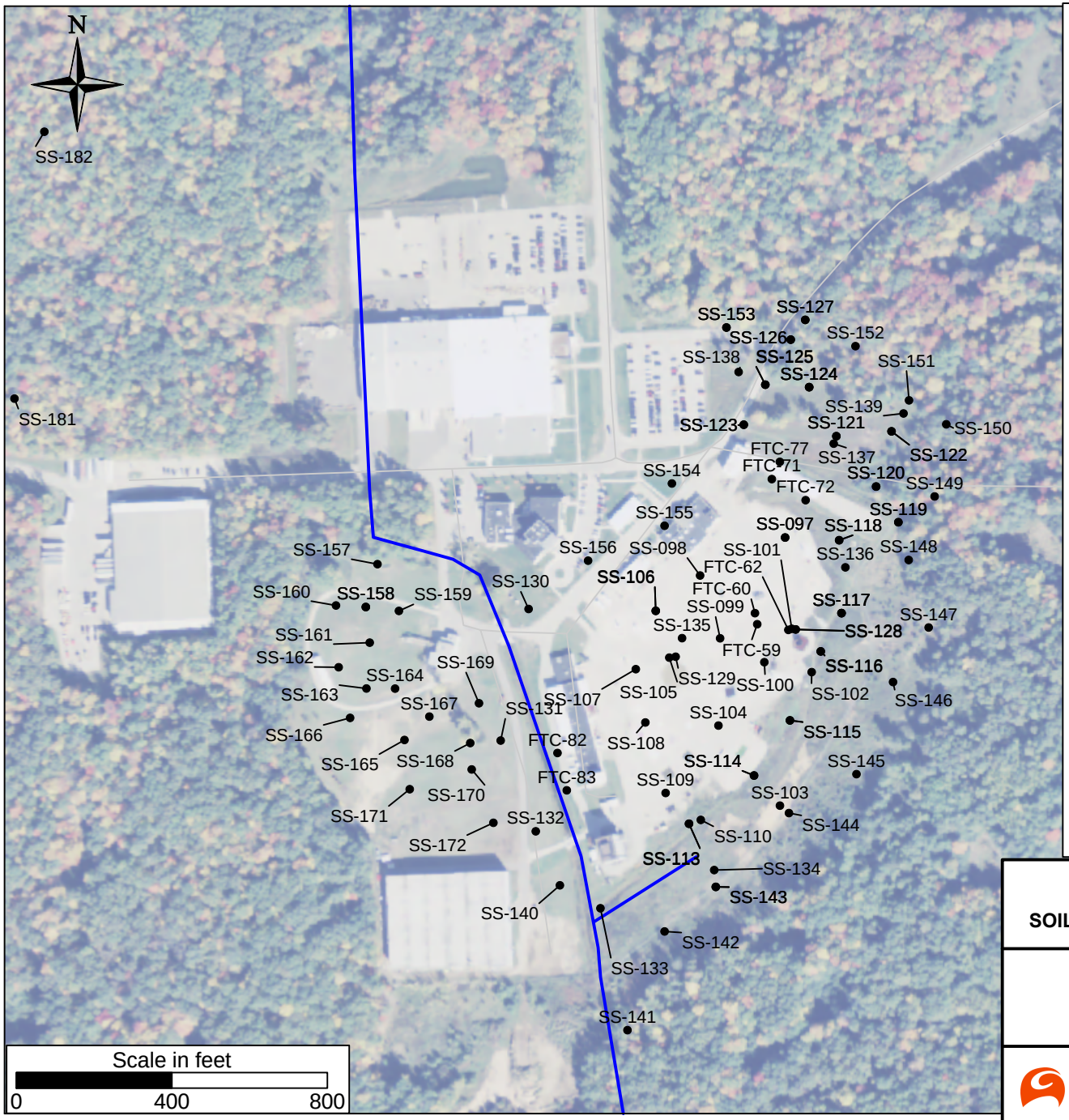
GRAPHIC SCALE IN FEET

TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

SITE LAYOUT

ARCADIS

FIGURE
2



Legend

FTC-60 ● Soil Boring Location

— Ditch

Note:

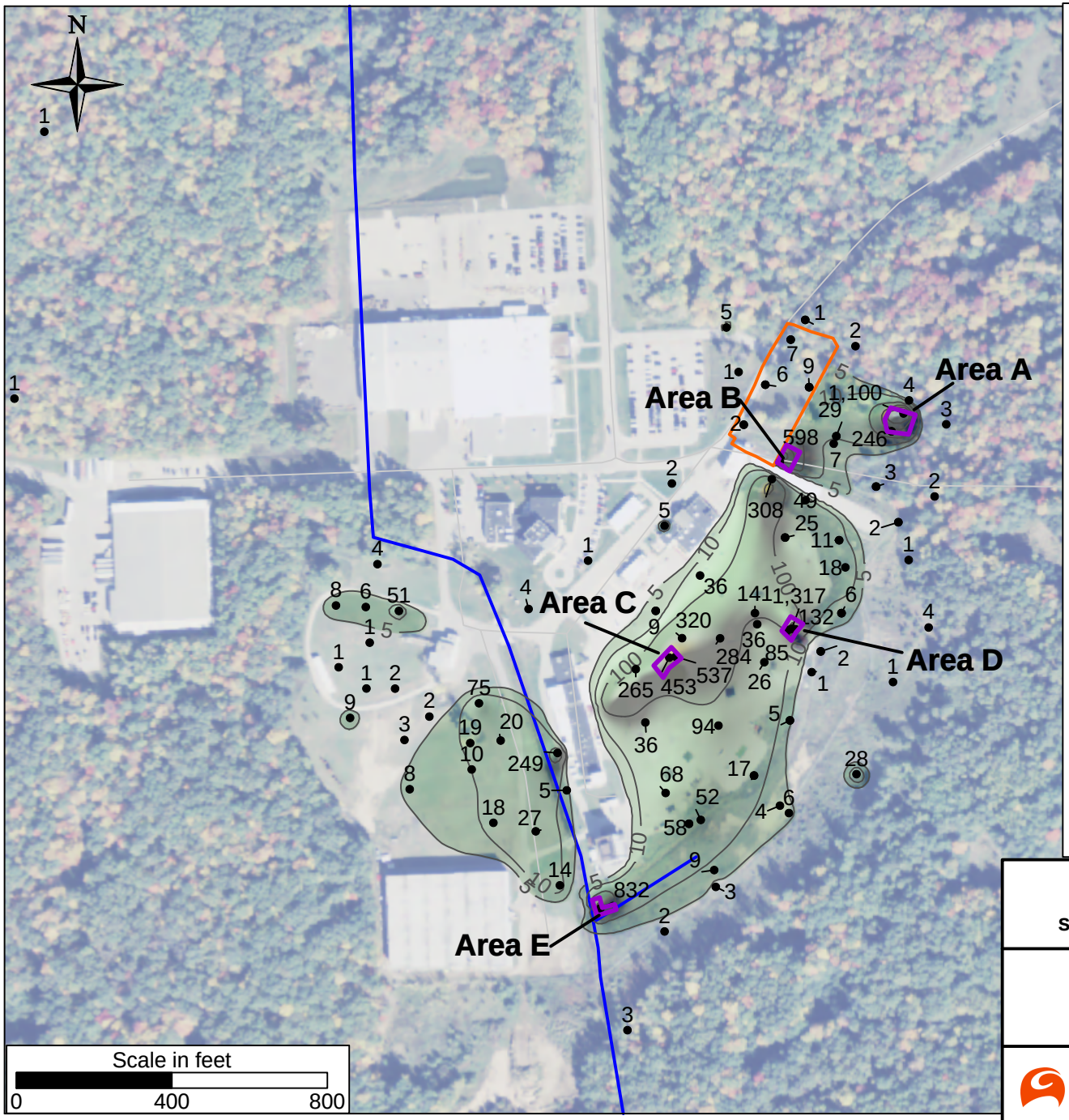
1. Aerial map from USGS.

TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

OTA SOIL SAMPLE LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3



Legend

832 Soil Boring Location (PFOA +PFOS Concentration shown)

Remediation Area

Ditch

Building 105 Excavation

PFOA+PFOS Soil Concentration (µg/kg)

1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
5

Notes:

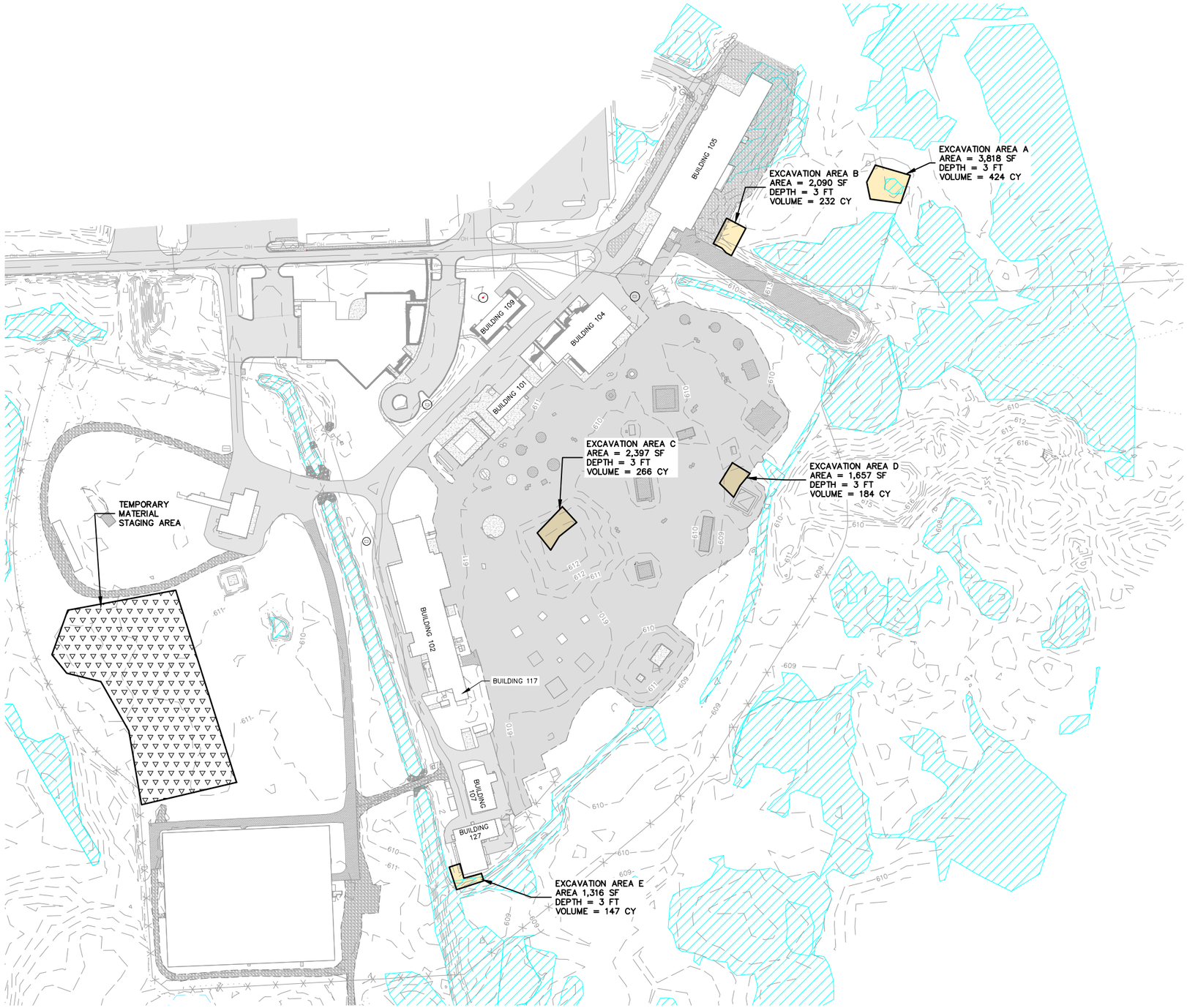
1. µg/kg = microgram per kilogram
2. Aerial map from USGS.
3. Soil data represent depths ranging from existing ground surface to the groundwater table (0 to 4 ft below ground surface).
4. PFOA+PFOS concentrations represent the concentrations at a given location.

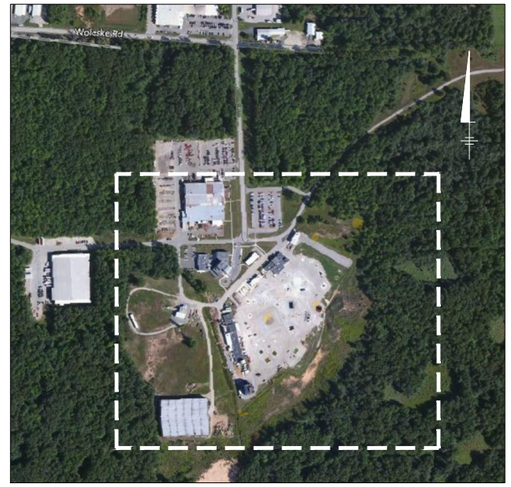
TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

OTA SOIL SAMPLE RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4





LEGEND

- LIMITS OF WETLANDS
- FTC DITCH A
- EXISTING CONTOUR
- LIMITS OF PROPOSED EXCAVATION
- TEMPORARY MATERIAL STAGING AREA
- LIMITS OF EXISTING GRAVEL AREA
- LIMITS OF EXISTING ASPHALT PAVING

0 100' 200'
GRAPHIC SCALE

TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

PROPOSED LIMITS OF EXCAVATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

Appendix A

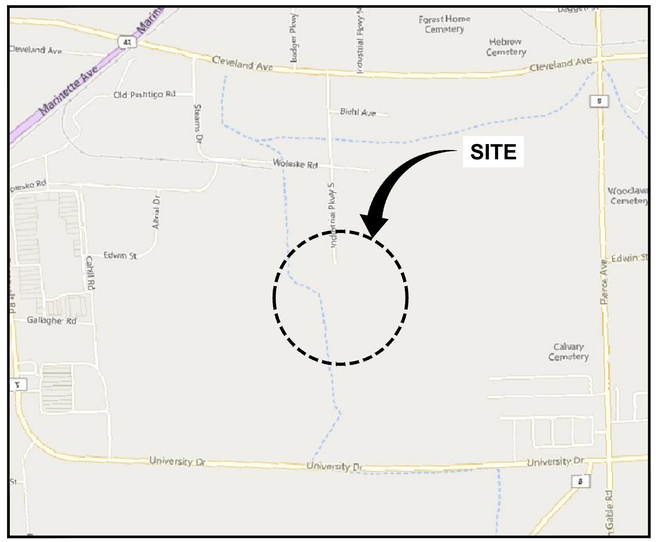
Design Drawings – Soil Interim Remedial Action

DESIGN DRAWINGS

SOIL INTERIM REMEDIAL ACTION

TYCO - FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN

DATE ISSUED
MARCH 2021



LOCATION MAP
0 1000' 2000'
GRAPHIC SCALE

INDEX TO DRAWINGS

ARCADIS
ARCADIS U.S., INC.

GENERAL SITE PLAN
0 500' 1000'
GRAPHIC SCALE

ARCADIS

LEGAL ENTITY:
ARCADIS U.S., INC.

COPYRIGHT: 2020

CONSULTANTS

REVISIONS

NO.	DATE	ISSUED FOR	BY

SEALS

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW, NOT FOR CONSTRUCTION

PROJECT STATUS:
PRELIMINARY

DATE: MARCH 2021
PROJECT NO.: 30075729
DESIGNED BY: PB
DRAWN BY: GS
CHECKED BY: _

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

CLIENT PROJ. NO.

SHEET TITLE
GENERAL

TITLE AND INDEX

SCALE:
AS SHOWN
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:
G-1

SHEET NO.: ____ OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\IRM-SOIL-DESIGN-DR-G01-COVER.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:15:18 Plot Date: Steinberger, George; 3/12/2021; 17:38 ; Layout:G-1

LEGEND:

- EXISTING GROUND SURFACE ELEVATION CONTOUR (610)
- LIMIT OF DISTURBANCE (LOD)
- PROPOSED TEMPORARY FENCE
- PROPOSED SILT FENCE (SF)
- PROPOSED EXCAVATION AREAS
- STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY MATERIAL STAGING AREA
- PROPOSED CONTOUR (611)
- CONTROL POINT (CP-A1)
- TOPSOIL AND HYDROSEED RESTORATION LIMITS
- GRAVEL RESTORATION LIMITS
- EXISTING GAS LINE (G)
- EXISTING ELECTRIC (E)
- EXISTING HEPTANE FUEL LINE (HEP)
- EXISTING SEWER/STORM DRAIN (S)
- ASPHALT AREA
- CONCRETE AREA
- GRAVEL AREA
- LIMITS OF WETLANDS
- BUSH/SHRUB
- TREE
- LIGHT POLE
- SIGN (SIGN)
- ELECTRIC PEDESTAL
- POWER POLE
- UTILITY VAULT

- INLET
- STORM MANHOLE (SS)
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- WATER VALVE
- POST (MISC.)
- BOLLARD (B)
- POLE (MISC.)
- MONITORING WELL
- PEDESTAL (MISC.) (P)
- VALVE (MISC.)
- MISCELLANEOUS POINTS
- BENCHMARK

GENERAL NOTES

1. SITE FEATURES, INCLUDING BUILDINGS, ROADS, WELLS, AND UTILITIES WERE SURVEYED BY COLEMAN ENGINEERING COMPANY, AUTOCAD FILE Johnson Controls–Site Topo–Coleman–January 2021.dwg, DATED 2/5/2021.
2. HORIZONTAL DATUM IS NAD 83 (2011) – WISCONSIN STATE PLANE, CENTRAL ZONE, US FEET.
3. VERTICAL DATUM IS NAVD88, US FEET.
4. PROPERTY LINES ARE APPROXIMATE. EASEMENTS AND RIGHT–OF–WAYS MAY NOT BE SHOWN.
5. THE CONTRACTOR WILL PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE ENGINEER AND OWNER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.
6. THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

ACRONYMS AND ABBREVIATIONS:

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CFR	CODE OF FEDERAL REGULATIONS
DGA	DENSE GRADED AGGREGATE
ETC	ET CETERA
FTC	FIRE TECHNOLOGY CENTER
HASP	HEALTH AND SAFETY PLAN
JSA	JOB SAFETY ANALYSIS
LOD	LIMIT OF DISTURBANCE
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
OSHA	OCCUPATION SAFETY AND HEALTH ADMINISTRATION
PSI	POUNDS PER SQUARE INCH
REBAR/BAR	REINFORCING STEEL
SDS	SAFETY DATA SHEET
WDNR	WISCONSIN DEPARTMENT OF NATURAL RESOURCES

SEQUENCE OF CONSTRUCTION

1. REVIEW THE EXISTING BASELINE SURVEY OF THE PROJECT SITE TO VERIFY THE LOCATION OF ALL ONSITE UTILITIES, BUILDINGS, EXISTING MONITORING WELLS, AND MAJOR TOPOGRAPHIC FEATURES.
2. PROTECT ONSITE UTILITIES AND MONITORING WELLS IN THE PROJECT AREA BY CLEARLY MARKING AND FLAGGING THEIR LOCATIONS TO MINIMIZE THE POTENTIAL FOR INADVERTENT DAMAGE BY CONSTRUCTION–RELATED EQUIPMENT. PROTECTION MAY INCLUDE THE PLACEMENT OF ROAD PLATES, STAKES AND HIGH–VISIBILITY TEMPORARY FENCING AROUND THE MONITORING WELLS SO THAT THEY ARE CLEARLY VISIBLE TO EQUIPMENT OPERATORS.
3. INSTALL INLET PROTECTION WITHIN ALL OPEN GRATES LOCATED ON THE PROJECT SITE WHERE APPLICABLE.
4. INSTALL EROSION CONTROLS AROUND THE PERIMETER OF THE EXCAVATION AREA(S) AND AROUND ANY AREAS IN WHICH EXCAVATED MATERIAL WILL BE HANDLED AND/OR STAGED.
5. ESTABLISH STAGING AREAS FOR CONTRACTOR EQUIPMENT, STORAGE CONTAINERS AND CLEAN FILL STOCKPILES. THE ANTICIPATED LOCATIONS OF THE STAGING AREAS TO BE DETERMINED IN THE FIELD IN CONSULTATION WITH ENGINEER AND FACILITY.
6. EXCAVATE MATERIAL AS PRESENTED ON THESE DESIGN DRAWINGS. EXCAVATED MATERIAL SHALL BE DIRECTLY LOADED INTO TRUCKS FOR TRANSPORTATION AND OFF–SITE DISPOSAL OR RELOCATED TO THE TEMPORARY MATERIALS STAGING AREA FOR STOCKPILING PRIOR TO OFF–SITE DISPOSAL.
7. BACKFILL WITH CLEAN FILL DAILY TO ELIMINATE THE NEED FOR DEWATERING.
8. PERFORM MATERIAL LOADOUT OF EXISTING STOCKPILED MATERIALS AND MATERIALS EXCAVATED ON THESE DESIGN DRAWINGS.
9. IMMEDIATELY UPON COMPLETION OF BACKFILL AND MATERIAL LOADOUT, DISMANTLE THE TEMPORARY MATERIAL STAGING AREA AND PERFORM FINAL RESTORATION ACTIVITIES IN ACCORDANCE WITH THESE DESIGN DRAWINGS.
10. REMOVE THE EROSION CONTROLS AND DEMOBILIZE ALL EQUIPMENT AND REMAINING MATERIAL FROM THE SITE.

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REVISIONS

NO.	DATE	ISSUED FOR	BY

SEALS

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PROJECT STATUS:

PRELIMINARY

DATE: MARCH 2021
PROJECT NO.: 30075729
DESIGNED BY: PB
DRAWN BY: GS
CHECKED BY: .

CLIENT PROJ. NO.

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

SHEET TITLE

CIVIL

LEGEND, SEQUENCE OF CONSTRUCTION, AND GENERAL NOTES

SCALE:
AS SHOWN
0 BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:

C-1

SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\IRM-SOIL-DESIGN-DR-C01-C03-NOTES.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:15:32 Plot Date: Steinberger, George; 3/12/2021; 17:38 ; Layout:C-1

1.0 INTRODUCTION

THE ENCLOSED DESIGN DRAWINGS AND SPECIFICATIONS CONTAIN INFORMATION FOR THE SOILS INTERIM REMEDIAL ACTION AT THE TYCO FIRE TECHNOLOGY CENTER (FTC) ON INDUSTRIAL PARKWAY IN MARINETTE, WISCONSIN. THE DRAWING SET COVER SHEET PROVIDES A LIST OF DRAWINGS THAT ARE REQUIRED FOR REMEDIAL CONSTRUCTION.

OWNER: TYCO

ENGINEER: ARCADIS US Inc.

CONTRACTOR: TO BE DETERMINED

2.0 HEALTH AND SAFETY REQUIREMENTS:

2.1 THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF HIS PERSONNEL AND SUBCONTRACTOR PERSONNEL. THE CONTRACTOR SHALL CONFORM TO THE ENGINEER'S AND OWNER'S SAFETY PROGRAM REQUIREMENTS. AT A MINIMUM THE CONTRACTOR SHALL: (A) DEVELOP AND HAVE AVAILABLE SITE–SPECIFIC HEALTH AND SAFETY PLAN (HASP) WHICH CONFORMS TO THE ENGINEER'S AND OWNER'S STANDARDS; (B) DEVELOP AND HAVE AVAILABLE ON–SITE JOB SAFETY ANALYSIS (JSAs) OUTLINING THE TASKS TO BE PERFORMED, THE JOB STEPS, THE HAZARDS, AND THE MITIGATING PROCEDURES TO MINIMIZE RISK AND MAXIMIZE SAFETY; AND, (C) CONDUCT AND DOCUMENT A TAILGATE SAFETY MEETING EACH MORNING AND AFTERNOON WHEN SITE WORK IS TO BE PERFORMED.

2.2 WORK HOURS SHALL BE DURING DAYLIGHT HOURS ONLY, UNLESS APPROVED BY THE OWNER AND ENGINEER PRIOR TO THE WORK BEING PERFORMED. WEEKEND WORK WILL NOT BE ALLOWED, UNLESS APPROVED BY OWNER AND ENGINEER PRIOR TO THE WORK BEING PERFORMED.

2.3 THE CONTRACTOR SHALL HAVE SUFFICIENT QUANTITIES AND QUALITY OF HARD HATS, GOGGLES, SAFETY GLASSES, REFLECTIVE VESTS, AND GLOVES ON SITE TO OUTFIT ALL CONTRACTOR WORKERS, AND PROVIDE FOR A SECURE WORK AREA.

2.4 A PRE–CONSTRUCTION SAFETY MEETING SHALL BE HELD AT THE SITE WITHIN TWO WEEKS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION. THE PRE–CONSTRUCTION SAFETY MEETING SHALL BE ATTENDED BY OWNER, THE ENGINEER, THE CONTRACTOR, AND OTHER INTERESTED PARTIES.

2.5 THE CONTRACTOR WILL PROVIDE EVIDENCE OF ALL ONSITE PERSONNEL COMPLETING OSHA 40–HOUR TRAINING AND 8–HOUR REFRESHER TRAINING AND MAINTAIN COPIES ONSITE, PRIOR TO INITIATING REMEDIAL CONSTRUCTION ACTIVITIES.

2.6 THE CONTRACTOR WILL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OSHA OF 1970 (PL 91–596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91–54) AND AMENDMENTS THERETO. THE CONTRACTOR WILL COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910 AND 29 CFR 1926.

2.7 THE CONTRACTOR WILL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL EXCAVATION SHORING/BRACING, SCAFFOLDING, SHIELDING, DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, PROPER WORKING EQUIPMENT WITH FUNCTIONING SAFETY MECHANISMS (E.G., LIFT GATE WARNING SIGNALS), ALL SITE SAFETY SIGNAGE, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, THE CONTRACTOR WILL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS TO SECURE SUCH PROTECTION.

2.8 THE CONTRACTOR WILL PROVIDE A LIST OF ALL CHEMICAL PRODUCTS AND A SAFETY DATA SHEET (SDS) FOR ALL CHEMICAL PRODUCTS TO BE BROUGHT ON–SITE. THE LIST MUST BE APPROVED BY THE OWNER PRIOR TO BEING BROUGHT ON–SITE.

3.0 SITE ACCESS & TRAFFIC CONTROL:

3.1 THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY TRAFFIC CONTROL MEASURES AS NECESSARY TO COMPLETE THE WORK.

3.2 THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SAFE AND ADEQUATE VEHICLE/EQUIPMENT ACCESS AND EGRESS TO THE WORK SITE TO FACILITATE THE EXCAVATION OF MATERIALS TO THE HORIZONTAL AND VERTICAL LIMITS IDENTIFIED OR AS DIRECTED BY THE ENGINEER.

4.0 SURVEY:

4.1 THE CONTRACTOR WILL ESTABLISH AND MAINTAIN SURVEY CONTROL DURING THE PERFORMANCE OF WORK.

4.2 SURVEY DOCUMENTATION OF PRE–CONSTRUCTION AND RESTORED CONDITIONS WILL BE PREPARED AND CERTIFIED BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF WISCONSIN. CONTRACTOR WILL PROVIDE AN ELECTRONIC COPY OF THE SURVEY (AUTOCAD 2020 OR EARLIER) IN ADDITION TO RECORD DRAWINGS STAMPED BY PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF WISCONSIN AT PROJECT COMPLETION.

4.3 SURVEY WILL BE ON A MAXIMUM 5' X 5' GRID (CONSISTENT POSITIONS FOR PRE– AND POST–CONSTRUCTION) AND AT EXCAVATION AREA BOUNDARIES. THE CONTRACTOR SHALL COLLECT A MINIMUM OF FOUR SURVEY CONTROL POINTS. ADDITIONAL SURVEY WILL ALSO BE PERFORMED AT ABRUPT CHANGES IN GRADE.

4.4 THE ACCURACY OF ALL SURVEY LAYOUT DATA SHALL BE PLUS OR MINUS ONE TENTH (0.1) FOOT HORIZONTAL AND ONE TENTH (0.1) FOOT VERTICAL, UNLESS OTHERWISE SPECIFIED.

4.5 TOPOGRAPHY SHALL BE PREPARED WITH 1 FOOT CONTOURS.

4.6 SURVEY DOCUMENTATION TO BE PERFORMED BY A LICENSED SURVEYOR IN THE STATE OF WISCONSIN INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING: (A) TOP OF EXCAVATION (PRE–CONSTRUCTION GRADE); (B) BOTTOM OF EXCAVATION; (C) FINAL GRADES OF ALL DISTURBED AREAS (POST–CONSTRUCTION GRADE); AND, (D) COMPACTION TEST LOCATIONS WHERE APPLICABLE.

5.0 EXISTING UTILITIES AND SITE CONDITIONS:

5.1 THE CONTRACTOR SHALL REVIEW THE DESIGN DRAWINGS, AND FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.

5.2 THE CONTRACTOR WILL PROMPTLY NOTIFY THE FACILITY AND ENGINEER UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE THAT DIFFER FROM THOSE INDICATED.

5.3 THE CONTRACTOR WILL NOTIFY WISCONSIN DIGGERS HOTLINE (811) AT LEAST 3 BUSINESS DAYS IN ADVANCE OF ANY LAND DISTURBANCE ACTIVITY.

5.4 UNDERGROUND UTILITIES SHOWN ARE COMPILED FROM PLANS OF RECORD AND MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. ADDITIONAL SITE FEATURES AND UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN THAT MUST BE VERIFIED IN CONJUNCTION WITH THE ENGINEER.

5.5 THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL UNDERGROUND AND OVERHEAD UTILITIES FOR THE DURATION OF THE WORK UNLESS OTHERWISE CALLED OUT ON THE CONTRACT DRAWINGS. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING: (A) INDUSTRIAL PRE–TREATMENT SYSTEM PIPING; (B) ELECTRICAL – CONTROL POWER; (C) HEPTANE FUEL PIPING AND VALVES; (D) PROPANE FUEL PIPING AND VALVES; AND (E) MONITORING WELL(S).

5.6 THE CONTRACTOR IS RESPONSIBLE FOR SUBCONTRACTING/COORDINATING WITH AN APPROPRIATE PRIVATE UTILITY LOCATOR TO LOCATE AND IDENTIFY UNDERGROUND UTILITIES WITHIN PROPERTY LIMITS.

5.7 ALL UTILITY CLEARANCE AND RELOCATION IF NECESSARY, SHALL BE COMPLETED BY THE CONTRACTOR PRIOR TO EXCAVATION TO AVOID POTENTIAL STANDBY TIME.

6.0 EROSION AND SEDIMENTATION CONTROL:

6.1 THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY EROSION CONTROLS THROUGHOUT CONSTRUCTION IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND THE EROSION CONTROL DETAILS WITHIN THE EROSION CONTROL PLAN.

6.2 THE CONTRACTOR IS RESPONSIBLE EROSION CONTROL MEASURES REQUIRED BY REGULATORY AUTHORITY REGARDLESS OF WHETHER OR NOT THEY ARE EXPLICITLY STATED HEREIN. THE CONTRACTOR SHOULD REVIEW THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR) STORMWATER CONSTRUCTION TECHNICAL STANDARDS FOR POTENTIALLY APPLICABLE EROSION CONTROL MEASURES AND BEST MANAGEMENT PRACTICES.

6.3 THE CONTRACTOR WILL INSTALL EROSION CONTROL MEASURES PRIOR TO DISTURBING EXISTING SITE SURFACES.

6.4 ALL STORM DRAINAGE INLETS WILL HAVE INLET PROTECTION INSTALLED AND INLET PROTECTION WILL REMAIN UNTIL PERMANENT STABILIZATION HAS BEEN ESTABLISHED.

6.5 ALL EROSION CONTROL DEVICES WILL BE INSPECTED DAILY AND MAINTAINED AS NECESSARY FOR THE DURATION OF THE PROJECT. ALL PRACTICAL PRECAUTIONS WILL BE USED TO PREVENT EROSION OR DEPOSITION OF SEDIMENTS OFFSITE BY RUNOFF OR WIND.

6.6 THE CONTRACTOR WILL UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE AT ALL TIMES. REFUSE, DEBRIS AND WASTE MATERIALS WILL NOT UNDER ANY CIRCUMSTANCES BE PLACED WITHIN ANY AREA NOT IDENTIFIED FOR SUCH PURPOSE. ALL CONSTRUCTION REFUSE, DEBRIS AND WASTE MATERIALS WILL BE DISPOSED OF PROMPTLY AND PROPERLY.

6.7 EQUIPMENT AND MATERIAL WILL BE STORED IN A MANNER AND LOCATION THAT WILL MINIMIZE POTENTIAL ENVIRONMENTAL IMPACTS. ANY EQUIPMENT USED IN THE STAGING OR EXCAVATION AREAS THAT USES FUEL, OIL OR HYDRAULIC FLUID WILL BE INSPECTED DAILY FOR LEAKAGE. ANY EQUIPMENT REPAIR, FUEL STORAGE AND/OR REFUELING OF VEHICLES WILL BE CONDUCTED AT A CONTAINED LOCATION OUTSIDE OF THE EXCAVATION AREA.

6.8 THE CONTRACTOR WILL DEVELOP A SPILL MANAGEMENT PLAN FOR ANY HAZARDOUS MATERIALS THAT MAY BE EMPLOYED DURING WORK. SPECIFICALLY, THE CONTRACTOR SHOULD BE PREPARED TO DEAL EFFECTIVELY WITH SPILLAGE OF FUEL OR HYDRAULIC FLUIDS FROM EQUIPMENT. APPROPRIATE SPILL MANAGEMENT EQUIPMENT WILL BE STORED IN A DRY READILY ACCESSIBLE AREA AND USED IN THE EVENT PETROLEUM BASED FLUIDS ARE SPILLED OR LEAKED. THE SPENT MATERIAL IS THEN TO BE CONTAINERIZED AND DISPOSED OF PROPERLY BY THE CONTRACTOR.

6.9 THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO MATCH THE PRE–CONSTRUCTION CONDITIONS AND THE SURROUNDING AREA. THIS INCLUDES BUT IS NOT LIMITED TO CONCRETE PAVING.

6.10 REFER TO DRAWINGS C–9 AND C–10 FOR ADDITIONAL EROSION AND SEDIMENTATION CONTROL NOTES, DETAILS, AND SPECIFICATIONS.

7.0 DUST AND ODOR CONTROL:

7.1 THE CONTRACTOR WILL CONTROL DUST AND ODOR GENERATED DURING THE PROJECT IN ACCORDANCE WITH THE AMBIENT AIR MONITORING PLAN. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING DUST AND ODOR CONTROLS. THE CONTRACTOR WILL BE RESPONSIBLE FOR COSTS ASSOCIATED WITH PROJECT DELAYS ASSOCIATED WITH UNCONTROLLED DUST AND ODOR EMISSIONS.

7.2 DUST AND ODOR CONTROL MEASURES WILL COMPLY WITH THE FOLLOWING MANAGEMENT PRACTICE: (A) WATERING ACTIVE DEMOLITION/CONSTRUCTION AREAS, IF NEEDED; (B) COVERING TRUCKS THAT WILL HAUL SOIL AND OTHER LOOSE MATERIALS; (C) CLEANING TRUCKS AND TIRES TO MINIMIZE THE TRACKING OF DRY MATERIALS ONTO LOCAL ROADS; (D) COVERING STOCKPILES AT THE END OF EACH WORKDAY AND WHEN NOT IN USE; AND COVERING ROLL–OFFS AT THE END OF EACH WORKDAY AND WHEN NOT IN USE.

8.0 EXCAVATION:

8.1 THE CONTRACTOR WILL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO EXCAVATE MATERIAL AND BACKFILL TO THE HORIZONTAL AND VERTICAL LIMITS IDENTIFIED IN THE FIGURES.

8.2 ALL MECHANIZED EQUIPMENT OPERATION (I.E., BACKHOE, EXCAVATOR, OR OTHER POWERED EQUIPMENT) SHALL BE PERFORMED BY COMPETENT PERSONNEL AND/OR PERSONNEL LICENSED TO PERFORM SUCH WORK. ALL CONSTRUCTION SHALL BE PERFORMED BY TRAINED PERSONNEL OPERATING UNDER A LICENSED CONTRACTOR.

8.3 THE CONTRACTOR WILL SUBMIT AN EXCAVATION PLAN AS PART OF THE WORK PLAN. THIS PLAN WILL INCLUDE THE FOLLOWING AT A MINIMUM: (A) A DESCRIPTION OF THE EQUIPMENT TO BE UTILIZED FOR EXCAVATION WORK, INCLUDING THE AMOUNT, TYPE, AND CAPABILITIES OF EACH EQUIPMENT; (B) A DESCRIPTION OF HANDLING, SIZING, PROCESSING, SEGREGATING CONCRETE AND DEBRIS; (C) METHODS TO CONTROL SIDEWALL SLOUGHING AND MINIMIZE WATER IN EXCAVATION; (D) METHODS TO ASSURE THE DESIGN EXCAVATION GRADES ARE ACHIEVED AND BACKFILL MATERIAL PLACED; (E) MEASURES TO AVOID OR MINIMIZE POSSIBLE SPILLAGE DURING LOADING, TRANSPORT, AND UNLOADING PROCEDURES; AND, (F) THE NUMBER AND TYPE OF TRUCKS TO BE USED FOR MATERIAL TRANSPORT.

8.4 THE HORIZONTAL LIMITS OF EXCAVATION ACTIVITIES WILL BE PHYSICALLY DELINEATED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR EXECUTING AND VERIFYING THE SPECIFIED EXCAVATION ELEVATION IS REACHED AND DOCUMENTED BY SURVEY.

8.5 THE CONTRACTOR WILL TAKE APPROPRIATE STEPS TO PROTECT THE STABILITY OF SLOPES NEAR THE EXCAVATION AREA. THE CONTRACTOR WILL REPAIR ANY DAMAGE RESULTING FROM EXCAVATION OPERATIONS, TRANSPORT OF EXCAVATED MATERIAL, OR OTHER CONSTRUCTION ACTIVITIES TO ITS ORIGINAL CONDITION (I.E., CONDITIONS THAT EXISTED PRIOR TO THE DAMAGE).

8.6 PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS WILL BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING IMPORTED BACKFILL MATERIAL. DURING REMEDIAL ACTIVITIES, ALL MATERIALS STORED OR DELIVERED TO THE TEMPORARY MATERIAL STAGING AREAS SHALL BE STORED OR CONTAINED IN CONTAINERS APPROPRIATE FOR THE STORAGE AND TRANSPORT OF THE MATERIALS.

8.7 THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO ENSURE ALL STORM WATER RUNOFF FROM CONSTRUCTION STOCKPILES (DEBRIS, EXCAVATED SOIL, CLEANFILL) OR DISTURBED SURFACES WILL NOT ENTER A STORM DRAIN OR RUNOFF THE SITE.

9.0 SITE RESTORATION:

9.1 DENSE GRADED AGGREGATE (DGA): (A) ENSURE THAT THE MOISTURE CONTENT OF DGA IMMEDIATELY BEFORE PLACEMENT IS 6 ± 2 PERCENT BASED ON DRY WEIGHT. IF DENSE–GRADED AGGREGATE IS TO BE PAID FOR ON A WEIGHT BASIS, DO NOT DELIVER DGA TO THE PROJECT WITH THE MOISTURE CONTENT EXCEEDING 8 PERCENT AND (B) PLASTICITY AND GRADATION. WHEN TESTED ACCORDING TO AASHTO T 90, ENSURE THAT THE PORTION PASSING THE NO. 40 SIEVE IS NON–PLASTIC. ENSURE THAT THE GRADATION CONFORMS TO THE REQUIREMENTS SPECIFIED IN TABLE 1.

TABLE 1 GRADATION REQUIREMENTS FOR DGA

SIEVE SIZE	PERCENT PASSING
1–1/2"	100
3/4"	90
No. 4	50
No. 50	20
No. 200	10

IMPORTED DGA SHALL BE PLACED IN A UNIFORM 6–INCH LOOSE LIFT THICKNESS AND SHALL COMPACT TO 90 PERCENT OF STANDARD COMPACTION PROCTOR (ASTM D1557). COMPACTION TESTING WILL BE PERFORMED AT THE RATE OF ONE TEST PER 500 SQUARE FEET PER 1–FOOT DEPTH COMPACTED LIFT OF SOIL. DGA WILL BE BROUGHT TO WITHIN 6– INCHES OF FINAL GRADE AND SURFACE WILL BE RESTORED TO MATCH CURRENT CONDITIONS.

9.2 NO.57 STONE–MATERIAL SHALL BE NATURAL OR PREPARED MIXTURES CONSISTING PREDOMINATELY OF HARD, DURABLE PARTICLES OF STONE OR GRAVEL AND FREE OF ORGANIC MATERIAL. MATERIAL SHALL MEET THE AASHTO NUMBER 57. ENSURE THAT THE GRADATION CONFORMS TO THE REQUIREMENTS SPECIFIED IN TABLE 2.

TABLE 2 GRADATION REQUIREMENTS FOR NO. 57 STONE

SIEVE SIZE	PERCENT PASSING
1–1/2"	100
3/4"	95–100
1/2"	25–60
No. 4	0–10
No. 8	0–5

IMPORTED NO. 57 STONE MATERIAL SHALL BE USED FOR THE SURFACE RESTORATION OF EXCAVATION AREAS "C" AND "D".

9.3 TOPSOIL SHALL: (A) BE FERTILE, FRIABLE, NATURAL–LOAM SURFACE SOIL, CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH; FREE OF ANY ADMIXTURE OF SUBSOIL, CLODS OF HARD EARTH, PLANTS OR ROOTS, STICKS, STONES LARGER THAN ONE INCH IN DIAMETER, PESTS AND PEST LARVAE, OR OTHER EXTRANEOUS MATERIAL HARMFUL TO PLANT GROWTH, IN COMPLIANCE WITH ASTM D5268; (B) HAVE A CLAY CONTENT OF MATERIAL PASSING THE NO. 200 SIEVE LESS THAN 20 PERCENT; (C) HAVE A PH RANGE OF 5.0 TO 7.0; AND, (D) HAVE ORGANIC CONTENT OF MATERIAL PASSING THE NO. 10 SIEVE GREATER THAN FIVE PERCENT AND LESS THAN 20 PERCENT.

9.4 HYDROSEED SHALL BE INSTALLED IN NEWLY TOPSOILED AREAS AND ANY OTHER PREVIOUSLY VEGETATED AREA THAT HAS BEEN DISTURBED BY THE CONSTRUCTION SHALL. HYDROSEED SHALL BE IN ACCORDANCE WITH WISCONSIN STANDARDS. SEED MIX DATA FROM SEED SUPPLIER SHALL BE SUBMITTED FOR APPROVAL BY THE OWNER. SEED MIX SHALL CONTAIN THE FOLLOWING SEED VARIETIES:

% PURE SEED (MIN)	TYPE/DESCRIPTION	GERM (MIN)
45	CREEPING RED FESCUE	85
25	HARD FESCUE	85
25	PERENNIAL RYEGRASS	90
5	KENTUCKY BLUEGRASS	85

9.5 PORTLAND CEMENT CONCRETE PAVEMENT SHALL BE TRUE AND EVEN WITH THE EXISTING GRADE (1/4 INCH MAXIMUM OVER 10 FEET STRAIGHT EDGE). THE SURFACE GRADE AND FINISH MUST MATCH THE SURROUNDING AREA. THE FINISHED CONCRETE SHALL BE FREE OF VOIDS, MOUNDS, RIDGES, DEPRESSIONS, CRACKS, OR OTHER IRREGULARITIES. ANY CONCRETE DETERMINED TO BE SUBSTANDARD SHALL BE REMOVED AND REPLACED AT NO COST TO OWNER OR THE ENGINEER.

9.6 CONCRETE RESTORATION SHALL ONLY OCCUR ALONG VERTICAL FORMS OR SAW CUT WALLS. WHEN POSSIBLE, SAW CUTS SHALL FOLLOW EXISTING JOINTS AND THE LAYOUT EXISTING CONCRETE SURFACE PATTERNS. NEWLY PLACED CONCRETE PAVEMENT SHALL BE PROTECTED FROM VEHICULAR AND PEDESTRIAN TRAFFIC UNTIL IT IS SUITABLY CURED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF THE CONCRETE PAVEMENT NOT MEETING DESIGN DOCUMENTS AND/OR SPECIFICATIONS. CONCRETE SHALL BE THOROUGHLY MIXED TO ASSURE UNIFORM MIXTURE OF COMPONENTS WITHIN THE MASS.

9.7 CONCRETE MATERIALS SHALL CONFORM TO THE FOLLOWING: (A) PORTLAND CEMENT SHALL CONFORM TO ASTM C–150 TYPE II; (B) FINE AND COARSE AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C–33 AND SHALL CONFORM TO THE APPROPRIATE ASTM GRADING REQUIREMENT. AGGREGATES SHALL BE CLEAN, HARD AND UNIFORMLY GRADED SAND, CRUSHED ROCK OR GRAVEL, FREE FROM LOAM, CLAY OR ORGANIC MATTER. SOUND AGGREGATE SHALL BE USED AND SHALL HAVE A MAXIMUM DIAMETER OF 1.5–INCHES; AND (C) WATER SHALL BE POTABLE AND FREE OF ACIDS, ALKALIS, AND ORGANIC MATERIALS.

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CIVIL

SPECIFICATIONS (1 OF 2)

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DRAWING NO.:

C-2

SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\RM-SOIL-DESIGN-DR-C01-C03-NOTES.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:15:32 Plot Date: Steinberger, George; 3/12/2021; 17:38 ; Layout:C-2

9.8 THE CONCRETE MIX SHALL PASS A COMPRESSIVE STRENGTH TEST OF 2,500 PSI AFTER 28 DAYS. IN CERTAIN LOCALITIES, 3,000 PSI COMPRESSIVE STRENGTH CONCRETE IS REQUIRED BY SEISMIC CODE. THE CONCRETE MIX SHALL HAVE A MINIMUM SLUMP OF 3–INCHES AND A MAXIMUM SLUMP OF 4–INCHES.

9.9 THE CONTRACTOR SHALL SPECIFY THE CONCRETE MIX AND PROVIDE A COPY OF THE CONCRETE SPECIFICATIONS FOR APPROVAL FROM FACILITY AND THE ENGINEER PRIOR TO PLACEMENT, IF REQUESTED. THE NUMBER OF BAGS OF CEMENT PER YARD, COMPRESSIVE STRENGTH, VOLUME OF WATER, SLUMP, TYPE AND WEIGHT OF FINE AND COARSE AGGREGATES, AND TYPE AND AMOUNT OF ADMIXTURES SHALL BE ADDRESSED IN THE SPECIFICATION.

9.10 ALL CONCRETE REINFORCEMENT SHALL BE AS FOLLOWS: (A) WELDED WIRE FABRIC.

9.11 CONCRETE JOINTS SHALL BE PROVIDED IN PAVING WHERE THEY PREVIOUSLY EXISTED AND SHALL BLEND SMOOTHLY WITH THOSE EXISTING JOINTS. AS A GENERAL RULE, JOINT SPACING SHALL NOT EXCEED 15 FEET.

9.12 SAW CUT CONTROL JOINTS SHALL BE CUT 4 TO 12 HOURS AFTER CONCRETE IS POURED, OTHERWISE USE TOOLED OR PREFORMED JOINT INSERTS. THE CONTRACTOR SHALL USE AQUA CRETE®OR EQUIVALENT SEALANT TO SEAL THE CONCRETE JOINTS. JOINT SURFACES SHALL BE THOROUGHLY CLEANED PRIOR TO APPLYING JOINT COMPOUND.

9.13 THE CONTRACTOR SHALL ASSURE THAT THE SUB–GRADE HAS BEEN PROPERLY PREPARED. NO CONCRETE SHALL BE POURED ON SOFT, SATURATED OR PUMPING SOIL, FROZEN SOIL, ICE, SNOW, OR STANDING WATER.

9.14 CONCRETE SHALL BE POURED IN ACCORDANCE WITH COMMONLY ACCEPTED INDUSTRY PRACTICES. THE CONTRACTOR SHALL: (A)PREVENT OVERWORKING AND AGGREGATE SEGREGATION; (B) ADEQUATELY TAMP OR VIBRATE TO CONCRETE TO PREVENT VOIDS OR HONEYCOMBING; (C) CAST AREA BETWEEN JOINTS AS ONE CONTINUOUS POUR.

9.15 THE MAXIMUM ALLOWABLE TRAVEL TIME TO THE SITE IN HOT WEATHER WILL BE 1 HOUR AND 15 MINUTES AND COLD WEATHER WILL BE 2 HOURS.

9.16 THE CONTRACTOR SHALL FINISH THE CONCRETE IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES. THE CONTRACTOR SHALL: (A) AFTER ALL THE BLEED WATER HAS DISAPPEARED; THE CONTRACTOR SHALL FLOAT THE FLAT SURFACE BY HAND USING A TROWEL; (B) AFTER FLOATING, A SOFT CONCRETE FINISH BROOM SHALL BE USED TO FINISH THE SURFACE TO MATCH THE EXISTING CONCRETE FINISH; (C) DRY CEMENT SHALL NOT BE USED TO REMOVE EXCESS WATER FROM THE SURFACE. FINISH WORK MUST BE DELAYED UNTIL THE WATER SHEEN HAS DISAPPEARED; (D) WATER SHALL NOT BE ADDED TO EASE THE FINISHING.

10.0 MATERIAL HANDLING AND WASTE MANAGEMENT:

10.1 DEPOSITION OF REMOVED MATERIAL IN PLACES OTHER THAN THOSE DESIGNATED ON THE DESIGN DRAWINGS OR OTHERWISE PREVIOUSLY APPROVED IS STRICTLY PROHIBITED AND MAY REQUIRE THE CONTRACTOR TO MOVE SUCH MISPLACED MATERIAL AT NO COST TO OWNER. WHEN NOTIFIED BY OWNER OR ENGINEER OF ANY VIOLATION OF THE FOREGOING PROVISIONS, THE CONTRACTOR WILL TAKE IMMEDIATE CORRECTIVE ACTION. SHOULD THE CONTRACTOR REFUSE OR FAIL TO PROMPTLY CORRECT SUCH VIOLATION, THE OWNER MAY ORDER ALL OR PART OF THE WORK STOPPED PENDING CORRECTION AND THE CONTRACTOR WILL NOT CLAIM OR BE ENTITLED TO AN EXTENSION OF CONTRACT COMPLETION TIME, EXCESS COSTS, OR DAMAGES DUE TO TIME LOST BY SUCH A STOP WORK ORDER.

10.2 THE CONTRACTOR WILL BE RESPONSIBLE FOR LOADING OUT OF ALL WASTE MATERIALS GENERATED DURING THE PROJECT AND COORDINATING TRANSPORTATION WITH THE APPROVED OFFSITE DISPOSAL FACILITIES.

10.3 IF CONSTRUCTION WATER IS GENERATED DURING THE PROJECT (E.G., FROM THE TEMPORARY MATERIAL STAGING AREA, DECONTAMINATION OF EQUIPMENT, ETC.) THE CONTRACTOR WILL BE RESPONSIBLE TO COLLECT AND CONTAINERIZE THE CONSTRUCTION WATER. THE ENGINEER SHALL PERFORM WASTE CHARACTERIZATION SAMPLING. THE CONTRACTOR WILL SUPPORT THE OFFLOADING OF THE CONSTRUCTION WATER ONCE A FINAL DISPOSITION OF THE WATER HAS BEEN DETERMINED.

11.0 SITE RESTORATION AND DEMOBILIZATION:

11.1 ALL AREAS IMPACTED BY OR OTHERWISE DISTURBED DURING THE PROJECT, INCLUDING BUT NOT LIMITED TO, EXCAVATION, MATERIAL STAGING AREAS, AND CONSTRUCTION ACCESS AREA(S) WILL BE RESTORED BY THE CONTRACTOR TO PRE–CONSTRUCTION CONDITIONS, IN A TIMELY MANNER AND PRIOR TO CONTRACTOR DEMOBILIZATION.

11.2 THE CONTRACTOR WILL BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ON–SITE AND/OR OFF– SITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES. ALL REPAIRS/REPLACEMENTS WILL MEET OR EXCEED EXISTING CONDITIONS.

11.3 ALL EQUIPMENT OPERATED WITHIN THE PROJECT WORK LIMITS WILL BE DECONTAMINATED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES PRIOR TO ARRIVING ONSITE AND PRIOR TO LEAVING THE SITE. PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS WILL BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING IMPORTED BACKFILL MATERIAL, AND PRIOR TO LEAVING THE SITE. THE CONTRACTOR WILL PREVENT TRACKING OF SOIL MATERIALS ONTO OFF–SITE AREAS. ANY SOIL MATERIALS TRACKED, SPILLED OR DROPPED ONTO OFF–SITE AREAS, WILL BE IMMEDIATELY CLEANED UP BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

11.4 A FINAL INSPECTION WILL BE PERFORMED BY THE ENGINEER. ALL ITEMS NOT MEETING THE SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS SHALL BE PROMPTLY REPAIRED AND/OR REPLACED BY THE CONTRACTOR AT NO EXPENSE TO OWNER.

11.5 DEMOBILIZATION OF ALL MATERIALS, EQUIPMENT, AND PERSONNEL UTILIZED AND BROUGHT TO THE SITE DURING MOBILIZATION AND CONSTRUCTION ACTIVITIES WILL OCCUR ONCE THE PROJECT IS COMPLETE AND ACCEPTED BY OWNER AND ENGINEER. ALL TEMPORARY FACILITIES WILL BE REMOVED.

12.0 SUBMITTALS:

THE CONTRACTOR WILL PROVIDE SUBMITTALS IN ACCORDANCE WITH THESE NOTES AT LEAST 2 WEEKS PRIOR TO PERFORMING THE WORK.

12.1 WORK PLAN – INCLUDING: (A) ENVIRONMENTAL PROTECTION AND SPILL MANAGEMENT; (B) TRAFFIC CONTROL – TRUCK/SITE VEHICLE ACCESS; PEDESTRIAN; (C) SITE SECURITY AND PERIMETER FENCING; (D) DUST CONTROL MEASURES; (E) ON–SITE PREPARATION; (F) CONSTRUCTION OF TEMPORARY MATERIAL STAGING AREAS; (G) EXCAVATION AND MATERIAL HANDLING; (H) EQUIPMENT DECONTAMINATION PROCEDURES; (I) RESTORATION OF THE SITE; AND, (J) WASTE HANDLING AND DISPOSAL.

12.2 HEALTH AND SAFETY PLAN WITH CONTRACTOR'S COVID PROTOCOLS.

12.3 PRE–CONSTRUCTION AND POST–CONSTRUCTION SURVEY.

12.4 CONTACT LIST – MINIMUM THREE CONTACT NUMBERS OF RESPONSIBLE PERSONNEL IN THE EVENT OF AN EMERGENCY.

12.5 LIST OF SUBCONTRACTORS AND VENDORS – INCLUDING VALID LICENSES FOR EACH AS REQUIRED

12.6 RECORD DRAWINGS AND ASSOCIATED SURVEY DATA – INCLUDING (A) PRE–CONSTRUCTION (B) EXCAVATION LIMITS; AND (C) RESTORED AREA SURVEY.

12.7 WASTE DISPOSAL DOCUMENTATION – INCLUDING VENDORS AND EXECUTED BILLS OF LADEN OR MANIFEST FOR ALL PROPOSED WASTE STREAMS

12.8 SELECT FILL MATERIALS (E.G., DGA, TOPSOIL, CONCRETE)– INCLUDING NAME AND LOCATION OF SOURCE; SAMPLES, CERTIFICATION BY THE SUPPLIER OR SAMPLE RESULTS FROM AN ENVIRONMENTAL LABORATORY APPROVAL PROGRAM–WDNR CERTIFIED LABORATORY DEMONSTRATING THAT THE FILL MATERIALS ARE CLEAN; AND ASSOCIATED WEIGH TICKETS FOLLOWING IMPORTATION.

12.9 EROSION CONTROL MATERIAL – INCLUDING (A) TEMPORARY FENCING; (B) SILT FENCE; (C) INLET PROTECTION); AND (D) TEMPORARY CONSTRUCTION ENTRANCE.

12.10 DAILY PROGRESS REPORTS – PROVIDING (A) A DESCRIPTION OF DAILY WORK ACTIVITIES; (B) LIST SITE PERSONNEL, DETAILS OF EQUIPMENT USED AND ITS PERFORMANCE; (C) ESTIMATED AND ACTUAL DAILY PRODUCTION RATES, ANY DELAYS ENCOUNTERED; (D) EXCAVATED MATERIAL VOLUME ESTIMATES: (E) MATERIAL MANAGEMENT AT THE STAGING AREA; (F) RESTORATION; AND, (G) OTHER RELEVANT ASPECTS.

12.11 CONTRACTOR'S SCHEDULE.

12.13 COMPACTION TESTING RESULTS.

13.0 SUBMITTAL PREPARATION AND REVIEW

13.1 BEFORE SUBMITTING EACH SUBMITTAL, THE CONTRACTOR WILL HAVE: (A) REVIEWED AND COORDINATED EACH SUBMITTAL WITH OTHER SUBMITTALS AND WITH THE REQUIREMENTS OF THE PROJECT; (B) DETERMINED AND VERIFIED ALL FIELD MEASUREMENTS, QUANTITIES, DIMENSIONS, SPECIFIED PERFORMANCE AND DESIGN CRITERIA, INSTALLATION REQUIREMENTS, MATERIALS, CATALOG NUMBERS, AND SIMILAR INFORMATION WITH RESPECT THERETO; (C) DETERMINED AND VERIFIED THE SUITABILITY OF ALL MATERIALS OFFERED WITH RESPECT TO INDICATED USE, FABRICATION, SHIPPING, HANDLING, STORAGE, ASSEMBLY, AND INSTALLATION PERTAINING TO THE PERFORMANCE OF THE WORK; AND (D) DETERMINED AND VERIFIED ALL INFORMATION RELATIVE TO THE CONTRACTOR'S RESPONSIBILITIES FOR MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENT THERETO.

13.2 EACH SUBMITTAL WILL BEAR A STAMP OR SPECIFIC WRITTEN CERTIFICATION THAT THE CONTRACTOR HAS SATISFIED THE CONTRACTOR'S OBLIGATIONS WITH RESPECT TO THE CONTRACTOR'S REVIEW AND APPROVAL OF THAT SUBMITTAL.

13.3 WITH EACH SUBMITTAL, THE CONTRACTOR WILL GIVE THE ENGINEER SPECIFIC WRITTEN NOTICE OF ANY VARIATIONS THAT THE SUBMITTAL MAY HAVE FROM THE REQUIREMENTS OF THE PROJECT. THIS NOTICE WILL BE BOTH A WRITTEN COMMUNICATION SEPARATE FROM THE SUBMITTAL AND BY A SPECIFIC NOTATION MADE ON EACH SUBMITTAL PROVIDED TO THE ENGINEER FOR REVIEW OF EACH SUCH VARIATION.

13.4 THE ENGINEER WILL PROVIDE TIMELY REVIEW OF SUBMITTALS. THE ENGINEER REVIEW WILL DETERMINE IF THE ITEMS COVERED BY THE SUBMITTALS WILL, AFTER INSTALLATION OR INCORPORATION IN THE WORK, CONFORM TO THE INFORMATION GIVEN IN THE PROJECT DOCUMENTS AND BE COMPATIBLE WITH THE DESIGN CONCEPT OF THE COMPLETED PROJECT AS A FUNCTIONING WHOLE AS INDICATED BY THE PROJECT DOCUMENTS.

13.5 THE ENGINEER'S REVIEW WILL NOT EXTEND TO MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES OF CONSTRUCTION (EXCEPT WHERE A PARTICULAR MEANS, METHOD, TECHNIQUE, SEQUENCE, OR PROCEDURE OF CONSTRUCTION IS SPECIFICALLY AND EXPRESSLY CALLED FOR BY THE PROJECT DOCUMENTS) OR TO SAFETY PRECAUTIONS OR PROGRAMS INCIDENT THERETO. THE REVIEW OF A SEPARATE ITEM AS SUCH WILL NOT INDICATE APPROVAL OF THE ASSEMBLY IN WHICH THE ITEM FUNCTIONS.

13.6 THE ENGINEER'S REVIEW WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY VARIATION FROM THE REQUIREMENTS OF THE PROJECT DOCUMENTS UNLESS THE CONTRACTOR HAS COMPLIED WITH THE REQUIREMENTS OF SUBMITTAL NOTE 15.5 AND THE ENGINEER HAS GIVEN WRITTEN AGREEMENT OF EACH SUCH VARIATION BY SPECIFIC WRITTEN NOTATION THEREOF INCORPORATED IN OR ACCOMPANYING THE SUBMITTAL.

13.7 PROVIDE A SEPARATE LETTER OF TRANSMITTAL WITH EACH SUBMITTAL, THAT INCLUDES THE FOLLOWING INFORMATION: (A) CONTRACTOR'S NAME; (B) ENGINEER'S NAME; (C) PROJECT NAME; (D) CONTRACT NAME AND NUMBER; (E) SUBMITTAL NUMBER; (F) REFERENCE TO NOTE REQUIRING SUBMITTAL; AND, (G) CONTRACTOR'S STAMP OR SPECIFIC WRITTEN CERTIFICATION.

14.0 CONSTRUCTION SCHEDULE:

14.1 THE CONTRACTOR SHALL CONFIRM A CONSTRUCTION SCHEDULE WITH THE ENGINEER AT LEAST ONE WEEK (5 BUSINESS DAYS) PRIOR TO ANY WORK AT THE SITE.

14.2 THE PROPOSED CONSTRUCTION SCHEDULE SHALL BE PRESENTED IN MICROSOFT PROJECT FORMAT SHOWING ESTIMATED START DATE, DURATION AND COMPLETION TIMES FOR EACH ACTIVITY. ANY DEVIATION FROM THE ORIGINALLY PROPOSED SCHEDULE MUST BE COMMUNICATED TO THE ENGINEER WITHIN 24–HOURS.

14.3 CONTRACTOR SHALL PROVIDE AN UPDATED CONSTRUCTION SCHEDULE WEEKLY TO THE ENGINEER/OWNER AND PROVIDE DETAILS REGARDING BASELINE SCHEDULE AND THE CHANGES/DIFFERENCE TO THE ACTUAL SCHEDULE.

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PROJECT STATUS:

PRELIMINARY

DATE: MARCH 2021
PROJECT NO.: 30075729
DESIGNED BY: PB
DRAWN BY: GS
CHECKED BY: .

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

CLIENT PROJ. NO.

SHEET TITLE

CIVIL

SPECIFICATIONS (2 OF 2)

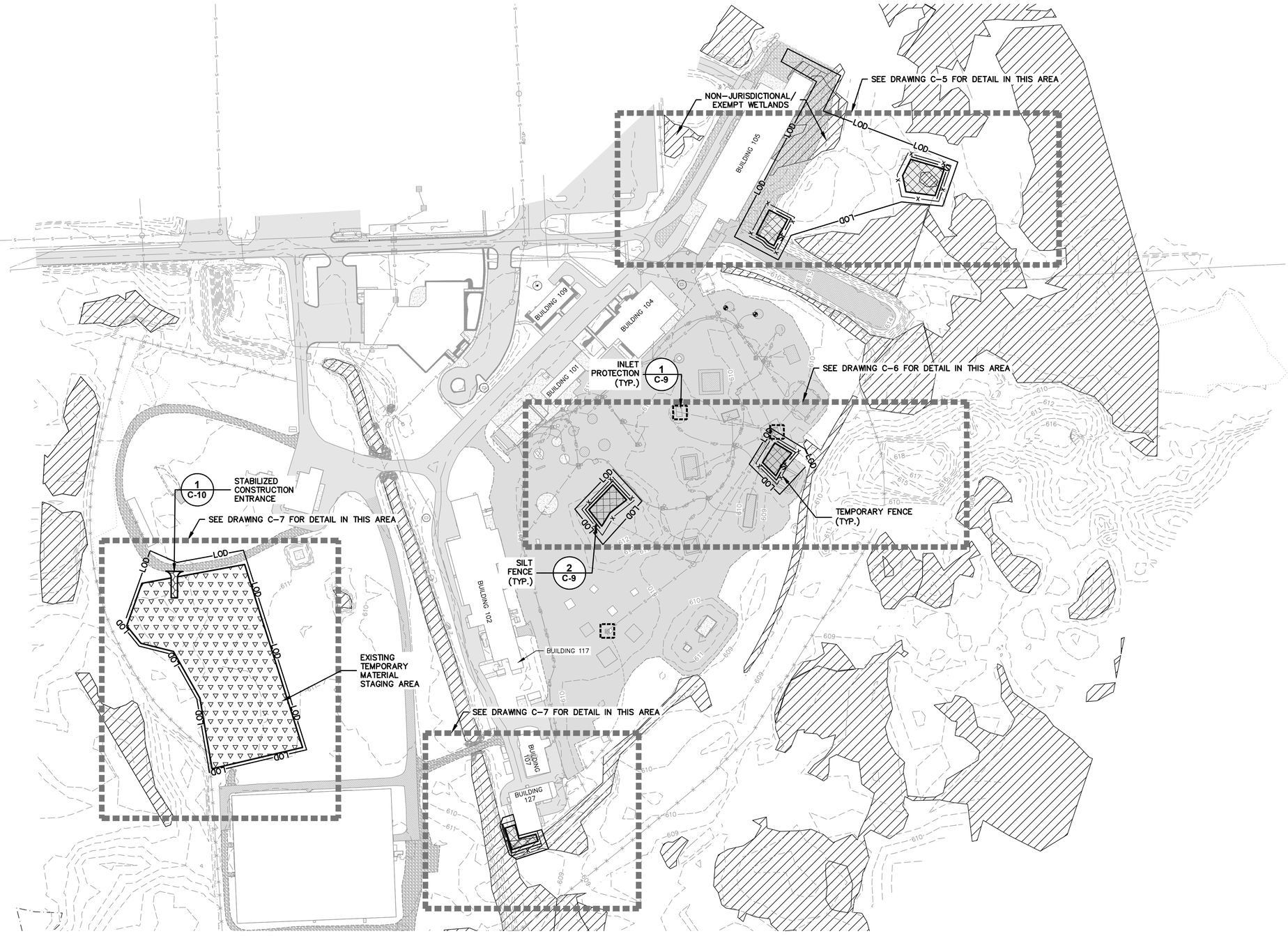
SCALE:
AS SHOWN
0 1
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:

C-3

SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\RM-SOIL-DESIGN-DR-C01-C03-NOTES.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:15:32 Plot Date: Steinberger, George; 3/12/2021; 17:38 ; Layout:C-3



NOTES:

1. REFER TO SECTION 6, EROSION AND SEDIMENT CONTROL ON DRAWING C-2, AND DRAWINGS C-9 AND C-10 FOR EROSION CONTROL DETAILS AND ADDITIONAL EROSION CONTROL AND STORMWATER MANAGEMENT NOTES.
2. LOCATIONS OF EROSION AND SEDIMENT CONTROLS SHALL BE MODIFIED IN THE FIELD AS NECESSARY TO FACILITATE COMPLETION OF THE WORK.
3. CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROLS AT LEAST ONCE PER DAY AND AFTER EACH RAIN EVENT. MAINTENANCE/REPAIRS TO DAMAGE OR MALFUNCTIONING CONTROLS SHALL BE PERFORMED IMMEDIATELY UPON DISCOVERY. THE ENGINEER SHALL INSPECT AND APPROVE OF MAINTENANCE / REPAIRS PRIOR TO RESUMING OTHER WORK.
4. THE LOCATIONS OF ALL STRUCTURES/UTILITIES SHOWN ARE APPROXIMATE. INFORMATION RELATED TO SUBSURFACE CONDITIONS SHOULD BE CONSIDERED IS GENERALLY REPRESENTATIVE AND SHOULD NOT BE RELIED UPON AS A COMPLETE DEPICTION OF SITE CONDITIONS. ADDITIONAL SITE FEATURES MAY BE PRESENT THAT ARE NOT SHOWN. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INCLUDING ABOVE-GRADE AND SUBSURFACE FEATURES WHETHER OR NOT SHOWN OR OTHERWISE DESCRIBED IN THE DOCUMENTS.
5. UNLESS OTHERWISE NOTED, ALL STRUCTURES AND SITE FEATURES, INCLUDING EXISTING ABOVE AND BELOW GROUND UTILITIES AND MONITORING WELLS, SHALL BE PROTECTED. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REPAIRING ALL DAMAGE MADE BY THE CONTRACTOR TO EXISTING MONITORING WELLS, WELL SEALS, MANHOLE BOXES, FTC EQUIPMENT, TESTING AND GROUND STRUCTURES AS THE RESULT OF ACCIDENT OR NEGLECT.
6. DISTURBANCE OF AREAS OUTSIDE THE LIMITS ESTABLISHED FOR EROSION CONTROL BARRIERS IS NOT ALLOWED.
7. THE CONTRACTOR SHALL ALWAYS UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE. REFUSE, DEBRIS AND WASTE MATERIAL SHALL NOT UNDER ANY CIRCUMSTANCES BE PLACED WITHIN ANY AREA NOT IDENTIFIED FOR SUCH PURPOSE. ALL CONSTRUCTION REFUSE, DEBRIS AND WASTE MATERIALS SHALL BE DISPOSED OF PROMPTLY AND PROPERLY.
8. THE CONTRACTOR SHALL REVIEW THE CONTRACT DRAWINGS, AND FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.

100' 0 100' 200'
1"=100'

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TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

SHEET TITLE

CIVIL

EROSION CONTROL PLAN

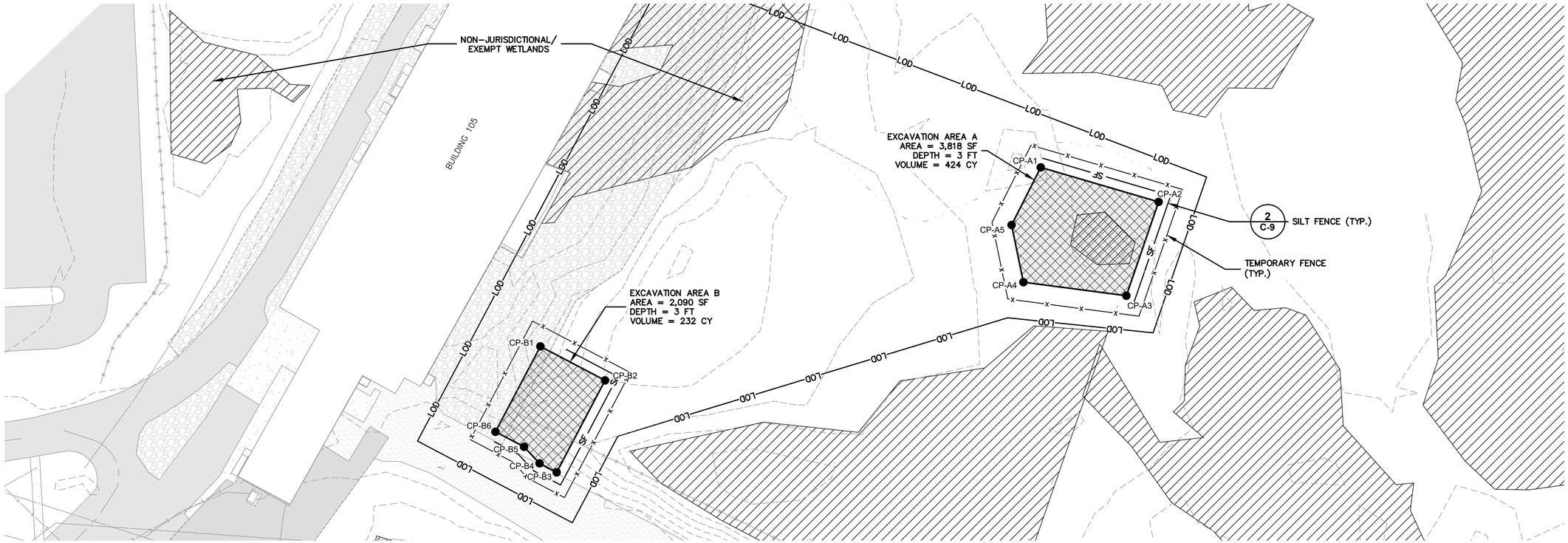
SCALE:
AS SHOWN
0 1
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:

C-4

SHEET NO.: ___ OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\IRM-SOIL-DESIGN-DR-C04-SESC.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:15:51 Plot Date: Steinberger, George; 3/12/2021; 17:38 ; Layout:C-4



NOTES:

1. SEE SHEETS C-2, C-3, AND C-4 FOR GENERAL NOTES AND TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL REVIEW THE CONTRACT DRAWINGS, AND FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
3. THE CONTRACTOR SHALL EXCAVATE MATERIALS IN SUCH A WAY AS TO MINIMIZE SLOUGHING AND WATER EGRESS FROM AND INTO THE EXCAVATION.
4. ALL STOCKPILING ACTIVITIES WILL OCCUR INSIDE THE DESIGNATED TEMPORARY MATERIAL STAGING AREA.
5. CONTRACTOR SHALL UTILIZE TEMPORARY ORANGE BARRICADE FENCING TO SECURE AND PROTECT WORK AREAS WHILE ACTIVE AND IN-ACTIVE.
6. UNLESS OTHERWISE NOTED, ALL STRUCTURES AND SITE FEATURES, INCLUDING EXISTING ABOVE AND BELOW GROUND UTILITIES AND MONITORING WELLS, SHALL BE PROTECTED. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REPAIRING ALL DAMAGE MADE BY THE CONTRACTOR TO EXISTING MONITORING WELLS, WELL SEALS, MANHOLE BOXES, FTC EQUIPMENT, TESTING AND GROUND STRUCTURES AS THE RESULT OF ACCIDENT OR NEGLECT.

CONTROL POINT	EASTING	NORTHING
CP-A1	2577913.48	462779.95
CP-A2	2577976.68	462761.47
CP-A3	2577959.40	462711.19
CP-A4	2577904.18	462718.43
CP-A5	2577897.86	462749.10
CP-B1	2577645.25	462684.05
CP-B2	2577679.91	462665.81
CP-B3	2577653.98	462616.52
CP-B4	2577644.79	462621.35
CP-B5	2577636.50	462630.21
CP-B6	2577621.17	462638.28

30' 0 30' 60'
1"=30'

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CHECKED BY: .

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

CLIENT PROJ. NO.

SHEET TITLE
CIVIL

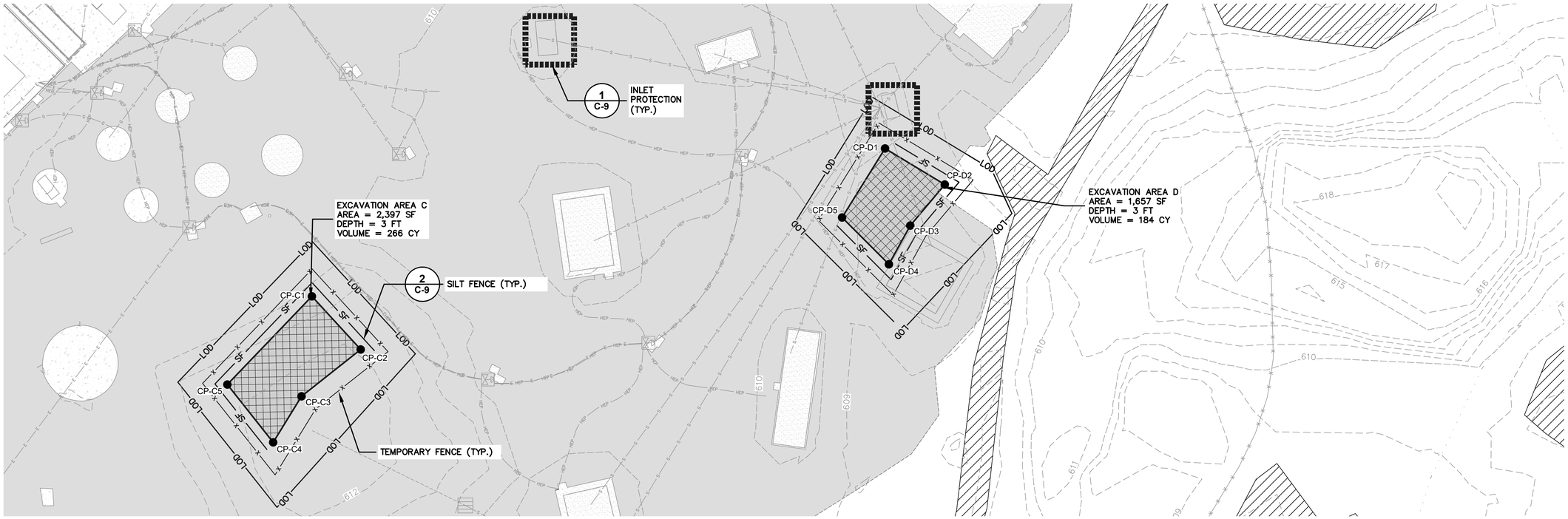
EXCAVATION PLAN - AREA A AND B

SCALE:
AS SHOWN
0
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:
C-5

SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\RM-SOIL-DESIGN-DR-C05-C07-EXCAV.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:16:06 Plot Date: Steinberger, George; 3/12/2021; 17:39 ; Layout:C-5



NOTES:

1. SEE SHEETS C–2, C–3, AND C–4 FOR GENERAL NOTES AND TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL REVIEW THE CONTRACT DRAWINGS, AND FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
3. THE CONTRACTOR SHALL EXCAVATE MATERIALS IN SUCH A WAY AS TO MINIMIZE SLOUGHING AND WATER EGRESS FROM AND INTO THE EXCAVATION.
4. ALL STOCKPILING ACTIVITIES WILL OCCUR INSIDE THE DESIGNATED TEMPORARY MATERIAL STAGING AREA.
5. CONTRACTOR SHALL UTILIZE TEMPORARY ORANGE BARRICADE FENCING TO SECURE AND PROTECT WORK AREAS WHILE ACTIVE AND IN–ACTIVE.
6. UNLESS OTHERWISE NOTED, ALL STRUCTURES AND SITE FEATURES, INCLUDING EXISTING ABOVE AND BELOW GROUND UTILITIES AND MONITORING WELLS, SHALL BE PROTECTED. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REPAIRING ALL DAMAGE MADE BY THE CONTRACTOR TO EXISTING MONITORING WELLS, WELL SEALS, MANHOLE BOXES, FTC EQUIPMENT, TESTING AND GROUND STRUCTURES AS THE RESULT OF ACCIDENT OR NEGLECT.

CONTROL POINT	EASTING	NORTHING
CP–C1	2577348.93	462163.58
CP–C2	2577375.05	462135.10
CP–C3	2577343.39	462110.02
CP–C4	2577328.20	462085.36
CP–C5	2577303.67	462116.34
CP–D1	2577655.76	462242.75
CP–D2	2577687.76	462223.42
CP–D3	2577669.28	462201.45
CP–D4	2577657.83	462180.72
CP–D5	2577632.77	462205.78

30' 0 30' 60'
1"=30'

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CHECKED BY: _

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

CLIENT PROJ. NO.

SHEET TITLE

CIVIL

EXCAVATION PLAN - AREA C AND D

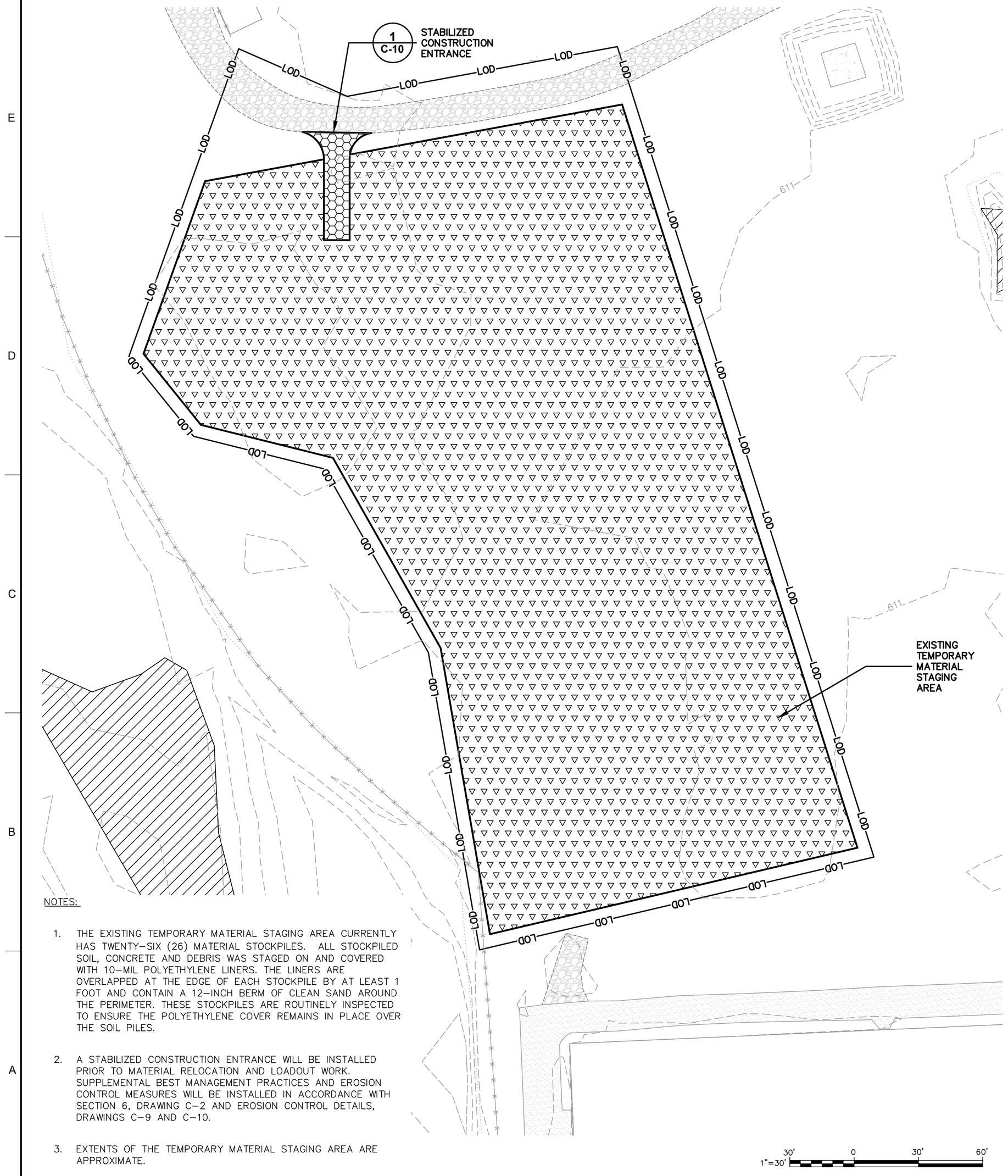
SCALE:
AS SHOWN
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:

C-6

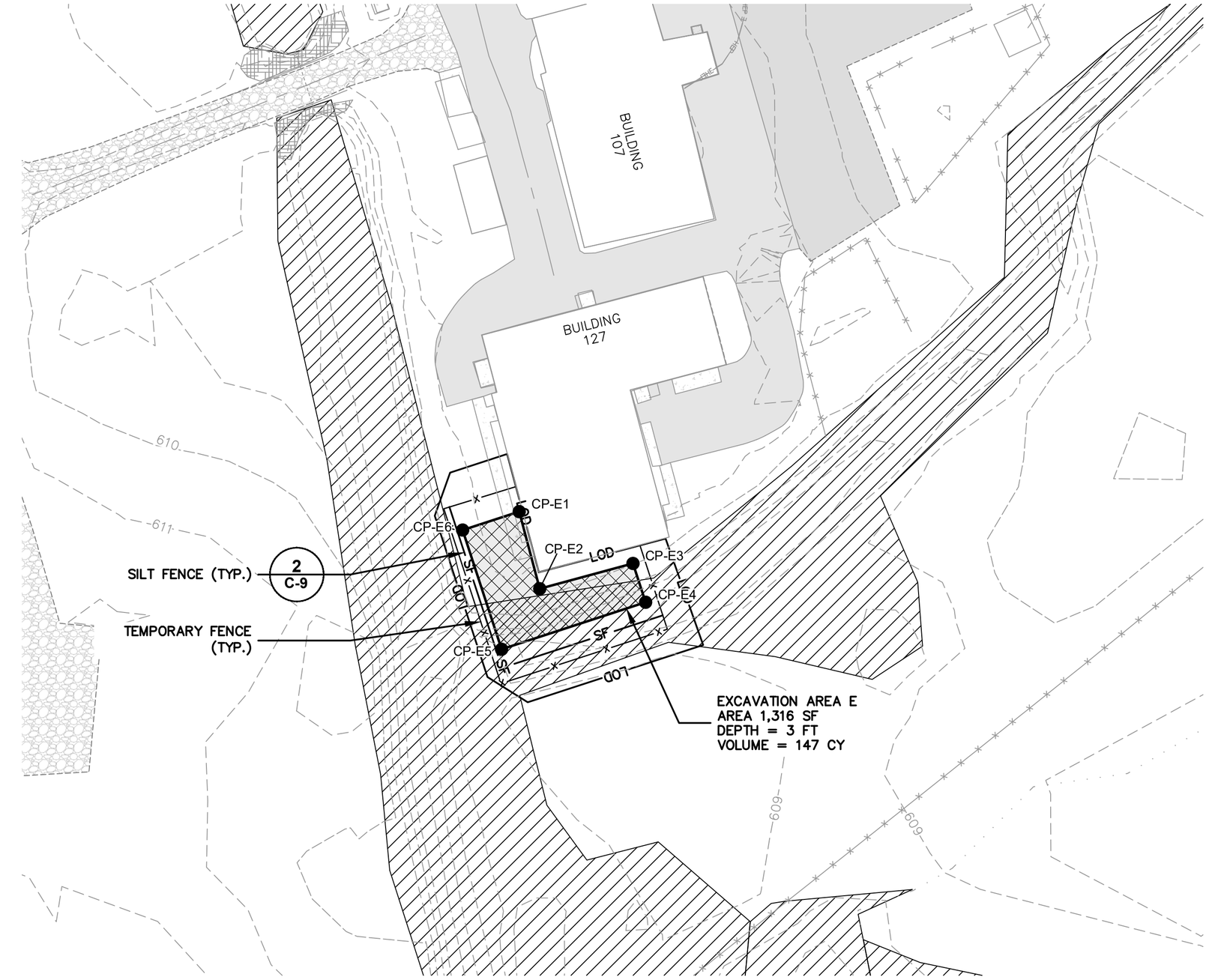
SHEET NO.: ___ OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\IRM-SOIL-DESIGN-DR-C05-C07-EXCAV.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:16:06 Plot Date: Steinberger, George; 3/12/2021; 17:39 ; Layout:C-6



NOTES:

1. THE EXISTING TEMPORARY MATERIAL STAGING AREA CURRENTLY HAS TWENTY-SIX (26) MATERIAL STOCKPILES. ALL STOCKPILED SOIL, CONCRETE AND DEBRIS WAS STAGED ON AND COVERED WITH 10-MIL POLYETHYLENE LINERS. THE LINERS ARE OVERLAPPED AT THE EDGE OF EACH STOCKPILE BY AT LEAST 1 FOOT AND CONTAIN A 12-INCH BERM OF CLEAN SAND AROUND THE PERIMETER. THESE STOCKPILES ARE ROUTINELY INSPECTED TO ENSURE THE POLYETHYLENE COVER REMAINS IN PLACE OVER THE SOIL PILES.
2. A STABILIZED CONSTRUCTION ENTRANCE WILL BE INSTALLED PRIOR TO MATERIAL RELOCATION AND LOADOUT WORK. SUPPLEMENTAL BEST MANAGEMENT PRACTICES AND EROSION CONTROL MEASURES WILL BE INSTALLED IN ACCORDANCE WITH SECTION 6, DRAWING C-2 AND EROSION CONTROL DETAILS, DRAWINGS C-9 AND C-10.
3. EXTENTS OF THE TEMPORARY MATERIAL STAGING AREA ARE APPROXIMATE.



NOTES:

1. SEE SHEETS C-2, C-3, AND C-4 FOR GENERAL NOTES AND TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL REVIEW THE CONTRACT DRAWINGS, AND FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
3. THE CONTRACTOR SHALL EXCAVATE MATERIALS IN SUCH A WAY AS TO MINIMIZE SLOUGHING AND WATER EGRESS FROM AND INTO THE EXCAVATION.
4. ALL STOCKPILING ACTIVITIES WILL OCCUR INSIDE THE DESIGNATED TEMPORARY MATERIAL STAGING AREA.
5. CONTRACTOR SHALL UTILIZE TEMPORARY ORANGE BARRICADE FENCING TO SECURE AND PROTECT WORK AREAS WHILE ACTIVE AND IN-ACTIVE.
6. UNLESS OTHERWISE NOTED, ALL STRUCTURES AND SITE FEATURES, INCLUDING EXISTING ABOVE AND BELOW GROUND UTILITIES AND MONITORING WELLS, SHALL BE PROTECTED. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REPAIRING ALL DAMAGE MADE BY THE CONTRACTOR TO EXISTING MONITORING WELLS, WELL SEALS, MANHOLE BOXES, FTC EQUIPMENT, TESTING AND GROUND STRUCTURES AS THE RESULT OF ACCIDENT OR NEGLECT.

30' 0 30' 60'
1"=30'

CONTROL POINT	EASTING	NORTHING
CP-E1	2577164.26	461519.77
CP-E2	2577171.28	461493.39
CP-E3	2577203.15	461502.03
CP-E4	2577207.49	461488.76
CP-E5	2577158.25	461472.68
CP-E6	2577144.93	461513.45

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CHECKED BY: .

CLIENT PROJ. NO.

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

SHEET TITLE

CIVIL

EXCAVATION PLAN - AREA E AND SITE PREPARATION - TEMPORARY MATERIAL STAGING AREA

SCALE:
AS SHOWN
0 1
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:

C-7

SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\RM-SOIL-DESIGN-DR-C05-C07-EXCAV.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:16:06 Plot Date: Steinberger, George; 3/12/2021; 17:39 ; Layout:C-7

NOTES:

1. SEE SHEETS C-2, C-3, AND C-4 FOR GENERAL NOTES AND TECHNICAL SPECIFICATIONS.
2. CONTRACTOR SHALL BACKFILL EXCAVATIONS TO EXISTING GRADE. POST EXCAVATION GRADES SHALL MATCH PRE-EXCAVATION TOPOGRAPHY.
3. LOCATIONS MARKED FOR VEGETATION REESTABLISHMENT SHALL HAVE 6-INCHES OF TOPSOIL PRIOR TO RE-SEEDING.
4. EXCAVATION AREAS "A" AND "E" WILL REQUIRE WETLAND RESTORATION. DISTURBED WETLANDS WILL BE RESTORED IN ACCORDANCE WITH APPROVED PERMITS FROM THE UNITED STATES ARMY CORPS OF ENGINEERS AND WISCONSIN DEPARTMENT OF NATURAL RESOURCES. PLEASE REFER TO THE WETLAND PERMITS FOR WETLAND RESTORATION REQUIREMENTS.
5. STRAW WATTLES AND SILT FENCE TO REMAIN IN PLACE UNTIL WORK AREA IS STABILIZED (ASSUME 85% VEGETATION COVER).
6. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE THE ENGINEER "AS-BUILT" DRAWINGS. THE "AS-BUILT" DRAWINGS SHALL SHOW THE ACTUAL CONSTRUCTION DETAILS.
7. A FINAL INSPECTION SHALL BE PERFORMED BY THE ENGINEER. ALL ITEMS NOT MEETING THE SPECIFICATIONS AND THE CONTRACT DRAWINGS SHALL BE PROMPTLY REPAIRED AND/OR REPLACED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

100' 0 100' 200'
1"=100'

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CHECKED BY: .

CLIENT PROJ. NO.

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

SHEET TITLE

CIVIL

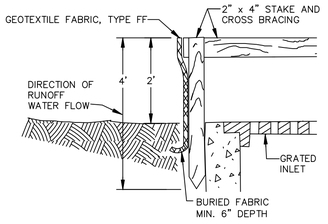
SITE RESTORATION PLAN

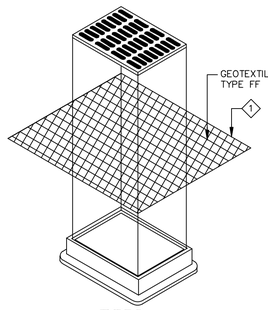
SCALE: AS SHOWN
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.: C-8

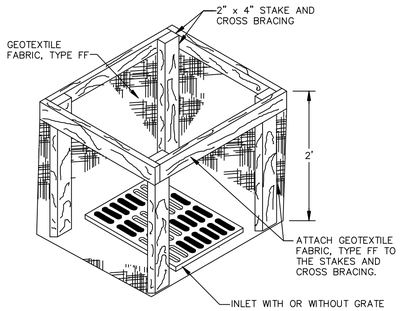
SHEET NO.: . OF XXX

User:GSTEINBERGER Spec:AUS-NCSMOD File:C:\BIM\ONEDRIVE - ARCADIS\BIM 360 DOCS\ANA-TYCO\MARINETTE\2021\01-DWG\IRM-SOIL-DESIGN-DR-C08-RESTORE.DWG Scale:1:1/2 SavedDate:3/12/2021 Time:16:07 Plot Date: Steinberger, George; 3/12/2021; 17:39 ; Layout:C-8

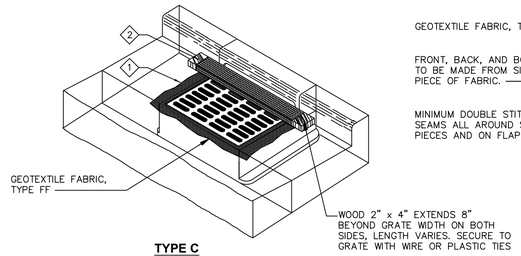




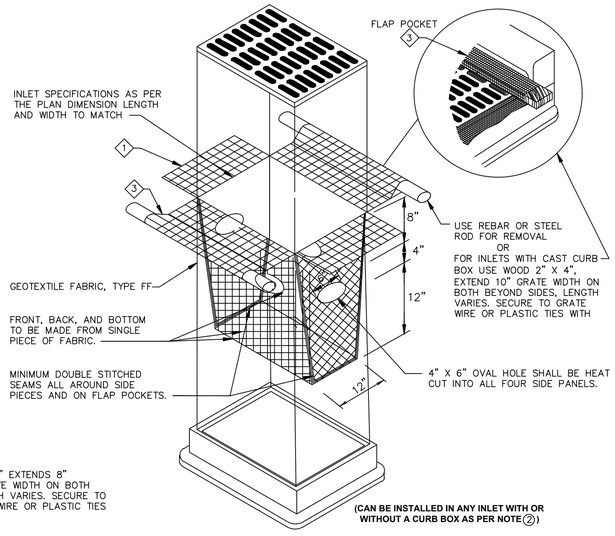
TYPE B
(WITHOUT CURB BOX)
(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



TYPE A



TYPE C
(WITH CURB BOX)



INLET PROTECTION, TYPE D
(CAN BE INSTALLED IN ANY INLET WITH OR WITHOUT A CURB BOX AS PER NOTE (2))

GENERAL NOTES

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

1. FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
2. FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
3. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

TYPE B & C

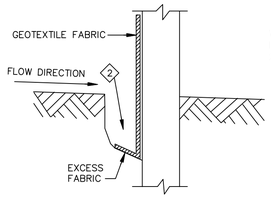
TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

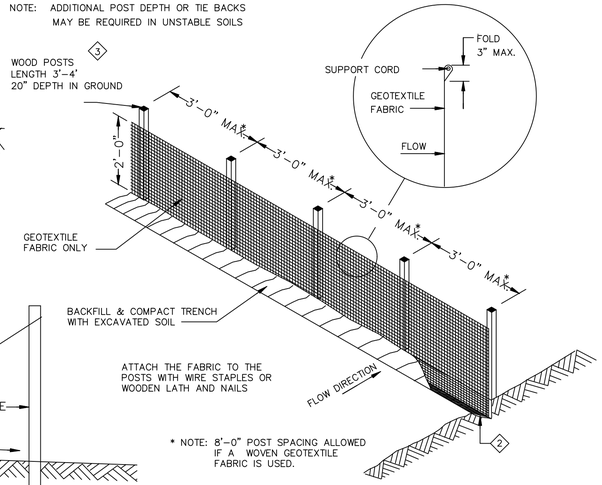
(NOTE: DETAILS ON THIS SHEET TAKEN DIRECTLY FROM WISCONSIN DEPARTMENT OF NATURAL RESOURCES "STORMWATER MANAGEMENT TECHNICAL STANDARDS" WEBSITE)

INLET PROTECTION DETAILS (1)
NOT TO SCALE

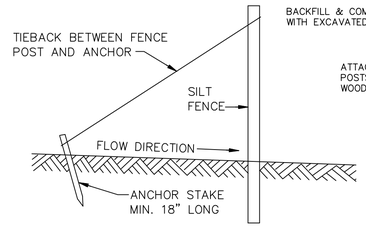


TRENCH DETAIL

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS



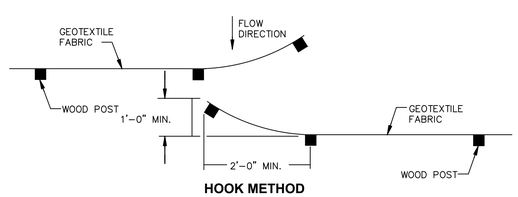
* NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.



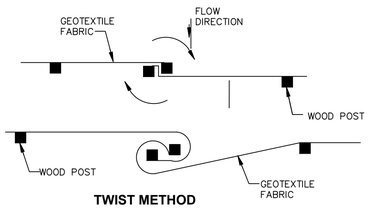
SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT REQUIRED)

SILT FENCE

1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
2. TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1" X 1" OF OAK OR HICKORY.
4. SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
5. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.
6. CONTRACTOR MAY USE AN EQUIVALENT PERIMETER EROSION CONTROL FOR EXCAVATIONS PERFORMED WITHIN THE CONCRETE PAVEMENT. STRAW WATTLE IS AN APPROVED EQUIVALENT. REFER TO DETAIL 3 ON THIS DRAWING.



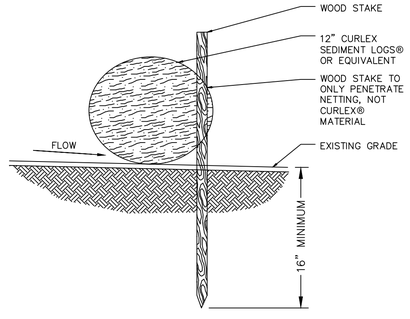
HOOK METHOD



TWIST METHOD

5 **JOINING TWO LENGTHS OF SILT FENCE**

SILT FENCE DETAILS (2)
NOT TO SCALE



NOTES:

1. WHERE STRAW WATTLE CANNOT BE STAKED INTO THE GROUND, SAND BAGS SHALL BE USED TO WEIGH DOWN THE STRAW WATTLE.
2. MAINTENANCE SHALL BE PERFORMED AFTER EVERY STORM EVENT OR MORE FREQUENTLY AS NEEDED AND MATERIAL REMOVED WHEN NECESSARY TO PERMIT ADEQUATE SEDIMENT TRAPPING.

STRAW WATTLE DETAIL (TYPICAL) (3)
NOT TO SCALE

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NO.	DATE	ISSUED FOR	BY

SEALS

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PROJECT STATUS:
PRELIMINARY

DATE: MARCH 2021
PROJECT NO.: 30075729
DESIGNED BY: PB
DRAWN BY: GS
CHECKED BY: .

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

CLIENT PROJ. NO.

SHEET TITLE
CIVIL
EROSION CONTROL DETAILS (1 OF 2)

SCALE:
AS SHOWN
0 1
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:
C-9

SHEET NO.: ____ OF XXX

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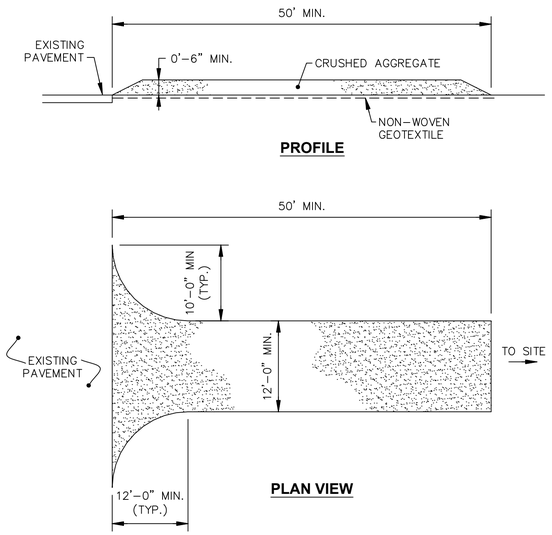

STABILIZED CONSTRUCTION ENTRANCE 1

NOT TO SCALE

MAINTENANCE & INSPECTION SCHEDULE:

THE CONTRACTOR SHALL PERFORM REGULAR INSPECTION AND MAINTENANCE FOR ALL EROSION AND SEDIMENT CONTROL PRACTICES. PERMANENT RECORDS OF MAINTENANCE AND INSPECTIONS MUST BE KEPT THROUGHOUT THE CONSTRUCTION PERIOD. INSPECTIONS MUST BE MADE DAILY AND IMMEDIATELY AFTER STORM EVENTS GREATER THAN 0.5 INCHES OF RAIN IN A 24 HOUR PERIOD. PROVIDE NAME OF INSPECTOR, MAJOR OBSERVATIONS, DATE OF INSPECTION AND CORRECTIVE MEASURES TAKEN.

SILT FENCE:
ENSURE THAT THE BOTTOM OF THE SILT FENCE IS EMBEDDED IN THE GROUND. THE TOP OF THE SILT FENCE SHALL BE DRAWN TIGHT BETWEEN POSTS. SILT SHALL BE REMOVED ONCE 40% OF THE CAPACITY IS LOST, OR THE FENCE SHALL BE REPLACED. JOINTS BETWEEN SECTIONS SHALL BE TIGHTLY JOINED WITHOUT GAPS.

INLET PROTECTION:
ENSURE THE BOTTOM OF THE FABRIC IS EMBEDDED IN THE GROUND AND THE FRAME OF THE INLET PROTECTOR HAS NOT COLLAPSED. CLEANOUT SEDIMENT ONCE 40% OF CAPACITY IS LOST. ENSURE THAT THE INLET IS NOT CAUSING STORM WATER TO BYPASS THE INLET. MAINTAIN BYPASS PREVENTION DIKE.

CONSTRUCTION ENTRANCE:
ENSURE THAT THE CONSTRUCTION ENTRANCE IS APPROPRIATELY SIZED TO MINIMIZE TRACKING ONTO THE ROADWAY. TOP DRESS GRAVEL EMBEDDED WITH SEDIMENT WITH CLEAN GRAVEL AS NEEDED. RESTRICT VEHICULAR ACCESS TO STABILIZED AREAS TO MINIMIZE OFF SITE TRACKING.

VEGETATIVE STABILIZATION:
ENSURE A 70% STAND ESTABLISHMENT RATE. REPAIR THOSE AREAS THAT DO NOT MINIMIZE OFF SITE TRACKING.

BMP DECOMMISSIONING

SILT FENCE:
-REMOVE SILT FENCE, DISPOSE OF PROPERLY
-SEED DISTURBED AREAS

INLET PROTECTION:
-REMOVE INLET PROTECTION & SILT FENCING, DISPOSE OF PROPERLY
-SEED DISTURBED AREAS

CONSTRUCTION ENTRANCE:
-REMOVE SILT FENCING, DISPOSE OF PROPERLY
-REMOVE STONE/INCORPORATE STONE INTO PAVEMENT SUBBASE
-SEED DISTURBED AREAS OUTSIDE OF PAVEMENT

EROSION CONTROL AND STORM WATER MANAGEMENT NOTES

1. THE EROSION CONTROL MEASURES INCLUDED IN THE CONTRACTOR'S EROSION CONTROL AND STORM WATER MANAGEMENT PLAN SHALL BE INSTALLED PRIOR TO INITIAL LAND DISTURBANCE ACTIVITIES OR AS SOON AS PRACTICAL. SEDIMENT SHALL BE PREVENTED FROM DISCHARGING FROM THE PROJECT SITE BY INSTALLING AND MAINTAINING SILT FENCE, SEDIMENT BASINS, ETC. AS SHOWN ON THE CONTRACTOR'S EROSION CONTROL AND STORM WATER MANAGEMENT PLAN. STRUCTURAL PRACTICES SHALL BE USED TO CONTROL EROSION FROM ALL SITES REMAINING DISTURBED FOR MORE THAN 14 DAYS.
2. THE CONTRACTOR SHALL CONTROL WASTES, GARBAGE, DEBRIS, WASTEWATER, AND OTHER SUBSTANCES ON THE SITE IN SUCH A WAY THAT THEY SHALL NOT BE TRANSPORTED FROM THE SITE BY THE ACTION OF WINDS, STORM WATER RUNOFF, OR OTHER FORCES. PROPER DISPOSAL OR MANAGEMENT OF ALL WASTES AND UNUSED BUILDING MATERIALS, APPROPRIATE TO THE NATURE OF THE WASTE OR MATERIAL, IS REQUIRED. COMPLIANCE IS REQUIRED WITH ALL STATE OR LOCAL REGULATIONS REGARDING WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEMS.
3. PUBLIC OR PRIVATE ROADWAYS SHALL BE KEPT CLEARED OF ACCUMULATED SEDIMENT. OFF-SITE VEHICLE TRACKING SEDIMENT SHALL BE MINIMIZED. CONSTRUCTION VEHICLES ARE LIMITED TO THE EASEMENT NOTED ON THE CONTRACTOR'S EROSION CONTROL AND STORM WATER MANAGEMENT PLAN UNLESS OTHERWISE APPROVED BY PROPERTY OWNER. BULK CLEARING OF ACCUMULATED SEDIMENT SHALL NOT INCLUDE FLUSHING THE AREA WITH WATER. CLEARED SEDIMENT SHALL BE RETURNED TO THE POINT OF LIKELY ORIGIN OR OTHER SUITABLE LOCATION.
4. ALL DISTURBED AREAS TO REMAIN INACTIVE FOR MORE THAN 14 DAYS SHALL BE STABILIZED BY SEEDING, SODDING, MULCHING, COVERING, OR BY OTHER EQUIVALENT EROSION CONTROL MEASURES WITHIN TWO (2) DAYS. PERMANENT SOIL STABILIZATION SHALL BE PROVIDED WITHIN 2 DAYS AFTER FINAL GRADE IS ESTABLISHED. INSTALL HAY BALE DITCH CHECKS AT 100' INTERVALS.
5. SEED ALL DISTURBED AREAS WITHIN 50 FEET OF STREAMS & WETLANDS WITHIN 2 DAYS OF LAST DISTURBANCE.
6. EXCESS SOIL THAT IS STOCKPILED MUST BE EITHER REMOVED OR PERMANENTLY STABILIZED WITHIN 14 DAYS OF THE COMPLETION OF THE CONSTRUCTION.
7. THIS CONTRACTOR'S EROSION CONTROL AND STORM WATER MANAGEMENT PLAN SHALL BE IMPLEMENTED ON ALL DISTURBED AREAS WITHIN THE CONSTRUCTION SITE. ALL MEASURES INVOLVING EROSION CONTROL PRACTICES SHALL BE INSTALLED UNDER THE GUIDANCE OF QUALIFIED PERSONNEL EXPERIENCED IN EROSION CONTROL, AND FOLLOWING THE PLANS AND SPECIFICATION INCLUDED HEREIN. OTHER EROSION AND SEDIMENT CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS.
8. DURING THE PERIOD OF CONSTRUCTION ACTIVITY, ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR. AT THE COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE THE TRANSFER OF MAINTENANCE RESPONSIBILITIES, IF REQUIRED, WITH THE OWNER.
9. ALL EROSION CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE WISCONSIN DNR AND THE WISCONSIN DEPARTMENT OF TRANSPORTATION (WIS.D.O.T.) STANDARD CONSTRUCTION DRAWINGS.
10. POST CONSTRUCTION STORM WATER MANAGEMENT: ALL DISTURBED AREAS SHALL HAVE ADEQUATE VEGETATION TO FILTER POLLUTANTS AS MUCH AS PRACTICAL. LOCAL LAWS REGARDING THE DISCHARGING OF OIL AND OTHER POLLUTANTS INTO DRAINAGE-WAYS SHALL APPLY.
11. ALL EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED IN ACCORDANCE WITH THE CONDITIONS OF APPLICABLE WPDES PERMITS.
12. ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE REMOVED AND DISPOSED OF WITHIN THIRTY DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY PRACTICES ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.
13. THE CONTRACTOR'S EROSION CONTROL AND STORM WATER MANAGEMENT PLAN, ALONG WITH THE NOI AND/OR WPDES PERMIT, MUST BE RETAINED ON-SITE AT ALL TIMES DURING THE PERIOD OF CONSTRUCTION.
14. FIELD ADJUSTMENTS FOR LOCATION AND DIMENSION OF SEDIMENT CONTROL DEVICES MAY BE MADE BY THE ENGINEER AS REQUIRED.
15. EROSION CONTROL DEVICES REMOVED DURING GRADING OPERATIONS SHALL BE PUT BACK IN PLACE AT THE END OF THE DAY OR DURING INCLEMENT WEATHER.
16. THERE SHALL BE NO SEDIMENT-LADEN DISCHARGES TO SURFACE WATERS OF THE STATE RESULTING FROM DEWATERING ACTIVITIES. IF TRENCH OR GROUND WATER CONTAIN SEDIMENT, IT MUST PASS THROUGH A SEDIMENT SETTLING POND OR OTHER EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE PRIOR TO BEING DISCHARGED FROM THE CONSTRUCTION SITE.
17. NO SOIL, ROCK, DEBRIS, OR OTHER MATERIAL SHALL BE DUMPED OR PLACED INTO A WATER RESOURCE OR INTO SUCH PROXIMITY THAT IT MAY READILY SLOUGH, SLIP, OR ERODE INTO A WATER RESOURCE UNLESS DUMPING OR PLACING IS AUTHORIZED BY THE ENGINEER AND, WHEN APPLICABLE, THE U.S. ARMY CORPS OF ENGINEERS, FOR SUCH PURPOSES AS, BUT NOT LIMITED TO, CONSTRUCTION BRIDGES, CULVERTS, AND EROSION CONTROL STRUCTURES.
18. SEDIMENT PONDS/TRAPS AND PERIMETER CONTROLS SHALL BE IMPLEMENTED AS A FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF GRUBBING AND SHALL CONTINUE TO FUNCTION UNTIL UPLAND AREAS ARE STABILIZED.
19. EROSION CONTROL BLANKETS WITH MATTING WILL BE USED ON DITCHES GREATER THAN 1.5% AND ALL OTHER SLOPES GREATER THAN 6% GRADE. EROSION CONTROL BLANKETS TO BE PLACED AT THE DIRECTION OF THE ENGINEER.
20. MARK LIMITS OF CLEARING AND GRUBBING FOR APPROVAL PRIOR TO CONSTRUCTION. AFTER CLEARING, BUT BEFORE GRUBBING, INSTALL ALL INITIAL EROSION CONTROL ITEMS. AFTER GRUBBING, BUT BEFORE TOPSOIL STRIPPING AND GRADING, INSTALL CONSTRUCTION FENCING AT THE CLEARING LIMIT LINE.
21. PROTECT UNDISTURBED AREAS THROUGHOUT CONSTRUCTION. DO NOT STORE EQUIPMENT, VEHICLES OR MATERIALS IN THE PROTECTED AREA BEYOND THE CONSTRUCTION FENCE.
22. IF WORK IS SUSPENDED FOR ANY REASON, THE CONTRACTOR SHALL MAINTAIN THE SOIL EROSION AND SEDIMENTATION CONTROLS IN GOOD OPERATING CONDITION DURING THE SUSPENSION OF THE WORK.
23. EROSION AND SEDIMENT CONTROL PRACTICES NOT SPECIFIED ON THIS PLAN MAY BE NECESSARY DUE TO UNFORESEEN ENVIRONMENTAL CONDITIONS AND/OR CHANGES IN DRAINAGE PATTERNS CAUSED BY GRADING ACTIVITIES.
24. CONTRACTORS AND SUBCONTRACTORS ARE REQUIRED BY SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT AND s.44.40, WIS. STATS, TO NOTIFY THE STATE HISTORIC PRESERVATION OFFICE OF ARCHEOLOGICAL DISCOVERIES LOCATED IN THE PROJECT AREA, AND TO COOPERATE WITH THAT ENTITY IN ARCHEOLOGICAL AND HISTORIC SURVEYS AND SALVAGE EFFORTS IT SUCH DISCOVERIES ARE UNCOVERED WITHIN THE PROJECT AREA. INFORMATION ON THE LOCATION AND EXISTENCE OF HISTORIC RESOURCES CAN BE OBTAINED FROM THE STATE HISTORIC PRESERVATION OFFICE AND THE NATIONAL REGISTER OF HISTORIC PLACES. IF CULTURAL, ARCHAEOLOGICAL, OR HISTORICAL RESOURCES ARE UNEARTHED DURING ACTIVITIES AUTHORIZED BY THIS PERMIT, WORK MUST BE STOPPED IMMEDIATELY AND THE STATE HISTORIC PRESERVATION OFFICER MUST BE CONTACTED FOR FURTHER INSTRUCTION.

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REVISIONS

NO.	DATE	ISSUED FOR	BY

SEALS

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PROJECT STATUS:
PRELIMINARY

DATE: MARCH 2021
PROJECT NO.: 30075729
DESIGNED BY: PB
DRAWN BY: GS
CHECKED BY: .

CLIENT PROJ. NO.

TYCO - FIRE TECHNOLOGY CENTER

SOIL INTERIM REMEDIAL ACTION

SHEET TITLE
CIVIL

EROSION CONTROL DETAILS (2 OF 2)

SCALE:
AS SHOWN
0 1
BAR IS ONE INCH ON UNREDUCED DRAWING

DRAWING NO.:
C-10

SHEET NO.: . OF XXX

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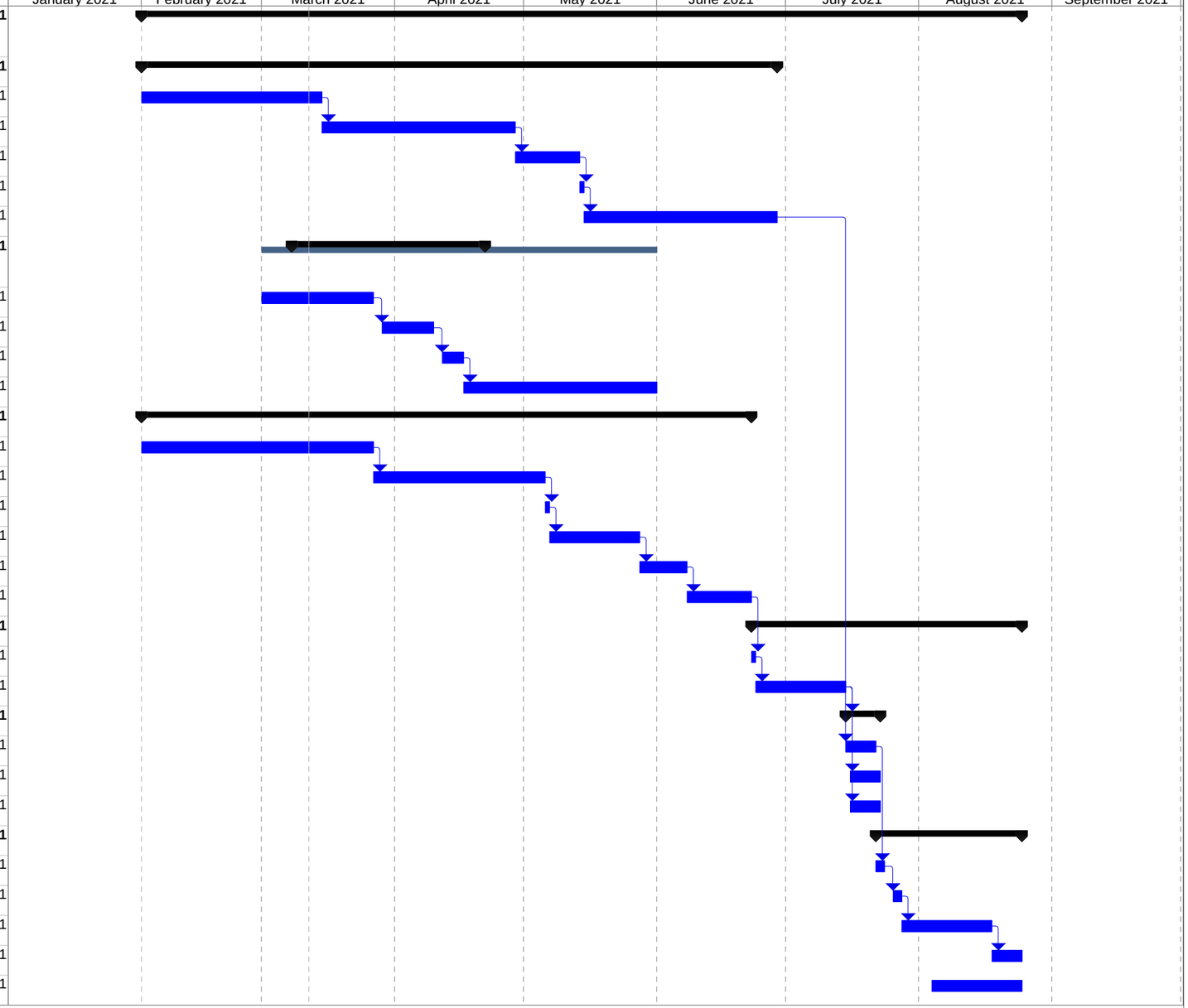
Appendix B

Preliminary Remedial Design, Reporting, and Construction Schedule

Preliminary Remedial Design, Reporting and Construction Schedule
Soil Interim Remedial Action Design Report

ID	Task Name	Duration	Start	Finish
1	**PRELIMINARY PROJECT SCHEDULE - REMEDIAL DESIGN, REPORTING AND CONSTRUCTION**	**147 days**	**Mon 2/1/21**	**Tue 8/24/21**
2	**SOILS - ITERIM REMEDIAL ACTION DESIGN REPORT**	**106 days**	**Mon 2/1/21**	**Tue 6/29/21**
3	Prepare and Submit the Final Interim Remedial Action Design Report	42 edays	Mon 2/1/21	Mon 3/15/21
4	Wisconsin DNR - Review and Comment	45 edays	Mon 3/15/21	Thu 4/29/21
5	Response to Comments - Update (Includes Client Review)	15 edays	Thu 4/29/21	Fri 5/14/21
6	Submit Revised Soils Interim Remedial Design Report	1 eday	Fri 5/14/21	Sat 5/15/21
7	WDNR - Review and Approval	45 edays	Sat 5/15/21	Tue 6/29/21
8	**WETLAND GENERAL PERMIT APPLICATION - AGGREGATE EXCAVATION(S)**	**33 days**	**Mon 3/8/21**	**Wed 4/21/21**
9	Prepare - Draft-Final Wetland General Permit Application	20 days	Mon 3/1/21	Fri 3/26/21
10	Client - Review and Comment	10 days	Mon 3/29/21	Fri 4/9/21
11	Prepare and Submit the Final Wetland General Permit Application	5 days	Mon 4/12/21	Fri 4/16/21
12	Wisconsin DNR - Review and Comment; Approval	45 edays	Fri 4/16/21	Mon 5/31/21
13	**REQUEST FOR PROPOSAL PROCESS**	**102 days**	**Mon 2/1/21**	**Tue 6/22/21**
14	Prepare Contract Documents, Technical Specifications and Drawings	40 days	Mon 2/1/21	Fri 3/26/21
15	RA Request for Proposal (RFP) - Issue to Bidders, Site Walk and Addendum	40 edays	Fri 3/26/21	Wed 5/5/21
16	Receive Proposals	1 eday	Wed 5/5/21	Thu 5/6/21
17	Evaluate Proposals	21 edays	Thu 5/6/21	Thu 5/27/21
18	Award of RA Contract	11 edays	Thu 5/27/21	Mon 6/7/21
19	Contractor Procurement	15 edays	Mon 6/7/21	Tue 6/22/21
20	**INTERIM REMEDIAL ACTION CONSTRUCTION**	**45 days**	**Tue 6/22/21**	**Tue 8/24/21**
21	Notice to Proceed	1 eday	Tue 6/22/21	Wed 6/23/21
22	Submittal Preparation and Review Processes	21 edays	Wed 6/23/21	Wed 7/14/21
23	**Mobilization**	**6 days**	**Thu 7/15/21**	**Thu 7/22/21**
24	Site Personnel / Equipment / Construction Trailer / Sanitation Facilities	5 days	Thu 7/15/21	Wed 7/21/21
25	Site Survey & Layout	5 days	Fri 7/16/21	Thu 7/22/21
26	Establish Work Zone Security/Fencing and Traffic Control Support	5 days	Fri 7/16/21	Thu 7/22/21
27	**Aggregate Area - Excavation**	**24 days**	**Thu 7/22/21**	**Tue 8/24/21**
28	Utility Survey and Mark out	2 days	Thu 7/22/21	Fri 7/23/21
29	Excavation Area Preparation	2 days	Mon 7/26/21	Tue 7/27/21
30	Excavate and Material Loadout	15 days	Wed 7/28/21	Tue 8/17/21
31	Backfill and Final Restoration	5 days	Wed 8/18/21	Tue 8/24/21
32	**Building 105 Stockpiles - Loadout & Restoration**	15 days	Wed 8/4/21	Tue 8/24/21



Soil Interim Remedial Action Design Report
Project: AppendixB-IRAR-RD-SCHEDULE-MARINETTE-03122021
Date: Fri 3/12/21

Task	External Tasks	Manual Task	Finish-only
Split	External Milestone	Duration-only	Progress
Milestone	Inactive Task	Manual Summary Rollup	Deadline
Summary	Inactive Milestone	Manual Summary	
Project Summary	Inactive Summary	Start-only	

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