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

Form 4400-237 (R 10/21)

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 Public 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		
Amundson	Lee		Former Econo-Care Cleaners		
Mailing Address			City	State	ZIP Code
1404 Webster Street			Green Bay	WI	54301
Phone # (include area code)	Fax # (include area code)		Email		

The requester listed above: (select all that apply)

- ☒ 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		
Powell	R. Scott		EnviroForensics, LLC		
Mailing Address			City	State	ZIP Code
825 North Capitol			Indianapolis	IN	46204
Phone # (include area code)	Fax # (include area code)		Email		
(317) 608-2706			rspowell@enviroforensics.com		

Environmental Consultant (if applicable)

Contact Last Name	First	MI	Organization/ Business Name		
Powell	R. Scott		EnviroForensics, LLC		
Mailing Address			City	State	ZIP Code
825 North Capitol			Indianapolis	IN	46204
Phone # (include area code)	Fax # (include area code)		Email		
(317) 608-2706			rspowell@enviroforensics.com		

☒ Attorney (if applicable)

Contact Last Name	First	MI	Organization/ Business Name		
Skwierawski	M. Andrew		HALLING & CAYO, S.C.		
Mailing Address			City	State	ZIP Code
320 E. Buffalo Street, Suite 700			Milwaukee	WI	53202
Phone # (include area code)	Fax # (include area code)		Email		
(414) 271-3400			mas@hallingcayo.com		

Section 2. Property Information

Property Name	FID No. (if known)
Econo-Care Cleaners	405008340
BRRTS No. (if known)	Parcel Identification Number
0205514372	

Street Address	City	State	ZIP Code
1404 South Webster Avenue	Green Bay	WI	54301

County	Municipality where the Property is located	Property is composed of:	Property Size Acres
Brown	○ City ○ Town ◉ Village of Allouez	◉ Single tax parcel ○ Multiple tax parcels	

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).

Section 4. Request for Liability Clarification

Select the type of liability clarification requested. Use the available space given or attach information, explanations, or specific questions that you need answered in DNR's reply. Complete Sections 6 and 7 of this form. **[Numbers in brackets are for DNR Use]**

☐ "Lender" liability exemption clarification - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the real Property, and/or the personal Property and fixtures;

(2) an environmental assessment, in accordance with s. 292.21, Wis. Stats.;

(3) the date the environmental assessment was conducted by the lender;

(4) the date of the Property acquisition; for foreclosure actions, include a copy of the signed and dated court order confirming the sheriff's sale.

(5) documentation showing how the Property was acquired and the steps followed under the appropriate state statutes.

(6) a copy of the Property deed with the correct legal description; and,

(7) the Lender Liability Exemption Environmental Assessment Tracking Form (Form 4400-196).

(8) If no sampling was done, please provide reasoning as to why it was **not** conducted. Include this either in the accompanying environmental assessment or as an attachment to this form, and cite language in s. 292. 21(1)(c)2.,h.-i., Wis. Stats.:

h. The collection and analysis of representative samples of soil or other materials in the ground that are suspected of being contaminated based on observations made during a visual inspection of the real Property or based on aerial photographs, or other information available to the lender, including stained or discolored soil or other materials in the ground and including soil or materials in the ground in areas with dead or distressed vegetation. The collection and analysis shall identify contaminants in the soil or other materials in the ground and shall quantify concentrations.

i. The collection and analysis of representative samples of unknown wastes or potentially hazardous substances found on the real Property and the determination of concentrations of hazardous waste and hazardous substances found in tanks, drums or other containers or in piles or lagoons on the real Property.

☐ "Representative" liability exemption clarification (e.g. trustees, receivers, etc.) - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the Property;

(2) the date of Property acquisition by the representative;

(3) the means by which the Property was acquired;

(4) documentation that the representative has no beneficial interest in any entity that owns, possesses, or controls the Property;

(5) documentation that the representative has not caused any discharge of a hazardous substance on the Property; and

(6) a copy of the Property deed with the correct legal description.

☐ Clarification of local governmental unit (LGU) liability exemption at sites with: (select all that apply)

☐ hazardous substances spills - s. 292.11(9)(e), Wis. Stats. [649];

☐ Perceived environmental contamination - [649];

☐ hazardous waste - s. 292.24 (2), Wis. Stats. [649]; and/or

☐ solid waste - s. 292.23 (2), Wis. Stats. [649].

❖ **Include a fee of $700, a summary of the environmental liability clarification being requested, and the following:**

(1) clear supporting documentation showing the acquisition method used, and the steps followed under the appropriate state statute(s).

(2) current and proposed ownership status of the Property;

(3) date and means by which the Property was acquired by the LGU, where applicable;

(4) a map and the ¼, ¼ section location of the Property;

(5) summary of current uses of the Property;

(6) intended or potential use(s) of the Property;

(7) descriptions of other investigations that have taken place on the Property; and

(8) (for solid waste clarifications) a summary of the license history of the facility.

Section 4. Request for Liability Clarification (cont.)

☐ Lease liability clarification - s. 292.55, Wis. Stats. [646]

- ❖ **Include a fee of $700 for a single Property, or $1400 for multiple Properties and the information listed below:**

(1) a copy of the proposed lease;

(2) the name of the current owner of the Property and the person who will lease the Property;

(3) a description of the lease holder's association with any persons who have possession, control, or caused a discharge of a hazardous substance on the Property;

(4) map(s) showing the Property location and any suspected or known sources of contamination detected on the Property;

(5) a description of the intended use of the Property by the lease holder, with reference to the maps to indicate which areas will be used. Explain how the use will not interfere with any future investigation or cleanup at the Property; and

(6) all reports or investigations (e.g. Phase I and Phase II Environmental Assessments and/or Site Investigation Reports conducted under s. NR 716, Wis. Adm. Code) that identify areas of the Property where a discharge has occurred.

General or other environmental liability clarification - s. 292.55, Wis. Stats. [682] - Explain your request below.

- ❖ **Include a fee of $700 and an adequate summary of relevant environmental work to date.**

☐ No Action Required (NAR) - NR 716.05, [682]

- ❖ **Include a fee of $700.**

Use where an environmental discharge has or has not occurred, and applicant wants a DNR determination that no further assessment or clean-up work is required. Usually this is requested after a Phase I and Phase II environmental assessment has been conducted; the assessment reports should be submitted with this form. This is not a closure letter.

☐ Clarify the liability associated with a "closed" Property - s. 292.55, Wis. Stats. [682]

- ❖ **Include a fee of $700.**

- Include a copy of any closure documents if a state agency other than DNR approved the closure.

Use this space or attach additional sheets to provide necessary information, explanations or specific questions to be answered by the DNR.

Section 5. Request for a Specialized Agreement

Select the type of agreement needed. Include the appropriate draft agreements and supporting materials. Complete Sections 6 and 7 of this form. More information and model draft agreements are available at: dnr.wi.gov/topic/Brownfields/lgu.html#tabx4.

☐ Tax cancellation agreement - s. 75.105(2)(d), Wis. Stats. [654]

- ❖ **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,

(2) a copy of the Property deed with the correct legal description.

☐ Agreement for assignment of tax foreclosure judgement - s.75.106, Wis. Stats. [666]

- ❖ **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,

(2) a copy of the Property deed with the correct legal description.

☐ Negotiated agreement - Enforceable contract for non-emergency remediation - s. 292.11(7)(d) and (e), Wis. Stats. [630]

- ❖ **Include a fee of $1400, and the information listed below:**

(1) a draft schedule for remediation; and,

(2) the name, mailing address, phone and email for each party to the agreement.

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: _____

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 Form - Non-Emergency Only (Form 4400-225) is accessible through the RR Program Submittal Portal application. Directions for using the form and the Submittal Portal application are available on the Submittal Portal web page.

Section 7. Certification by the Person who completed this form

- ☐ I am the person submitting this request (requester)
- ☒ I prepared this request for: Lee Amundson
  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.

R. Scott Powell
Signature

July 12, 2024
Date Signed

Regional Director
Title

(248) 909-7290
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.

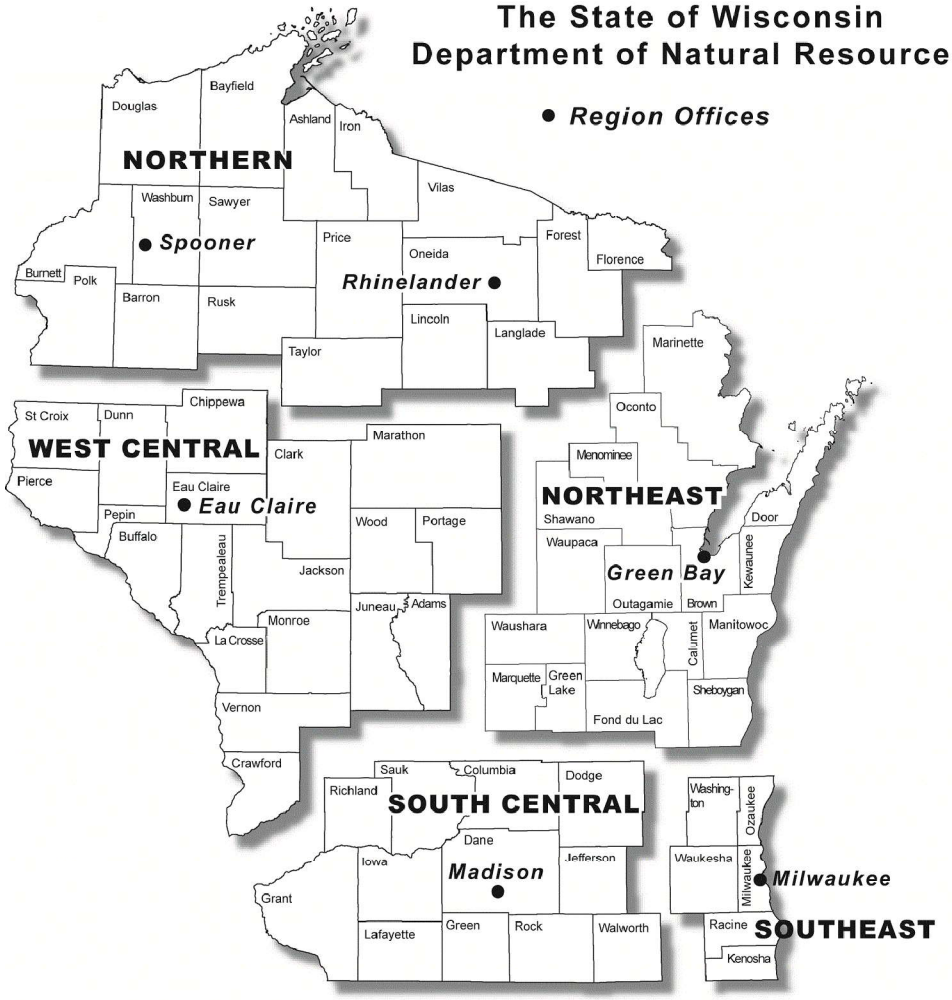
DNR NORTHERN REGION
Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

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
Milwaukee DNR Office
1027 West St. Paul Ave
Milwaukee WI 53233

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		

PREPARED BY
EnviroForensics, LLC
825 North Capitol Avenue
Indianapolis, Indiana 46204
866.888.7911

July 8, 2024

Josie Schultz
Wisconsin Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313-672

Subject: **Further Site Investigation and Quarterly Groundwater Sampling Work Plan**
Former Econo Care Cleaners
1404 S. Webster Avenue
Green Bay, Wisconsin 54301
BRRTS# 02-05-514372
EnviroForensics Project #200030

Dear Ms. Schultz:

EnviroForensics, LLC (EnviroForensics) has prepared this *Further Site Investigation and Quarterly Groundwater Sampling Work Plan* (FSI WP) to conduct further site investigation activities for Econo Care Cleaners, formerly located at 1404 S. Webster Avenue in Green Bay, Wisconsin (Site). The location of the Site is depicted on **Figure 1**. The proposed investigation consists of the following objectives:

- Assessment of vapor intrusion (VI) risk to 917 Derby Lane.
- Preparation of a conceptual site model (CSM).
- Investigate the magnitude and extent of chlorinated volatile organic compounds (cVOCs) in shallow soil around SB-3, in the area of the former drycleaning machine, and in areas of additional potential sources identified in the CSM.
- Further delineate the horizontal extents of the cVOC plume in groundwater.
- Assessment of per- and polyfluoroalkyl substances (PFAS) in Site wells.

1.0 VAPOR ASSESSMENT

Based on conversations with WDNR staff, EnviroForensics was requested to look at the potential risk of VI to the apartment building at 917 Derby Lane because it is within 100 feet of MW-4, which has groundwater concentrations of tetrachloroethene (PCE) exceeding WDNR Public Health Enforcement Standards. As presented in EnviroForensics' October 4, 2023, *Site Investigation Report*, VI risks have been investigated at the buildings adjoining the Site, and no

VI risks have been identified. Additionally, the sanitary sewer laterals from the adjacent buildings and the sanitary sewer manholes along Derby Lane were sampled and determined to not be a VI risk.

Based on prior VI assessments at the residential and commercial buildings adjacent to the Site, VI assessment in the sanitary sewer line along Derby Lane, and no sewer gas or sub-slab vapor concentrations exceeding state screening levels, vapor plume migration and VI risk to the apartment building at 917 Derby Lane is unlikely. Therefore, VI assessment of the building at 917 Derby Lane does not appear to be necessary.

2.0 CONCEPTUAL SITE MODEL DEVELOPMENT

The development of a CSM is a key component in the successful evaluation of the Site. A CSM describes the characteristics of the Site and the processes by which potential contaminants may move from contaminant sources to receptors. A comprehensive CSM will include data from multiple sources that will allow for the understanding of impacts in each media, including vapor, soil, and groundwater. Additionally, the CSM will present a thorough understanding of potential exposure pathways including direct contact, ingestion, and inhalation. This includes:

- The evaluation of analytical data and chemical identification;
- Field data, including boring logs, and field sampling forms;
- Site-specific and regional geologic data;
- Background and historical property use data;
- Site utility locations and other potential migration pathways; and
- Other potential sources.

Information gathered during prior investigations and reporting will be gathered into a concise summary to obtain a clear picture of the following:

- Current, historical, and potential future land use;
- Historical operations data;
- Geologic setting;
- Susceptible areas; and
- Potential area receptors.

EnviroForensics will review and summarize the following information provided in prior reports to incorporate into the CSM summary:

- Past environmental investigation reports (Phase I, Phase II, etc.);
- Correspondence with EPA and/or WDNR;
- Evidence of prior owners/operators;
- Waste manifests;
- Electronic environmental database reports;

- Aerial photographs;
- Fire insurance maps;
- City Directory information;
- Regional and site-specific geological information;
- Regional groundwater and surface water records;
- Rare, threatened, or endangered species, environmentally sensitive areas, and critical habitats;
- Building construction blue-prints or drawings;
- Maps or drawings showing underground utilities and/or structures;

EnviroForensics will conduct a site inspection and an interview of the current operator to assess the current and former conditions at the Site and surrounding properties, and to determine soil boring locations. The site inspection will document the following:

- Site layout, buildings, and general condition of site structure;
- Current chemicals used/stored onsite;
- Current and/or former locations, with brief descriptions, of the following potential indoor/outdoor sources of contamination and potential transport pathways;
    - Dry cleaning machines
    - Spotting board
    - Chemical storage areas and chemical purchase/consumption history
    - Waste storage areas and disposal practices
    - ASTs/USTs
    - Maintenance areas
    - Parts cleaners
    - Floor drains
    - Floor cracks
    - Septic tank and drain field
    - Sumps, oil/water separators
    - Discharge piping
    - Sanitary sewer line
    - French drains
    - Ditches, pits, ponds, or lagoons
- Visible evidence of spills;
- Underground utilities; and
- Surrounding land use including
    - Adjacent properties (names, addresses, buildings, layout, etc.)
    - Specific description of properties within a 3-block radius of the site. The following will be noted:
        - Residences
        - Offices
        - Retail

- Industrial
- Schools
- Parks
- Playgrounds
- Churches
- Day care facilities.

A detailed assessment of the geologic setting will be conducted. Information obtained during reporting and site investigation activities will be used during geologic setting assessment activities. The purpose of the geologic setting is to provide a foundation for understanding the distribution, migration, and fate of chemicals. The following three (3) fundamental components of the geologic setting will be evaluated:

- Regional landforms;
- Subsurface composition and structure; and
- Groundwater flow.

The CSM will relate the above components of the geologic setting to the distribution of contaminants to provide a clear understanding of migration mechanisms and will be updated based on the collection of additional data.

An assessment for susceptible areas will be conducted and will include information on the following:

- Preferential pathways;
- Local municipal wells; and
- Ecologically susceptible areas.

The information reviewed will be summarized for inclusion in future reports and will include summaries of findings, tables, and figures.

3.0 ACCESS COORDINATION

EnviroForensics will attempt to coordinate access with the property owners and occupants of 1410 and 1412 S. Webster Avenue. An access agreement is already in place with the owner of 1410 S. Webster Avenue and we will notify them of the request for additional Site work on their property. EnviroForensics will prepare an Access Agreement letter for 1412 S. Webster Avenue with the following objectives: the advancement of one (1) deep soil boring targeting the groundwater interface.

Follow-up telephone calls and one (1) visits with the property owners will also be conducted if needed to secure access. EnviroForensics will request WDNR assistance with access if these access efforts are ignored or denied.

4.0 SOIL BORING INVESTIGATION

Previous investigation activities conducted at the Site identified cVOC soil impacts to the east of the Site building. Prior investigation did not include soil sampling within the building footprint, or to the west of the Site building due to limited access. Additionally, the groundwater concentrations to the east, south, and west of the Site have not been fully delineated to date. The following investigation data gaps have been identified:

- The delineation of shallow soil impacts of PCE at SB-3 (0'-2.5') at 9,400 micrograms per kilogram (µg/kg). The vertical extent of impacts have been delineated during prior investigations, however, WDNR has determined further refinement of the horizontal extents of shallow soil impacts is appropriate.
- Assessment of potential impacts in shallow soil associated with the FDCM, drycleaner chemical storage area, and waste filter storage area.
- The delineation of groundwater impacts of cVOCs in MW-2.

4.1 Boring Locations

To investigate the magnitude and extent of shallow cVOC contamination around SB-3, three (3) soil borings (SB-A, SB-B, and SB-C) will be advanced 10 to 15 feet to the north, east, and south of SB-3 and to an approximate depth of five (5) feet below ground surface (bgs) using direct-push technology (DPT) methods. One (1) soil sample for laboratory analysis will be collected from each boring at a shallow depth equivalent to the prior SB-3 shallow findings.

Based on the findings of the updated CSM (Section 2.0 above) and accessibility to the building interior, one (1) soil boring (SB-D) will be advanced adjacent to the FDCM to an approximate depth of 10 feet bgs using a hand-truck DPT rig. Up to three (3) soil samples will be collected for laboratory analysis to delineate potential impacts associated with the FDCM.

Three (3) soil borings will be advanced to the north, south and west of the FDCM to delineate potential shallow soil impacts, and the west and south locations will include grab-groundwater samples to assess the plume extents.

- SB-E will be advanced north of the Site building to an approximate depth of five (5) feet bgs and one (1) soil sample will be collected for laboratory analysis from the shallow interval.
- SB-F will be advanced to the west of the Site building to an approximate depth of 30 feet bgs. Up to three (3) soil samples will be collected for laboratory analysis to delineate potential soil impacts associated with the FDCM and/or other sources with the Site building. One (1) grab-groundwater sample will be collected for groundwater plume delineation purposes.
- SB-G will be advanced to the south of the Site building to an approximate depth of 30 feet bgs. Up to three (3) soil samples will be collected for laboratory analysis to

delineate potential soil impacts associated with the FDCM and/or other sources with the Site building. One (1) grab-groundwater sample will be collected for groundwater plume delineation purposes.

- SB-H will be advanced to the south of MW-2 to an approximate depth of 30 feet bgs. Up to three (3) soil samples will be collected for laboratory analysis to further delineate soil impacts previously identified in Site borings SB-5 and SB-6. One (1) grab-groundwater sample will be collected for groundwater plume delineation purposes.

The proposed boring locations are depicted on **Figure 1**. Additional borings will be advanced on the Site as needed to address potential source areas identified during the development of the CSM.

4.2 Utility Clearance

In accordance with safe work practices and as required by state law, EnviroForensics will contact Wisconsin Digger's Hotline subsurface utility protection service at least 72 hours prior to the anticipated onset of subsurface work at the Site. As a result, subsurface utilities and structures owned or managed by member companies and municipalities will be located by an independent contractor service. EnviroForensics will also contract with a private underground utility locating service to provide additional confidence regarding the position of potential underground hazards at the drilling locations. The private locating service will use geophysical and electromagnetic equipment to locate underground utilities across the entire Site. Utility information will be added to the Site plan and used to position investigative borings.

4.3 Soil Sample Collection

Soil cores will be continuously collected in 5-foot long by 1.5-inch diameter vinyl acetate plastic sample sleeves. The sample sleeve will be placed on clean plastic and the cutting tool decontaminated between samples. Nitrile gloves will be changed between each sample interval and new plastic sleeves will be inserted into the sample probe for each interval. Field screening using a photoionization detector (PID) will be conducted in 2-foot intervals, the results of which will be recorded. Soil lithology will be continuously described in accordance with the Unified Soil Classification System (USCS) and recorded on boring logs.

Sample depths will be based on soil lithology, physical observations, and PID readings. Soil samples selected for laboratory analysis will be collected using EPA SW-846 Method 5035A using TerraCore, or equivalent, sample vials and in lab supplied clean jars with Teflon lined lids. Soil samples will be labeled, logged on a chain of custody and placed into a cooler containing ice. Nitrile gloves will be changed between each sample interval and new plastic sleeves will be inserted into the sample probe. Samples will be submitted to a state-certified laboratory for analysis of VOCs by USEPA SW-846 Test Method 8260.

4.4 Grab-Groundwater Sample Collection

Grab-groundwater samples will be collected from three (3) of the DPT soil borings. The borings will be advanced to 10 feet below the water table (approximately 30 feet bgs). Groundwater samples will be collected using a temporary well at each direct push boring location. The temporary wells will be screened across the groundwater interface to the termination of the boring. The temporary wells will consist of 1-inch diameter ID, 0.010- inch slotted PVC well screen, with PVC riser extending to the ground surface. If the temporary well screen cannot be advanced due to bore hole collapse, a stainless-steel screen-point sampler[1] or similar device will be advanced to the groundwater interface. If used, the screen-point sampler will be decontaminated between each location.

Grab-groundwater samples will then be collected using a check valve with new dedicated polyethylene tubing. Grab-groundwater samples will be transferred directly into laboratory-supplied 40 milliliter (ml) vials pre-preserved with a hydrochloric acid solution and placed in a cooler with ice. One (1) duplicate sample, one (1) MS/MSD sample, and one (1) trip blank will be analyzed for QA/QC purposes. Samples will be submitted under appropriate chain-of-custody procedures to a state-certified laboratory for analysis of VOCs using US EPA SW-846 Method 8260B.

5.0 QUARTERLY GROUNDWATER SAMPLING

EnviroForensics proposes to conduct four (4) groundwater monitoring events that include depth to water measurements and sample collection from all monitoring wells to track contaminant trends and comply with WDNR investigation requirements. The monitoring network currently consists of 11 water table wells and one (1) piezometer.

Well caps will be removed at least 15 minutes prior to collecting water level measurements to allow groundwater in the monitoring well to equilibrate with the atmospheric pressure. The depth to water in each well will be measured to the nearest 0.01 of a foot using an electronic sounding device and recorded on sampling forms prior to sample collection activities.

EnviroForensics anticipates groundwater purging and sampling using bailer and standard low-flow methods as assigned in **Table 1**, based on prior sampling events. Some of the monitoring wells have variable conditions and low-flow methods may not be suitable due to limited recharge rates, therefore, purging and sampling will be completed using new, disposable bailers. Field parameters including pH, specific conductivity, temperature, oxidation-reduction potential (ORP), and dissolved oxygen (DO) will be measured during purging and recorded on a field sampling form. Wells that purge dry will be allowed to recharge for a minimum of four (4) hours prior to sample collection.

[1] https://geoprobe.com/tooling/sp16-groundwater-sampler

Groundwater samples will be transferred directly into laboratory-provided containers containing hydrochloric acid preservative and placed into a cooler with ice. Samples will be submitted under appropriate chain-of-custody procedures to a state-certified laboratory for analysis of VOCs according to U.S. EPA SW Method 8260. For quality assurance/quality control (QA/QC) purposes, duplicate and equipment blank samples will be collected at a frequency of one (1) sample per ten (10) investigative samples during each monitoring event. Purge water will be temporarily stored in a 55-gallon drum. Three (3) wells (MW-1, MW-2, and MW-10) will include analysis of geochemical/natural attenuation parameters. The geochemical parameters will include methane, ethane, and ethene, nitrate, nitrite, sulfate, chloride, total and dissolved iron, dissolved nitrate/nitrite, and total organic carbon.

6.0 PFAS IN GROUNDWATER ASSESSMENT

The drycleaning industry has been identified as a potential contributor to PFAS contamination because of suspected leakage from bulk storage of water-proofing and/or stain repellents and also from PFAS accumulation in dry cleaning waste. Though there is no confirmation of waterproofing or stain-repellent treatments routinely applied at the Site, and records of bulk storage of these types of compounds have not been identified for the Site to date, WDNR has requested PFAS sampling of the Site wells. EnviroForensics will plan to collect PFAS samples from the Site wells (MW-1, MW-2, and MW-3) during one of quarterly groundwater sampling events outlined in Section 6.0.

Groundwater sampling for PFAS analysis will be performed according to EnviroForensics standard operating procedure (SOP), presented in **Attachment 1**. Purging and sampling of the onsite wells will be performed by bailer. A PVC bailer with non-PFAS string will be used at each monitoring well. Per the SOP and standard industry practice, sampling will be done by a two-person team. Groundwater samples will be transferred directly into laboratory-provided HDPE containers and placed into a cooler with ice. The following will be collected for quality assurance/quality control (QA/QC) purposes: one (1) duplicate sample, one (1) equipment blank (PFAS free water passed through a clean bailer), and one (1) field blank (PFAS free water exposed to the atmosphere at the Site).

Samples will be submitted under appropriate chain-of-custody procedures to an ALS Laboratory in Holland, MI, which has been granted PFAS certification in the state of Wisconsin. The samples will be analyzed for the 33 compounds on the current WDNR PFAS list[2] according to a modified EPA 537 procedure (EPA 537M).

7.0 INVESTIGATIVE DERIVED MEDIA MANAGEMENT

Investigation-derived media (IDM) will consist of soil cuttings and groundwater generated during well purging prior to sample collection. Soil cuttings will be placed in a DOT 17H-rated

[2] https://dnr.wisconsin.gov/sites/default/files/topic/PFAS/LabUpdate20210301.pdf

55-gallon drum. A composite soil sample will be collected for profiling. Based on the concentrations of contaminants detected in previous soil samples, EnviroForensics anticipates that soil IDM will be characterized as non-hazardous.

Groundwater will be staged in a 55-gallon drum each quarter. Based on the concentrations of contaminants detected in previous monitoring well samples and prior characterization approval of groundwater as non-hazardous, EnviroForensics will retain a licensed contractor to transfer the IDM off-site for proper disposal.

8.0 DATA EVALUATION AND OFFSITE OWNER NOTIFICATION

The soil, grab-groundwater, and quarterly groundwater data will be evaluated and summarized in comparison to regulatory standards as laboratory results are received. The CSM, tables, and figures will be updated with tasks completed.

EnviroForensics will also provide risk communication to each offsite property owner and develop individual Results Notification letters communicating the sampling results related to each property sampled.

9.0 SUMMARY REPORT

Once the analytical results are available from each investigation event and four (4) quarters of groundwater sampling are completed, EnviroForensics will prepare a Furter Site Investigation Report that summarizes the results of the work activities associated with the proposed tasks. The report will include tables, maps, figures, and appendices, as appropriate, to aid data presentations and interpretation and the findings of the investigation. A detailed assessment of the Site CSM will also be included in the report.

After completion of this phase of investigations, it is our intent, barring unexpected findings, to move the Site to remedial action planning and progress to closure.

Sincerely,

EnviroForensics, LLC

R. Scott Powell, PE, LPG
Regional Director
rspowell@enviroforensics.com
317.608.2706

TABLE

1 Monitoring Well Sampling Schedule

FIGURE

1 Site Map

ATTACHMENT

1 Standard Operating Procedure: Sampling Protocol for Per- and Polyfluoroalkyl Substances (PFAS)

Table

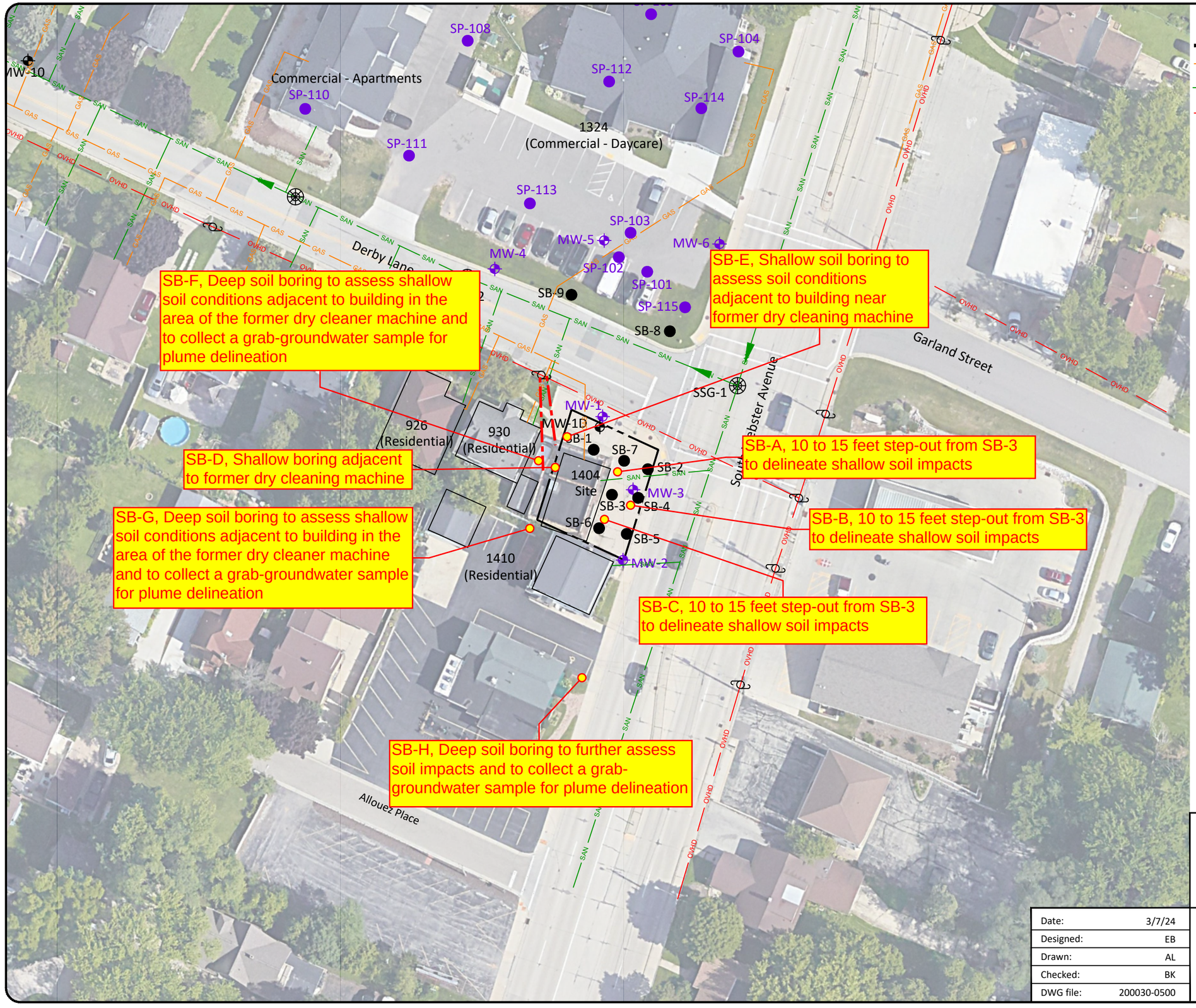
TABLE 1
MONITORING WELL SAMPLING SCHEDULE

Former Econo Care Cleaners
1404 South Webster Avenue, Allouez, Wisconsin

Monitoring Well ID	**Q1**	**Q2**	**Q3**	Q4	VOCs	MNA	PFAS	Sample Method	Note
MW-1	X	X	X	X	X	X	X	Bailer	
MW-1D	X	X	X	X	X			Bailer	Occasionally Dry
MW-2	X	X	X	X	X	X	X	Bailer	Occasionally Dry
MW-3	X	X	X	X	X		X	Bailer	
MW-4	X	X	X	X	X			LF / Bailer	Occasionally Dry
MW-5	X	X	X	X	X			Bailer	Occasionally Dry
MW-6	X	X	X	X	X			LF	
MW-7	X	X	X	X	X			LF	
MW-8	X	X	X	X	X			LF	
MW-9	X	X	X	X	X			LF	
MW-10	X	X	X	X	X	X		LF	

LF = Low Flow / Micro - Purge

Figure



Legend

- Property boundary
- Underground gas utility line
- Underground sanitary utility line
- Arrow for flow direction
- Over head electrical utility line
- Utility Pole
- Manhole
- MW-1 — Monitoring Well (By Others)
- MW-7 — Monitoring Well
- SB-8 — Soil Boring
- SP-101 — Soil Boring (By Others)
- SSG-1 — Sewer gas sample location

N

50 0 10 20 30 40 50

SCALE: 1" = 50'

SITE MAP

1404 South Webster Avenue
Green Bay, Wisconsin

Date:	3/7/24
Designed:	EB
Drawn:	AL
Checked:	BK
DWG file:	200030-0500

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
1
Project
200030

ATTACHMENT 1

Standard Operating Procedure: Sampling Protocol for Per- and Polyfluoroalkyl Substances (PFAS)

STANDARD OPERATING PROCEDURE

Sampling Protocol for Per-and Polyfluoroalkyl Substances (PFAS)

INTRODUCTION

State regulatory agencies are currently developing sampling guidance, soil and groundwater standards, and other procedures aimed at the regulation of per- and polyfluoroalkyl substances (PFAS). Along with the developing regulatory procedures, there exist several sampling guidance resources from various agencies such as the State of Michigan, the U.S. Department of Defense, the U.S. Environmental Protection Agency, the Interstate Technology & Regulatory Council, and a few analytical laboratories such as Pace Analytical and Test America. This Standard Operating Procedure (SOP) was based on the procedures and guidance developed to date by these agencies. Since regulations and standards regarding PFAS are evolving, it is anticipated that this SOP will require periodic modifications.

When sampling for PFAS, this SOP should be used as a supplement to modify existing EnviroForensics SOP's related to standard groundwater and soil sampling procedures.

Although similar to standard sampling methods for other chemical compounds, special precautions are necessary when sampling for PFAS due to the laboratory detection limits that are in the parts per trillion range, and the proliferation of PFAS in common consumer products. This greatly raises the potential for these compounds to be inadvertently introduced to the samples, resulting in false-positive detections.

The sampling precautions and protocol for PFAS are rigorous and there are many potential opportunities for mistakes in the field that can result in cross-contamination, or the inadvertent introduction of PFAS into the sample media. **It is required that any field investigations for PFAS be conducted by a two (2) person team**. One (1) person is assigned the actual sample collection protocol and the other person is assigned to maintaining the integrity of the sample throughout the sampling process.

PRE-SAMPLING CONSIDERATIONS

As mentioned, PFAS have been detected in many everyday products including cosmetics, soaps, sun-screen, insect repellent, and many products having water repellents and/or stain-resistant coatings to include carpeting, car upholstery, some Tyvek suits, water proof leather boots, garments, and rain-wear. Several agencies have prepared a list of acceptable materials that have

been tested free of PFAS; however, there is a long list of items that have not been tested. This SOP provides some acceptable materials that can be safely used before and during sampling for PFAS, along with comments regarding materials that should not be used and various recommendations to improve sample integrity.

A limited number of readily available and recognizable products are presented below instead of listing all options. For example, there are numerous sun-screen and insect repellent products that have been determined to be PFAS-free (and the list will likely grow over time); however, only a few readily available and recognizable products are listed or recommended here to reduce the number of product decisions that project staff may need to make. If any other product is proposed for use, but is not identified in this SOP as PFAS-free, then that product or substance will need to be analyzed or otherwise determined to be PFAS-free before it can be used.

Personal Hygiene and Care Products

Many personal care products may contain PFAS. These products include soaps, shampoos, cosmetics, deodorants, and dental products including floss. By following this SOP it is not likely that these types of products will come into direct contact with a sample. However, it is **highly recommended that the use of personal care products be curtailed the day of sampling** until more information is available for personal care products that do not contain PFAS.

Personal Protective Equipment

Many common types of protective equipment including clothes, jackets, boots, gloves, Tyvek products, sunscreen, and insect repellents contain PFAS. For common clothing, jackets, boots, and gloves, the PFAS occurs in water repellent and stain repellent treatments that have been applied to the clothing and outer wear. The use of fabric softeners during laundering may also impart PFAS to clothing. Rain suits made of breathable, yet water repellent, materials typically have PFAS in them. Items made of rubber or PVC do not contain PFAS.

Items that may be worn and are known to be free of PFAS include:

- Powderless nitrile gloves;
- Clothing made of natural and synthetic fibers (preferably cotton) and that have been **washed at least six (6) times and without using fabric softeners or dryer sheets**;
- Polyvinyl chloride (PVC) or wax-coated fabrics, including rain gear;
- Any boots or over-boots made of polyurethane or PVC;
- Neoprene;
- Un-coated Tyvek® coveralls;

- Sunscreen: Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30; or Coppertone Sunscreen Lotion Ultra Guard Broad Spectrum SPF 50; and
- Insect repellent: Off Deep Woods.

Items that **may not** be worn due to the potential for containing PFAS:

- Coated Tyvek® materials as they do contain PFAS;
- Leather or other steel-toed work boots unless polyurethane or PVC over-boots are used;
- Clothing treated with stain or water repellents;
- Clothing and outerwear that has been dry cleaned; and
- Any rain gear having Gore-Tex™ or other water-proof, or water-repellent fabrics or coatings.

Field Sampling Equipment

Carefully select sampling equipment that directly contacts the sample to ensure it is free from PFAS. Submersible pumps, down-hole instruments, and tubing used for groundwater sampling could have external or internal parts that are not PFAS-free. Check with the manufacturer to evaluate whether there are PFAS-containing components in the equipment. If unsure collect an equipment blank and have it analyzed for PFAS.

Some materials that are known to be PFAS-free include:

- Metals (metal components used for groundwater sampling are typically either stainless steel or brass);
- Nylon;
- PVC (bailers and pump parts);
- High-density polyethylene (HDPE);
- Polypropylene and polyurethane (bailer rope and tubing);
- Silicone (tubing); and
- Acetate (drill core sleeves).

Materials that may contain PFAS and **are not** to be used include:

- Low-density polyethylene (LDPE) tubing. LDPE does not inherently contain PFAS, but may have acquired it through materials used in the manufacturing process. LDPE Zip-loc® sample bags can be used if they do not contact the sample media directly;
- Aluminum foil;

- Teflon-lined tubing or equipment having Teflon components;
- Any product or equipment having any "fluoro" prefix;
- "Rite in the Rain" or other all-weather field books; and
- Sharpie markers, post-it notes, or other adhesive paper products.

In addition, **do not** transport field equipment in direct contact with vehicle carpet or seats. These materials typically contain PFAS in stain and water repellent applications. If equipment must be set on seats or carpet, then transport it in a closed container.

Sample Collection Recommendations:

1. If the depth to water is shallow, use disposable PVC bailers with polypropylene or polyurethane rope.
2. Collect an equipment blank from or through any sampling equipment before its use in the field, unless all equipment materials are inherently PFAS-free, or the manufacturer can guarantee that all components are PFAS-free.
3. Determine if the measuring tape on the water level meter contains PFAS, see #2 above.
4. If using a peristaltic pump to collect shallow water table samples, use only new, unused, tubing that is inherently PFAS-free at each sample location (HDPE, nylon, polyurethane, silicone).
5. If using any other submersible pump in deeper water table conditions, see #2 above.
6. If using any other down-hole data collection probe, see #2 above.
7. For longer-term monitoring of confirmed PFAS in groundwater, consider using dedicated and PFAS-free equipment such as dedicated pumps. Passive Diffusion Bags may be used if equipped with HDPE hydrasleeves and the de-ionized water is PFAS-free.
8. If setting temporary wells, collecting soil samples, or using any other drilling method, ensure that the core sleeves are either acetate, PVC, or HDPE (see #2 above).
9. Use only stainless steel tools or wooden disposable tongue depressors to collect soil sub-samples from drill cores.
10. Use only aluminum or Masonite clipboards with loose paper (non-water resistant) to record field notes.
11. Use only ball-point pens to record field data, prepare sample labels, etc.

Decontamination

It is extremely important that any **water** used for decontamination of equipment or hand washing before, between, and after sampling be free of PFAS. Commercially available distilled water sources should be analyzed for PFAS before its use in the field and should come in an HDPE container. If using municipal water, check with the municipality to determine if the source is

PFAS-free. If that cannot be readily determined, then sample the water for PFAS before its use.

All rental equipment and in-house equipment previously used at other sites needs to be decontaminated before its use. Use only Alconox®, Liquinox®, or Citranox® to decontaminate equipment or wash hands, and use only PVC or HDPE brushes for scrubbing equipment.

Decontaminate equipment before collecting samples, between samples, and at the end of the day. Triple-rinse equipment after cleaning, and change nitrile gloves after decontaminating equipment between sample locations.

FIELD SAMPLING PROCEDURES

Sample Handling

Sample handling procedures are implemented to ensure that sample integrity is maintained throughout the sample collection process. Therefore, the procedures for collecting PFAS samples are not unlike typical sample handling procedures already employed by EnviroForensics personnel. However, due to the pervasiveness of PFAS in the environment, low laboratory detection limits, and possibility of cross-sample contamination, the sample handling procedures for PFAS are more rigorous. EnviroForensics uses a clean hands/dirty hands approach during sample handling activities. One person handles all of the sampling equipment and the other person handles only the sample containers. Specific sample handling procedures with respect to PFAS include:

1. Label sample containers and zip-lock bags in the office before visiting the Site, or in a staging area, and keep the containers in a PFAS-free cooler for use on site. Wash hands and don new powderless nitrile gloves before sample collection.
2. The person designated "dirty hands" handles the sampling equipment only. The person designated "clean hands" holds the sample container and seals the container lid after collecting the sample.
3. **Do not** touch anything other than decontaminated field sampling equipment or sample containers after donning clean nitrile gloves. If you do by accident, change gloves before proceeding further.
4. **Do not** touch the sample or let the outside of the sampling equipment (tubing, bailer, etc.) touch the sample container during sample collection.
5. **Do not** set the sample container on the ground or other surfaces while collecting the sample. That is why there are two people involved.

6. Hands must be washed and new powderless nitrile gloves donned after any decontamination procedure, or (if using all disposable materials) before collecting another groundwater or soil sample;
7. Double bag individual soil or groundwater samples in zip-loc bags and immediately place samples on ice in the cooler.

Additional Considerations

1. Wash hands and change gloves frequently during a long decontamination procedure.
2. Set up a staging area away from the sample collection area for logging field notes, labeling samples containers before sampling, and for taking breaks.
3. **Do not bring any fast food to the site or go off site for lunch.** Fast food wrappers typically contain PFAS. Instead, prepare a lunch and bring it in a plain paper bag to consume in the staging area.
4. Wash hands thoroughly and don clean nitrile gloves following lunch and other breaks.

Laboratory

Many states are currently developing PFAS regulatory standards and laboratory certification programs. There are many compounds of concern contained in the overall PFAS family of chemicals. If State standards have not yet been developed, check with the State regulatory agency to determine the particular compounds to analyze for. Some analytical laboratories have been certified by various agencies such as: State regulatory agencies; Department of Defense; Department of Energy; National Environmental Laboratory Accreditation Program; and International Organization for Standardization. That does not mean that they are set up to analyze for all PFAS chemicals of concern to a particular State agency. Check with the laboratory after determining the State requirements.

Do not use glass sampling containers, as glass tends to adsorb PFAS. Instead, use HDPE or polypropylene containers. Container caps should be of the same material with no Teflon™ seal. Confirm that coolers used to store and ship laboratory samples are PFAS-free. A qualified laboratory will provide the appropriate media for these protocols.

For groundwater samples, do not filter or use a chemical preservative. For samples of municipal drinking water (also possibly used for equipment decontamination) the analytical methods call for preservation with Trizma® to buffer and remove chlorine. Check with the laboratory regarding how many sample containers are needed per sample and appropriate preservatives. Place samples separately in double zip-loc® bags and place immediately on ice. Maintain temperature of the samples below 50° F (10° C). Use regular ice. **Do not use "blue ice" or**

chemical ice packs.

Seal Chain-of-Custody forms and other forms in a zip-loc® bag and tape to the inside lid of the cooler. Tape the cooler closed with a custody seal and ship to the analytical laboratory. Hold time is 14 days to the laboratory with extraction within 28 days.

The current U.S. Environmental Protection Agency (USEPA) developed, and validated analytical methods for PFAS are USEPA Method 533, and USEPA Method 537.1. USEPA Method 533 is focused on the detection of short-chained PFAS (4-12 carbon chain lengths), while Method 537.1 is more focused on detecting longer chain PFAS. Using both methods, up to 29 PFAS chemicals can be detected. These methods were developed for drinking water, but would also apply to groundwater. Soil samples are currently being analyzed for PFAS using a modified Method 537M. New sampling methods are evolving, so these methods may change in the future. Check with State agencies and the analytical laboratories to determine if the above stated methods are still valid or if other methods have been developed and approved by the USEPA and State.

ADDITIONAL FIELD QUALITY CONTROL (BLANKS)

Several different blanks will need to be collected during and possibly before field sampling operations. As previously mentioned, equipment blanks should be collected and analyzed before site work if any materials to be used in field sampling cannot be determined to be PFAS-free. There are additional blanks that will need to be collected during the actual sample collection process to ensure that quality control has been maintained and samples have not been contaminated by outside sources.

Equipment Blanks

Equipment blanks are collected to determine the adequacy of the decontamination process. Equipment blanks are not needed if using dedicated or disposable sampling equipment that has been determined to be PFAS-free.

- Collect an equipment blank by passing PFAS-free water through/over field sampling equipment before use; and
- Collect an additional equipment blank for every five (5) samples collected.

Have the analytical laboratory hold the equipment blanks for possible analysis. Some of the equipment blanks may be analyzed if one or more samples contain PFAS detections.

Field Reagent Blanks

Field reagent blanks (FRBs) are collected to determine if PFAS have entered the samples through the ambient environment, the sampling process in general, and the analytical laboratory sample handling processes. The analytical laboratory will supply a vial of PFAS-free water and an empty sample container for collecting the FRB. The analytical laboratory should be consulted regarding the number of FRBs that should be collected per sampling event.

The FRB will be opened during the collection of one (1) site sample and handled in the same way as that of the site sample. The laboratory provided PFAS-free water will be poured into the provided clean sample vial to mimic field sample collection procedures. As with equipment blanks, reserve the FRBs for possible laboratory analysis if PFAS is detected in any given sample.

Field Duplicates

Collect duplicate samples to measure both field and laboratory precision. The State regulatory agency should be contacted to determine the number of duplicate samples to collect. The State may require more duplicate samples than would be typical for other types of contaminants. For example, the Wisconsin Department of Natural Resources typically requires that one (1) duplicate sample be collected for every 10 groundwater samples that are collected. However, this is guidance (refer to *Groundwater Sampling Desk Reference*, PUBL-DG-037, September 1996) and they may require more when sampling for PFAS.

Trip Blanks

Typically, trip blanks are utilized to determine cross-contamination during shipment of samples and the possible introduction of contaminants in the laboratory environment due to volatile organic compounds. However, the analytical laboratory should be consulted regarding the need for a trip blank during PFAS sampling.

If requested by the laboratory, the laboratory will prepare the trip blanks using PFAS-free water and will ship them with the cooler. If required, include one (1) trip blank in each sample cooler. Do not remove the trip blank from the cooler during sampling, or transport to and from the site. The laboratory will decide whether to run the trip blank if one (1) or more site samples contain PFAS.

REFERENCES

California State Water Quality Control Board, Division of Water Quality, 2019, *Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidelines*, 9 pp.

Interstate Technology Regulatory Council, 2018, *Site Characterization Considerations, Sampling Precautions, and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS)*, 9 pp.

Michigan Department of Environmental Quality, 2018, *General PFAS Sampling Guidance*, 24 pp.

Pace Analytical Webpage, *PFAS Field Sampling Guide*: https://www.pacelabs.com/assets/2020-01-14-pfas-field-sampling-guide.pdf.

United States Department of Defense Webpage, *Bottle Selection and Other Sampling Considerations When Sampling for Per- and Poly-Fluoroalkyl Substances (PFAS)*: https://www.denix.osd.mil/edqw/home/what-s-new/unassigned/edqw-pfas-sampling-factsheet-rev-1-2-july-2017/.

United States Environmental Protection Agency Webpage, *EPA Drinking Water Laboratory Method 537 Q&A*: https://www.epa.gov/pfas/epa-drinking-water-laboratory-method-537-qa.