Water Sampling Protocol

soilfix
GROUND RISK SOLUTIONS

Point of Ayr, Talacre

MS004 -Water Sampling Protocol for PFAS-containing Water

For Stuart Wells Ltd

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1 Introduction

1.1 Overview

Soilfix Limited (Soilfix) were appointed by Stuart Wells Ltd to carry out treatment and water pumping trials on Per – and Polyfluoroalkyl Substances (PFA)-containing waters from Point of Ayr terminal, Talacre.

PFAS are a class of persistent organic pollutants that are widely distributed in the environment due to their extensive industrial and consumer use. Given the ultra-trace levels at which PFAS are regulated (often in the parts-per-trillion range), preventing cross-contamination during sampling is critical to obtain accurate and defensible results. Because PFAS compounds can leach from common materials and persist on surfaces, strict contamination control measures must be integrated into all aspects of sampling, personnel preparation, equipment selection, sample handling, and transport.

This document outlines the primary hazards and risks associated with PFAS sampling and provides guidance to minimize cross-contamination. This document is intended to provide guidance to field staff sampling PFAS.

The document describes the intended use, scope and application, personnel qualifications, equipment, cautions, health and safety considerations and procedures of PFAS water sampling.

1.2 Reference Documents

There are numerous documents available for carrying out water sampling of PFA-containing water. The following key documents have been referenced to produce this protocol.

- Sampling Recommendations for PFAS to Maximize Data Quality - ALS Global, Issue 2, May 2003; and
- TGI – Per- and Polyfluoroalkyl Substances (PFAS) Field Sampling Guide - Arcadis, Rev 10, dated January 26 2022.

2 Qualifications

2.1 Personnel

Sampling personnel can be an inadvertent source of PFAS contamination if not properly trained and equipped. Cross-contamination risks arise from the use of personal care products (e.g., sunscreens, cosmetics, moisturisers, insect repellents) and clothing treated with water-, stain-, or wrinkle-resistant coatings. Personnel must wear natural fibre clothing such as untreated cotton, avoid PFAS-containing personal products before and during sampling, and change gloves frequently, especially between sample sites or tasks.

Nitrile gloves may contain PFAS in some formulations, so only pre-approved, PFAS-free gloves should be used.

Strict adherence to clean handling techniques is necessary to prevent sample contamination through contact with bottle interiors, tubing ends, or sampling devices.

Field personnel should have current Health and Safety training and have read and signed onto this protocol in Section 6 below.

2.2 Laboratories

Samples must be sent to laboratories accredited for PFAS analysis. Sample containers must be specific to PFAS analysis and must be requested from the laboratory. The following laboratories are examples (but not an exhaustive list) that could be used to analyse environmental medial for PFAS pending project approval:

- ALS Global; and,
- Normec DETS.

3 Equipment

Sampling equipment presents one of the greatest risks of introducing PFAS contamination due to the prevalence of fluoropolymer materials in tubing, valves, and seals. Equipment that includes polytetrafluoroethylene (PTFE), fluorinated ethylene propylene (FEP), or similar materials must be avoided. Acceptable alternatives include stainless steel, high-density polyethylene (HDPE), and polypropylene.

All equipment, including pumps, tubing, sample bottles, and filtration units, should be certified PFAS-free or cleaned according to validated protocols using laboratory-grade solvents and rinsing with PFAS-free water.

Field blanks and equipment blanks must be collected to detect any background contamination that may be introduced during equipment handling or deployment.

Examples of equipment that can/can't be used for water sampling is detailed below:

- Latex & powder free nitrile gloves (for each sample). Ensure PFAS free;
- HDPE bottles fitted with polypropylene screw cap only. Request specific bottles for PFAS samples from the laboratory. Glass bottles are not suitable;
- Ziploc® bags to hold ice and samples. Do not use blue ice blocks;
- Label with biros not permanent/solvent markers; and,
- Do not use waterproof/treated notebooks.

4 Cautions

4.1 Food packaging

Some food packaging may be treated with PFAS-containing chemicals to prevent permeation of oil and water in the food outside of the packaging. To avoid potential food packaging-related PFAS contact:

- Do not bring any food outside of the site vehicles and eat snacks and meals offsite;
- Wash hands after eating; and,
- Remove any field clothing or outer layers prior to eating. Do not put them back on until you have finished eating and your hands are washed.

4.2 Clothing and PPE

Clothing and personal protective equipment (PPE) are potential sources for PFAS contamination. Many outdoor garments are treated with water repellent coatings that contain fluorinated compounds. Therefore, field personnel should wear untreated, 100% cotton clothing, avoiding any synthetic or chemically treated fabrics. Rain gear, boots, and gloves must also be evaluated for PFAS content. When rain protection is required, only garments confirmed to be free of PFAS should be used.

Nitrile gloves are typically used during sampling but must be sourced from suppliers who can confirm that they are PFAS-free. Gloves should be changed before handling each sample or clean surface and never reused. Safety glasses and protective footwear must be PFAS-free and regularly inspected for cleanliness. All PPE should be stored in clean containers or sealed bags to avoid environmental contamination before use.

4.3 Personnel Hygiene

Some personnel hygiene items can also contain PFAS. Do not use personal care products after showering such as lotions, makeup, and perfumes, unless medically necessary.

If sunscreens and insect repellents as necessary for health and safety, use PFAS free items. Some insect repellents and suncreams have been approved for PFAS sampling, these are listed below.

Insect Repellents

- OFF Deep Woods
- Sawyer Permethrin

Sunscreen

- Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30
- Meijer Sunscreen Lotion Broad Spectrum SPF 30
- Neutrogena Ultra-Sheer Dry-Touch Sunscreen Broad Spectrum SPF 30
- Banana Boat for Men Triple Defense Continuous Spray Sunscreen SPF 30
- Banana Boat Sport Performance Coolzone Broad Spectrum SPF 30
- Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30
- Banana Boat Sport Performance Sunscreen Stick SPF 50

- Coppertone Sunscreen Lotion Ultra Guard Broad Spectrum SPF 50
- Coppertone Sport High-Performance AccuSpray Sunscreen SPF 30
- Coppertone Sunscreen Stick Kids SPF 55
- L'Oréal Silky Sheer Face Lotion 50+
- Meijer Clear Zinc Sunscreen Lotion Broad Spectrum SPF 15, 30 and 50
- Meijer Wet Skin Kids Sunscreen Continuous Spray Broad Spectrum SPF 70
- Neutrogena Beach Defense Water + Sun Barrier Lotion SPF 70
- Neutrogena Beach Defense Water + Sun Barrier Spray Broad Spectrum SPF 30
- Neutrogena Pure & Free Baby Sunscreen Broad Spectrum SPF 60+

Insect repellents and sunscreens should be applied away from the works area. When re-applying stay at least 10m from the sampling location and equipment. Wash hands after application and use new nitrile gloves.

4.4 Visitors

Visitors are asked to keep at least 10m from the sampling areas.

5 Health and Safety Considerations

Although acute exposure risks during field sampling are minimal, chronic exposure to PFAS through skin contact or incidental ingestion should be minimized. PPE such as gloves, eye protection, and splash-resistant clothing should be worn to avoid contact with potentially contaminated water. In situations where aerosol or splash is possible, face shields or goggles should be used. Used gloves, wipes, and disposable sampling materials should be treated as potentially contaminated waste and disposed of per waste protocols. Decontamination wastewater should be collected and managed in compliance with applicable environmental regulations to prevent secondary contamination.

Follow site specific RAMS for the task to be carried out which will specify PPE requirements.

6 Water Sampling Procedure

6.1 Before Sample Collection

- Prepare lab-provided HDPE bottles fitted with a HDPE lined (no Teflon™) screw cap. Make sure that the caps remain on the bottle until immediately prior to sample collection.
- Do not use glass bottles due to potential loss of analyte through adsorption. This is particularly important for aqueous samples.
- Wear a new set of nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Complete bottle labels once the sample has been taken and after the caps have been placed back on each bottle. Use biro pens, not permanent/solvent markers.

6.2 During Sample Collection

- Do not touch waterproof or Hi-Viz reflective strips on clothing and do not allow waterproof treated footwear to come into contact with sample material.
- Fill groundwater samples (to the neck of the bottle, some headspace is acceptable) from the dedicated sampling ports. While collecting the sample, make sure the bottle cap remains in the other hand of the sampler, until replaced on the bottle.
- To mitigate cross contamination, collect groundwater samples in a pre-determined order from least impacted to greater impacted based on previous analytical data or knowledge about past activities at the site ie. Treated water should contain less PFAS than untreated water.
- After collecting the sample, tightly screw on the cap.

6.3 Collection, Storage and Transportation of Sample

- Place each sample bottle in two sealed Ziploc® bags (or similar LDPE bags).
- Do not write on sample containers with permanent marker, use biro or double bag and write on the outer bag.
- Do not use blue ice blocks – chill using Ziplock bagged ice cubes or pre-chill and insulate samples.

7 Protocol Briefing Record

Protocol Briefing Record				
Name	**Employer**	**Signature**	**Date**	**Briefing by** (initials)