Remedial Investigation Workplan

Benner Township PFAS Investigation Area
2535 Fox Hill Road
State College, Pennsylvania

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ACRONYMS

Act 2 – Pennsylvania Land Recycling and Environmental Remediation Standards Act of 1995
AFFF – Aqueous Film-Forming Foam
Airport – State College Regional Airport
bgs – below ground surface
CCAA – Centre County Airport Authority
COA – November 13, 2024 Consent Order and Agreement, Effective Date of June 24, 2025
CSM – Conceptual Site Model
Department Investigation Area – The Benner Township PFAS Investigation Area
DO - Dissolved Oxygen
ERI – Electrical Resistivity Imaging
FAA – Federal Aviation Administration
FRB – Field Reagent Blank
F3 – Fluorine Free Foam
GIS – Geographic Information System
GPR – Ground Penetrating Radar
HASP – Health and Safety Plan
HAL – Health Advisory Level
IDW – Investigation Derived Waste
LIDAR – Light Detection and Ranging
MCL - Maximum Contaminant Levels
MGW – Migration to Groundwater
MSCs – Medium Specific Concentrations
msl – mean sea level
ng/l – nanograms per liter
NPDES – National Pollutant Discharge Elimination System
NRDC – Non-Residential Direct Contact
OHSM – Office Health and Safety Manager
ORP - Oxidation-Reduction Potential
PAANG – Pennsylvania Air National Guard
PADEP – Pennsylvania Department of Environmental Protection
PFAS – Per- and Poly-Fluoroalkyl Substances
PFBS – Perfluorobutane Sulfonic Acid
PFHxS – Perfluorohexane Sulfonic Acid
PFNA – Perfluorononanoic Acid
PFOA – Perfluorooctanoic Acid
PFOS – Perfluorooctane Sulfonic Acid
PID – Photoionization Detector
POET – Point-of Entry Treatment
PUL – Precision Utility Locating
PVC - Polyvinyl Chloride
QAPP – Quality Assurance Project Plan
QA/QC – Quality Assurance and Quality Control
QC – Quality Control
RCRA - Resource Conservation and Recovery Act
RDC – Residential Direct Contact
RUA – Residential Used Aquifer

RI – Remedial Investigation
RIR – Remedial Investigation Report
RIWP – Remedial Investigation Workplan
Roux – Roux Associates, Inc.
SHSO – Site Health and Safety Officer
SOPs – Standard Operating Procedures
SOTA – State of the Art, a Local Business
SOW – Scope of Work
TGM – Act 2 Technical Guidance Manual
University – The Pennsylvania State University
USEPA – United States Environmental Protection Agency
USGS – United States Geological Survey
UST – Underground Storage Tank

1. INTRODUCTION

On behalf of The Pennsylvania State University (the "University"), Roux Associates, Inc. ("Roux") has prepared this Remedial Investigation Work Plan ("RIWP") for the investigation of potential per- and poly-fluoroalkyl substances ("PFAS") releases from the State College Regional Airport ("Airport") within the Benner Township PFAS Investigation Area ("Department Investigation Area"), as defined in Exhibit A of the November 13, 2024 Consent Order and Agreement ("COA") with an effective date of June 24, 2025.[1] The University, together with the Centre County Airport Authority ("CCAA"), owns real property on which the Airport is located. Operations are split between the University and CCAA, with the University conducting the Airport Operation responsibilities and CCAA responsible for operation of the Airline Terminal. The Department Investigation Area is located primarily in Benner Township and partly in Patton and College Townships. **Figure 1** is a Site Location Map depicting the Airport and the Department Investigation Area on a United States Geological Survey ("USGS") map. **Figure 2** is a Site Map depicting the same two areas on an aerial photograph map.

This RIWP has been prepared and submitted to the Pennsylvania Department of Environmental Protection ("PADEP") in accordance with the approved schedule for the remedial investigation ("RI") of the Airport.[2]

The Department Investigation Area includes the Airport, located at 2535 Fox Hill Road, State College, PA 16803, and certain surrounding residential, commercial, and agricultural areas as depicted in Exhibit A of the COA. Pursuant to the COA, potential releases of perfluorooctane sulfonic acid ("PFOS"), perfluorooctanoic acid ("PFOA"), perfluorobutane sulfonic acid ("PFBS"), perfluorononanoic acid ("PFNA") and perfluorohexane sulfonic acid ("PFHxS") at or from the Airport will be investigated and remediated under the Pennsylvania Land Recycling and Environmental Remediation Standards Act of 1995 ("Act 2"), associated regulations (PA Code Title 25 Chapter 250), the Act 2 Technical Guidance Manual ("TGM"),[3] and this RIWP.

The objective of this RIWP is to define the scope of work ("SOW") and procedures for implementation of the RI to assess potential PFAS releases from the Airport. The RI is expected to be implemented in an iterative manner with the results from the first step used to inform and design the subsequent steps. The SOW proposed in this RIWP is intended to generate data to a) focus the investigation area, b) further characterize conditions within the Department Investigation Area, c) produce an increasingly refined, site-specific conceptual site model ("CSM"), and d) help define the next steps to address data gaps. The structure of this RIWP is outlined below.

- Section 2 – Summary of SOW
- Section 3 – Background Information
- Section 4 – Preliminary CSM
- Section 5 – RI SOW
- Section 6 – Quality Assurance and Quality Control ("QA/QC")
- Section 7 – Reporting

[1] This Workplan is being submitted consistent with the requirements set forth in the COA. Nothing stated herein is intended to alter or amend the rights and obligations set forth in the COA.
[2] PADEP approved a July 22, 2025 Revised Proposed Schedule and approved an email extension for submission of the RIWP, with a submission date for the RIWP of November 26, 2025.
[3] TGM last updated January 19, 2019, with addendum on March 26, 2021.

- Section 8 – Health and Safety
- Section 9 – RIWP Implementation Schedule

This RIWP is supported by underlying studies and data generated by others. Key information and data from previous studies have been compiled and are presented herein. Additional compilation and interpretation of previous studies is expected to occur as the RI progresses.

2. SUMMARY OF SOW

A summary of the SOW included in this 2025 RIWP is presented below. As discussed above, the RI is expected to be implemented in an iterative manner with the results from the first step used to inform and design the subsequent steps.

1. **Task 1 – Preparatory Tasks**

    a. **Task 1a – Compile Existing Data**: Continue the compilation and interpretation of existing data and information including but not limited to published literature and local studies.

    b. **Task 1b – Field Conditions Verification**: Conduct field inspections (including with key subcontractors) to a) verify reported conditions, b) observe geologic and topographic conditions, c) confirm the viability and access constraints related to the proposed SOW, and d) inspect areas of work with Airport personnel to fully understand Airport safety requirements and limitations.

    c. **Task 1c – Access/Permitting/Contracting/Training**: Complete a variety of necessary preparatory tasks including a) seeking access to properties (to the extent not owned by the University), b) identifying and obtaining necessary permits, c) selecting and contracting with subcontractors, and d) completing any necessary Airport-specific training for both Roux and its key subcontractors. Other tasks not detailed herein may also be completed to facilitate execution of subsequent tasks.

2. **Task 2 – Private Supply Well Tasks**

    a. **Task 2a – Access Agreements**: Secure access agreements with property owners with Point of Entry Treatment ("POET") systems that are to be monitored and maintained by the University after transition of this responsibility from PADEP.

    b. **Task 2b – Private Supply Well Sampling**: An area-wide sampling event for an estimated 43 residential and commercial private supply wells (properties previously sampled by PADEP or the University but not requiring a POET system) within the Department Investigation Area.

    c. **Task 2c – POET System Sampling**: Monitoring and maintenance of 39 POET systems in accordance with the COA after transition of this responsibility from PADEP.

3. **Task 3 – Remedial Investigation Field Work Tasks**

    a. **Task 3a – Surface Geophysical Survey**: Conduct a surface geophysical survey comprised of a series of transects to characterize subsurface geologic conditions and optimize the selection of monitoring well locations.

    b. **Task 3b – Soil Sampling and Analysis**: Conduct a soil sampling program comprised of approximately 100 soil borings and 200 soil samples in 13 areas to a) validate previous soil source condition findings, b) support horizontal and vertical delineation, c) evaluate potential stormwater transport pathways, d) assess past soil movement activities related

to construction at the Airport to evaluate potential source material relocation, and e) evaluate the potential PFAS contribution, if any, related to biosolids use on or immediately adjacent to the airport.

c. **Task 3c – Monitoring Well Installation**: Install an estimated six new bedrock monitoring wells with three at approximately fixed locations identified in **Section 5.4.3** and three to be located based, in part, on the surface geophysical survey and soil boring observations associated with the initial fixed locations.

d. **Task 3d – Gauging Water Levels and Groundwater Sampling and Analysis**: Complete four water level gauging events and one groundwater sampling event of approximately ten wells (four existing wells on the Airport and the six proposed new bedrock monitoring wells on or adjacent to the Airport).

e. **Task 3e – Pressure Transducer Installation**: Install an estimated five pressure transducers to obtain preliminary data regarding water level responses to precipitation including rate of response and amplitude of change in water levels.

f. **Task 3f – Surface Water Inspection**: Conduct a visual inspection of local streams to assess physical characteristics including actual versus mapped locations, identification of dry segments, and selection/identification of potentially viable segments for future stream flow transects.

g. **Task 3g – Survey**: Complete a survey to include key site features, monitoring well locations and elevations, location and elevation of surface geophysical survey transects, and other features as warranted.

h. **Task 3h – Waste Disposal**: Conduct characterization sampling and management and proper disposal of investigation derived wastes (“IDW”).

4. **Task 4 – Reporting Tasks**

a. **Task 4a – Quarterly Progress Reporting**: Quarterly progress reports are proposed to facilitate effective communication on a timely basis.

b. **Task 4b – Progress Meetings**: In-person, field, or virtual progress meetings are proposed and will be scheduled, as needed.

c. **Task 4c – Supplemental RIWP**: Supplemental RIWP(s) are anticipated based on the iterative nature of the remedial investigation.

d. **Task 4d – Remedial Investigation Report**: An Act 2 compliant remedial investigation report (“RIR”) will be submitted at the completion of the RI.

Details regarding each of the main components of the 2025 RIWP SOW are presented in the text, tables, figures, and appendices contained herein.

3. BACKGROUND INFORMATION

Roux has reviewed available historic documents provided by PADEP and the University and compiled and tabulated historic analytical data for soil and groundwater collected within the Department Investigation Area. A summary of previous environmental activities including a preliminary compilation of soil and groundwater results is provided below.

General background information is presented below in the following subsections:

- Section 3.1 – Initial Identification of PFAS;
- Section 3.2 – Airport Description;
- Section 3.3 – Airport AFFF Use and Source Areas;
- Section 3.4 – Local Land Use;
- Section 3.5 – Local Topography, Drainage Basins, and Surface Water;
- Section 3.6 – Geologic and Hydrogeologic Setting; and
- Section 3.7 – PFAS Distribution in Soils and Groundwater.

3.1 Initial Identification of PFAS

An Executive Order was signed by the former governor of Pennsylvania, Tom Wolf, on September 19, 2018 which ordered the formation of a PFAS Action Team. The goal of this team was to identify and eliminate potential sources of PFAS contamination and to ensure the safety of drinking water and the environment in the state. PADEP was directed to prepare and implement a PFAS sampling plan to test drinking water throughout the Commonwealth.

As part of the statewide sampling program, PADEP conducted sampling of a public supply well in August 2019 at State of the Art, Inc. ("SOTA"; a local business at 2470 Fox Hill Road) for analysis of six PFAS compounds. The sampling indicated that PFOS and PFOA were present in water at a combined concentration of 114 nanograms per liter ("ng/l"), which exceeded the then-applicable United States Environmental Protection Agency ("USEPA") Combined Lifetime Health Advisory Level ("HAL") for PFOS and PFOA of 70 ng/l. Confirmatory sampling at SOTA verified the presence of PFOS and PFOA in the well.

Additional sampling was conducted in November 2019 of one potable well at Matreya, LLC (2178 High Tech Road) and one potable well at Handy Delivery, Inc. (2197 High Tech Road). The combined PFOS and PFOA results for samples collected in November 2019 exceeded USEPA's HAL at concentrations of 138.6 ng/l at Matreya, LLC and 112.1 ng/l at Handy Delivery, Inc.

Based on these findings, PADEP and its contractor completed a due diligence assessment in the vicinity of these potable wells to identify potential sources of the PFAS observed in groundwater. In addition, PADEP and its contractor and the University and its contractors collected soil, groundwater, and private supply well data at the Airport and at surrounding properties within the Department Investigation Area.

Based, in part, on the data collected by PADEP and its contractor and the University and its contractors, PADEP and the University entered into the COA. In accordance with the COA, on behalf of the University,

Roux is submitting this RIWP to continue the execution of an Act 2 compliant RI for the Department Investigation Area.[4]

3.2 Airport Description

The Department Investigation Area is located primarily in Benner Township and partly in Patton and College Townships. The University, together with the CCAA, owns real property on which the Airport is located. Operations are split between the University and CCAA, with the University conducting the Airport Operation responsibilities and CCAA responsible for operation of the Airline Terminal. The Airport is located entirely within the boundaries of the Department Investigation Area. **Figure 1** is a Site Location Map depicting the Airport and the Department Investigation Area on a USGS map. **Figure 2** is a Site Map depicting the same two areas on an aerial photograph map.

Currently, as depicted on **Figure 3**, the Airport is comprised of various facilities, including the following[5]:

- Main (commercial) airline terminal;
- General aviation terminal;
- Automobile parking for passengers and employees;
- Paved airport runway, several paved taxiways and aprons, and airport access roads;
- Paved deicing areas;
- Several aircraft hangars;
- Fuel storage facilities;
- Aircraft rescue and fire-fighting facility;
- Airport stormwater controls; and
- Airfield electrical vault and generator.

3.3 Airport AFFF Use and Source Areas

3.3.1 AFFF Use

The Airport is currently and has historically operated as an airport beginning in the 1950s and is a Federal Aviation Administration ("FAA") certified commercial airport under 14 CFR Part 139, known as the State College Regional Airport (formerly known as the University Park Airport). Prior to 2021, and pursuant to federal regulations (14 CFR Part 139), the FAA mandated that the Airport use aqueous film-forming foam ("AFFF") for aircraft rescue and fire suppression pursuant to FAA regulations to conform with military specification MIL-PRF-24385: “Fire Extinguishing Agent, Aqueous Film Forming Foam”. As such, the AFFF required to be used by the FAA may have contained PFAS. In 2023, FAA released military specification MIL-PRF-32725 providing guidance on the use of Fluorine Free Foam (F3), available for use at airports in lieu of AFFF. Following this guidance, State College Regional Airport was the first airport in Pennsylvania to purchase the new PFAS-free foam[6].

[4] Potential sources other than the Airport exist for PFAS in soil and/or groundwater within the Department Investigation Area. As additional data is developed, the CSM for the RI will include, as warranted, identification of additional PFAS contributors to conditions beneath the Department Investigation Area.
[5] Sustainable Master Plan, University Park Airport, July 2015.
[6] Paragraph L, page 5 of the COA.

3.3.2 AFFF Source Areas

As previously reported to PADEP, AFFF may have been discharged in four areas on the Airport which are subject to investigation under the COA. These four areas are described below.

- **Area 1**: An area where AFFF equipment testing may have occurred on the Airport sometime before 2006, reportedly near inlet drains used for stormwater collection.
- **Area 2**: An area where AFFF equipment testing occurred periodically between 2006 and 2019 on the deicing pad. Fluid runoff from the deicing pad was collected in a trench drain system that previously discharged to a 50,000-gallon deicing runoff underground storage tank ("UST")[7].
- **Area 3**: An area where AFFF equipment testing may have occurred on the Airport sometime before 2006, reportedly near a stormwater basin in a grassy area approximately 200 feet southeast of the deicing pad.
- **Area 4**: An area where an AFFF discharge may have occurred during a 2009 training event, reportedly located in a grassy area southwest of the apron area.

These four potential PFAS source areas and associated media and transport pathways will be investigated and remediated, as applicable, in accordance with the COA. **Figure 4** depicts the four potential AFFF source areas and also depicts existing wells at the Airport.

3.4 Local Land Use

The Department Investigation Area is located in a mixed-use area. A regional Land Use Map is provided as **Figure 5**. As depicted on the map, the Department Investigation Area is comprised of various features and land uses as described below.

- Transportation and vacant land use predominate for the Airport operations area.
- Residential land use is present to the northwest and southeast of the central portion of the Airport operations. The residential area to the southeast is referred to herein as the Walnut Grove Estates community. In addition to these residential areas, there are sporadic residential properties elsewhere within the Department Investigation Area.
- Commercial and industrial land use is present to the north of the central portion of the Airport operations. This area is referred to herein as the High Tech Road area. In addition to this area, there are sporadic commercial properties elsewhere within the Department Investigation Area.
- Substantial agricultural, forested, and vacant land is observed throughout the Department Investigation Area.
- The Pennsylvania Air National Guard ("PAANG") property is located south-southwest of the central portion of the Airport operations.

3.5 Local Topography, Drainage Basins, and Surface Water

3.5.1 Topography

The Airport operations area and Fox Hill Road adjacent to the airport are a relatively flat-lying, topographic high at an elevation of approximately 1,200 to 1,225 feet mean sea level ("msl"). This topographic high

[7] The 50,000 deicing fluid collection UST has since been replaced by a 100,000-gallon UST.

approximately bisects the Department Investigation Area and is oriented southwest to northeast. From this topographic high, topography drops off in essentially all directions as described below.

- Due north from the central portion of the Airport, the topography slopes down in the direction of High Tech Road and at the extent of the Department Investigation Area, near Buffalo Run, the elevation has dropped approximately 200 feet.
- Northeast from the central portion of the Airport, the topography slopes gently down in the direction of Rock Road and then rises back up beyond Rock Road, and at the extent of the Department Investigation Area, just beyond the test track property, the elevation is similar to the elevation at the Airport.
- Due east from the central portion of the Airport, the topography slopes down in the direction of Pond 4A and at the extent of the Department Investigation Area, near Spring Creek, the elevation has dropped approximately 300 feet.
- South-southeast from the central portion of the Airport, the topography slopes down in the direction of Pond 1A and at the extent of the Department Investigation Area, near Big Hollow Creek, the elevation has dropped approximately 200 to 250 feet.
- Southwest from the central portion of the Airport, the topography slopes more gently down in the direction of Bernel Road and at the extent of the Department Investigation Area, near Bernel Road, the elevation has dropped approximately 50 to 75 feet.

Figure 6 depicts the surface topography in the vicinity of the Department Investigation Area.

3.5.2 Local Drainage Basins/Surface Water

The Department Investigation Area is located within the Spring Creek surface water drainage basin. The Spring Creek surface water drainage basin sits within Nittany Valley, bounded to the northwest by Bald Eagle Mountain and to the southeast by Nittany Mountain. According to published literature, the primary source of water entering the basin is from springs, with contributions from precipitation and runoff (overland flow) carried into the basin via tributaries. A majority of the runoff coming from the mountains is reportedly lost to sinkholes and fractures near the base of the ridges, which eventually re-enters the valley through springs on the basin floor. Water entering the basin ultimately drains primarily to Spring Creek. Spring Creek exits the basin at the Milesburg Gap in Bald Eagle Ridge northeast of the Department Investigation Area.

Within the overall drainage basin, the Department Investigation Area is situated a) north and west of Spring Creek which flows from southwest to northeast, b) south and east of Buffalo Run, also flowing from southwest to northeast and joins Spring Creek prior to its exit from the basin at Milesburg Gap, and c) north of Big Hollow Creek, a tributary to Spring Creek, flowing east-northeast on the southern border of the Investigation Area, until it joins with Spring Creek. Smaller, unnamed tributaries to Spring Creek, Buffalo Run, and Big Hollow Creek exist within the Department Investigation Area.

Figure 7 depicts the approximate locations of Spring Creek, Buffalo Run and Big Hollow Creek and the associated unnamed tributaries. **Figure 7** also depicts the approximate sub-watershed boundaries for these three surface water bodies proximate to the Department Investigation Area.

3.5.3 Airport Drainage, Outfalls, and Dams

As part of its National Pollutant Discharge Elimination System ("NPDES") permit for the Airport operations, the University has assessed stormwater runoff at the Airport and at Airport-owned property surrounding the Airport operations. In accordance with the NPDES Industrial Stormwater permit, the Airport operations and surrounding area have been delineated by 14 outfall boundary areas and 14 associated outfall discharge locations (1, 1A, 2, 2A, and 3 through 12). These 14 outfall boundaries and discharge locations are depicted on **Figure 8**. Also depicted on **Figure 8** are two detention ponds and associated dams located to the east-northeast and south-southeast of the airport operations and identified as 4A and 1A, respectively.

Based on an assessment of the airport operations, periodic stormwater sampling is completed by the University for select outfalls as defined in the permit. In accordance with the NPDES permit, the outfall stormwater compliance samples will be analyzed for permit-defined PFAS constituents. These PFAS stormwater compliance sample results will be assessed as part of the RI under the COA.

3.6 Geologic and Hydrogeologic Setting

This general area of Pennsylvania has been the subject of substantial geologic and, to a lesser extent, hydrogeologic investigation over many years. In addition, there have been various geotechnical, water supply, or environment assessments within the Department Investigation Area that also provide useful information to understand the geologic and hydrogeologic setting and to design the RI. A general summary of the geologic and hydrogeologic setting is included below, recognizing that increasingly refined, site-specific interpretations of the geologic and hydrogeologic settings will be developed as the RI proceeds.

3.6.1 Geologic Setting

Certain pertinent geologic observations from the available documentation are presented below. To assist in the interpretation of the geologic conditions beneath the Department Investigation Area, plan and cross-sectional views showing geologic formations and certain structural features are provided as **Figure 9**.

- The Department Investigation Area is located within the Ridge and Valley Province of Pennsylvania. More locally, the Department Investigation Area is located within the Spring Creek Basin of Centre County. The Spring Creek Basin is underlain by extensive thicknesses of interbedded carbonates (limestone and dolomite) and sandstone of Cambrian, Ordovician, Silurian, and Devonian age.[8]

- Soils at the Airport are comprised of the Hagerstown-Opequon-Hublerburg Group, which were formed in residual and colluvial materials[9] weathered primarily from limestone.[10]

- As depicted on **Figure 9**, the rocks that underlie the majority of the Department Investigation Area are known as the Gatesburg Formation, which was a sedimentary deposit of the Upper Cambrian period.[11] The rocks of the Gatesburg Formation and the surrounding area were deposited on, and proximate to, the Great American Carbonate Bank. This carbonate bank was a broad, rimmed platform of low relief on the edges of the ancient North American craton (Laurentia) that was subject to periodic sea level changes.[12] Seas in the early Cambrian mixed substantial amounts of sand

[8] Siddiqui 1969.
[9] Colluvium material are loose, heterogeneous sediments that have been deposited at the base of hills or mountains by the surficial flow of rainwater or slow downslope creep.
[10] Braker 1981.
[11] Wood 1980.
[12] Demicco 1985; Read 1989.

derived from metamorphosed and eroded bedrock during sea-level transgressions across the continental edges of Laurentia. The sand spread westward, covering the exposed continental rock, resulting in basal sandstones that range in age from earliest Cambrian to late Middle Cambrian, but are generally late Middle Cambrian in Pennsylvania. These sandstones formed a vast, shallow continental shelf, which formed thousands of meters of carbonates and subordinate evaporites during the remainder of the Cambrian and into the Late Ordovician with periodic deposition of sediments washing in during periods of low sea level.[13]

- The Gatesburg Formation is comprised of the Mines Member (Ꞓgm), which is underlain by the Upper Sandy Member, Ore Hill Member, and Lower Sandy Member (collectively referenced as the 'Lower Members',Ꞓgl).[14]

    - The Gatesburg Mines Member ranges from zero to 310 feet in thickness and consists of 1- to 6-foot beds of massive, medium gray, medium crystalline dolostone and dark gray, coarsely crystalline dolostone interbedded with thinly bedded, dark gray, fine-grained dolostone.[15] It also contains abundant chert, with some containing black, siliceous ooids 0.5 to 1 millimeter in diameter within a light gray to white groundmass. The Mines Member generally strikes northeast-southwest with a 10-degree dip to the southeast.

    - The Upper Sandy Member ranges from about 650 to 700 feet in thickness and consists of interbedded dolostones and sandstone. The Lower Sandy Member is lithological similar to the Upper Sandy member but is about 400 feet thick. The Ore Hill Member ranges from 130 to 213 feet in thickness and consists of medium to dark gray medium crystalline dolostone with some dark gray finely crystalline limestone beds. The Lower Members generally strike northeast-southwest with an approximate 9-to-20-degree dip to the southeast.[16]

- The rocks that comprise the northern and southern portions of the Department Investigation Area are known as the Nittany Formation (On) and the Stonehenge/Larke Formation (Osl).[17] Both the Nittany Formation and the Stonehenge/Larke Formation were deposited in the Early Ordovician and strike northeast-southwest.

    - The Stonehenge/Larke Formation consists of blue, thin-bedded limestone with some dolomite and is approximately 250 to 600 feet thick. The Stonehenge/Larke Formation dips to the northwest at approximately 15 degrees in the northern portion of the Department Investigation Area and to the southeast at approximately 10 to 15 degrees in the southern portion of the Department Investigation Area.

    - The Nittany Formation, which overlies the Stonehenge/Larke Formation, is characterized by blue, thick-bedded, fine to coarse crystalline dolomite with interbeds of very fine crystalline dolomite and is approximately 1,200 feet thick. The Nittany Formation dips to the northwest at approximately 10 degrees in the northern portion of the Department Investigation Area

[13] Laughrey and Harper 2012.
[14] Laughrey and Harper 2012.
[15] Knowles 1966.
[16] Butts and Moore 1936; Wagner 1966; Laughrey and Harper 2012.
[17] Wood 1980.

and to the southeast at approximately 15 degrees in the southern portion of the Department Investigation Area.[18]

- The physiography of the Ridge and Valley Province has been subject to extensive folding that reportedly commonly includes inverted topography, where topographic low areas (valleys) form on geological features that are structurally high (anticline folds). As depicted on **Figure 9**, an anticline is mapped bisecting the Department Investigation Area with a strike orientation of northeast-southwest. A complementary syncline fold is present on the eastern portion of the Department Investigation Area, terminating in a fault that strikes northeast-southwest. A small strike-slip fault, whose strike is northwest-southeast, is mapped in the northern portion of the Department Investigation Area. Preferential erosion of fracture weakened, soluble carbonates at the core of the anticline helped to produce the broad low-lying Nittany Valley, bound by more resistant rock to the northwest and southeast, manifested as Bald Eagle Mountain and Nittany Mountain, respectively.

- Secondary features (including cleavage, bedding-plane partings, joints, and faults) in the carbonate rocks beneath the region have been enlarged by dissolution, resulting in extensive karst features in the area, and generally have north-south and east-west strikes.[19] These enlarged fractures (i.e., sinkholes, caves, and subterranean drainage systems) have a significant influence on the rate and direction of groundwater flow.[20]

- Based on review of soil boring logs from within the Department Investigation Area, the thickness of unconsolidated overburden materials can be substantial (up to 300 feet). The unconsolidated overburden materials periodically contain boulders or zones of unweathered, consolidated rock, and the overburden interval is generally dry except for locally perched intervals.

3.6.2 Hydrogeologic Setting

Certain pertinent hydrogeologic observations from the available documentation are presented below.

- The Spring Creek Basin consists of two principal settings, a forested, siliciclastic-bedrock upland and a carbonate-bedrock valley with extensive agricultural and urban land use. Precipitation, runoff, and infiltration from the bedrock uplands recharge streams and groundwater in the valley. Groundwater in the Spring Creek Basin flows from the siliciclastic-bedrock uplands to the carbonate-bedrock valley, producing an overall northern-northeastern flow direction to a low point at the confluence of Spring Creek with Bald Eagle Creek, approximately 5.5 miles northeast of the Airport.[21]

- The Department Investigation Area is located within the carbonate-bedrock valley, which was formed on carbonate rocks that are less resistant to weathering than the silica-rich rocks of the uplands, leading to the development of extensive karst features within the Department Investigation Area and surrounding areas.[22] Karst conditions develop through the dissolution of limestone and/or dolomite, which are the dominate rock type in the Spring Creek Basin. Karst regions complicate the characterization of regional groundwater aquifers due to the presence of sinkholes, caves, or voids that can affect local groundwater transport. Although karst conditions are observed throughout the

[18] Butts and Moore 1936; Siddiqui 1969; Fulton et al 2005.
[19] Lattman and Parizek 1964; Parizek and Drew 1966.
[20] Fulton et al 2005.
[21] Giddings 1974; Wood 1980; Taylor 1997.
[22] Fulton et al 2005.

Department Investigation Area, more karst features have been observed within the Mines Member of the Gatesburg Formation, northwest of the anticline fold axis that bisects the area.

- Groundwater in the carbonate-bedrock valley is recharged in several ways, including direct infiltration of precipitation on soil and rock, concentrated stormwater runoff from valley or uplands into sinkholes, diffuse surface runoff from uplands, and streamflow losses.[23] The Department Investigation Area is located in the regional Valley and Ridge aquifer system, whose aquifers are dominated by carbonate (limestone and dolomite) and sandstone bedrock. In general, rocks of Cambrian and early Ordovician age (i.e., the rock types identified beneath the Department Investigation Area) are dominated by limestone aquifers.[24] The aquifers in the carbonate-bedrock valley have been generalized according to the nature of the openings creating permeability: 1) diffuse-flow-dominated carbonate, which includes the Lower Members of the Gatesburg Formation, 2) fracture-dominated carbonate, which includes the Mines Member of the Gatesburg Formation and the Nittany Formation, and 3) conduit-dominated carbonate, which includes the Stonehenge/Larke Formation.[25]

- Groundwater flow, especially within the fracture-dominated and conduit-dominated aquifers is altered by structural control and secondary permeability features, such as solution-enlarged fractures, joints, and sinkholes. These features, and regional structures such as the Birmingham Thrust Fault that strikes northeast-southwest and is observed within the Stonehenge/Larke Formation on the northern portion of the Site, enhance groundwater movement parallel to strike and valley alignment and controls groundwater flow rates and locations of springs. The deep water table in the Gatesburg Formation is due, in part, to the development of solution conduits along the zone of the Birmingham Thrust Fault and underdrainage in dissolution-enhanced sandy bedrock units.[26]

3.7 PFAS Distribution in Soils and Groundwater

The Department Investigation Area has been subject to various soil and groundwater sampling events for PFAS analysis from 2019 to present. These sampling events and the results for soil and groundwater are discussed below.[27] This is a general summary of the soil and groundwater sampling completed within the Department Investigation Area, recognizing that increasingly refined, site-specific interpretations of the PFAS distribution in soil and groundwater will be developed as the remedial investigation proceeds.

3.7.1 Soil PFAS Sampling and Results

The PFAS sampling completed for soil (and asphalt) within the Department Investigation Area is summarized below.

- **2020** – University's contractor collected three composite soil samples of soil stockpile.
- **2021** – University's contractor collected 10 shallow soil samples in advance of construction project.
- **2021 to 2022** – PADEP collected soil samples from 10 soil borings at High Tech Road and three background locations.

[23] Parizek 1984; Fulton et al 2005.
[24] USGS 1997.
[25] Fulton et al 2005.
[26] Butts and Moore 1936; Giddings 1974; Fulton et al 2005.
[27] There are some, more limited data for stormwater or surface water. These data will be considered, and supplemented as necessary, after there is a more robust understanding of the soil and groundwater conditions within the Department Investigation Area.

- **2021 to 2022** – University's contractor collected soil samples from six potential soil source areas on the Airport including Areas 1, 3, and 4, the 50,000-gallon deicing fluid collection UST, and two former septic systems.
- **2022** – PADEP (with University split samples) collected shallow soil samples from 18 locations associated with the two dams and other outfall/drainage pathways.
- **2023** – PADEP collected soil samples from 11 locations associated with septic systems for properties in the High Tech Road Area.
- **2023** – University's contractor collected 15 composite soil samples from 60 shallow soil borings in advance of construction projects.
- **2023** – Mountain Research, LLC collected 9 shallow soil samples in the Walnut Grove Estates community.
- **2024** – University's contractor collected 19 soil samples related to glycol collection UST replacement project.[28]
- **2024 to 2025** – University's contractor collected 25 asphalt samples from shallow core borings in advance of construction projects.

These soil/asphalt data have been compiled from the various reports and are summarized in the documents listed below.

- **Table 1** – Statistics for Soil PFAS Sampling Results.
- **Table 2** – Statistics for Asphalt PFAS Sampling Results.
- **Figure 10** – Soil/Asphalt Results for PFOS.
- **Figure 11** – Soil/Asphalt Results for PFOA.
- **Appendix A**, Table A1 – Summary of Soil PFAS Sampling Results.
- **Appendix A**, Table A2 – Summary of Asphalt PFAS Sampling Results.

The distribution of PFAS in soil/asphalt was considered in the preparation of the CSM and in the design of this 2025 RIWP SOW which are discussed in Sections 4 and 5, respectively.

Review of the compiled soil and asphalt sampling results from samples collected in the Department Investigation Area reveals the observations below.

- A total of approximately 200 soil samples were analyzed for a variable list of PFAS constituents (11 to 40 constituents, depending upon the laboratory methods and timing of the work). The two most prevalent PFAS constituents in terms of frequency of detection and concentration are PFOS and PFOA which are discussed further below.
- A total of approximately 160 soil samples were collected from 0 to 2 feet below ground surface ("bgs") and 40 samples were collected from 2 to 20 feet bgs.
- Assessment of all soil sampling results for the five PFAS constituents that are the subject of the COA reveals the following:

[28] These data are not yet in Roux's database and are not depicted in soils dot maps, but the data will be assessed prior to completing the proposed soil sampling in the UST area.

- Of the approximately 200 soil samples, 0 exceeded the Residential Direct Contact ("RDC") 0-15 feet bgs Medium Specific Concentrations ("MSCs")[29];
- Of the approximately 200 soil samples, 0 exceeded the Non-Residential Direct Contact ("NRDC") 0-2 feet bgs and 2-15 feet bgs MSCs (referenced herein as "NRDC MSCs")[30];
- Of the approximately 200 soil samples, 26 exceeded the default Residential Used Aquifer ("RUA") Migration to Groundwater ("MGW") MSCs[31];
  - Of the approximately 160 soil samples collected from 0 to 2 feet bgs, 24 exceeded the default RUA MGW MSCs; and
  - Of the approximately 40 soil samples collected from 2 to 20 feet bgs, 2 exceeded the default RUA MGW MSCs.[32]

- The distributions of soil exceedances for PFOS and PFOA (maximum result observed at any depth interval in a soil boring) are depicted on **Figures 10** and **11**, respectively. These two figures also depict the asphalt sample results which had 0 exceedances of RDC, NRDC, and RUA MGW MSCs. The depicted distribution of PFOS and PFOA in soil and asphalt reveal the following:
  - There are localized areas of soil exceedances, solely of the RUA MGW MSCs as follows:
    - Proximate to an area of reported AFFF use designated as Area 1;
    - Proximate to an area of reported AFFF use designated as Area 3;
    - Proximate to an area of reported AFFF use designated as Area 4;
    - Proximate to the intersection of High Tech Road and Fox Hill Road;
    - Within 2 areas sampled for general construction/soil handling purposes; and
    - Proximate to the 50,000 gallon UST that was removed and replaced.

    These localized areas are subject to additional sampling described in this RIWP to further characterize the nature and extent of the exceedances.
  - There are other areas with no observed soil/asphalt exceedances as follows:
    - The area to the east-southeast of areas of reported AFFF use designated as Areas 2, 3, and 4;
    - The area surrounding the PAANG property;
    - The detention pond and associated dam located to the east-northeast of the airport operations and identified as 4A;
    - The detention pond and associated dam located to the south-southeast of the airport operations and identified as 1A;

[29] The "RDC MSC" standards cited here refer to concentrations of constituents in soil that PADEP has determined do not pose an unacceptable risk (for inhalation or ingestion) for a residential setting. These RDC values are typically more stringent than NRDC values.
[30] The "NRDC MSC" standards cited here refer to concentrations of constituents in soil that PADEP has determined do not pose an unacceptable "direct contact" risk (i.e., inhalation or ingestion) for a non-residential setting. These NRDC values are typically less stringent than RDC values.
[31] The "RUA MGW MSCs" standards cited here refer to concentrations of constituents in soil that PADEP has determined do not pose an unacceptable risk of leaching out of the soil and migrating to groundwater.
[32] The 2 sample exceedances represent a sample and a split sample from a single sampling interval in one soil boring.

- The area to the southwest, west and northwest of the SOTA property; and
- The area of the Walnut Grove Estates community.

Based on field evaluations, one or more of these areas with no observed soil exceedances may be subject to verification sampling to supplement the initial findings.

3.7.2 Groundwater PFAS Sampling and Results

The PFAS sampling completed for groundwater within the Department Investigation Area is summarized below.

- **2019** – PADEP sampling of supply wells on High Tech Road.
- **2019 to 2020** – University sampling of monitoring wells on the Airport.
- **2020** – Sampling results from Alexander Wellfield.
- **2019 to Present** – PADEP and University sampling of private supply wells and/or conducting POET system performance sampling.

These groundwater data have been compiled from the various reports and are summarized in the documents listed below.

- **Table 3** – Statistics for Private Supply Well PFAS Sampling Results (Pre-POET Installation).
- **Table 4** – Statistics for POET Performance PFAS Sampling Results (Post-POET Installation).
- **Table 5** – Statistics for Airport and Proximate Wells PFAS Sampling Results.
- **Figure 12** – Groundwater Results for PFOS.
- **Figure 13** – Groundwater Results for PFOA.
- **Appendix B**, Table B1 – Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation).
- **Appendix B**, Table B2 – Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation).
- **Appendix** B, Table B3 – Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation).
- **Appendix B**, Table B4 – Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation).
- **Appendix B**, Table B5 – Summary of POET QA/QC (FRP) Performance PFAS Sampling Results (Post-POET Installation).
- **Appendix B**, Table B6 – Summary of Airport and Proximate Wells PFAS Sampling Results.

The distribution of PFAS in groundwater was considered in the preparation of the CSM and in the design of this 2025 RIWP SOW which are discussed in Sections 4 and 5, respectively.

Review of the compiled groundwater sampling results from samples collected in the Department Investigation Area reveals the observations below.

- A total of approximately 80 properties within the Department Investigation Area were sampled for PFAS constituents. Approximately 900 samples were analyzed from these 80 properties.[33]

- These approximately 900 samples were analyzed for a variable list of PFAS constituents over time (11 to 40 constituents, depending upon the laboratory methods and timing of the work). The 2 most prevalent PFAS constituents in terms of frequency of detection and concentration are PFOS and PFOA which are discussed further below.

- Assessment of the sampling results for the five PFAS constituents that are the subject of the COA reveals the following:

    - Of the approximately 80 properties, 40 rely on a private water supply and had data showing exceedances of PADEP's Maximum Contaminant Levels ("MCLs") which are derived from USEPA MCLs and are adopted by PADEP as the RUA MSCs. Thirty-nine (39) of these properties have a POET system to treat the water.[34] The other properties did not have exceedances of RUA MSCs.

    - Of the 39 properties that have POET system performance monitoring data, the pre-treatment results for the five PFAS constituents that are the subject of the COA are as follows:

        - PFOS exceeds the PADEP RUA MSC in 164 of 190 samples;
        - PFOA exceeds the PADEP RUA MSC in 115 of 190 samples;
        - PFBS exceeds the PADEP RUA MSC in 0 of 190 samples;
        - PFNA exceeds the PADEP RUA MSC in 0 of 190 locations; and
        - PFHxS exceeds the PADEP RUA MSC in 158 of 190 locations.

    - The POET system performance data, reported by PADEP to the property owners, shows that the POET systems are effective at removal of the detected PFAS compounds.[35]

- The distributions of groundwater exceedances for PFOS and PFOA (maximum result observed for untreated samples) are depicted on **Figures 12** and **13**, respectively. The depicted distribution of PFOS and PFOA in groundwater reveal the following:

    - There are two primary areas of RUA MSC groundwater exceedances as follows:

        - West-northwest of the central portion of the Airport in the High Tech Road area of the Department Investigation Area; and

        - Southeast of the central portion of the Airport in the Walnut Grove Estates community area of the Department Investigation Area.

[33] The total number of samples is listed as "approximate" as these observations, and the data tables presented herein, include various duplicate samples, QA/QC samples, and both raw and treated POET system sampling results. In addition, there are data available from monitoring wells and public water supply sampling that may not be depicted in figures or tables as they are subject to additional QA/QC review before including in the database for this project.
[34] One additional property elected to use bottled water for drinking water in lieu of connecting to the available public water supply.
[35] The few exceedances on Table 4 for PM samples (one of 186 samples) and for PE samples (9 of 197 samples), were addressed by PADEP or its consultant via plumbing modifications, filter media change out or verification sampling.

The investigative SOW described in this RIWP is designed to further characterize the source(s), nature and extent, and transport pathways that produce these observed exceedances of RUA MSCs.

- There are other areas with no observed groundwater exceedances as follows:
  - The western portion of the Department Investigation Area based on the groundwater data for wells near Fox Hill Road, Bernel Road, Kristina Circle, Buffalo Run Road and Far Hills Avenue;
  - The northern portion of the Department Investigation Area based on the groundwater data for wells near Bloom Lane, Buffalo Run Road, Old Farm Lane, Haller Farm, and UN-36/Test Track;
  - The east-northeast portion of the Department Investigation Area based on the groundwater data for wells near Rock Road and Barns Lane; and
  - The southeast portion of the Department Investigation Area, beyond the Walnut Grove Estates community area, based on the groundwater data for wells near Ellman Lane, Rock Road, Big Hollow Road, and Timber Ridge Road.

  These areas with no observed groundwater exceedances may be subject to verification sampling to supplement the initial findings.

- There are three secondary areas of RUA MSC groundwater exceedances as follows:
  - The Benner Spring Outfall and Hatchery Well #2 at the eastern extent of the Department Investigation Area;
  - 587 Rock Road near the southeastern extent of the Department Investigation Area; and
  - 754 and 786 Big Hollow Road near the southern extent of the Department Investigation Area.

  These three secondary areas may need to be assessed in the future, including assessment of potential sources that may differ from the sources for the two primary areas of RUA MSC groundwater exceedances.

4. PRELIMINARY CONCEPTUAL SITE MODEL

The Department Investigation Area has been subject to various soil and groundwater sampling events for PFAS analysis from 2019 to present. These sampling events and the results for soil and groundwater have been discussed above. Similarly, a summary of background conditions, inclusive of geologic and hydrogeologic setting were discussed above. Based on the available information, and prior to the initiation of the RI by Roux on behalf of the University, a preliminary CSM has been prepared.

This is a preliminary CSM, recognizing that increasingly refined, site-specific interpretations of the CSM will be developed as the RI proceeds. This preliminary CSM discusses potential sources of PFAS, potential transport pathways, and potential receptors. The preliminary CSM is presented below.

4.1 Sources

There are four areas where the University has indicated that AFFF, possibly containing PFAS, may have been discharged to the ground surface.[36] These and other potential sources are discussed below.

- The four potential discharge areas are identified as Areas 1, 2, 3, and 4 on **Figure 4**.
    - Areas 1, 3, and 4 are unpaved surfaces. Area 2 is a paved area.
    - All 4 areas are exposed to precipitation.
    - In Areas 1, 2 and 3, the suspected method of discharge would have been via discrete discharges of AFFF foam as part of FAA-mandated aircraft rescue firefighting equipment testing events. Pursuant to FAA requirements, the testing events occurred two-times per year and resulted in discrete discharges of AFFF (i.e., not a regular, long term, or continuous discharge).
        - From 2006 to 2019, all FAA-mandated testing of AFFF has taken place on the paved surface of Area 2.
        - Since 2020, all FAA-mandated testing of AFFF has been contained in a storage container and disposed of off-site.
    - In Area 4, the suspected method of discharge would have been via a one-time discharge of AFFF foam as part of a FAA-mandated training exercise in 2009.
    - Soil sampling directly within each of the 4 areas has previously been completed.
    - Supplemental work is proposed herein.

- The four areas are located on/near pavement, on/near catch basins, and/or on/near drainage swales. These conditions can potentially result in an “offset” of the four original source areas via stormwater transport, with redistribution of PFAS constituents either along a drainage swale or at the discharge point of a piped discharge.
    - Soil sampling directly within drainage pathways and at outfalls has previously been completed.
    - Supplemental work is proposed herein.

[36] In 2023, FAA released military specification MIL-PRF-32725 providing guidance on the use of F3, available for use at airports in lieu of AFFF. Following this guidance, State College Regional Airport was the first airport in Pennsylvania to purchase the new PFAS-free foam (Paragraph L, Page 5 of the COA).

- There has been construction work at the Airport that has resulted in the sampling and/or movement of soil within the Airport. In some cases, there are soil stockpiles that are expected to be assessed as part of the RI under the COA.
    - Soil sampling directly from stockpiled soil has previously been completed.
    - Supplemental work is proposed herein.
- There has been historic use of biosolids on the Airport that may be a source of PFAS compounds. The presence of PFAS in the environment from historic farming practices, either on/near the Airport or in the overall region, may complicate interpretation of data.
    - Minimal, if any, soil sampling has been completed to assess potential biosolids contributions to PFAS at the Airport based on the documentation reviewed to date.
    - Supplemental work is proposed herein.

4.2 Transport Pathways

PFAS constituents potentially derived from AFFF discharge during FAA mandated fire training/equipment testing exercises in the four source areas may be subject to transport via several different pathways. These potential transport pathways are identified and discussed below.

- Vertical migration of PFAS constituents from source area shallow soil via precipitation to deeper soil and groundwater.
    - Existing soil analytical results from samples greater than 2 feet bgs indicate the absence of any substantial transport by this transport pathway in soil.
    - Based on the clay-rich character of the soil, and significant overburden thickness in the source areas, it is unlikely that vertical migration through the soil column is a primary transport pathway producing observed groundwater conditions.
    - Supplemental work to further assess this potential pathway is proposed herein.
- Horizontal migration of PFAS constituents from source area shallow soil via stormwater to shallow soils elsewhere.
    - Existing soil analytical results from samples collected directly within drainage pathways and at outfalls indicate the absence of any substantial offset sources of PFAS remaining in shallow soils produced by this transport pathway.
    - Based on the clay-rich character of the soil, and significant overburden thickness in the source areas, it is unlikely that stormwater transport has produced offset sources that would allow vertical migration of PFAS through the soil column producing observed groundwater conditions.
    - Supplemental work to further assess this potential pathway is proposed herein.
- Vertical migration of PFAS constituents from source area shallow soil via stormwater to groundwater via preferential pathways.

- Structural features, especially solution enhanced karst features, may produce preferential pathways for stormwater transport of PFAS constituents from source area soils to groundwater.
- This is a transport pathway that has been identified in reports prepared by others, specifically pointing to sink holes as possible transport pathways to allow PFAS in shallow soils to be transported to bedrock groundwater.
- Supplemental work to further assess this potential pathway is proposed herein.

- Horizontal or vertical transport of PFAS constituents via groundwater

  - Structural features and groundwater extraction, especially in the presence of solution enhanced karst features, may produce preferential pathways for groundwater transport of PFAS constituents.
  - This is a transport pathway that has been identified in reports prepared by others, specifically pointing to karst features as possible transport pathways to allow PFAS to be transported to and within bedrock groundwater.
  - Supplemental work to further assess this potential pathway is proposed herein.

4.3 Receptors

PFAS constituents potentially derived from AFFF discharge during FAA mandated fire training/equipment testing exercises in the four source areas may be subject to transport via several different pathways. These potential transport pathways could allow PFAS constituents to reach certain receptors. The primary potential receptors are identified and discussed below.[37]

- Direct contact with surface or subsurface soils is a receptor of potential concern.

  - At the Airport itself, existing soil sampling results and physical access controls indicate an absence of concern related to direct contact with surface or subsurface soils containing PFAS compounds at levels above applicable PADEP MSCs.
  - Beyond the Airport operations area, existing soil sampling results indicate an absence of concerns related to direct contact with surface or subsurface soils containing PFAS compounds at levels above applicable PADEP MSCs.
  - This direct contact with surface or subsurface soils receptor is subject to supplemental work proposed herein and will be reassessed based on the results.

- Direct contact with private potable wells (e.g., drinking water) is a receptor of potential concern.

  - PADEP and the University have tested private potable wells within the Department Investigation Area and identified those wells with concentrations of PFAS at levels above or below applicable PADEP MSCs and MCLs.
  - Based on the private potable well testing results, PADEP has identified 39 wells that require a POET system.[38]

[37] Other receptors of concern may be identified as the RI progresses.
[38] One additional property elected to use bottled water for drinking water in lieu of connecting to the available public water supply.

- The POET systems have been subject to performance monitoring, completed by a subcontractor of PADEP. This performance monitoring is being continued, with transfer of this work to the University in accordance with the terms of the COA.
- The properties without POET systems and within the Department Investigation Area are also subject to a monitoring program proposed herein.
- Assessment of the source and transport pathway(s) producing the observed PFAS conditions in the private potable wells within the Department Investigation Area is proposed herein.

- Direct contact with public potable wells (e.g., drinking water) is a receptor of potential concern.
  - Public potable wells (i.e., the Alexander Wellfield wells) within the Department Investigation Area have been tested and the results indicate PFAS at levels below applicable PADEP MSCs and MCLs.
  - Assessment of the overall source and transport pathway(s) producing the observed PFAS conditions in the Department Investigation Area is proposed herein. These assessment activities will consider whether there are complete pathways to this potential receptor.

- Direct contact with surface water (e.g., ecological exposures) is a receptor of potential concern.
  - Surface water within the Department Investigation Area has been tested and the results indicate PFAS at levels above and below applicable PADEP MSCs and MCLs.[39]
  - The surface water data is limited and the source of PFAS constituents is unclear.
  - Assessment of the overall source and transport pathway(s) producing the observed PFAS conditions in surface water in the Department Investigation Area is expected to be completed as part of the RI. These assessment activities will consider whether there are complete pathways to this potential receptor, in part based on the groundwater transport assessment.
  - An inspection of the surface water features is proposed herein to better design future assessment activities.

[39] See, for example, Sierra Club sampling in 2024.

5. REMEDIAL INVESTIGATION SCOPE OF WORK

5.1 RIWP Goals

The RI is expected to be implemented in an iterative manner with the results from the first step used to inform and design the subsequent steps. The SOW proposed in this RIWP is intended to generate data to a) focus the investigation area, b) further characterize conditions within the Department Investigation Area, c) produce an increasingly refined, site-specific CSM, and d) help define the next steps to address data gaps.

Based on the existing data and the CSM presented above, current RIWP goals are described below. The findings, CSM, and RI goals are expected to be revised and refined over time as the RI is implemented.

- Validate, characterize, and delineate four original AFFF potential soil sources and assess whether meaningful source mass remains.
- Similarly, identify and assess potential off-set soil sources including the following:
    - Off-set locations due to stormwater transport via overland flow;
    - Off-set locations due to stormwater transport via engineered features (e.g., piped discharge) to outfall discharge points; and
    - Off-set locations due to physical movement related to construction activities.
- Assess the effect biosolids handling or application on/near the Airport may have had as a source of PFAS constituents in the Department Investigation Area.
- Assess the geologic and hydrogeologic conditions to understand the following:
    - Preferential pathways that may promote accelerated transport of PFAS-containing surface discharges from the Airport to the bedrock water table beneath the Department Investigation Area, with or without stormwater transport; and
    - Preferential pathways in bedrock that promote groundwater transport via structural controls and related karst conditions.
- Collect private supply well data to demonstrate conformance with PADEP MSCs and MCLs, including POET system performance monitoring, while the RI is being completed.

Addressing these goals, and identifying additional goals as the RI proceeds, is initiated through the implementation of the SOW contained in this RIWP.

5.2 Task 1 – Preparatory Tasks

5.2.1 Task 1a – Compile Existing Data

The objective of this task is to continue the compilation and interpretation of existing data and information including, but not limited to, published literature and local studies. Much of this work has been completed to support the preparation of this RIWP, but there is more to be done. Compilation of existing data in the Department Investigation Area is expected to include one or more of the following sources of data:

- Preparation of more detailed topographic mapping via existing light detection and ranging ("LIDAR') files;
- Collection of records and interpretation of existing karst observations and repairs from prior construction projects;
- Cataloging existing private supply wells (to the extent not already in Roux's database);
- Collection and interpretation of historical records and aerial photographs to understand biosolids handling and application areas related to historic local and regional farming practices;
- Reviewing Airport improvement design documents and discussions with Airport personnel to refine the areas for assessment of soils relocated during construction projects;
- Establishing geographic information system ("GIS") coordinates for prior sampling efforts to allow field location of sampling points;
- Identifying a proximate source of clean water supply to be used by driller and for other field services; and
- Preparing a list of properties from tax maps for potential supply well testing under Task 2b.

The data and information compiled under these tasks are expected to help refine the proposed locations of field samples described in this RIWP or support the interpretation and presentation of the result of this currently proposed SOW.

5.2.2 Task 1b – Field Conditions Verification

The objective of this task is to conduct field inspections (including inspections with certain subcontractors) to "field truth" the conditions as understood and the field activities described in this RIWP. The field verification task is expected to include one or more of the following:

- Verify reported conditions as described in this RIWP;
- Observe geologic and topographic conditions;
- Field locate select previous samples;
- Complete an inspection for overhead and below grade utilities, fences and other potential obstructions;
- Inspect four existing wells on the Airport for suitability of use as part of the RI;
- Confirm the viability and access constraints related to soil boring locations;
- Confirm the viability and access constraints related to proposed monitoring well locations;
- Confirm the viability and access constraints related to surface geophysical survey locations;
- Inspect NPDES outfall locations;
- Inspect Ponds 1A and 4A;
- Inspect all areas of work with Airport personnel to understand limitations on the proposed work due to Airport safety requirements;
- Identify appropriate locations for staging supplies and equipment;
- Inspect and verify suitability of staging area for IDW;
- If feasible and necessary, conduct sampling of clean water source in advance of use; and
- Conduct a drive-by reconnaissance of properties to verify the properties for supply well testing under Task 2b.

The data and information compiled under these tasks are expected to help refine the proposed locations of field samples described in this RIWP or support the timely execution of the currently proposed SOW.

5.2.3 Task 1c – Access/Permitting/Contracting/Training

The objective of this task is to complete certain pre-mobilization tasks (including for certain subcontractors, as applicable) necessary for the timely implementation of the field activities described in this RIWP. These pre-mobilization tasks are expected to include one or more of the following:

- Preparing and obtaining access agreements to complete work on properties not owned by the University;
- Identifying and obtaining any necessary permits;
- Bidding, selecting, and contracting with various subcontractors; and
- Completing Airport-specific safety training for both Roux and its key subcontractors.

Completion of these tasks is necessary to support the timely execution of the currently proposed SOW.

5.3 Task 2 – Private Supply Well Tasks

5.3.1 Task 2a – Access Agreements

Access agreements are actively being sought with those property owners with POET systems that are to be monitored and maintained by the University after assumption of this responsibility from PADEP. At the time of submission of this RIWP, 37 of 39 access agreements have been executed for the POET system monitoring and maintenance activities.[40] The November sampling event was conducted during the period of November 10 to 13, 2025 and samples were collected from 38 of the 39 properties.

5.3.2 Task 2b – Private Supply Well Sampling

An area-wide sampling event is proposed for an estimated 43 residential and commercial private supply wells that were previously sampled by PADEP but did not require a POET system. This sampling event will be for properties within the Department Investigation Area.[41] A list of the addresses proposed to be sampled is provided as **Table 6**. It is anticipated that this sampling event will coincide with the May 2026 POET system sampling event. Prior to implementation of the sampling event, a review of tax parcels and an area-wide drive-by reconnaissance will be completed (see Tasks 1a and 1b) to validate the list of properties on **Table 6.**

A discussion of the protocols for private supply well sampling is presented below.

- A Field Sampling Activity Report ("Field Report") will be filled out concurrently with sample collection for each residence during the sampling event. Field Reports will detail date and time of sample collection and any other pertinent notes specific to each property.

- One domestic sample will be collected from each property, primarily from either a kitchen or basement sink after purging. Prior to sample collection, the water system will be purged for

[40] One property owner has allowed access, but refuses to sign an access agreement.
[41] This sampling event is for those residential and commercial private supply wells without bottled water or POET systems.

approximately 10 minutes to ensure piping and any water treatment components (i.e., water softener, filter, etc.) are evacuated of standing water before sample is collected.

- Field reagent blank ("FRB") samples will be collected at a frequency of one per 20 samples. Duplicate samples will be collected at a frequency of one per 20 samples and will be submitted as blind duplicates to the analytical laboratory.

- All samples will be collected directly into appropriate bottleware provided by a Pennsylvania-certified laboratory. Each sample container will be labeled by the sampling personnel with the sample designation, time and date of collection, and the sampler's initials. The sample containers will be placed on ice in an insulated cooler and maintained at a temperature of approximately 4°C. A chain-of-custody form will be completed and maintained for each property, tracking samples throughout collection, transport, and delivery. All samples collected will be identified with a unique designation recorded on the chain-of-custody form. Samples will be delivered or shipped to a laboratory immediately following the sampling event.

- Roux will contract with one or more commercial laboratories, certified to perform PFAS analysis in drinking water samples via USEPA Method 537.1 for 18 PFAS constituents. The analyte list to be employed through Method 537.1 includes the five PFAS compounds required for sampling as specified in the COA as follows:

    - PFOS;
    - PFOA;
    - PFNA;
    - PFHxS; and
    - PFBS.

- If PFAS are detected in these private supply well samples at concentrations greater than one-half of applicable PADEP MCLs, a confirmatory sample will be collected from the property that exhibited the detections; and if the confirmatory sample documents exceedances of MCLs for applicable PFAS, the following will occur:

    - Bottled water will be offered to the affected property, at no cost to the owner, within 14 days of receipt and validation of confirmed results in exceedance of PFAS MCLs, pursuant to the COA.
    - A POET system will be installed within 60 days of receipt and validation of confirmed results in exceedance of PFAS MCLs and after receiving a signed access agreement from the property owner, pursuant to the COA.
    - Approximately one week following the POET system installation, the POET system will be subject to performance sampling (at a minimum, mid-point and effluent samples) to ensure proper function of the system.
    - New POET systems will be incorporated into the semi-annual POET system sampling program and henceforth sampled in accordance with the POET Workplan and the provisions of the COA.

- Upon receipt of private supply well sampling data, and after completion of a QA/QC review, the results for the complete sampling event will be submitted to PADEP. The results for each individual property will be included in a letter sent by Roux directly to each individual property owner.

This area-wide private supply well sampling event will be conducted in accordance with the Standard Operating Procedures ("SOPs"), Quality Assurance Project Plan ("QAPP"), and Health and Safety Plan ("HASP") provided in **Appendices D, E,** and **F**, respectively.

5.3.3 Task 2c – POET Systems Sampling

In accordance with the terms of the COA, the University has assumed responsibility for monitoring and maintenance of 39 POET systems. The addresses for these 39 properties are provided on **Table 7**.

A stand-alone POET Workplan was submitted to PADEP and approved on October 24, 2024. The POET Workplan was submitted in advance of this RIWP so that the November 2025 POET system performance monitoring could be implemented in accordance with PADEP reviewed and approved protocols. Details regarding the POET system performance monitoring program are found in the stand-alone POET Workplan.

5.4 Task 3 – Remedial Investigation Field Work Tasks

5.4.1 Task 3a – Surface Geophysical Survey

A surface geophysical survey is proposed to characterize subsurface geologic conditions, identify potential preferential pathways, and assist in the selection of certain proposed new monitoring well locations. The work will be completed by a qualified geophysical subcontractor to be selected after a competitive bidding process that includes assessment of equipment, personnel, and local/karst experience. The anticipated scope is described below.

Electrical Resistivity Imaging ("ERI") is expected to be completed along three proposed geophysical transects which, due to the length of the transects will be comprised of multiple overlapping transects. The proposed paths of the three transects are shown on **Figure 14**. The total length of the survey is approximately 16,000 feet. The ERI survey is expected to be completed using an Advanced Geosciences, Inc. Sting R8 automatic electrode resistivity system (or similar). The tests is planned to be conducted with an electrode spacing of 20 feet. Each individual transect line will be up to 2,220 feet in length. It is expected eight lines will be performed with the 20-foot electrode separation. The 20-foot electrode spacing is chosen based on the expected depth to top of rock (approximately 200 to 300 feet). Along the northeast-southwest transect, the lines will be overlapped by 400 feet to allow for maximum coverage at depth along the transect. Three additional lines with 10-foot electrode spacing will also be conducted along the northeast-southwest transect. The 10-foot electrode spacing for these three supplemental transects is expected to provide higher resolution but may not provide quality data regarding the top of rock (depending on actual depth). The purpose of these three supplemental lines is to assess whether the higher resolution, but shallower depth screening, provides decision-relevant data.

As described in the pre-mobilization task, there will be formal bidding of this work to competent geophysical firms. The exact methods may vary and the lines of transect may be adjusted based on fence lines, access agreements, pipelines or other utilities, topography, or other factors including, notably, airport safety considerations.

Once established, the positions of the lines will be recorded using an Emlid RS3 GPS (or similar) with a base station. This will allow for accurate recording of elevation changes along the line. The ERI data will be analyzed using EarthImager 2D (or similar), a computer inversion program, which will provide a two-dimensional vertical cross-sectional resistivity model (pseudo-section) of the subsurface. The anticipated maximum exploration depth of the ERI transects will range from 300 to 350 feet below land surface (with 20-foot spacing) or 200 to 250 feet (with 10-foot spacing).[42] If the resolution is good, the exploration depth for the 20-foot spacing transects should provide quality data regarding the top of rock and shallow bedrock. If, due to field conditions, the exploration depth is substantially less than expected and the resolution is poor, then PADEP will be notified and the remainder of the survey may be reduced, adjusted, or terminated.

5.4.2 Task 3b – Soil Sampling and Analysis

The soil sampling program is comprised of approximately 100 soil borings and 200 soil samples to assess a variety of potential source areas and related transport mechanisms. At present, as described in **Subsection 3.7**, the available soils data have not demonstrated any significant residual concentrations in shallow soil and essentially none in deeper soils. This soil sampling program is designed to:

- Validate previous source condition findings;
- Support horizontal and vertical delineation;
- Evaluate potential stormwater transport pathways;
- Assess past soil movement activities from construction work; and
- Evaluate potential effects of historical biosolids applications on the Airport.

The areas where these soil borings will be completed are shown on **Figure 15.** Actual soil boring locations will be established in the field based on a variety of factors including one or more of the following:

- Establishing the field location of prior sample locations;
- Assessment of local topography and runoff directions;
- Identification of stormwater collection features (catch basins, drainage swales, etc.);
- Proximity of impervious surfaces;
- Review of additional documents or aerial photos;
- Accessibility of proposed drilling locations by a track-mounted drill rig; and
- Utility and airport safety conditions.

The anticipated SOW for Areas A through K is discussed below. Please note that soil borings for adjacent areas may be depicted on the individual figures provided in Appendix C.

[42] If the contact resistance between the ERI electrodes and surrounding soils is very high, then the exploration depth of the ERI testing may be significantly reduced.

Location: Area A
Approximate Number of Soil Borings: 5
Approximate Location of Soil Borings: See Figure C-1 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: None.

Location: Area B
Approximate Number of Soil Borings: 14
Approximate Location of Soil Borings: See Figure C-2 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Sample depths for 4 borings adjacent to deicing pad may be adjusted to elevation change due to construction work in area.

Location: Area C
Approximate Number of Soil Borings: 11
Approximate Location of Soil Borings: See Figure C-3 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Sample depths for 5 borings near Fox Hollow Road may be adjusted to elevation change due to construction work in area. The boring collocated with existing soil boring UPA-SB-6 will be advanced to 30 feet bgs with 2 additional samples at 19.5 to 20 feet bgs and 29.5 to 30 feet bgs.

Location: Area D
Approximate Number of Soil Borings: 4
Approximate Location of Soil Borings: See Figure C-4 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: None.

Location: Area E
Approximate Number of Soil Borings: 11
Approximate Location of Soil Borings: See Figure C-5 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Sample depths for the borings in this area may be adjusted to elevation change due to construction work in area.

Location: Area F
Approximate Number of Soil Borings: 5
Approximate Location of Soil Borings: See Figure C-6 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Sample depths for the borings in this area may be adjusted to elevation change due to construction work in area. These boring will also benefit the assessment of Area A.

Location: Area G
Approximate Number of Soil Borings: 6
Approximate Location of Soil Borings: See Figure C-7 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Sample depths for the borings in this area may be adjusted to elevation change due to construction work in area. These borings will also need to be adjusted based on the UST present in this area. Also, additional samples may be collected at greater depth after consideration of UST removal soil samples which are not presently in Roux's database

Location: Area H
Approximate Number of Soil Borings: 14
Approximate Location of Soil Borings: See Figure C-8 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: None.

Location: Area I
Approximate Number of Soil Borings: 10
Approximate Location of Soil Borings: See Figure C-9 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Soil borings in this area will need to consider physical access and the methods of construction of the feature prior to selecting boring locations to minimize potential for damage to the feature. Deeper drilling in this area will be subject to further consideration before proceeding to ensure preferential drainage through karst conditions is not promoted.

Location: Area J
Approximate Number of Soil Borings: 9
Approximate Location of Soil Borings: See Figure C-10 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: Soil borings in this area will need to consider physical access and the methods of construction of the feature prior to selecting boring locations to minimize potential for damage to the feature. The 6 borings proximate to the Dam 4A area will be advanced to 20 feet bgs with 2 additional samples at 9.5 to 10 feet bgs and 19.5 to 20 feet bgs. Deeper drilling in this area will be subject to further consideration before proceeding to ensure preferential drainage through karst conditions is not promoted.

Location: Area K1
Approximate Number of Soil Borings: 3
Approximate Location of Soil Borings: See Figure C-11.1 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (2 to 2.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: The 3 borings located in this area will be based on aerial photographs and may be modified based on airport safety requirements. The shallow sample depth interval was adjusted to target the potential residual biosolids in this area.

Location: Area K2
Approximate Number of Soil Borings: 3
Approximate Location of Soil Borings: See Figure C-11.2 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: The 3 borings located in this area will be based on aerial photographs and available documentation of biosolids application.

Location: Area K3
Approximate Number of Soil Borings: 3
Approximate Location of Soil Borings: See Figure C-11.3 in Appendix C
Estimated Number of Soil Samples per Soil Boring (and depth bgs): 2 (0 to 0.5 and 4.5 to 5)
Analytes/Method: PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633
Comments: The 3 borings located in this area are based on the absence of available documentation of biosolids application.

SPLP Analysis: It is anticipated that up to 10 samples may be analyzed for synthetic precipitation leaching procedure ("SPLP') and may be used to assess the site-specific migration of PFAS from soil to groundwater. Additional aliquot of soil from shallow soil samples will be collected, shipped to the analytical laboratory, and placed on hold. Select samples will be released, as appropriate, after receipt of the total PFAS analytical results. Samples will be released from hold for SPLP analysis based on location and concentration distribution.

The drilling and sampling work described above is expected to be completed in accordance with procedures below. To the extent there are any meaningful modifications to the work, it will be discussed with PADEP in advance or documented in the RI report as a deviation from the proposed SOW.

- Prior to initiating the soil borings, utility locating via ground penetrating radar ("GPR") and other precision utility locating ("PUL") methods will be used as a tool to assist in identifying underground utilities (to reduce the potential for damaging utilities during drilling) and as a tool to attempt to identify subgrade features subject to investigation (i.e., voids)[43];

- Prior to the commencement of drilling activities and to the extent practicable, each soil boring location will be pre-cleared for underground utilities via soft digging methods (e.g., hand tools and/or air-knife/vacuum excavation) to depths of up to 5 feet bgs. Since many of the soil borings terminate at 5 feet bgs, hand tools or geophysical tools may be employed in lieu of soft-dig methods. Soil borings will be logged for lithologic description and field indications of potential impact (i.e., odor, staining, elevated photoionization detector ["PID"] concentrations)[44];

- Soil borings will be advanced using direct push drilling methods (or hand auger) to anticipated depths ranging up to 30 feet bgs by a Pennsylvania-licensed driller using a direct-push drill rig (i.e., Geoprobe™). Soil borings will be advanced with a pneumatic hammer to the designated depth using a disposable 2-inch diameter acetate-lined Macro-Core sampler. All non-dedicated sampling equipment will be decontaminated between each sampling location, and the disposable acetate sleeve will be replaced between each sampling interval. It is anticipated that the 5 foot soil borings

[43] Shallow borings completed with hand tools may not employ these geophysical tools.
[44] It is recognized that these field observations are not sensitive to low level PFAS conditions in soil.

will be backfilled using soil cuttings to match the pre-existing grades. Deeper soil borings will be grouted and soil cuttings raked out in the immediate area of the boring. As described in the pre-mobilization task, there will be formal bidding of this work to competent drilling firms;

- Absent any field indications of impact, shallow samples will be targeted to the six-inch interval described above, with adjustment based on potential grade elevation changes related to construction work at the airport. A deep sample will be collected from each boring from the deeper interval described above; and

- Soil samples will be analyzed for PFAS via USEPA Method 1633.

- It is not anticipated that groundwater will be encountered.

Soil sampling will be conducted in accordance with the SOPs, QAPP, and HASP provided in **Appendices D, E,** and **F**, respectively.

5.4.3 Task 3c – Monitoring Well Installation

Six new bedrock monitoring wells are proposed in this RIWP. Three are proposed at fixed locations identified herein, and three are expected to be located based on the surface geophysical survey. **Figure 16** depicts the following:

- Four existing wells that may be available for water level gauging;

- Three of the six proposed new monitoring well locations; and

- The proposed lines of transects for surface geophysical survey.

The objectives of three of the proposed new monitoring wells shown on Figure 16 are as follows:

- With the four existing wells and the three proposed new well locations, it is anticipated that overall potentiometric head maps can be prepared for the Airport;

- Two of the three proposed new wells shown on Figure 16 are located at intersection points of the proposed surface geophysical transects so that the lithologic conditions observed during drilling of the new proposed monitoring wells can be used to calibrate interpretations of the geophysical data; and

- The three proposed new wells shown on Figure 16 are located to the east, southeast, and south of the center of Airport operations and are intended to provide good distribution of groundwater results between the Airport and the residential areas to the south-southeast.

These three proposed new wells described above and shown on **Figure 16** are expected to be supplemented by three additional proposed new bedrock wells for a total of six proposed new wells. The three additional proposed new well locations will be selected based on the following:

- Surface geophysical results which may reveal preferential pathways to target with the three additional new wells;

- Additional research or field inspections conducted under pre-mobilization Tasks 1a and 1b; and

- A balance of spatial coverage and targeted locations to help assess the potential relationship between AFFF use at the Airport and the conditions found in the Walnut Grove Estates community.

It is expected that once the pre-mobilization and surface geophysical tasks are complete and the results are interpreted that a revised proposed new bedrock well location map will be prepared and submitted to PADEP to secure review and final approval of the drilling locations prior to proceeding.

The drilling work is expected to be completed in accordance with procedures below. To the extent there are any meaningful modifications to the work, it will be discussed with PADEP in advance or documented in the RI report as a deviation from the proposed SOW.

- Prior to the commencement of drilling activities, utility locating via GPR and other PUL methods are expected to be used as a tool to assist in identifying underground utilities (to reduce the potential for damaging utilities during drilling) and as a tool to attempt to identify subgrade features subject to investigation (i.e., voids);

- Prior to the commencement of drilling activities and to the extent practicable, each proposed new monitoring well location will be pre-cleared for underground utilities via soft digging methods (e.g., hand tools and/or air-knife/vacuum excavation) to depths of up to 5 feet bgs. Soils will be logged for lithologic description and field indications of potential impact (i.e., odor, staining, elevated PID concentrations).

- Depending on selected drilling method, a temporary or permanent casing may be installed to the top of bedrock. The temporary or permanent casing may be 5- to 8-inches in diameter. Open hole drilling into bedrock will continue to the desired monitoring well depth.

- Downhole geophysics will be conducted prior to setting the monitoring well to assess overall lithology (for cased and uncased portions) and structure (for uncased portions) via the following anticipated suite of instruments: three-arm caliper, optical televiewer, acoustic televiewer, fluid temperature and conductivity, natural gamma, electrical resistivity suite, and heat pulse flowmeter;

- Due to the karst terrain and potential for infilling from adjacent voids, installation of 2-inch polyvinyl chloride (“PVC”) casing may be employed to prevent borehole infill or collapse. After setting the casing, the proposed new monitoring wells will be developed using a submersible pump until there is significant improvement to water clarity or one hour elapses; and

- The proposed new monitoring wells will be completed with an outer casing and a flush mounted curb box (or other protective covering) to minimize the potential for infiltration of surface water down the grouted borehole annulus.

Monitoring well installation will be conducted in accordance with the SOPs, QAPP, and HASP provided in **Appendices D, E,** and **F**, respectively.

5.4.4 Task 3d – Gauging Water Levels and Groundwater Sampling and Analysis

The proposed SOW for this task includes the following:

- Measuring water levels on up to four events from up to 4 existing wells and 6 proposed new monitoring wells on the Airport as follows:

    - One event to occur coincident with the placement of pressure transducers;
    - One event completed after at least 1 week of dry weather;
    - One event completed within one day of a rain event; and
    - One event to occur coincident with the downloading of pressure transducer data.

A discussion of the protocols for groundwater gauging and sampling is presented below.

- A total of up to 10 wells (4 existing wells and 6 proposed new monitoring wells) are expected to be sampled and analyzed for PFOS; PFOA; PFNA; PFHxS; and PFBS via USEPA Method 1633.

- Prior to groundwater sampling activities, the new and existing wells will be gauged using an electronic water level meter. Gauging events will take place concurrently with groundwater sampling events, and the wells will be gauged within a minimal time interval.

- The depth to water measurements will be used to calculate groundwater elevation in each monitoring well. Following each event, a groundwater elevation contour map, along with inferred groundwater flow direction will be prepared.

- Groundwater sampling will be conducted by Roux personnel using low flow sampling methodologies.[45] During low-flow sampling, Roux will monitor purge water from the well approximately every five minutes using a calibrated water quality meter for indicator parameters including: temperature, pH, oxidation-reduction potential ("ORP"), dissolved oxygen ("DO"), turbidity and specific conductivity. Samples will be collected once parameters stabilize within acceptable limits.

- Purge water from the groundwater sampling events is expected to be minimal and will be directed to permeable soil in the vicinity of the well being sampled. The field sampling team will take care to avoid allowing transport of purge water to stormwater catch basins.

- All groundwater samples will be collected in appropriate bottleware provided by a Pennsylvania certified laboratory. Each sample container will be labeled by the on-Site personnel with the sample designation, time and date of collection, and the sampler's initials. The sample containers will be placed on ice in an insulated cooler and maintained at a temperature of approximately 4°C. A chain-of-custody form will be completed and maintained for all samples throughout collection, transport and delivery. All samples collected will be identified with a unique designation recorded on the chain-of-custody form. Samples will be delivered or shipped to a laboratory immediately following the sampling event.

These groundwater gauging and sampling activities will be conducted in accordance with the SOPs, QAPP, and HASP provided in **Appendices D, E,** and **F**, respectively.

[45] Other groundwater sampling methodologies (i.e., volume average purge, passive diffusion bag ("PDB"), etc.) may be evaluated and employed throughout the investigation if deemed more appropriate.

5.4.5 Task 3e – Pressure Transducer Installation

The proposed SOW for this task includes the following:

- Install an estimated 5 pressure transducers in wells to get a preliminary assessment of water level responses to precipitation, both rate of response and amplitude of change in water levels.

- The wells subject to installation of pressure transducers are as follows:

    - One existing well located in the Airport operations area, subject to access and use (e.g. GAT-1);
    - Two targeted to proposed new fixed wells (i.e., wells not targeted to a suspected structural feature); and
    - Two targeted to proposed new wells selected based on surface geophysical survey findings (i.e., wells targeted to a suspected structural feature).

Based on the results of the initial pressure transducer data, a determination will be made whether to expand or discontinue the pressure transducer assessment.

A discussion of the protocols for pressure transducer installation and monitoring is presented below.

- Prior to pressure transducer installation, initial depth to water and depth to bottom measurements will be collected.

- The pressure transducer (datalogger) will then be placed approximately 20 feet into the water column. If water columns are shorter than 20 feet, dataloggers will be installed just off the bottom of the well.

- Dataloggers will be programmed by field personnel to continuously monitor potentiometric elevation after a chosen start time.

Pressure transducer installation will be conducted in accordance with the SOPs, QAPP, and HASP provided in **Appendices D, E,** and **F**, respectively.

5.4.6 Task 3f – Surface Water Inspection

The proposed SOW for this task includes conducting an inspection of local streams within the Department Investigation Area to visually inspect physical characteristics, including location versus mapped locations, identification of piped outfalls, identification of dry segments, and selection of potentially viable segments for future stream flow transects.

This surface water inspection will be conducted in accordance with the Health and Safety Plan provided in **Appendix F**.

5.4.7 Task 3g – Survey

The proposed SOW for this task includes completion of a survey to include key site features, monitoring well locations and elevations, location and elevation of surface geophysical survey transects, and other features as warranted for effective presentation of data in the RIR.

This survey will be conducted in accordance with the Health and Safety Plan provided in **Appendix F**.

5.4.8 Task 3h – Waste Disposal

IDW expected to be generated during execution of the RIWP include the following:

- Soil and Rock Cuttings; and
- Groundwater.

A discussion of IDW handling for waste streams identified above is provided in the sections below.

Soil and Rock Cuttings

It is anticipated that soil and/or rock IDW will be generated as part of the following activities:

- Soil Boring Installation; and
- Bedrock Monitoring Well Installation.

Soil and/or rock cuttings generated as part of the activities identified above will be stockpiled at a central location and/or containerized in advance of being properly characterized. The characterization sampling and analysis will include Resource Conservation and Recovery Act ("RCRA") characteristics, PFAS, disposal facility analytes, and management of clean fill analytes. It is anticipated that shallow soils and soils in source areas will be segregated from deeper soils and rock cuttings and they will be characterized separately.

Based on the IDW characterization results, the IDW soil and rock cuttings will either be re-emplaced on site in accordance with the PADEP's Management of Fill Policy or properly treated and/or disposed of at an off-site facility. If the materials are to be managed on site, the data supporting that decision will be presented to PADEP for its concurrence to avoid any optics concerns.

If off-site disposal is conducted, all material will be shipped in accordance with applicable laws and procedures.[46] Documentation regarding waste characterization and IDW treatment and/or disposal will be included in the final report.

Disposal facility identification, permit-defined acceptance criteria, sampling requirements and other logistics will be determined as part of the pre-mobilization task.

Groundwater

It is anticipated that groundwater IDW may be generated as part of the following activities:

- Monitoring well installation;
- Monitoring well development; and
- Groundwater sampling activities.

Aqueous IDW generated during drilling or development of monitoring wells will be containerized and transported to a central staging area (on the Airport or at a nearby PSU facility) or temporarily staged at an off-site point of generation and then transported to the central staging area. If applicable, IDW may be shipped

[46] The University operates under small quantity generator USEPA ID # PAR000506063.

from the point of generation directly to an approved offsite facility for treatment and/or disposal. The water will be contained in one or more holding tanks and/or drums as applicable and properly characterized for off-site treatment and/or disposal. The characterization sampling and analysis for aqueous drilling IDW and development water will include RCRA characteristics, PFAS, and disposal facility analytes.

All material for off-site disposal will be shipped in accordance with applicable laws and procedures.[47] Documentation regarding waste characterization and IDW treatment and/or disposal will be included in the final report.

Disposal facility identification, permit-defined acceptance criteria, sampling requirements and other logistics will be determined as part of the pre-mobilization task.

This IDW sampling and handling will be conducted in accordance with the SOPs, QAPP, and HASP provided in **Appendices D, E,** and **F**, respectively.

5.5 Task 4 – Reporting Tasks

5.5.1 Task 4a – Quarterly Progress Reporting

Quarterly progress reports to PADEP are proposed to ensure effective communication in a timely basis. The reports will include the following, as applicable:

- A description of work completed to date;
- Results of recent sampling in tabular and/or figure format; and
- Proposed next steps to address data gaps and comply with COA remedial timeframes.

5.5.2 Task 4b – Progress Meetings

In-person, field, or virtual progress meetings with PADEP are proposed and will be scheduled as needed or as requested by PADEP.

5.5.3 Task 4c – Supplemental RIWP

Supplemental RIWP(s) are anticipated based on the iterative nature of the remedial investigation. The tasks associated with any Supplemental RIWP(s) will vary based on work completed to date, but may include the following:

- Supplemental surface and downhole geophysical surveys;
- Soil boring advancement and soil sampling;
- Monitoring well installation and supplemental monitoring well sampling;
- Continued evaluation of aquifer conditions; and
- Ongoing evaluation of the surface water network and associated surface water sampling.

[47] The University operates under small quantity generator USEPA ID # PAR000506063.

5.5.4 Task 4d – Remedial Investigation Report

An Act 2 compliant RIR will be submitted at the completion of the RI, which will include the following general sections:

- Introduction: this section will describe the report objectives;
- Site Description: this section will describe current and historic operations, the physical location of the Airport and surrounding area, and previous remedial work;
- Site Characterization: this section will describe the nature, concentration, extent, and potential for pathways for movement of PFAS at the Airport, as well as include a revised CSM;
- Fate and Transport Analysis: this section will provide a discussion of fate and transport of PFAS at the Airport; and
- Conclusions and Recommendations: this section will provide a summary of the findings of the RIR and will identify appropriate remedial technology options, as may be warranted.

6. QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Laboratory Selection

A qualified analytical laboratory will be selected prior to initiating sampling activities to perform all laboratory analyses. Information regarding the qualifications of the selected analytical laboratory will be provided to the PADEP prior to initiating field sampling activities. Should PADEP have any concerns with the selected analytical laboratory, we will provide additional information from the laboratory or select an alternative laboratory.

6.1.1 Analytical Results and Data Package

The following summarizes the information to be included in analytical data packages generated for the sampling activities discussed in this report:

- General Deliverable Data including:
    - Title Page;
    - Table of Contents and Sample Identification Page;
    - Sample Analysis Request;
    - Chain of Custody Records (Field);
    - Chain of Custody Records (Internal);
    - Laboratory Chronicles with Documentation of Follow-Up Communication;
    - Method Summary;
    - Methodology References;
    - Non-Conformance Summary Report; and
    - Case Narrative.
- Quality Control Data including:
    - Reagent blank, matrix spike summary, initial and continuing calibration/validation, and duplicate summaries (as applicable).
- Sample Data Package including sample results summaries.

6.1.2 Analytical Methods

Analytical methods to be employed and the analytes to be analyzed as part of the SOW discussed in this report are listed on **Table 8**.

6.2 Data Quality Evaluation

The following sections discuss the procedures to be used in data reduction, evaluation, and reporting. Analytical data will be obtained from the laboratory and will include soil and groundwater results, QA/QC results, and laboratory-prepared quality control data.

As part of the quality assurance program, Roux personnel will independently review all analytical data. Any inconsistencies found with the laboratory data packages will be addressed with the laboratory.

6.2.1 Quality Assurance Project Plan

QA/QC for all sampling activities summarized in this RIWP will be completed in accordance with the site-specific QAPP provided in **Appendix E**.

6.2.2 Data Reduction

Data received from the laboratory will be summarized and tabulated to facilitate review of the results. All data received will be reported according to accepted practices of quality assurance. Outliers (i.e., values outside the "expected" range of values) will be reported, if encountered, along with documentation of the cause of the problem, if known. Reported values below the method detection limit will be qualified with the value "J". Compounds reported in samples and detected in either the method, trip, or field blanks will be qualified with the value "B".[48]

6.2.3 Data Evaluation

Data review procedures will be consistent with the standard USEPA analytical method chosen. The review performed will initially be focused on an evaluation of holding times, method blank results, duplicate and replicate analysis, and surrogate recovery rates. In addition, the non-conformance summary will be reviewed. These areas will be analyzed qualitatively and quantitatively using the prescribed evaluation techniques listed for each standard method. If initial findings suggest problems with the analytical data, a portion of the data may be subjected to independent, third-party data validation procedures.

6.2.4 Data Reporting

The data collected will be arranged in a format that is both clear and logical. The sample results will be presented in tabular form, including the field QA/QC sampling results.

Other presentation methods, such as superimposing analytical results on a sampling location map, will be evaluated and used if beneficial. All reporting will be accomplished in a manner consistent with PADEP requirements.

6.3 Field-Related Quality Control

Field-related quality control ("QC") measures are implemented to help ensure that quality assurance is maintained throughout sample collection and analysis. A primary goal of field QC is to monitor and document the quality of data gathered.

6.3.1 Field Sampling Plan

All field sampling described in this SOW will be conducted in accordance with Roux's SOP for sample collection and handling. Applicable SOPs are provided in **Appendix D**. Methods of sample collection are described in Section 5.

6.3.2 Field QC Sample Type and Collection Procedures

The following types of QC samples will be collected as part of the sampling program discussed in this report.

- Equipment Rinsate (Field) Blanks;

[48] Alternate or additional qualifiers used by the selected analytical laboratory may be employed and will be identified and defined in the RIR.

- Duplicate Samples; and
- Field Reagent Blanks.

The QC samples identified above are discussed below.[49]

Equipment Rinsate (Field) Blanks

Equipment Rinsate (Field) Blanks will be collected at a frequency of one per 20 samples collected per media.[50] Rinsate blanks will be collected by pouring laboratory-supplied water over or through pre-cleaned sampling tools and collecting the rinsate into a sample container with preservatives, as applicable. The rinsate blank will be analyzed for the same parameters for which that day's field samples are evaluated. The rinsate blank will allow the adequacy of equipment cleaning procedures to be evaluated. The rinsate blank will be handled in the same manner as a field sample.

Duplicate Samples

Duplicate Samples will be collected at a frequency of one per 20 samples collected per media. The duplicate samples will be "blind" samples (i.e., no distinguishing designation for the laboratory) and will be collected in the same manner, from the same location, and temporally as close as possible to the (original) sample they are duplicating.

Field Reagent Blanks

Field Reagent Blanks ("FRBs") will be collected at a frequency of one per 20 samples per media. The FRB water and sample bottleware will accompany the laboratory-provided sample jars and cooler to the field, during the sampling event and back to the laboratory. Laboratory supplied, PFAS-free water shall travel with the coolers and then will be poured into laboratory supplied bottleware.

6.3.3 Internal QC Checks

Internal QC checks will include documentation of the calibration of field equipment in accordance with equipment manufacturer specifications. Any departures from standard recommended procedures will be documented in the field notebook.

6.3.4 Corrective Action Planning

Field-related quality assurance problems will be addressed as encountered. Advanced planning of activities will help eliminate problems prior to their impacting the investigation data quality. Laboratory-related quality assurance issues will be researched and addressed as appropriate. Every effort will be made to anticipate and eliminate potential problems before they arise by careful preparation and planning.

6.4 Chain-of-Custody Procedures

The chain-of-custody forms will be completed during the day of sample collection. The sampling containers sent from the laboratory will in general be coordinated to arrive at the Site the day of or the day before the planned sampling event. These containers will be visually inspected and will be assumed clean unless noted

[49] Due to the screening nature of certain tasks, QA/QC samples may not be collected for certain activities as described in the text of the individual tasks in this SOW.
[50] If single use dedicated sampling devices are employed, this sampling frequency is not required.

otherwise upon inspection. The analysis of the FRB samples will help to confirm the integrity of the sampling containers.

An individual chain-of-custody form will be completed, at a minimum, for each day of sample collection. The chain-of-custody form will have the following information: site location, sampler name, sample designation, date of collection, time of collection, sample matrix, number of sampling containers, analysis to be performed, preservatives present, and a signature with date and time of each party responsible for custody of the samples.

The party with responsibility for the samples will maintain custody of the samples throughout the sampling period. A signed and dated custody seal will be placed on each sample cooler prior to shipment to the laboratory. Once the laboratory has received the samples, the in-house custody procedures established by the laboratory will be followed.

6.5 Sample Designations

Sample bottles (including those containing preservatives, where necessary), labels, shipping containers, and field blank water will be provided by the laboratory. During collection of samples, containers will be labeled with the following information:

- Sample identification code (as discussed below);
- Site identifier;
- Date and time of collection;
- Type of analysis;
- Type of preservative added (if applicable); and
- Sampler's initials.

Sample identification codes will be established for samples to be collected as part of the RI.

6.6 Sample Containers

Sample containers will be supplied by the laboratory (i.e., bottleware) and coordinated to arrive at the sampling location on the day of or the day prior to sampling. Sample containers will be kept under chain-of-custody, either in the presence of the authorized personnel or in a secure locked area. Sample containers will be visually inspected by field personnel prior to use to ensure they are clean and undamaged. Any containers with loose or missing caps will not be used. Extra containers will be included to replace containers broken during shipment and/or to obtain additional samples if desired based on observations during sampling activities. QC sample containers along with a supply of PFAS-free water will be obtained from the laboratory.

Upon collection, samples will be placed in a cooler with an ample supply of ice as a preservative. The samples will be maintained at approximately 4 degrees Celsius during handling and transport to the analytical laboratory. Additional preservatives, if any, will be added at the laboratory prior to shipment. No preservatives will be added to the samples in the field.

6.7 Field Equipment Cleaning Procedures

Dedicated disposable equipment will be used where practical (e.g., bailers, tubing, etc.). When sampling equipment will be reused, it will be cleaned using the following procedures.

- Wash with laboratory-grade glassware detergent and scrub to remove visual contamination;
- Generous rinse with tap water; and
- Rinse with distilled/deionized, analyte-free water.

7. REPORTING

Following completion of the investigative activities discussed in this RIWP, one of the following will occur:

- After compilation of results, a meeting with PADEP will be convened to discuss the results, implications, and next steps;
- Based on the results developed from implementation of the RIWP, data gaps are identified and a Supplemental RIWP is prepared and submitted to the PADEP for its review and approval under the terms of the COA; or
- Based on the results developed from implementation of the RIWP, no data gaps are identified and a RIR is prepared and submitted to the PADEP for its review and approval under the terms of the COA.

The RIR will include a summary of the investigative activities, results, figures, findings and recommendations.

It is anticipated that the Roux project team will be in communication with PADEP on a regular basis and will, at a minimum be providing PADEP with regular updates via the Quarterly Progress Reports. In this way, as data are generated from the various field activities, the results will be reported on an ongoing basis. This approach will promote a) early identification of data gaps and b) timely development of Supplemental RIWPs.

8. HEALTH AND SAFETY

A comprehensive Health and Safety Plan ("HASP") has been prepared in accordance with 29 CFR 1910.120 and Roux's Standard Operating Procedures. The HASP addresses the SOW discussed in this RIWP and will be implemented by the designated Site Health and Safety Officer ("SHSO") during Site work. Compliance with the HASP is required for persons who are involved in field activities during implementation of this SOW. Assistance in implementing the HASP will be provided by the Roux Office Health and Safety Manager ("OHSM"), as required. The content of the HASP may undergo revision based upon additional information made available before or during the investigation. Any changes proposed will be reviewed and approved by the Roux OHSM or their designee. A copy of the HASP is provided in **Appendix F**.

9. RIWP IMPLEMENTATION SCHEDULE

The proposed schedule for completion of the 2025 RIWP SOW as described herein is provided on **Table 9**. As seen on **Table 9**, Roux anticipates that the primary field investigation in this RIWP can be completed within approximately six months (Q2 and Q3 2026) with the overall schedule indicating completion of the 2025 RIWP SOW by Q4 2026. The start and completion dates may be affected by the following:

- Timing of approval to proceed from PADEP;
- Execution of access agreements with off-site property owners;
- Subcontractor schedules; and
- Weather conditions.

Most of the pre-mobilization tasks will not require access agreements and will therefore begin upon approval from PADEP. In addition, access agreements and planning for POET system monitoring and maintenance are already under way and a separate stand-alone POET workplan has been submitted to PADEP.

It is anticipated that minor deviations or adjustments to the schedule will be communicated to PADEP via the Quarterly Progress Reports. Should there be the need for substantial modifications to the schedule due to circumstances outside our control, PADEP will be informed, and a revised schedule may be submitted for approval.

TABLES

1. Statistics for Soil PFAS Sampling Results
2. Statistics for Asphalt PFAS Sampling Results
3. Statistics for Private Supply Well PFAS Sampling Results (Pre-POET Installation)
4. Statistics for POET Performance PFAS Sampling Results (Post-POET Installation)
5. Statistics for Airport and Proximate Wells PFAS Sampling Results
6. List of Sampled Private Supply Wells
7. List of Private Supply Wells with POET Systems
8. List of Analytical Methods and Analytes
9. RIWP Implementation Schedule

Table 1. Statistics for Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

	PADEP RDC 0-15 Soil MSCs	PADEP RUA 100x SGW MSCs	Most Stringent Standard	Minimum	Maximum	Sample Count	Detections	Most Stringent	RDC 0-15 Soil MSCs	RUA 100x SGW MSCs	RL Minimum	RL Maximum
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	NS	0.00103	0.00103	94	1	0	0	0	0.000024	0.00129
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	NS	0.000028	0.000067	43	2	0	0	0	0.00002	0.00074
3:3 FTCA	NS	NS	NS	—	—	29	0	0	0	0	0	0.000025
4:2 FTS	NS	NS	NS	—	—	32	0	0	0	0	0.00002	0.00114
5:3 FTCA	NS	NS	NS	—	—	29	0	0	0	0	0	0.000024
6:2 FTS	NS	NS	NS	0.0003	0.0014	32	2	0	0	0	0.000056	0.000573
7:3 FTCA	NS	NS	NS	0.00038	0.00038	29	1	0	0	0	0	0.00002
9Cl-PF3ONS	NS	NS	NS	0.00103	0.00103	94	1	0	0	0	0.000026	0.0029
DONA	NS	NS	NS	0.00103	0.00103	103	1	0	0	0	0.000024	0.0044
HFPODA	NS	NS	NS	0.001	0.00206	131	2	0	0	0	0.000023	0.00301
NEtFOSA	NS	NS	NS	—	—	29	0	0	0	0	0	0.000035
NEtFOSAA	NS	NS	NS	0.000044	0.00103	117	5	0	0	0	0.000024	0.0029
NEtFOSE	NS	NS	NS	—	—	29	0	0	0	0	0.000023	0.000028
NMeFOSA	NS	NS	NS	—	—	29	0	0	0	0	0	0.000043
NMeFOSAA	NS	NS	NS	0.000027	0.00103	117	2	0	0	0	0.000025	0.0029
NMeFOSE	NS	NS	NS	—	—	29	0	0	0	0	0.000026	0.000032
Perfluorobutanesulfonic acid	66	1	1	0.000035	0.00103	198	4	0	0	0	0	0.0029
Perfluorobutanoic acid	NS	NS	NS	0.000046	0.0005	43	27	0	0	0	0.000029	0.00099
Perfluorodecanesulfonic acid (PFDS)	NS	NS	NS	0.000032	0.000098	43	3	0	0	0	0.000024	0.000573
Perfluorodecanoic acid	NS	NS	NS	0.000028	0.00103	117	47	0	0	0	0.000026	0.00119
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	NS	0.000025	0.00042	29	5	0	0	0	0.000023	0.000028
Perfluorododecanoic acid	NS	NS	NS	0.000028	0.00103	117	29	0	0	0	0.000025	0.00119
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	NS	0.000029	0.00023	43	9	0	0	0	0.000023	0.000573
Perfluoroheptanoic acid	NS	NS	NS	0.000026	0.00095	88	45	0	0	0	0.000028	0.00088
Perfluorohexanesulfonic acid	NS	NS	NS	0.000026	0.0083	170	75	0	0	0	0	0.00129
Perfluorohexanoic acid	NS	NS	NS	0.000023	0.00086	117	63	0	0	0	0.000021	0.00119
Perfluorononanesulfonic acid (PFNS)	NS	NS	NS	0.00012	0.00012	43	1	0	0	0	0.000025	0.00114
Perfluorononanoic acid	NS	NS	NS	0.000028	0.0012	117	57	0	0	0	0.000025	0.00119
Perfluorooctanesulfonamide (PFOSA)	NS	NS	NS	0.000026	0.0011	63	7	0	0	0	0.000024	0.00129
Perfluorooctanesulfonic acid	4.4	0.007	0.007	0.00014	0.1004	198	144	26	0	26	0	0.00111
Perfluorooctanoic acid	4.4	0.007	0.007	0.000045	0.00217	198	98	0	0	0	0	0.00119
Perfluoropentanesulfonic acid	NS	NS	NS	0.000025	0.00018	43	5	0	0	0	0.000025	0.00114
Perfluoropentanoic acid	NS	NS	NS	0.000045	0.0016	43	32	0	0	0	0.000029	0.000573
Perfluorotetradecanoic acid	NS	NS	NS	0.000022	0.00103	117	10	0	0	0	0.000026	0.00129
Perfluorotridecanoic acid	NS	NS	NS	0.000024	0.00103	117	16	0	0	0	0.000023	0.00129
Perfluoroundecanoic acid	NS	NS	NS	0.000023	0.00103	117	20	0	0	0	0.000038	0.00119
PFECA A	NS	NS	NS	—	—	29	0	0	0	0	0	0.000028
PFECA B	NS	NS	NS	—	—	29	0	0	0	0	0	0.00003
PFECA F	NS	NS	NS	0.0011	0.0011	29	1	0	0	0	0	0.000029
PFEESA	NS	NS	NS	—	—	29	0	0	0	0	0	0.000025

Notes:
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium Specific Concentrations.
RDC = Residential Direct Contact.
RUA = Residential Used Aquifer.
RL = Reporting Limit.
SGW = Soil to Groundwater.
NS = No Standard.
mg/kg = Milligrams per kilogram.
— = All samples non-detect.

Table 2. Statistics for Asphalt PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

	PADEP RDC 0-15 Soil MSCs	PADEP RUA 100x SGW MSCs	Most Stringent Standard	Minimum	Maximum	Sample Count	Detections	Most Stringent	RDC 0-15 Soil MSCs	RUA 100x SGW MSCs	RL Minimum	RL Maximum
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
3:3 FTCA	NS	NS	NS	—	—	21	0	0	0	0	0.000914	0.000996
4:2 FTS	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
5:3 FTCA	NS	NS	NS	—	—	21	0	0	0	0	0.00457	0.00498
6:2 FTS	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
7:3 FTCA	NS	NS	NS	—	—	21	0	0	0	0	0.00457	0.00498
9Cl-PF3ONS	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
DONA	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
HFPODA	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
NEtFOSA	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
NEtFOSAA	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
NEtFOSE	NS	NS	NS	—	—	21	0	0	0	0	0.00183	0.00199
NMeFOSA	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
NMeFOSAA	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
NMeFOSE	NS	NS	NS	—	—	21	0	0	0	0	0.00183	0.00199
Perfluorobutanesulfonic acid	66	1	1	0.000054	0.000059	25	2	0	0	0	0.000183	0.000199
Perfluorobutanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000731	0.000797
Perfluorodecanesulfonic acid (PFDS)	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorodecanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorododecanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluoroheptanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorohexanesulfonic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorohexanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorononanesulfonic acid (PFNS)	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorononanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorooctanesulfonamide (PFOSA)	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorooctanesulfonic acid	4.4	0.007	0.007	—	—	25	0	0	0	0	0.000183	0.000199
Perfluorooctanoic acid	4.4	0.007	0.007	—	—	25	0	0	0	0	0.000183	0.000199
Perfluoropentanesulfonic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluoropentanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000366	0.000398
Perfluorotetradecanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluorotridecanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
Perfluoroundecanoic acid	NS	NS	NS	—	—	21	0	0	0	0	0.000183	0.000199
PFECA A	NS	NS	NS	—	—	21	0	0	0	0	0.000366	0.000398
PFECA B	NS	NS	NS	—	—	21	0	0	0	0	0.000366	0.000398
PFECA F	NS	NS	NS	—	—	21	0	0	0	0	0.000366	0.000398
PFEESA	NS	NS	NS	—	—	21	0	0	0	0	0.000366	0.000398

Notes:
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium Specific Concentrations.
RDC = Residential Direct Contact.
RUA = Residential Used Aquifer.
RL = Reporting Limit.
SGW = Soil to Groundwater.
NS = No standard currently established.
mg/kg = Milligrams per kilogram.
— = All samples non-detect.

Table 3. Statistics for Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

	USEPA Primary MCLs	PADEP RUA GW MSCs	Minimum	Maximum	Sample Count	Detections	Exceeds Primary MCLs	Exceeds RUA GW MSCs	RL Minimum	RL Maximum
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00043	0.00043	274	1	0	0	0.00161	0.0037
9Cl-PF3ONS	NS	NS	—	—	274	0	0	0	0.00159	0.0036
DONA	NS	NS	—	—	274	0	0	0	0.00161	0.0037
HFPODA	0.01	0.01	—	—	277	0	0	0	0.0017	0.0039
NEtFOSAA	NS	NS	0.00027	0.0008	277	11	0	0	0.0017	0.0039
NMeFOSAA	NS	NS	0.00052	0.00083	277	8	0	0	0.0017	0.0039
Perfluorobutanesulfonic acid	2	2	0.00032	0.0199	277	105	0	0	0.00154	0.0034
Perfluorodecanoic acid	NS	NS	—	—	277	0	0	0	0.0017	0.0039
Perfluorododecanoic acid	NS	NS	0.00042	0.00042	277	1	0	0	0.0017	0.0039
Perfluoroheptanoic acid	NS	NS	0.00047	0.007	277	91	0	0	0.00174	0.0039
Perfluorohexanesulfonic acid	0.01	0.01	0.00036	0.098	277	109	66	66	0.00159	0.0036
Perfluorohexanoic acid	NS	NS	0.00059	0.016	277	105	0	0	0.00174	0.0039
Perfluorononanoic acid	0.01	0.01	0.00046	0.0036	277	8	0	0	0	0.0039
Perfluorooctanesulfonic acid	0.004	0.004	0.00022	0.2089	290	136	83	83	0	0.0036
Perfluorooctanoic acid	0.004	0.004	0.00051	0.0161	290	116	51	51	0.0017	0.0039
Perfluorotetradecanoic acid	NS	NS	—	—	277	0	0	0	0.0017	0.0039
Perfluorotridecanoic acid	NS	NS	—	—	277	0	0	0	0.0017	0.0039
Perfluoroundecanoic acid	NS	NS	0.0012	0.0012	277	1	0	0	0.0017	0.0039

Notes:
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
POET = Point-of-Entry Treatment.
USEPA = United State Environmental Protection Agency.
MCL = Maximum Contaminant Level.
MSCs = Medium-Specific Concentrations.
RL = Reporting Limit.
RUA = Residential Used Aquifer.
NS = No standard currently established.
µg/l = Micrograms per liter.
— = All samples non-detect.

Table 4. Statistics for POET Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

		Pre-Treatment			Mid-Point			Post-Treatment			Field Reagent Blank		
	PADEP RUA GW MSCs	Sample Count	Detections	Exceeds RUA GW MSCs	Sample Count	Detections	Exceeds RUA GW MSCs	Sample Count	Detections	Exceeds RUA GW MSCs	Sample Count	Detections	Exceeds RUA GW MSCs
PFAS (µg/l)													
11Cl-PF3OUdS	NS	176	0	0	173	0	0	184	0	0	155	0	0
9Cl-PF3ONS	NS	176	0	0	173	0	0	184	0	0	155	0	0
DONA	NS	176	0	0	173	0	0	184	0	0	155	0	0
HFPODA	0.01	190	0	0	186	0	0	197	0	0	156	0	0
NEtFOSAA	NS	190	1	0	186	1	0	197	4	0	156	1	0
NMeFOSAA	NS	190	5	0	186	3	0	197	5	0	156	3	0
Perfluorobutanesulfonic acid	2	190	154	0	186	0	0	197	3	0	156	0	0
Perfluorodecanoic acid	NS	190	0	0	186	0	0	197	0	0	156	0	0
Perfluorododecanoic acid	NS	190	0	0	186	0	0	197	0	0	156	0	0
Perfluoroheptanoic acid	NS	190	146	0	186	0	0	197	5	0	156	0	0
Perfluorohexanesulfonic acid	0.01	190	170	158	186	0	0	197	9	5	156	0	0
Perfluorohexanoic acid	NS	190	166	0	186	0	0	197	5	0	156	0	0
Perfluorononanoic acid	0.01	190	3	0	186	1	1	197	3	0	156	1	0
Perfluorooctanesulfonic acid	0.004	190	169	164	186	16	1	197	12	9	156	1	1
Perfluorooctanoic acid	0.004	190	160	115	186	1	1	197	6	4	156	0	0
Perfluorotetradecanoic acid	NS	190	0	0	186	0	0	197	0	0	156	0	0
Perfluorotridecanoic acid	NS	190	0	0	186	0	0	197	0	0	156	0	0
Perfluoroundecanoic acid	NS	190	0	0	186	0	0	197	0	0	156	0	0

Notes:
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
POET = Point-of-Entry Treatment.
MSCs = Medium-Specific Concentrations.
RUA = Residential Used Aquifer.
NS = No standard currently established.
µg/l = Micrograms per liter.

Table 5. Statistics for Airport and Proximate Wells PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

	USEPA Primary MCLs	PADEP RUA GW MSCs	Minimum	Maximum	Sample Count	Detections	Exceeds Primary MCLs	Exceeds RUA GW MSCs	RL Minimum	RL Maximum
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	—	—	2	0	0	0	0.0017	0.0017
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	NS	NS	—	—	1	0	0	0	0.0017	0.0017
4:2 FTS	NS	NS	—	—	1	0	0	0	0.0017	0.0017
6:2 FTS	NS	NS	—	—	1	0	0	0	0.0017	0.0017
9Cl-PF3ONS	NS	NS	—	—	2	0	0	0	0.0017	0.0017
DONA	NS	NS	—	—	2	0	0	0	0.0017	0.0017
HFPODA	0.01	0.01	—	—	2	0	0	0	0.0017	0.0017
NEtFOSAA	NS	NS	—	—	1	0	0	0	0	0
NMeFOSAA	NS	NS	—	—	1	0	0	0	0	0
Perfluoro-3-methoxypropanoic acid (PFMPA)	NS	NS	—	—	1	0	0	0	0.0017	0.0017
Perfluoro-4-methoxybutanoic acid (PFMBA)	NS	NS	—	—	1	0	0	0	0.0017	0.0017
Perfluorobutanesulfonic acid	2	2	0.0072	0.0072	4	1	0	0	0.0017	0.0017
Perfluorobutanoic acid	NS	NS	—	—	1	0	0	0	0.0017	0.0017
Perfluorodecanoic acid	NS	NS	—	—	2	0	0	0	0.0017	0.0017
Perfluorododecanoic acid	NS	NS	—	—	2	0	0	0	0.0017	0.0017
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	1	0	0	0	0.0017	0.0017
Perfluoroheptanoic acid	NS	NS	—	—	3	0	0	0	0.0017	0.0017
Perfluorohexanesulfonic acid	0.01	0.01	0.0107	0.073	4	2	2	2	0.0017	0.0017
Perfluorohexanoic acid	NS	NS	0.0063	0.0063	2	1	0	0	0.0017	0.0017
Perfluorononanoic acid	0.01	0.01	0.0024	0.0024	4	1	0	0	0.0017	0.0017
Perfluorooctanesulfonic acid	0.004	0.004	0.0025	0.1	14	10	8	8	0.0017	0.0018
Perfluorooctanoic acid	0.004	0.004	0.0029	0.021	14	10	8	8	0.0017	0.0018
Perfluoropentanesulfonic acid	NS	NS	—	—	1	0	0	0	0.0017	0.0017
Perfluoropentanoic acid (PFPeA)	NS	NS	0.00058	0.00058	1	1	0	0	0	0
Perfluorotetradecanoic acid	NS	NS	—	—	1	0	0	0	0	0
Perfluorotridecanoic acid	NS	NS	—	—	1	0	0	0	0	0
Perfluoroundecanoic acid	NS	NS	—	—	2	0	0	0	0.0017	0.0017
PFECA B	NS	NS	—	—	1	0	0	0	0.0017	0.0017
PFEESA	NS	NS	—	—	1	0	0	0	0.0017	0.0017

Notes:
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
USEPA = United State Environmental Protection Agency.
MCL = Maximum Contaminant Level.
MSCs = Medium-Specific Concentrations.
RL = Reporting Limit.
RUA = Residential Used Aquifer.
NS = No standard currently established.
µg/l = Micrograms per liter.
— = All samples non-detect.

Table 6. List of Sampled Private Supply Wells. The Pennsylvania State University; State College, Pennsylvania.

Address	City, State	Township
1250 Barns Lane	State College, PA	Benner Township
1276 Barns Lane	State College, PA	Benner Township
1380 Barns Lane	State College, PA	Benner Township
1471 Barns Lane	State College, PA	Benner Township
1550 Barns Lane	State College, PA	Benner Township
1667 Barns Lane	State College, PA	Benner Township
1671 Barns Lane	State College, PA	Benner Township
1679 Barns Lane	State College, PA	Benner Township
1681 Barns Lane	State College, PA	Benner Township
1725 Barns Lane	State College, PA	Benner Township
1737 Barns Lane	State College, PA	Benner Township
2255 Bernel Road	State College, PA	Patton Township
122 Big Hollow Road	State College, PA	Benner Township
147 Big Hollow Road	State College, PA	Benner Township
168 Big Hollow Road	State College, PA	Benner Township
480 Big Hollow Road	State College, PA	College Township
135 Bloom Lane	State College, PA	Benner Township
145 Bloom Lane	State College, PA	Benner Township
1996 Buffalo Run Road	State College, PA	Benner Township
2092 Buffalo Run Road	State College, PA	Benner Township
2748 Buffalo Run Road	State College, PA	Patton Township
153 Far Hills Avenue	State College, PA	Benner Township
50 Far Hills Avenue	State College, PA	Benner Township
84 Far Hills Avenue	State College, PA	Benner Township
1000 Fillmore Road	State College, PA	Patton Township
1004 Fillmore Road	State College, PA	Patton Township
1667 Fox Hill Road	State College, PA	Patton Township
2178 High Tech Road	State College, PA	Benner Township
2190 High Tech Road	State College, PA	Benner Township
2197 High Tech Road	State College, PA	Benner Township
500 Kristina Circle	State College, PA	Benner Township
525 Kristina Circle	State College, PA	Patton Township
549 Kristina Circle	State College, PA	Patton Township
258 Old Farm Lane	State College, PA	Benner Township
140 Quick Farm Lane	State College, PA	Benner Township
186 Quick Farm Lane	State College, PA	Benner Township
489 Rock Road	State College, PA	Benner Township
580 Rock Road	State College, PA	Benner Township
582 Rock Road	State College, PA	Benner Township
1841 Seibert Road	State College, PA	Benner Township
1735 Shiloh Road	State College, PA	Benner Township
107 Timber Ridge Road	State College, PA	Benner Township
101 Timber Ridge Road	State College, PA	Benner Township

Table 7. List of Private Supply Wells with POET Systems. The Pennsylvania State University; State College, Pennsylvania.

Address	City, State	Township	POET System Install Date
1250 Rock Road	State College, PA	Benner Township	10/15/2024
1412 Majestic View Drive	State College, PA	Benner Township	10/26/2022
1413 Majestic View Drive	State College, PA	Benner Township	8/30/2022
1418 Majestic View Drive	State College, PA	Benner Township	10/24/2022
1419 Majestic View Drive	State College, PA	Benner Township	10/26/2022
1424 Majestic View Drive	State College, PA	Benner Township	11/15/2022
1425 Majestic View Drive	State College, PA	Benner Township	3/21/2023
1430 Majestic View Drive	State College, PA	Benner Township	11/11/2022
1431 Majestic View Drive	State College, PA	Benner Township	4/5/2023
1436 Majestic View Drive	State College, PA	Benner Township	10/21/2022
1437 Majestic View Drive	State College, PA	Benner Township	8/4/2022
1442 Majestic View Drive	State College, PA	Benner Township	5/9/2023
1443 Majestic View Drive	State College, PA	Benner Township	11/17/2022
1810 Walnut Grove Drive	State College, PA	Benner Township	3/29/2023
1811 Walnut Grove Drive	State College, PA	Benner Township	10/14/2024
182 Big Hollow Road	State College, PA	Benner Township	12/16/2024
1822 Walnut Grove Drive	State College, PA	Benner Township	5/2/2023
1828 Walnut Grove Drive	State College, PA	Benner Township	3/28/2023
1829 Walnut Grove Drive	State College, PA	Benner Township	7/22/2022
1834 Walnut Grove Drive	State College, PA	Benner Township	3/30/2023
1835 Walnut Grove Drive	State College, PA	Benner Township	Unknown
1840 Walnut Grove Drive	State College, PA	Benner Township	3/30/2023
1841 Walnut Grove Drive	State College, PA	Benner Township	3/30/2023
1846 Walnut Grove Drive	State College, PA	Benner Township	5/24/2023
1852 Walnut Grove Drive	State College, PA	Benner Township	11/1/2022
1853 Walnut Grove Drive	State College, PA	Benner Township	10/28/2022
1858 Walnut Grove Drive	State College, PA	Benner Township	7/22/2022
1859 Walnut Grove Drive	State College, PA	Benner Township	11/8/2022
1864 Walnut Grove Drive	State College, PA	Benner Township	5/9/2023
1876 Millson Circle	State College, PA	Benner Township	11/23/2022
1877 Millson Circle	State College, PA	Benner Township	3/28/2023
1882 Millson Circle	State College, PA	Benner Township	Unknown
1883 Millson Circle	State College, PA	Benner Township	3/21/2023
194 Big Hollow Road	State College, PA	Benner Township	11/3/2023
288 Big Hollow Road	State College, PA	College Township	10/21/2024
338 Big Hollow Road	State College, PA	College Township	10/16/2024
587 Rock Road	State College, PA	Benner Township	12/16/2024
754 Big Hollow Road	State College, PA	Patton Township	10/18/2024
786 Big Hollow Road	State College, PA	College Township	4/5/2023

Table 8. List of Analytical Methods and Analytes. The Pennsylvania State University; State College, Pennsylvania.

Aqueous Sample Reference Guide
Per- and Polyfluoroalkyl Substances ("PFAS")

Analyses	Methods	Container	Sugg. Qty.	Preservative	Holding Time
PFAS	EPA 537.1	HDPE or Polypropylene	(2) 250 mL	Trizma, 4° C	14 Days (Extraction)
PFAS	EPA 1633	HDPE or Polypropylene	(2) 250 mL	4° C	28 Days (Extraction)

Soil/Solid Sample Reference Guide
Per- and Polyfluoroalkyl Substances ("PFAS")

Analyses	Methods	Container	Sugg. Qty.	Preservative	Holding Time
PFAS	EPA 1633	HDPE or Polypropylene	8 oz	4° C	90 Days (Extraction)

Notes:
HDPE = High-Density Polyethylene.
mL = Milliliter.
oz = Ounce.

Groundwater and soil samples will be analyzed for the following PFAS via EPA Method 1633, in accordance with the November 13, 2024 Consent Order and Agreement: perfluorooctane sulfonic acid ("PFOS"), perfluorooctanoic acid ("PFOA"), perfluorobutane sulfonic acid ("PFBS"), perfluorononanoic acid ("PFNA"), and perfluorohexane sulfonic acid ("PFHxS").

Potable water samples will be analyzed for the PFAS 18 List via EPA Method 537.1.

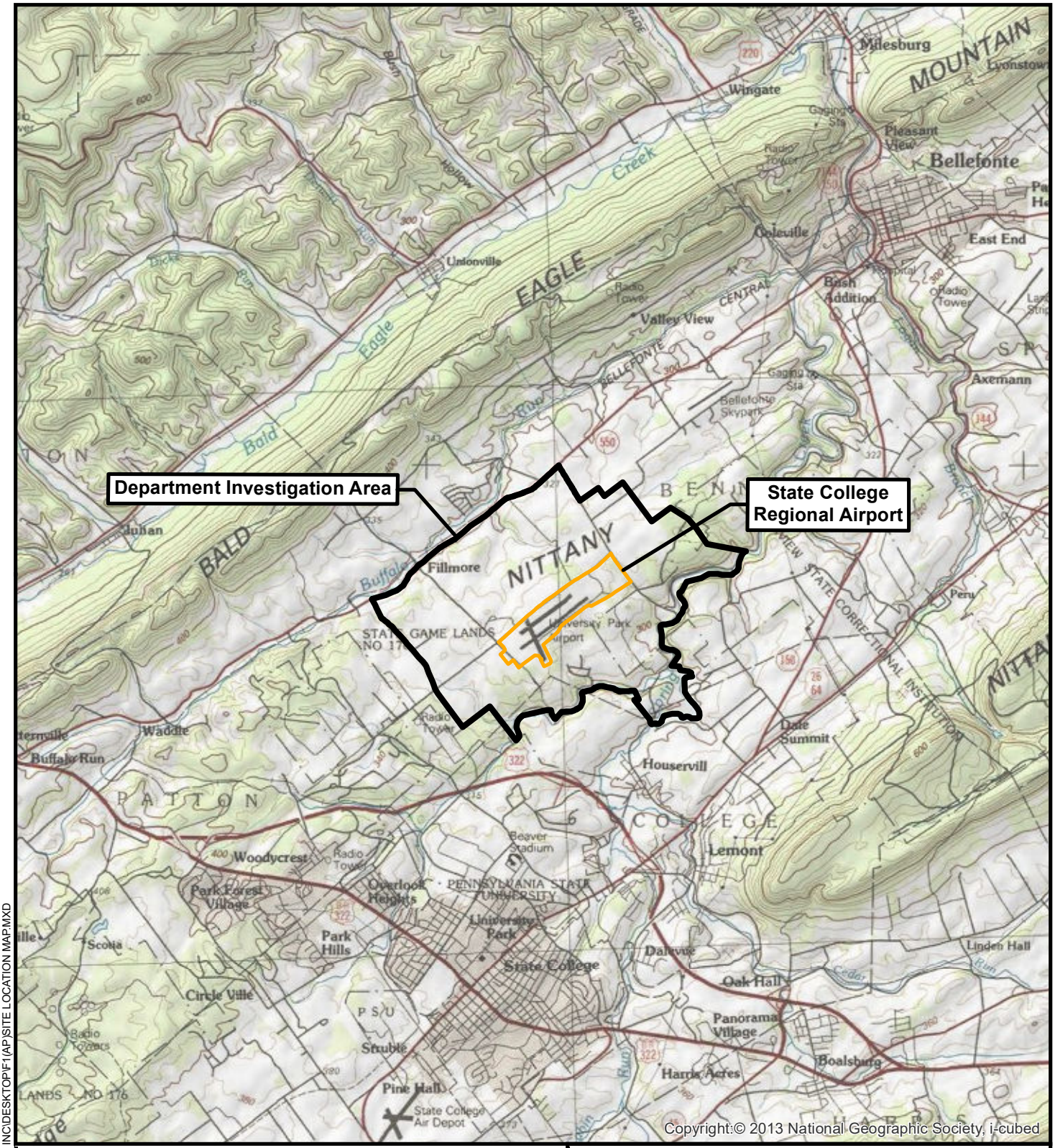
Table 9. RIWP Implementation Schedule. The Pennsylvania State University; State College, Pennsylvania.

Year	2025				2026				2027			
Timeframe	Quarter				Quarter				Quarter			
	1	2	3	4	1	2	3	4	1	2	3	4
Preparatory Tasks												
Compile Existing Data												
Field Conditions Verification												
Access/Permitting/Training/Contracting												
Private Supply Well Tasks												
Access Agreements												
Private Supply Well Sampling												
POET System Sampling												
Remedial Investigation Field Work Tasks												
Surface Geophysical Survey												
Soil Sampling and Analysis												
Monitoring Well Installation												
Gauging Water Levels and Groundwater Sampling and Analysis												
Pressure Transducer Installation												
Surface Water Inspection												
Survey												
Waste Disposal												
Reporting Tasks												
Quarterly Progress Reporting												
Progress Meetings (as needed)												
Supplemental RIWP(s) (as needed)												
Remedial Investigation Report (TBD)												

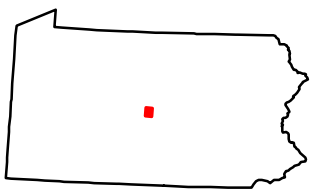
Notes:
RIWP = Remedial Investigation Workplan.
POET = Point-of-Entry Treatment.
TBD = To be determined.
PADEP = Pennsylvania Department of Environmental Protection.
Schedule is approximate and subject to revision due to timing of PADEP approval of RIWP, access approvals, subcontractor schedules, weather, etc.
Schedule modifications will be communicated to PADEP in quarterly progress reports.
PADEP will be notified at least two week in advance of field activities.

FIGURES

1. Site Location Map
2. Site Map
3. Site Map with Airport Features and Surrounding Properties
4. Site Map with Airport Wells and AFFF Areas
5. Land Use Map
6. Surface Topography
7. Site Map with Area Watersheds
8. Site Map with Airport Drainage Areas and Outfalls
9. Geologic Formations – Plan View and Cross-Section
10. Soil/Asphalt Results for PFOS
11. Soil/Asphalt Results for PFOA
12. Groundwater Results for PFOS
13. Groundwater Results for PFOA
14. Areas and Conceptual Lines for Surface Geophysical Survey
15. Site Plan Showing Areas of Proposed Soil Sampling
16. Site Plan Showing Proposed Monitoring Well Locations



QUADRANGLE LOCATION
(STATE COLLEGE)



Pennsylvania

NOTES
EASTING (X): 1941671.68
NORTHING (Y): 250114.97

BASEMAP SOURCE:
USA TOPO MAPS (ESRI).

N

8,000 0 8,000'

Title:

SITE LOCATION MAP

STATE COLLEGE, PA

Prepared for:

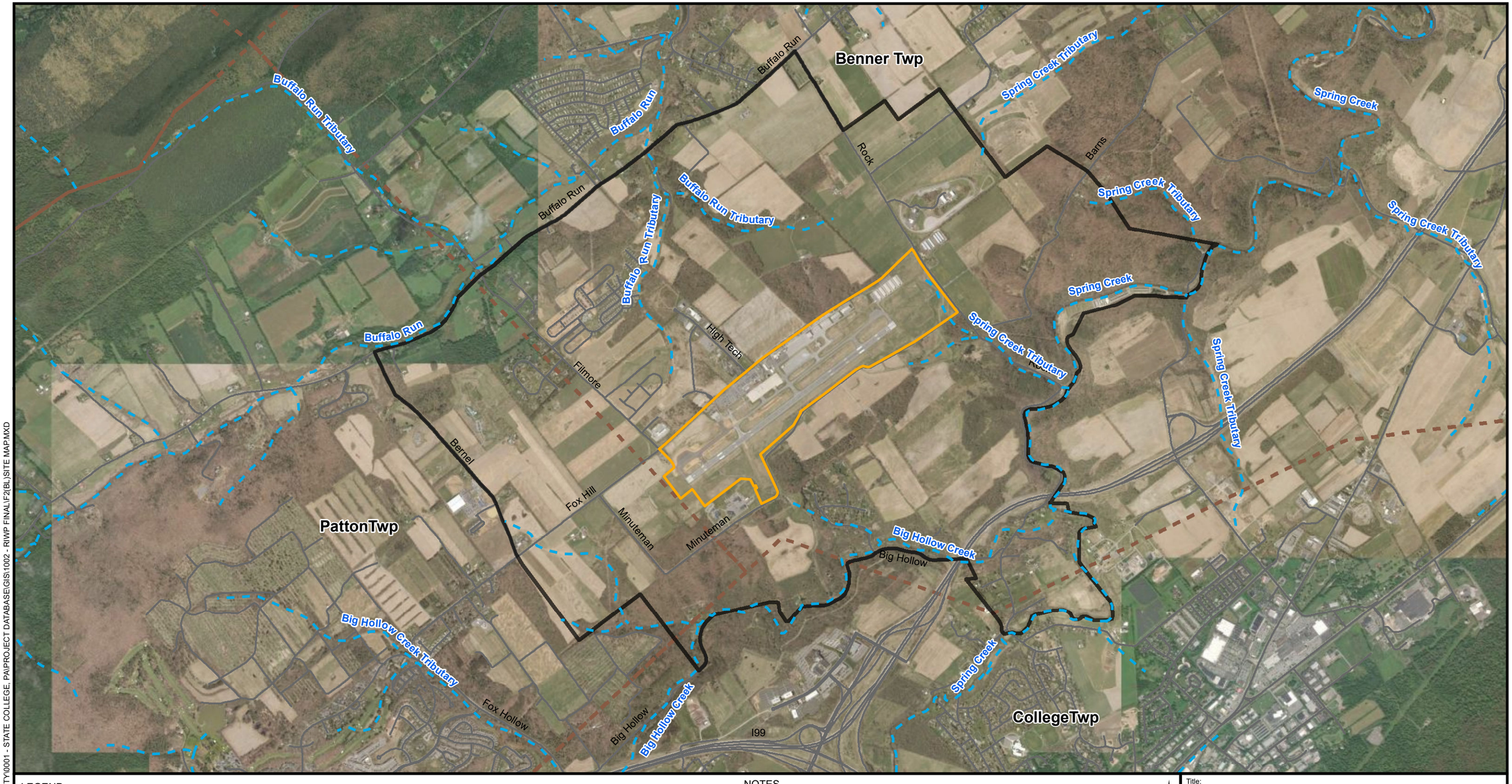
THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 02/03/25
Prepared by: D.S.M.	Scale: AS SHOWN
Project Mgr: H.E.K.	Project: 4470.0001J000
File: F1(AP)	

FIGURE 1

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F1(AP)SITE LOCATION MAP.MXD



LEGEND

- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

2,400 0 2,400'

Title:

SITE MAP

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 10/01/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	2
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F2(BL)		

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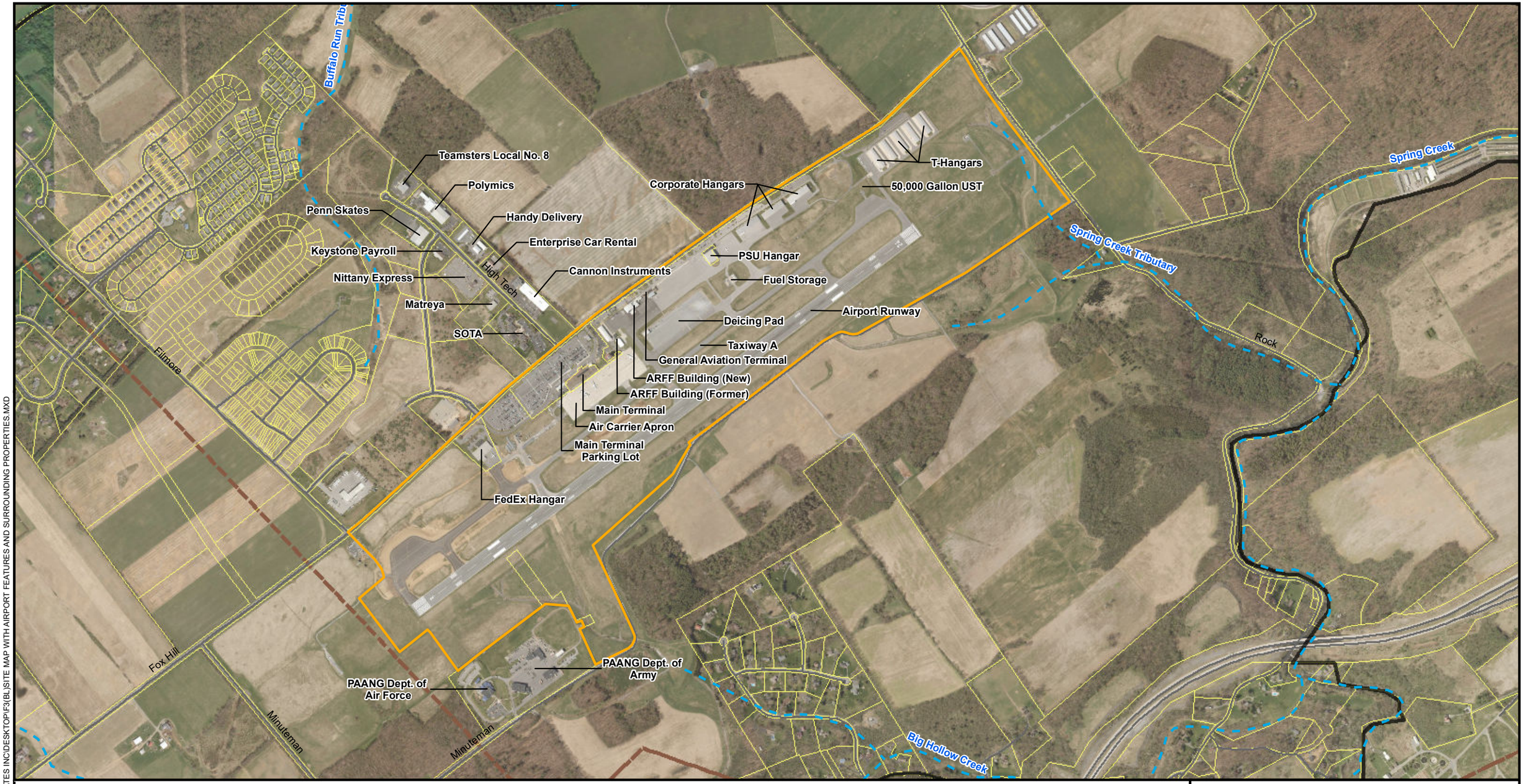


C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F3(BL)SITE MAP WITH AIRPORT FEATURES AND SURROUNDING PROPERTIES.MXD

LEGEND

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)
- Centre County Parcels

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries, Road Centerlines and Parcels (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.
4. ARFF = Aircraft Rescue Fire Fighting.
5. SOTA = State of the Art.
6. PAANG = Pennsylvania Air National Guard.
7. PSU = The Pennsylvania State University.
8. UST = Underground Storage Tank.

N

1,000 0 1,000'

Title:

SITE MAP WITH AIRPORT FEATURES AND SURROUNDING PROPERTIES

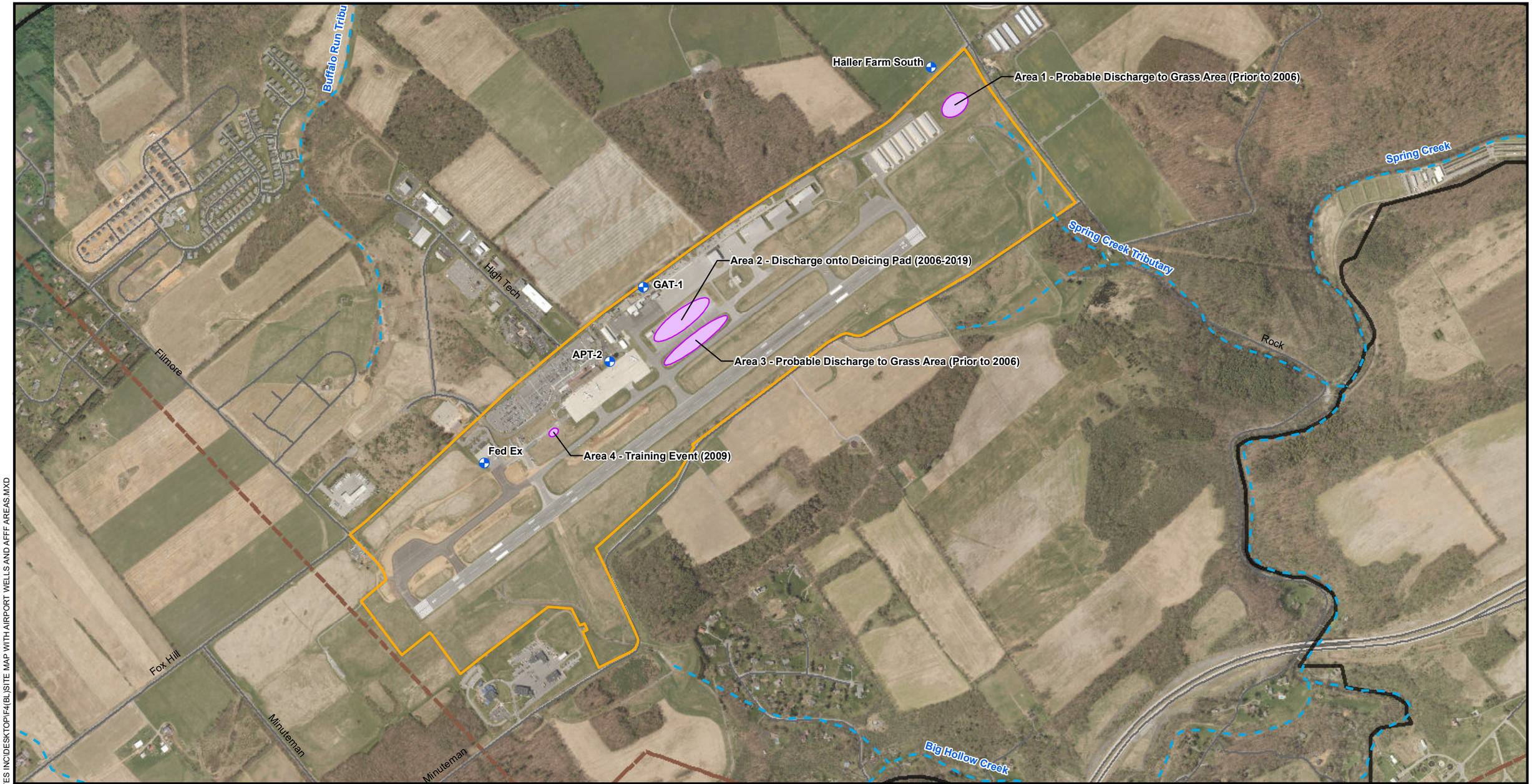
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	3
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F3(BL)		



C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F4(BL)SITE MAP WITH AIRPORT WELLS AND AFFF AREAS.MXD

LEGEND

- Well Location
- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.
4. AFFF = Aqueous Film-Forming Foam.

N

1,000 0 1,000'

Title:

SITE MAP WITH AIRPORT WELLS AND AFFF AREAS

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
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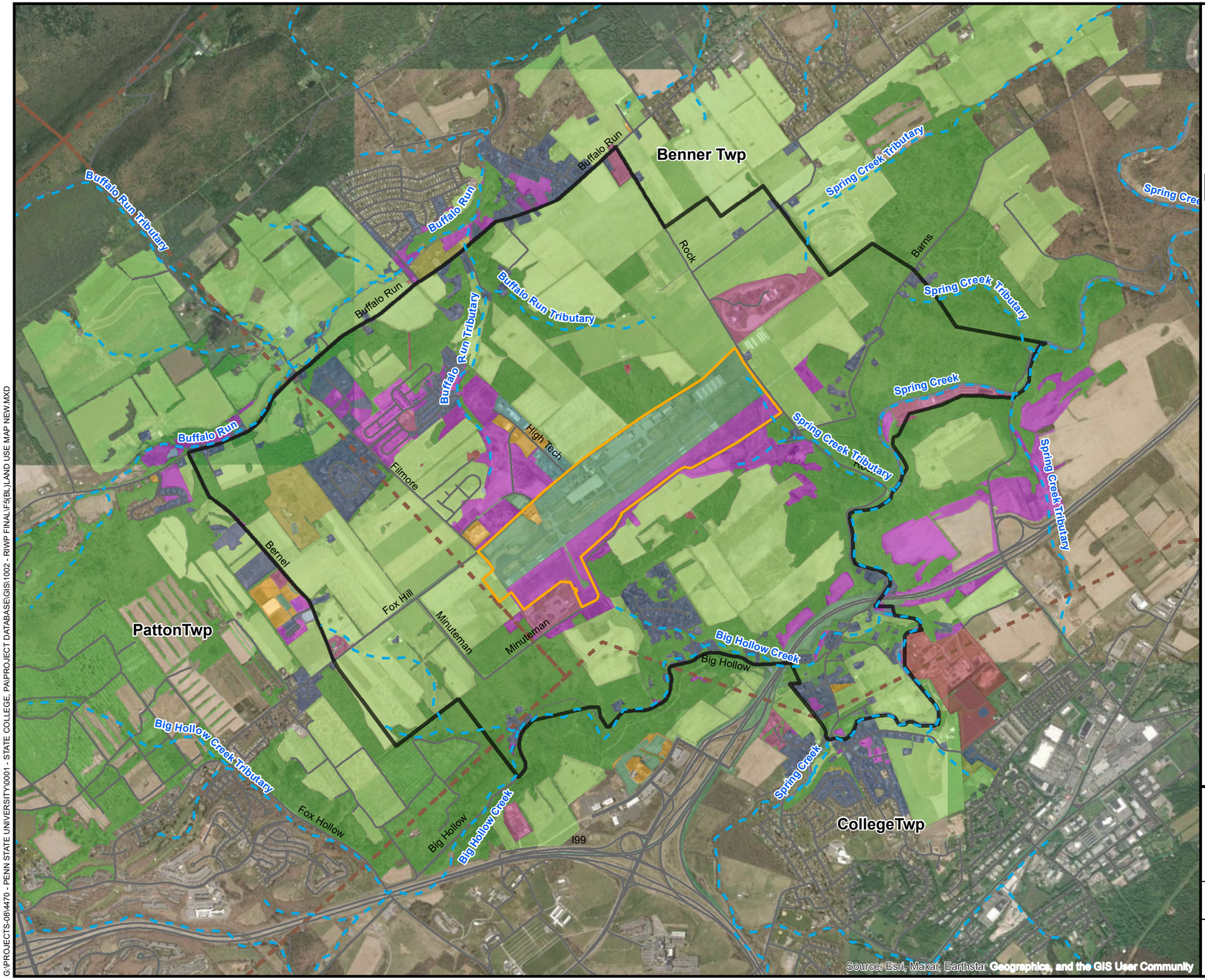
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F4(BL)		



G:\PROJECTS-08\4470 - PENN STATE UNIVERSITY\0001 - STATE COLLEGE, PA\PROJECT DATABASE\GIS\1002 - R\WP FINAL\F5(BL)LAND USE MAP NEW.MXD

LEGEND

- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

Land Use Type

- Agriculture
- Commercial
- Forests
- Industrial
- Public or Semi-Public
- Recreation
- Residential
- Transportation
- Utility
- Vacant and Unused Land
- Water

N

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries, Road Centerlines and Land Use (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

2,400 0 2,400'

Title:

LAND USE MAP

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 10/07/25	FIGURE
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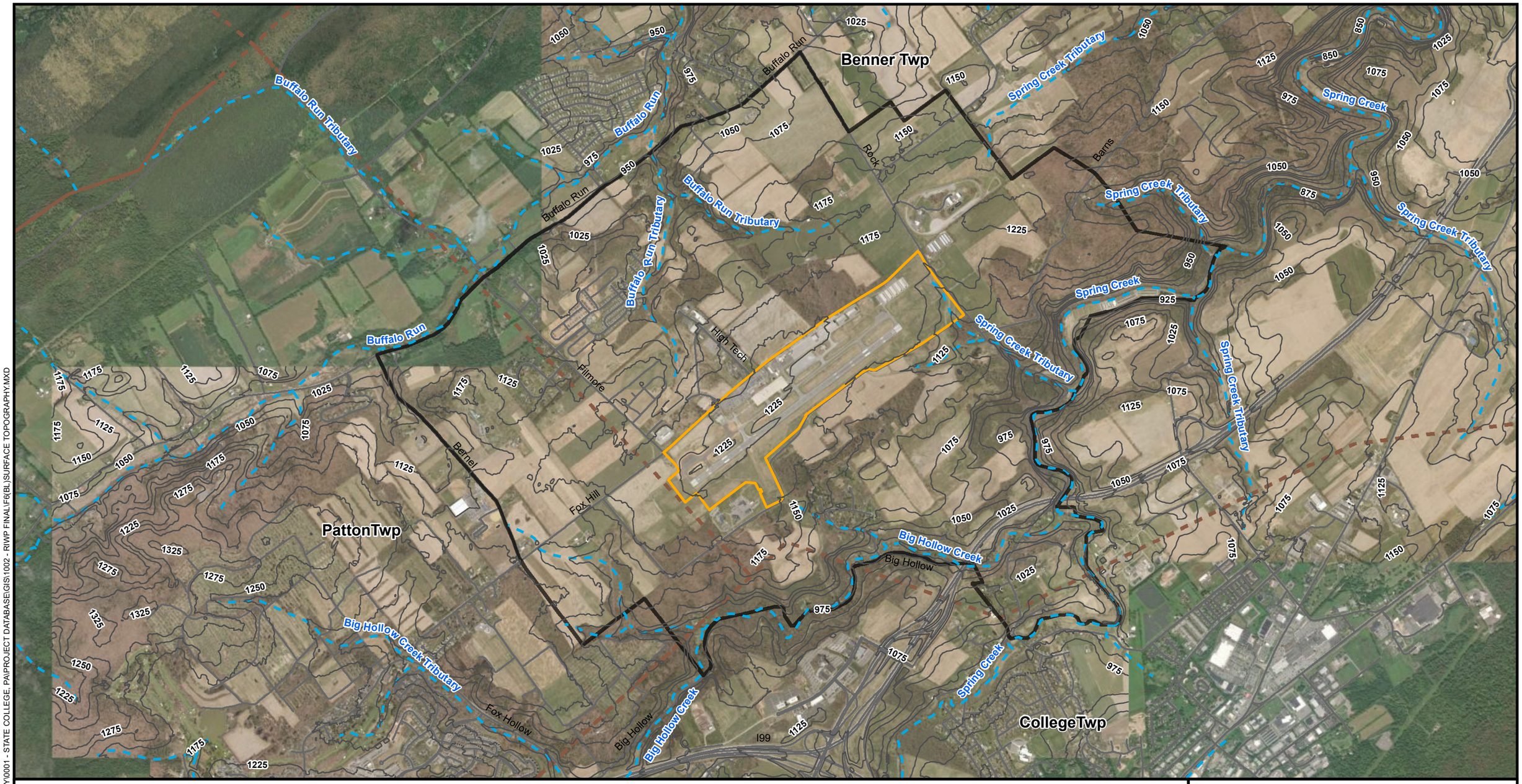

LEGEND

- 25 Foot Contour Line
- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines Surfacewater Body (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Outfalls, Outfall Boundaries and Pond Boundaries (PSU OPP).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

2,400 0 2,400'

Title:

SURFACE TOPOGRAPHY

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 10/07/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	6
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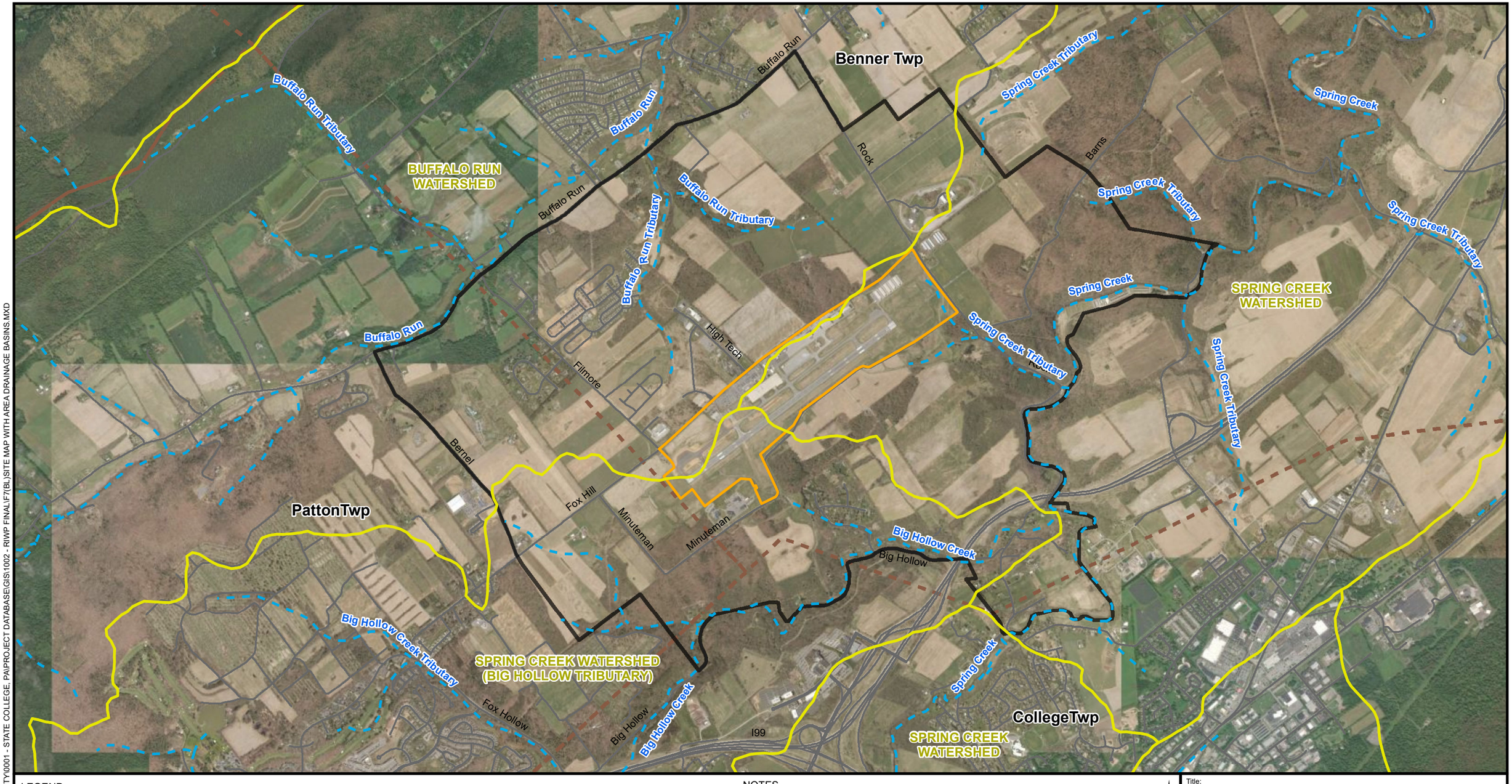


G:\PROJECTS-08\4470 - PENN STATE UNIVERSITY\0001 - STATE COLLEGE, PA\PROJECT DATABASE\GIS\1002 - RIWP FINAL\F7(BL)SITE MAP WITH AREA DRAINAGE BASINS.MXD

LEGEND

- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Watersheds
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries, Road Centerlines and Watersheds (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

2,400 0 2,400'

Title:

SITE MAP WITH AREA WATERSHEDS

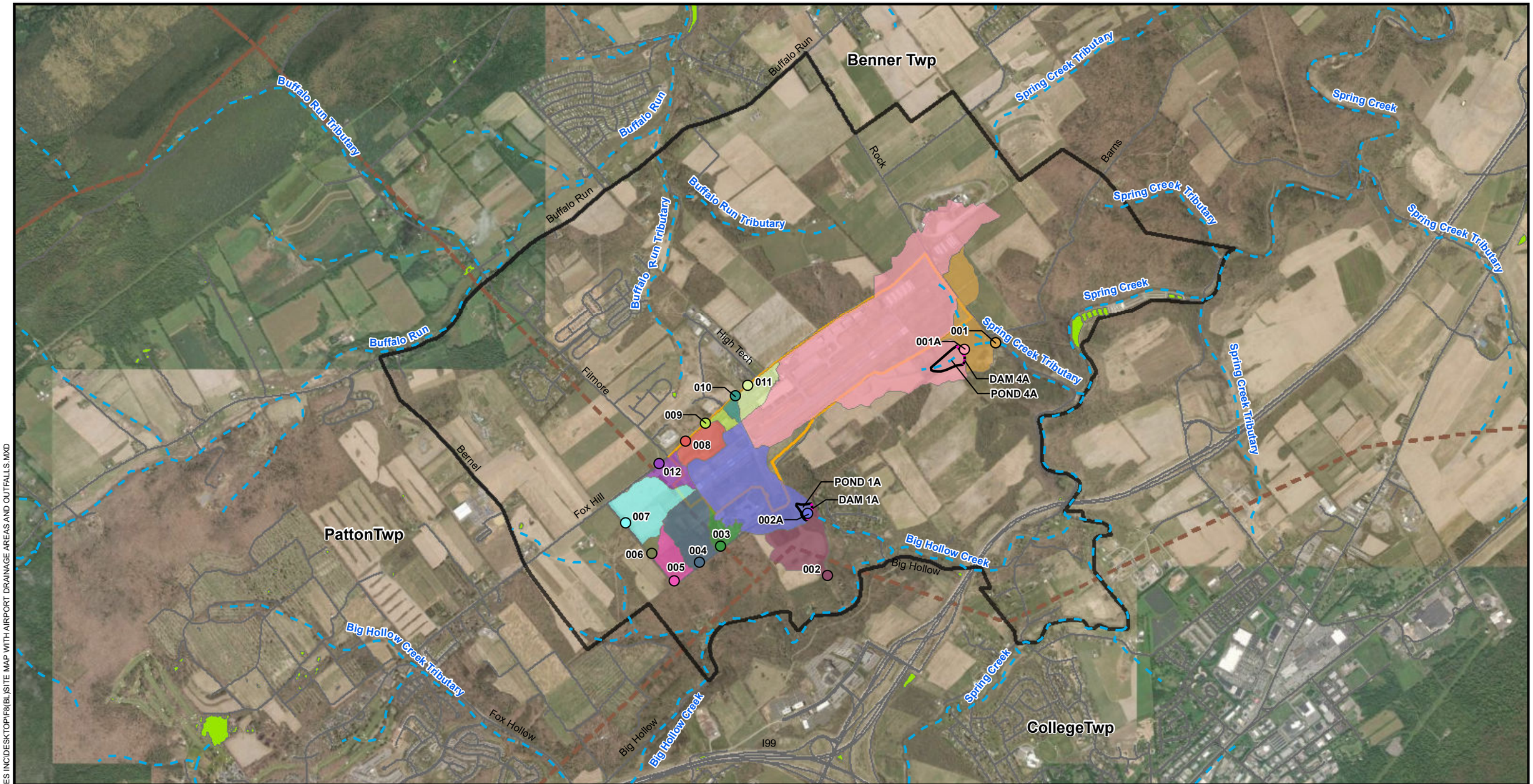
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 10/07/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	7
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F7(BL)		



LEGEND

- Outfall Location
- Dam
- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- Outfall Boundary
- Pond Boundary
- Surfacewater Body
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines Surfacewater Body (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Outfalls, Outfall Boundaries and Pond Boundaries (PSU OPP).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

2,400 0 2,400'

Title:

SITE MAP WITH AIRPORT DRAINAGE AREAS AND OUTFALLS

STATE COLLEGE, PA

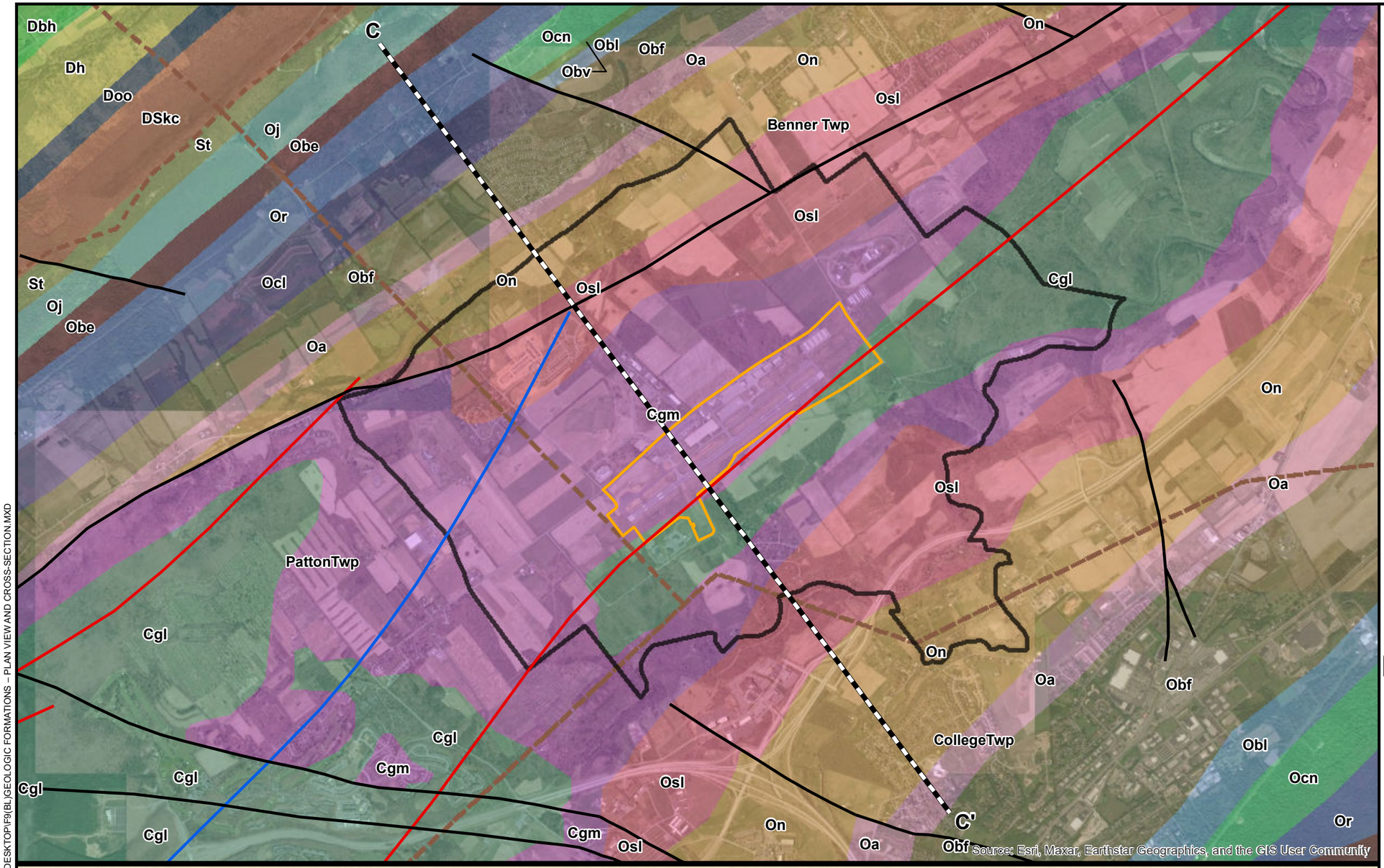
Prepared for:

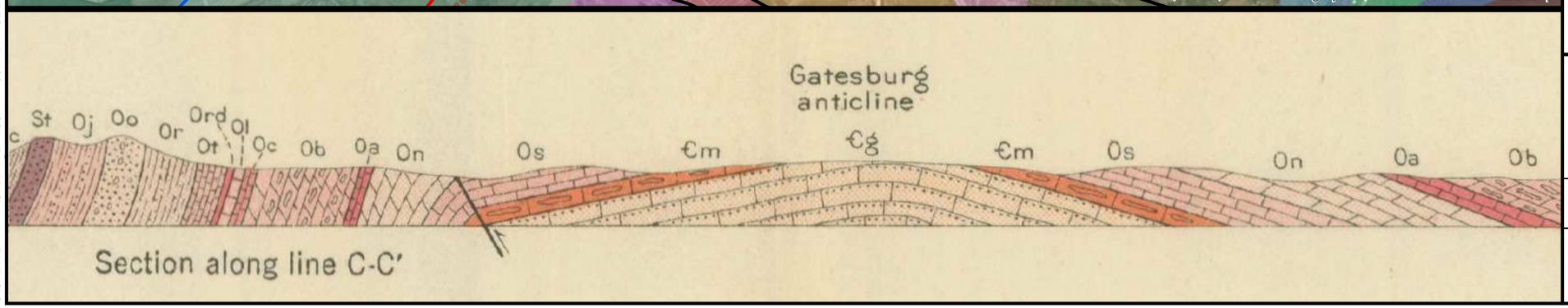
THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	8
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F8(BL)		

C:\USERS\DMART\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F8(BL)\SITE MAP WITH AIRPORT DRAINAGE AREAS AND OUTFALLS.MXD





LEGEND

- Fault
- Anticline Fold
- Syncline Fold
- Cgl - Lower Members of Gatesburg Formation, undivided
- Cgm - Mines Member of Gatesburg
- Osl - Stonehenge/Larke Formation
- On - Nittany Formation
- Oa - Axemann
- Obf - Bellefonte Formation
- Ocl - Coburn Formation through Loysburg Formation, undivided
- Or - Reedsville Formation
- Obe - Bald Eagle Formation
- Oj - Juniata Formation
- St - Tuscarora Formation
- DSkc - Keyser Formation through Clinton Group, undivided
- Dbh - Brallier and Harrell Formations,
- Dh - Hamilton Group
- Doo - Onondaga and Old Port Formations, undivided
- Obl - Benner Formation through Loysburg Formation, undivided
- Obv - Valentine Member of Benner
- Ocn - Coburn Formation through Nealmont Formation, undivided
- Municipal Boundary Lines
- State College Regional
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

N

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area) Municipal Boundaries (Centre County GIS), Bedrock Geology (DCNR), Cross Section (Butts & Moore, 1936).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

3,000 0 3,000'

Title:

GEOLOGIC FORMATIONS – PLAN VIEW AND CROSS-SECTION

STATE COLLEGE, PA

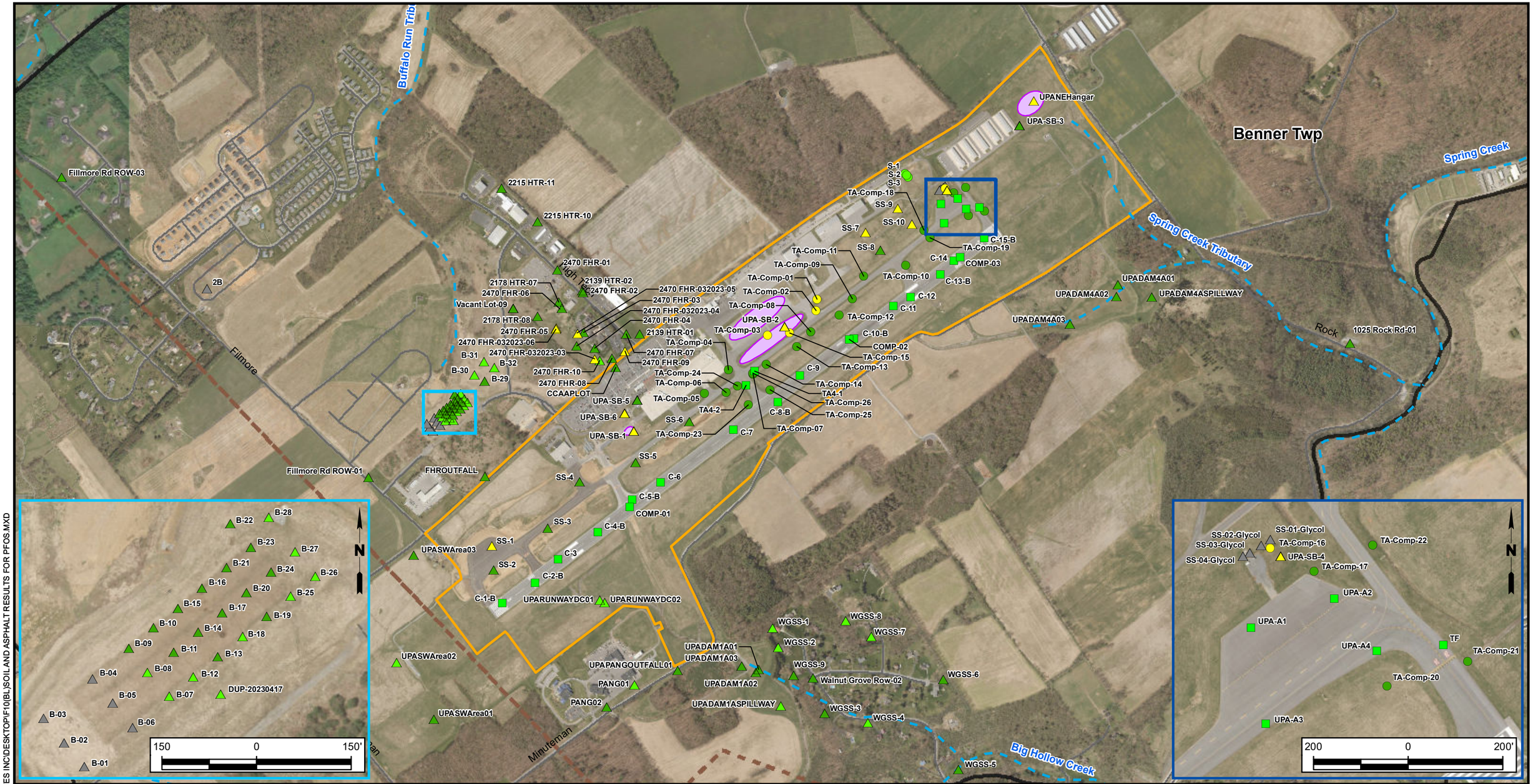
Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/20/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	9
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F9(BL)		

C:\USERS\DMART\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F9(BL)GEOLOGIC FORMATIONS – PLAN VIEW AND CROSS-SECTION.MXD



C:\USERS\DMART\NONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F10(BL)SOIL AND ASPHALT RESULTS FOR PFOS.MXD

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. Location of composite sample selected based on central most location of 4 grab samples that make up composite sample.
7. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
8. mg/kg = milligrams per kilogram.

1,000 0 1,000'

N

Title:

SOIL/ASPHALT RESULTS FOR PFOS

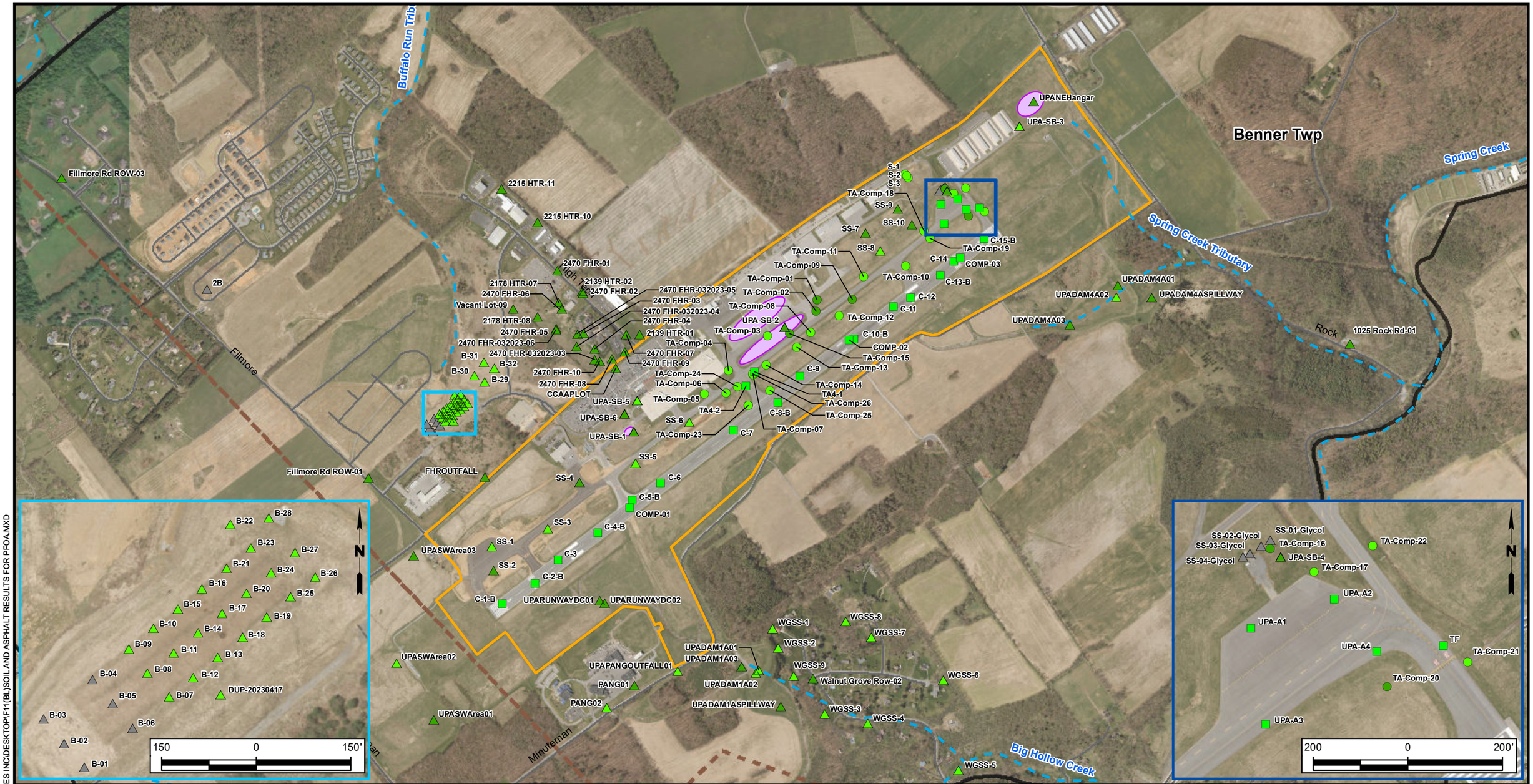
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	10
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F10(BL)		



C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F11(BL)SOIL AND ASPHALT RESULTS FOR PFOA.MXD

LEGEND

Soil PFOA Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOA = Perfluorooctanoic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. Location of composite sample selected based on central most location of 4 grab samples that make up composite sample.
7. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
8. mg/kg = milligrams per kilogram.

1,000 0 1,000'

N

Title:

SOIL/ASPHALT RESULTS FOR PFOA

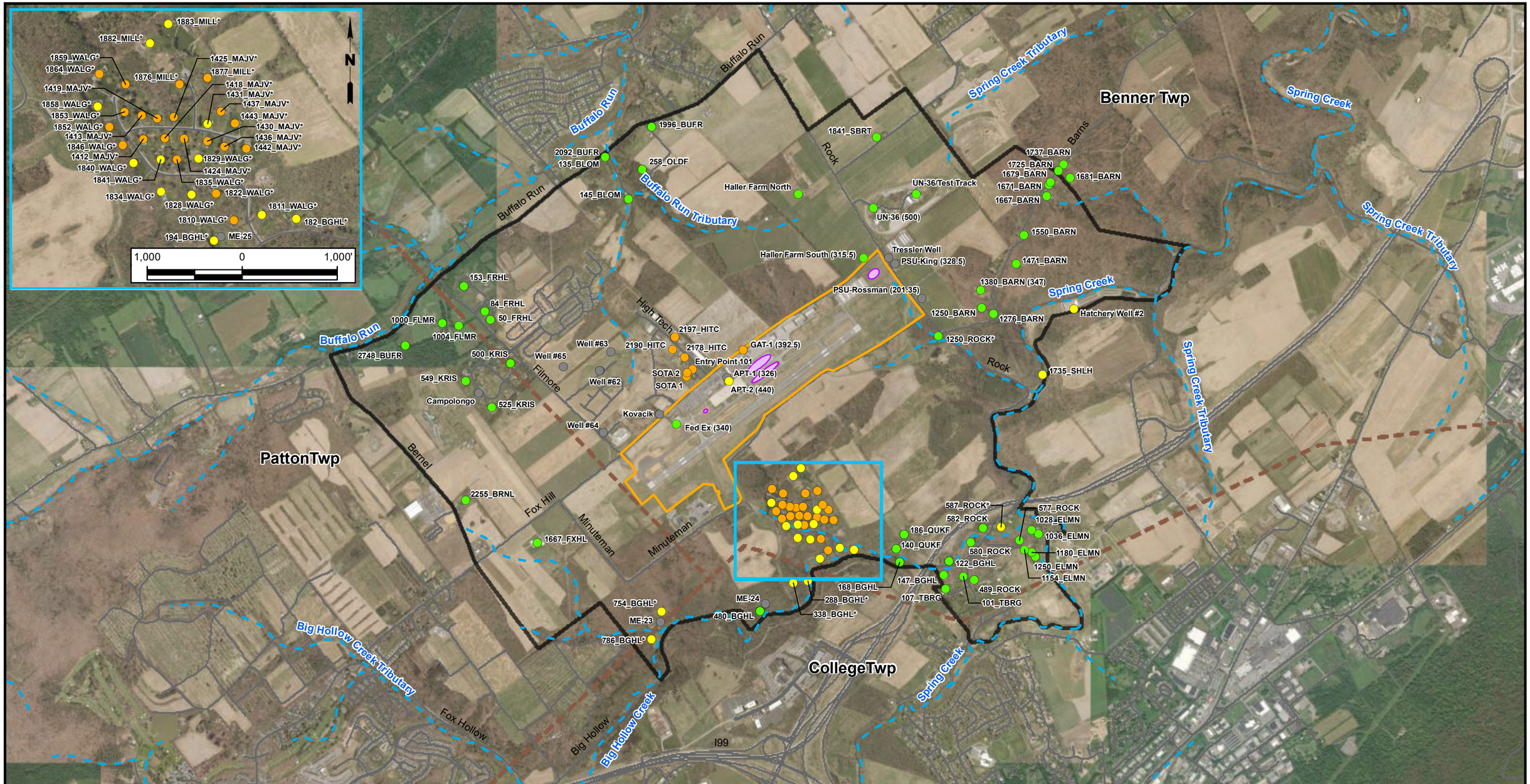
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	11
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F11(BL)		



LEGEND

Groundwater PFOS Results

- < 0.004 (ug/L)
- 0.004 (ug/L) - < 0.04 (ug/L)
- 0.04 (ug/L) - < 0.4 (ug/L)
- ≥ 0.4 (ug/L)
- Not Analyzed for PFAS

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

Well ID — APT-1 (326) — Total Well Depth in feet bgs

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. * = Indicates POET system installed.
7. POET = Point of Entry Treatment.
8. ug/L = micrograms/liter.
9. bgs = below ground surface.
10. If no well depth listed, well depth is unknown.

N

2,400 0 2,400'

Title:

GROUNDWATER RESULTS FOR PFOS

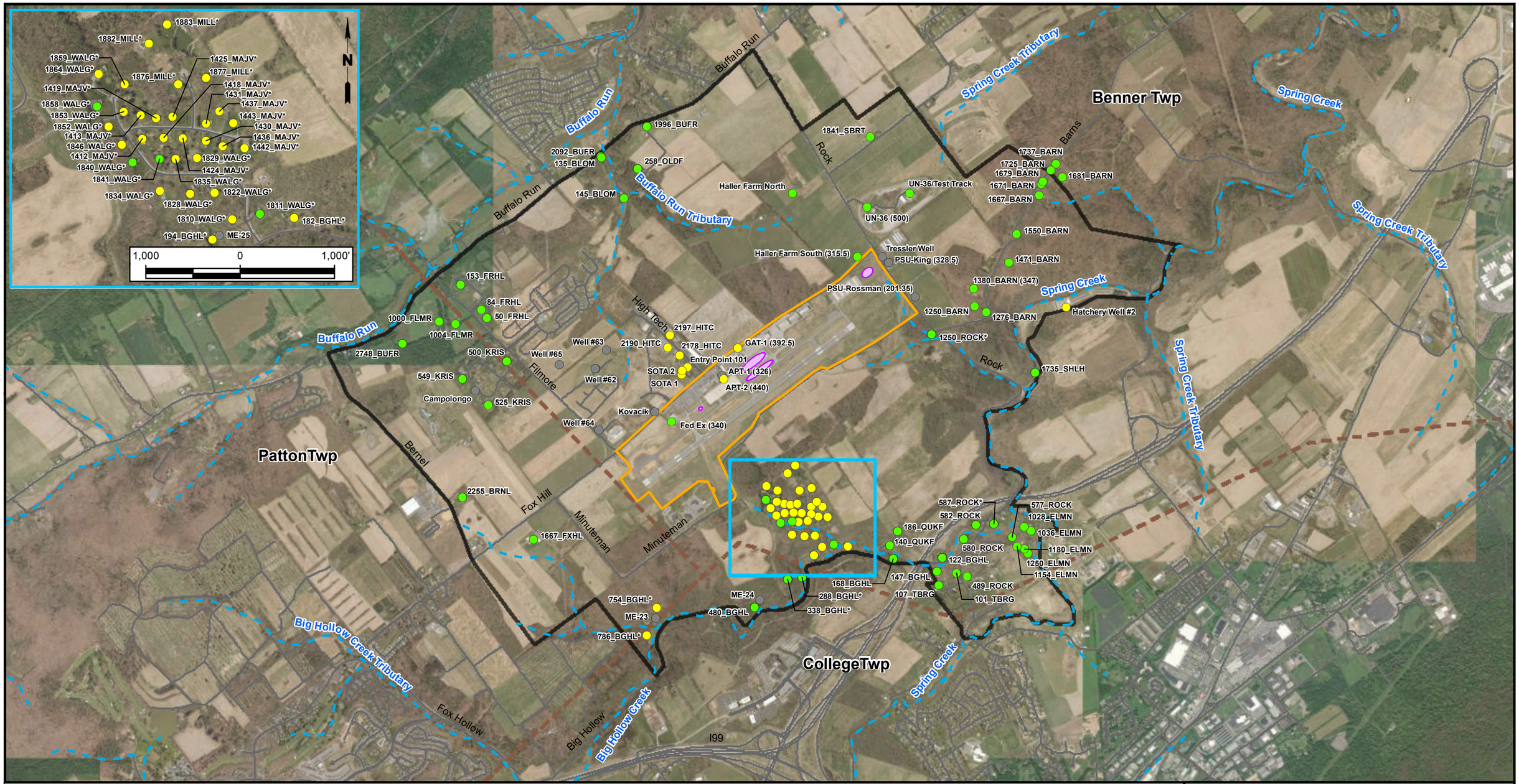
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	12
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F12(BL)		



LEGEND

Groundwater PFOA Results

- < 0.004 (ug/L)
- 0.004 (ug/L) - < 0.04 (ug/L)
- 0.04 (ug/L) - < 0.4 (ug/L)
- ≥ 0.4 (ug/L)
- Not Analyzed for PFAS

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

Well ID — APT-1 (326) — Total Well Depth in feet bgs

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOA = Perfluorooctanoic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. * = Indicates POET system installed.
7. POET = Point of Entry Treatment.
8. ug/L = micrograms/liter.
9. bgs = below ground surface.
10. If no well depth listed, well depth is unknown.

N

2,400 0 2,400'

Title:

GROUNDWATER RESULTS FOR PFOA

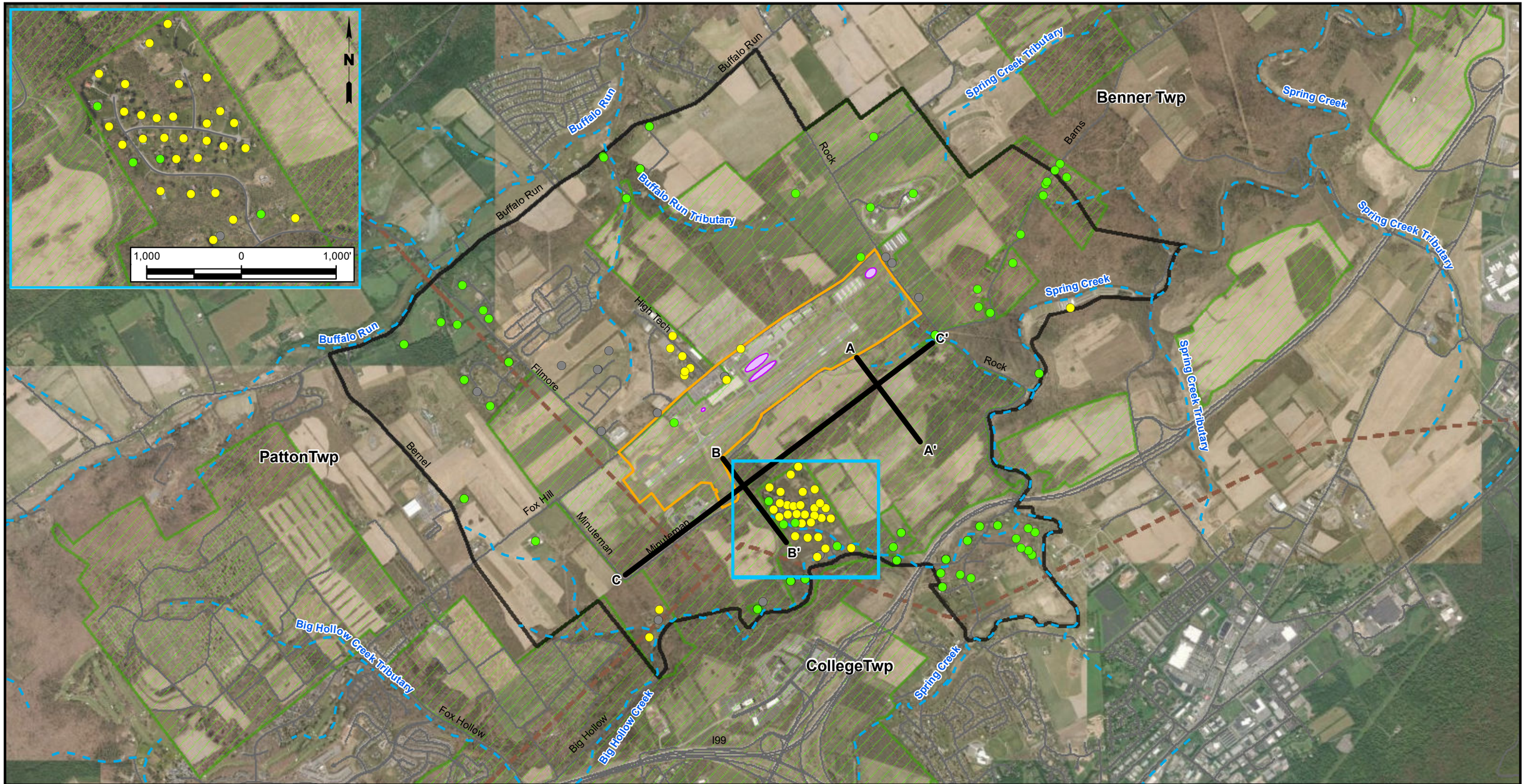
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	13
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F13(BL)		



LEGEND

Groundwater PFOA Results

- < 0.004 (ug/L)
- 0.004 (ug/L) - < 0.04 (ug/L)
- 0.04 (ug/L) - < 0.4 (ug/L)
- ≥ 0.4 (ug/L)
- Not Analyzed for PFAS
- Stream Centerlines
- Conceptual Lines for Surface Geophysical Survey
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)
- PSU Property

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report), PSU Property (PSU OPP).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOA = Perfluorooctanoic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. ug/L = micrograms/liter.

N

2,400 0 2,400'

Title:

AREAS AND CONCEPTUAL LINES FOR SURFACE GEOPHYSICAL SURVEY

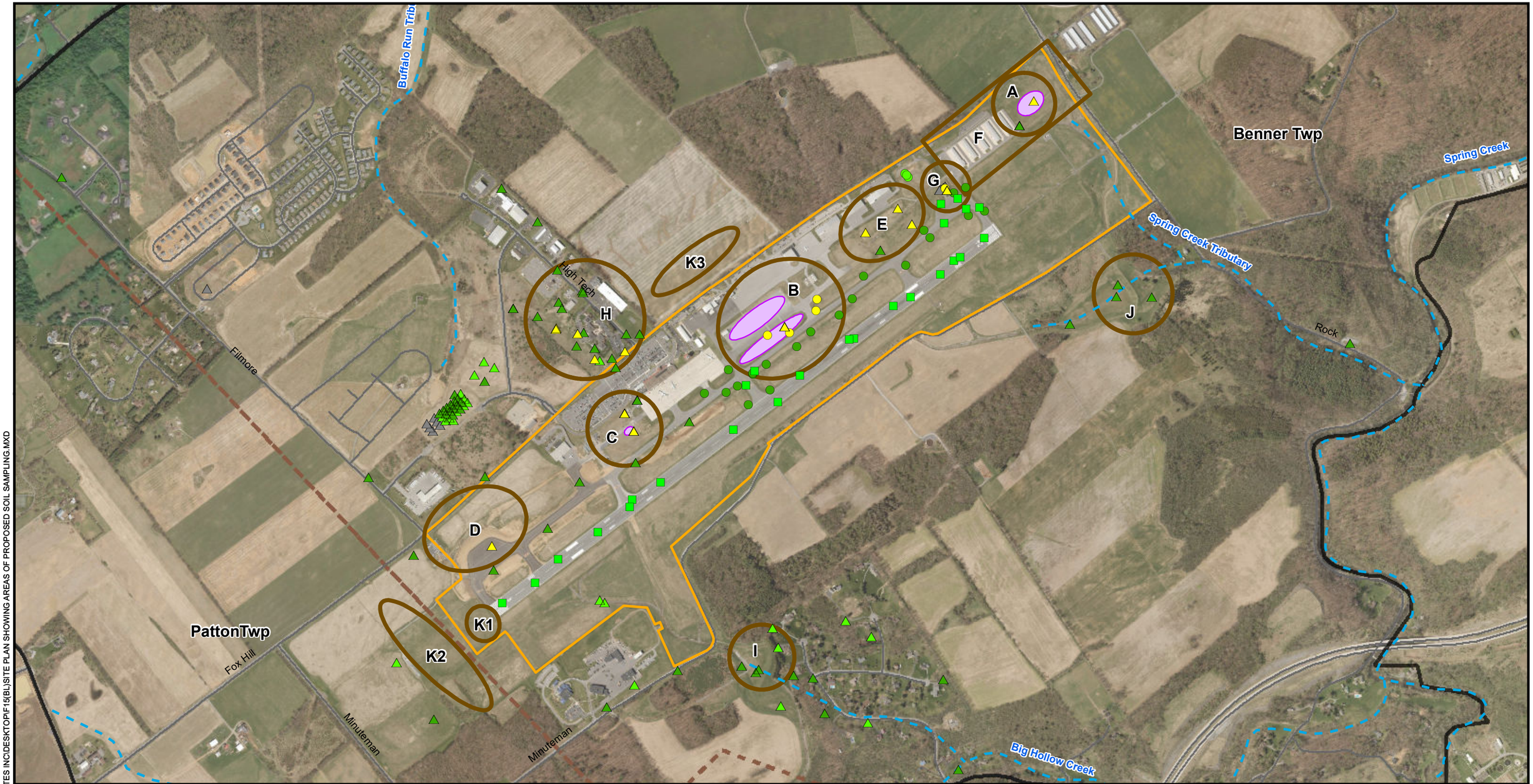
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	14
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F14(BL)		



LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. Location of composite sample selected based on central most location of 4 grab samples that make up composite sample.
7. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
8. mg/kg = milligrams per kilogram.

N

1,000 0 1,000'

Title:

SITE PLAN SHOWING AREAS OF PROPOSED SOIL SAMPLING

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	15
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F15(BL)SITE PLAN SHOWING AREAS OF PROPOSED SOIL SAMPLING.MXD

Existing Monitoring Well Locations
- Four existing monitoring wells are proposed to be utilized as part of the gauging network.

Proposed Monitoring Well Locations (not shown)
- Three additional monitoring wells are proposed in the area.
- The locations of these monitoring wells will be determined after execution and evaluation of the surface geophysical survey (which may reveal preferential pathways) and a field inspection conducted as part of pre-mobilization tasks.

Proposed Monitoring Well Locations
- Three monitoring wells are proposed east, southeast, and south of the center of Airport operations.
- The locations will provide a good distribution of groundwater results between the Airport and the residential areas to the south-southeast.
- Two of the three monitoring wells are located at intersection points of the surface geophysical transects so that the lithologic conditions observed during drilling can be used to calibrate interpretations of the geophysical data.

LEGEND

Groundwater PFOA Results
- < 0.004 (ug/L)
- 0.004 (ug/L) - < 0.04 (ug/L)
- 0.04 (ug/L) - < 0.4 (ug/L)
- ≥ 0.4 (ug/L)
- Not Analyzed for PFAS
- Proposed Well Location

- Well Location
- Conceptual Lines for Surface Geophysical Survey
- Stream Centerlines
- Road Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Reported AFFF Discharge Areas
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)
- PSU Property

NOTES
1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU), Reported AFFF Discharge Locations (HDR Due Diligence Report), PSU Property (PSU OPP).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOA = Perfluorooctanoic Acid.
4. COA = Consent Order and Agreement.
5. AFFF = Aqueous Film-Forming Foam.
6. ug/L = micrograms/liter.

N

2,400 0 2,400'

Title:

SITE PLAN SHOWING PROPOSED MONITORING WELL LOCATIONS

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	16
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F16(BL)		

APPENDICES

A. Soil and Asphalt Sample Results
    a. Table A1 – Summary of Soil PFAS Sampling Results
    b. Table A2 – Summary of Asphalt PFAS Sampling Results
B. PSW Non-POET, PSW POET, and Monitoring Well PFAS Sample Results
    a. Table B1 – Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation)
    b. Table B2 – Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation)
    c. Table B3 – Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation)
    d. Table B4 – Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation)
    e. Table B5 – Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation)
    f. Table B6 – Summary of Airport and Proximate Wells PFAS Sampling Results
C. Site Plans Showing Preliminary Soil Sampling Locations
D. Standard Operating Procedures
E. Quality Assurance Project Plan
F. Health and Safety Plan

APPENDIX A

Soil and Asphalt Sample Results (Tables A1 and A2)

APPENDIX A – Table A1

Summary of Soil PFAS Sampling Results

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1025 Rock Rd-01	1025 Rock Rd-01	2139 HTR-01	2139 HTR-01	2139 HTR-02	2139 HTR-02	2178 HTR-07	2178 HTR-07	2178 HTR-08	2178 HTR-08
Sample Depth (ft bgs)	PADEP	PADEP	0-2	8-10	0-2	8-10	0-2	8-10	0-2	6-8	0-2	8-10
Lab Sample ID	RDC 0-15	RUA 100x	410-74072-1	410-74072-2	410-117577-1	410-117577-2	410-117577-3	410-117577-4	410-117577-14	410-117577-15	410-117577-16	410-117577-17
Sample Date	Soil MSCs	SGW MSCs	2/22/2022	2/22/2022	3/2/2023	3/2/2023	3/2/2023	3/2/2023	3/2/2023	3/2/2023	3/2/2023	3/2/2023
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	0.0024 U	0.0026 U	0.0023 U	0.0025 U	0.0022 U	0.0024 U	0.0024 U	0.0023 U
DONA	NS	NS	—	—	0.0036 U	0.0039 U	0.0035 U	0.0037 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U
HFPODA	NS	NS	—	—	0.0024 U	0.0026 U	0.0023 U	0.0025 U	0.0022 U	0.0024 U	0.0024 U	0.0023 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	0.0024 U	0.0026 U	0.0023 U	0.0025 U	0.0022 U	0.0024 U	0.0024 U	0.0023 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	0.0024 U	0.0026 U	0.0023 U	0.0025 U	0.0022 U	0.0024 U	0.0024 U	0.0023 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0024 U	0.0025 U	0.0024 U	0.0026 U	0.0023 U	0.0025 U	0.0022 U	0.0024 U	0.0024 U	0.0023 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorohexanesulfonic acid	NS	NS	0.00071 U	0.00074 U	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorohexanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.0003 J**	0.00074 U	**0.001**	0.00078 U	**0.0013**	0.00074 U	0.00067 U	0.00071 U	**0.0059**	**0.00036 J**
Perfluorooctanoic acid	4.4	0.007	**0.00044 J**	0.00074 U	**0.00032 J**	0.00078 U	**0.00026 J**	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluorotridecanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
Perfluoroundecanoic acid	NS	NS	—	—	0.00071 U	0.00078 U	0.00069 U	0.00074 U	0.00067 U	0.00071 U	0.00071 U	0.00068 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2215 HTR-10	2215 HTR-10	2215 HTR-11	2215 HTR-11	2470 FHR-01	2470 FHR-01	2470 FHR-02	2470 FHR-02	2470 FHR-03	2470 FHR-03	2470 FHR-04
Sample Depth (ft bgs)	PADEP	PADEP	0-2	8-10	0-2	8-10	0-2	8-10	0-2	8-10	0-2	8-10	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-117577-20	410-117577-21	410-117577-22	410-117577-23	410-74072-7	410-74072-8	410-74072-9	410-74072-10	410-74072-11	410-74072-12	410-74072-13
Sample Date	Soil MSCs	SGW MSCs	3/2/2023	3/2/2023	3/2/2023	3/2/2023	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/23/2022	2/23/2022	2/23/2022
PFAS (mg/kg)													
11Cl-PF3OUdS	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.0022 U	0.0026 U	0.0023 U	0.0023 U	—	—	—	—	—	—	—
DONA	NS	NS	0.0033 U	0.0039 U	0.0034 U	0.0035 U	—	—	—	—	—	—	—
HFPODA	NS	NS	0.0022 U	0.0026 U	0.0023 U	0.0023 U	—	—	—	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.0022 U	0.0026 U	0.0023 U	0.0023 U	—	—	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.0022 U	0.0026 U	0.0023 U	0.0023 U	—	—	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0022 U	0.0026 U	0.0023 U	0.0023 U	0.0024 U	0.0024 U	0.0023 U	0.0026 U	0.0022 U	0.0024 U	0.0023 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	0.00072 U	0.00073 U	0.0007 U	0.00078 U	0.00065 U	0.00072 U	0.00068 U
Perfluorohexanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.00054 J**	0.00078 U	**0.00083**	0.0007 U	0.00072 U	0.00073 U	**0.00036 J**	0.00078 U	**0.0063**	**0.00061 J**	**0.00035 J**
Perfluorooctanoic acid	4.4	0.007	**0.00033 J**	0.00078 U	**0.00034 J**	0.0007 U	0.00072 U	0.00073 U	0.0007 U	0.00078 U	**0.00024 J**	0.00072 U	0.00068 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	0.00066 U	0.00078 U	0.00069 U	0.0007 U	—	—	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2470 FHR-04	2470 FHR-05	2470 FHR-05	2470 FHR-06	2470 FHR-06	2470 FHR-07	2470 FHR-07	2470 FHR-08	2470 FHR-08	2470 FHR-09	2470 FHR-09 DUP
Sample Depth (ft bgs)	PADEP	PADEP	8-10	0-2	8-10	0-2	8-10	0-2	8-10	0-2	8-10	0-2	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-74072-14	410-74072-15	410-74072-16	410-74072-17	410-74072-18	410-74072-19	410-74072-20	410-74072-21	410-74072-22	410-74072-23	410-74072-27
Sample Date	Soil MSCs	SGW MSCs	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022
PFAS (mg/kg)													
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
HFPODA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0027 U	0.0025 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0027 U	0.0025 U	0.0023 U	0.0024 U	0.0026 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.0008 U	**0.00031 J**	0.00072 U	0.00074 U	0.00072 U	0.00072 U	0.00082 U	0.00075 U	0.0007 U	0.00071 U	0.00077 U
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	0.0008 U	**0.01**	0.00072 U	**0.00038 J**	0.00072 U	0.00072 U	0.00082 U	**0.0012**	0.0007 U	**0.0014**	**0.1004**
Perfluorooctanoic acid	4.4	0.007	0.0008 U	**0.0005 J**	0.00072 U	**0.00026 J**	0.00072 U	0.00072 U	0.00082 U	**0.00045 J**	0.0007 U	**0.00047 J**	**0.00049 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2470 FHR-09	2470 FHR-10	2470 FHR-10	2470 FHR-032023-03	2470 FHR-032023-03	2470 FHR-032023-04	2470 FHR-032023-04	2470 FHR-032023-05
Sample Depth (ft bgs)	PADEP	PADEP	8-10	0-2	8-10	0-2	8-10	0-2	8-10	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-74072-24	410-74072-25	410-74072-26	410-117577-5	410-117577-6	410-117577-7	410-117577-8	410-117577-9
Sample Date	Soil MSCs	SGW MSCs	2/23/2022	2/23/2022	2/23/2022	3/2/2023	3/2/2023	3/2/2023	3/2/2023	3/2/2023
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	0.0024 U	0.0023 U	0.0024 U	0.0026 U	0.0024 U
DONA	NS	NS	—	—	—	0.0036 U	0.0035 U	0.0036 U	0.0039 U	0.0035 U
HFPODA	NS	NS	—	—	—	0.0024 U	0.0023 U	0.0024 U	0.0026 U	0.0024 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	0.0024 U	0.0023 U	0.0024 U	0.0026 U	0.0024 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	0.0024 U	0.0023 U	0.0024 U	0.0026 U	0.0024 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0024 U	0.0022 U	0.0025 U	0.0024 U	0.0023 U	0.0024 U	0.0026 U	0.0024 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluorohexanesulfonic acid	NS	NS	0.00071 U	0.00065 U	0.00074 U	0.00072 U	0.00069 U	0.00073 U	0.00078 U	**0.00032 J**
Perfluorohexanoic acid	NS	NS	—	—	—	**0.00055 J**	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	0.00071 U	**0.00027 J**	**0.00026 J**	**0.0092**	0.00069 U	**0.0005 J**	0.00078 U	**0.014**
Perfluorooctanoic acid	4.4	0.007	0.00071 U	0.00065 U	0.00074 U	**0.00064 J**	0.00069 U	**0.00044 J**	0.00078 U	**0.00067 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluorotridecanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
Perfluoroundecanoic acid	NS	NS	—	—	—	0.00072 U	0.00069 U	0.00073 U	0.00078 U	0.00071 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2470 FHR-032023-05	2470 FHR-032023-06	2470 FHR-032023-06 DUP	2470 FHR-032023-06	B-07	B-08	B-09	B-10	B-11
Sample Depth (ft bgs)	PADEP	PADEP	8-10	0-2	0-2	8-10	0-2	0-2	0-2	0-2	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-117577-10	410-117577-12	410-117577-11	410-117577-13	L2320716-07	L2320716-08	L2320716-09	L2320716-10	L2320716-11
Sample Date	Soil MSCs	SGW MSCs	3/2/2023	3/2/2023	3/2/2023	3/2/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023
PFAS (mg/kg)											
11Cl-PF3OUdS	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.0022 U	0.0025 U	0.0024 U	0.0025 U	—	—	—	—	—
DONA	NS	NS	0.0033 U	0.0037 U	0.0037 U	0.0038 U	—	—	—	—	—
HFPODA	NS	NS	0.0022 U	0.0025 U	0.0024 U	0.0025 U	0.00277 U	0.00279 U	0.00277 U	0.00282 U	0.00287 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.0022 U	0.0025 U	0.0024 U	0.0025 U	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.0022 U	0.0025 U	0.0024 U	0.0025 U	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0022 U	0.0025 U	0.0024 U	0.0025 U	0.000277 U	0.000279 U	0.000277 U	0.000282 U	0.000287 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	0.00066 U	**0.00043 J**	0.00073 U	0.00075 U	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.00066 U	**0.00037 J**	**0.00025 J**	0.00075 U	—	—	—	—	—
Perfluorohexanoic acid	NS	NS	0.00066 U	**0.00067 J**	**0.00031 J**	0.00075 U	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	0.00066 U	**0.008**	**0.0084**	0.00075 U	**0.000368**	**0.000354**	**0.000421**	**0.000644**	**0.000624**
Perfluorooctanoic acid	4.4	0.007	0.00066 U	**0.00073 J**	**0.00038 J**	0.00075 U	0.000277 U	0.000279 U	0.000277 U	0.000282 U	0.000287 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	0.00066 U	0.00074 U	0.00073 U	0.00075 U	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			B-12	B-13	B-14	B-15	B-16	B-17	B-18	B-19	B-20	B-21	B-22	B-23
Sample Depth (ft bgs)	PADEP RDC 0-15	PADEP RUA 100x	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Lab Sample ID	Soil MSCs	SGW MSCs	L2320716-12	L2320716-13	L2320716-14	L2320716-15	L2320716-16	L2320716-17	L2320716-18	L2320716-19	L2320716-21	L2320716-22	L2320716-23	L2320716-24
Sample Date			4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/17/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023
PFAS (mg/kg)														
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
HFPODA	NS	NS	0.00271 U	0.00272 U	0.00291 U	0.00286 U	0.0028 U	0.00297 U	0.00262 U	0.00281 U	0.00262 U	0.00301 U	0.00281 U	0.00296 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.000271 U	0.000272 U	0.000291 U	0.000286 U	0.00028 U	0.000297 U	0.000262 U	0.000281 U	0.000262 U	0.000301 U	0.000281 U	0.000296 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.000382**	**0.000412**	**0.000413**	**0.000651**	**0.00193**	**0.000428**	**0.000304**	**0.000413**	**0.000647**	**0.000801**	**0.000415**	**0.000873**
Perfluorooctanoic acid	4.4	0.007	0.000271 U	0.000272 U	0.000291 U	0.000286 U	0.00028 U	0.000297 U	0.000262 U	0.000281 U	0.000262 U	0.000301 U	0.000281 U	0.000296 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			B-24	B-25	B-26	B-27	B-28	B-28 DUP	B-29	B-30	B-31	B-32	CCAAPLOT
Sample Depth (ft bgs)	PADEP	PADEP	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Lab Sample ID	RDC 0-15	RUA 100x	L2320716-25	L2320716-26	L2320716-27	L2320716-28	L2320716-29	L2320716-34	L2320716-30	L2320716-31	L2320716-32	L2320716-33	410-130726-3
Sample Date	Soil MSCs	SGW MSCs	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	4/18/2023	6/13/2023
PFAS (mg/kg)													
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—	—	—	0.0021 U
DONA	NS	NS	—	—	—	—	—	—	—	—	—	—	0.0032 U
HFPODA	NS	NS	0.00289 U	0.00291 U	0.00278 U	0.00274 U	0.00276 U	0.00264 U	0.00273 U	0.00275 U	0.00266 U	0.00282 U	0.0021 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	0.0021 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—	—	—	—	0.0021 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.000289 U	0.000291 U	0.000278 U	0.000274 U	0.000276 U	0.000264 U	0.000273 U	0.000275 U	0.000266 U	0.000282 U	0.0021 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorohexanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.000836**	**0.000302**	**0.000391**	**0.000376**	0.000276 U	0.000264 U	**0.000435**	**0.000275**	0.000266 U	0.000282 U	**0.0013**
Perfluorooctanoic acid	4.4	0.007	0.000289 U	0.000291 U	0.000278 U	0.000274 U	0.000276 U	0.000264 U	0.000273 U	0.000275 U	0.000266 U	0.000282 U	**0.00036 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—	—	0.00064 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			CCAAPLOT	CCAAPLOT	DUP-20230417	FHROUTFALL	FHROUTFALL	Fillmore Rd ROW-01 DEP	Fillmore Rd ROW-03	Fillmore Rd ROW-03
Sample Depth (ft bgs)	PADEP	PADEP	8-10	20-22	0-2	0-2	8-10	0.5-1	0-2	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-130726-4	410-130726-5	L2320716-20	410-130726-1	410-130726-2	22208240601	410-74072-5	FillmoreRdROW.03(0-2).2022
Sample Date	Soil MSCs	SGW MSCs	6/13/2023	6/13/2023	4/17/2023	6/13/2023	6/13/2023	8/18/2022	2/22/2022	2/22/2022
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.0024 U	0.0023 U	—	0.0023 U	0.0026 U	0.00109 U	—	—
DONA	NS	NS	0.0036 U	0.0035 U	—	0.0035 U	0.0039 U	0.00109 U	—	—
HFPODA	NS	NS	0.0024 U	0.0023 U	0.00264 U	0.0023 U	0.0026 U	0.00219 U	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.0024 U	0.0023 U	—	0.0023 U	0.0026 U	0.00109 U	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.0024 U	0.0023 U	—	0.0023 U	0.0026 U	0.00109 U	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0024 U	0.0023 U	0.000264 U	0.0023 U	0.0026 U	0.00109 U	0.0024 U	ND
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	0.00073 U	ND
Perfluorohexanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	0.00109 U	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.00043 J**	0.0007 U	**0.000291**	**0.00055 J**	0.00078 U	0.00109 U	0.00073 U	ND
Perfluorooctanoic acid	4.4	0.007	0.00071 U	0.0007 U	0.000264 U	**0.00033 J**	0.00078 U	0.00109 U	0.00073 U	ND
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluorotridecanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
Perfluoroundecanoic acid	NS	NS	0.00071 U	0.0007 U	—	0.0007 U	0.00078 U	0.00109 U	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			Fillmore Rd ROW-03	Fillmore Rd ROW-03	PANG01 DEP	PANG01 PSU	PANG02 DEP	PANG02 PSU	S-1	S-2	S-3	SS-1
Sample Depth (ft bgs)	PADEP	PADEP	3-5	3-5	0.5-2	0.5-2	0.25-1.7	0.25-1.7	—	—	—	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-74072-6	FillmoreRdROW.03(3-5).2022	22208240603	410-95230-2	22208240602	410-95230-1	L2057900-01	L2057900-02	L2057900-03	SS-1.20210428
Sample Date	Soil MSCs	SGW MSCs	2/22/2022	2/22/2022	8/18/2022	8/18/2022	8/18/2022	8/18/2022	12/29/2020	12/29/2020	12/29/2020	4/28/2021
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	—	—	0.00119 U	0.000027 U	0.00117 U	0.000027 U	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	0.00065 U
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	0.0011 U	0.00114 U	0.00107 U	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	0.00119 U	0.00003 U	0.00117 U	0.000029 U	—	—	—	—
DONA	NS	NS	—	—	0.00119 U	0.000027 U	0.00117 U	0.000027 U	—	—	—	—
HFPODA	NS	NS	—	—	0.00237 U	0.00025 U	0.00235 U	0.000024 U	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	0.00119 U	0.000027 U	**0.000118 J**	**0.00009**	0.000549 U	0.000573 U	0.000535 U	0.00022 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	0.00119 U	0.000038 U	**0.000027 J**	0.000037 U	0.000549 U	0.000573 U	0.000535 U	0.00022 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0025 U	ND	0.00119 U	0.00045 U	0.00117 U	0.00044 U	0.000275 U	0.000286 U	0.000268 U	0.00044 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	0.00087 U
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluorodecanoic acid	NS	NS	—	—	0.00119 U	**0.000032 J**	**0.00014 J**	**0.0001**	0.000275 U	0.000286 U	0.000268 U	**0.00022 J**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	0.00119 U	0.000029 U	**0.000082 J**	**0.000051 J**	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluoroheptanoic acid	NS	NS	—	—	—	0.00003 U	—	**0.00003 J**	0.000275 U	0.000286 U	0.000268 U	0.00022 U
Perfluorohexanesulfonic acid	NS	NS	0.00075 U	ND	0.00119 U	0.000024 U	**0.000043 J**	0.000023 U	0.000275 U	0.000286 U	0.000268 U	**0.00046 J**
Perfluorohexanoic acid	NS	NS	—	—	**0.000035 J**	**0.000029 J**	**0.000047 J**	**0.000042 J**	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	0.0011 U	0.00114 U	0.00107 U	0.00022 U
Perfluorononanoic acid	NS	NS	—	—	**0.000029 J**	0.000029 U	**0.000065 J**	**0.000047 J**	0.000275 U	0.000286 U	0.000268 U	0.00022 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	0.00119 U	—	**0.000026 J**	—	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluorooctanesulfonic acid	4.4	0.007	0.00075 U	ND	**0.000269 J**	**0.00024**	**0.0015**	**0.0012**	0.000275 U	0.000286 U	0.000268 U	**0.0069**
Perfluorooctanoic acid	4.4	0.007	0.00075 U	ND	0.00119 U	**0.000056 J**	**0.000116 J**	**0.000094 J**	0.000275 U	0.000286 U	0.000268 U	**0.00039 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	0.0011 U	0.00114 U	0.00107 U	0.00022 U
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	0.000549 U	0.000573 U	0.000535 U	**0.00025 J**
Perfluorotetradecanoic acid	NS	NS	—	—	0.00119 U	0.00003 U	**0.000044 J**	**0.000029 J**	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluorotridecanoic acid	NS	NS	—	—	0.00119 U	0.000026 U	**0.000042 J**	**0.000041 J**	0.000549 U	0.000573 U	0.000535 U	0.00022 U
Perfluoroundecanoic acid	NS	NS	—	—	0.00119 U	0.00007 U	**0.000077 J**	0.000067 U	0.000549 U	0.000573 U	0.000535 U	0.00022 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			SS-1 DUP	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10
Sample Depth (ft bgs)	PADEP	PADEP	0-2	0-1.2	0-2	0-1.2	0-1.1	0-2	0-2	0-1.3	0-0.67	0-0.83
Lab Sample ID	RDC 0-15	RUA 100x	QC.20210428	SS-2.20210428	SS-3.20210428	SS-4.20210428	SS-5.20210428	SS-6.20210428	SS-7.20210428	SS-8.20210428	SS-9.20210428	SS-10.20210428
Sample Date	Soil MSCs	SGW MSCs	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021	4/28/2021
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	0.00068 U	0.00065 U	0.00023 U	0.00071 U	0.00023 U	0.00067 U	0.00067 U	0.00074 U	0.00064 U	0.00065 U
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—	—	—	—
HFPODA	NS	NS	—	—	—	—	—	—	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.00046 U	0.00022 U	0.00023 U	0.00048 U	0.00046 U	0.00045 U	0.00022 U	0.00049 U	0.00043 U	0.00043 U
Perfluorobutanoic acid	NS	NS	0.00091 U	0.00086 U	0.00023 U	0.00095 U	0.00092 U	0.0009 U	0.0009 U	0.00099 U	0.00086 U	0.00086 U
Perfluorodecanesulfonic acid (PFDS)	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluorodecanoic acid	NS	NS	**0.00024 J**	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00067**	0.00025 U	**0.00033 J**	**0.00036 IJ**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00023 J**	0.00025 U	0.00021 U	0.00022 U
Perfluoroheptanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00095**	0.00025 U	**0.00028 J**	**0.00033 J**
Perfluorohexanesulfonic acid	NS	NS	**0.00049 J**	**0.00022 J**	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.0043**	**0.00048 J**	**0.001**	**0.0015**
Perfluorohexanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00086**	**0.00029 J**	**0.00055 J**	**0.00054 J**
Perfluorononanesulfonic acid (PFNS)	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluorononanoic acid	NS	NS	**0.00028 J**	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.0012**	0.00025 U	**0.00033 J**	**0.0003 J**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluorooctanesulfonic acid	4.4	0.007	**0.0084**	**0.0033**	**0.0048**	**0.00065 J**	**0.0012**	**0.0023**	**0.054**	**0.006**	**0.019**	**0.0077**
Perfluorooctanoic acid	4.4	0.007	**0.0004 J**	**0.00049 J**	**0.00037 J**	**0.00044 IJ**	**0.00035 J**	**0.00031 J**	**0.0017**	**0.0004 J**	**0.0006 J**	**0.00063 J**
Perfluoropentanesulfonic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluoropentanoic acid	NS	NS	**0.00034 J**	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.0016**	**0.00027 J**	**0.00059 J**	**0.00051 J**
Perfluorotetradecanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00025 U	0.00021 U	0.00022 U
Perfluorotridecanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00025 J**	0.00025 U	0.00021 U	0.00022 U
Perfluoroundecanoic acid	NS	NS	0.00023 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	**0.00084**	0.00025 U	**0.00039 J**	0.00022 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			TA-Comp-01	TA-Comp-02	TA-Comp-03	TA-Comp-04	TA-Comp-05	TA-Comp-06	TA-Comp-06 DUP	TA-Comp-07	TA-Comp-08	TA-Comp-09
Sample Depth (ft bgs)	PADEP	PADEP	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5
Lab Sample ID	RDC 0-15	RUA 100x	410-117335-1	410-117335-2	410-117335-3	410-117335-4	410-117335-5	410-117335-6	410-117335-76	410-117335-7	410-117335-8	410-117335-9
Sample Date	Soil MSCs	SGW MSCs	2/28/2023	2/28/2023	2/28/2023	2/28/2023	3/1/2023	3/1/2023	3/1/2023	3/1/2023	3/1/2023	3/1/2023
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	0.000026 U	0.000026 U	0.000026 U	0.000027 U	0.000027 U	0.000029 U	0.000027 U	0.000028 U	0.000025 U	0.000031 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	**0.000034 J I**	**0.000067 J**	0.00002 U	0.000021 U	0.000021 U	0.000023 U	0.000021 U	0.000022 U	0.00002 U	0.000024 U
3:3 FTCA	NS	NS	0.000024 U ! FL	0.000024 U ! -	0.000024 U ! -	0.000025 U ! -	0.000024 U ! -	0.000027 U ! -	0.000024 U ! -	0.000026 U ! -	0.000023 U ! -	0.000028 U ! -
4:2 FTS	NS	NS	0.00002 U	0.00002 U	0.00002 U	0.000021 U	0.000021 U	0.000023 U	0.000021 U	0.000022 U	0.00002 U	0.000024 U
5:3 FTCA	NS	NS	0.000022 U ! FL	**0.000059 J ! st-**	0.000023 U ! -	0.000024 U ! -	0.000023 U ! -	0.000025 U ! -	0.000023 U ! -	0.000025 U ! -	0.000022 U ! -	0.000026 U ! -
6:2 FTS	NS	NS	0.000058 U	**0.0003**	**0.0014**	0.000061 U	0.000059 U	0.000066 U	0.00006 U	0.000063 U	0.000056 U	0.000068 U
7:3 FTCA	NS	NS	0.000019 U ! FL	0.000019 U ! -	0.000019 U ! -	0.00002 U ! -	0.000019 U ! -	0.000021 U ! -	0.00002 U ! -	0.000021 U ! -	0.000018 U ! -	0.000022 U ! -
9Cl-PF3ONS	NS	NS	0.000028 U	0.000029 U	0.000029 U	0.00003 U	0.000029 U	0.000032 U	0.000029 U	0.000031 U	0.000028 U	0.000033 U
DONA	NS	NS	0.000026 U	0.000026 U	0.000026 U	0.000027 U	0.000027 U	0.000029 U	0.000027 U	0.000028 U	0.000025 U	0.000031 U
HFPODA	NS	NS	0.00024 U	0.00024 U	0.00024 U	0.00025 U	0.00024 U	0.00027 U	0.00024 U	0.00026 U	0.00023 U	0.00028 U
NEtFOSA	NS	NS	0.000029 U	0.00003 U	0.00003 U	0.000031 U	0.00003 U	0.000034 U	0.000031 U st5-	0.000032 U	0.000029 U	0.000035 U
NEtFOSAA	NS	NS	0.000026 U	0.000026 U	0.000026 U	0.000027 U	0.000027 U	0.000029 U	0.000027 U	0.000028 U	0.000025 U	0.000031 U
NEtFOSE	NS	NS	0.000024 U	0.000024 U	0.000024 U	0.000025 U	0.000024 U	0.000027 U	0.000024 U	0.000026 U	0.000023 U	0.000028 U
NMeFOSA	NS	NS	0.000037 U	0.000037 U	0.000037 U	0.000039 U	0.000037 U	0.000042 U	0.000038 U st5-	0.00004 U	0.000036 U	0.000043 U
NMeFOSAA	NS	NS	0.000037 U	0.000037 U	0.000037 U	0.000039 U	0.000037 U	0.000042 U	0.000038 U	0.00004 U	0.000036 U	0.000043 U
NMeFOSE	NS	NS	0.000027 U	0.000027 U	0.000027 U	0.000029 U	0.000028 U	0.000031 U	0.000028 U	0.00003 U	0.000026 U	0.000032 U
Perfluorobutanesulfonic acid	66	1	0.00043 U F2	0.00043 U	0.00043 U	0.00045 U	0.00044 U	0.00049 U	0.00044 U	0.00047 U	0.00042 U	0.0005 U
Perfluorobutanoic acid	NS	NS	**0.00029**	**0.00043**	**0.00035**	**0.00012**	**0.000077**	**0.00017**	0.000029 U B	**0.000083**	**0.00016**	**0.00023**
Perfluorodecanesulfonic acid (PFDS)	NS	NS	**0.0002 I**	**0.00087 I**	0.000025 U	0.000026 U	0.000025 U	0.000028 U	0.000026 U	0.000027 U	0.000024 U	**0.000075 J**
Perfluorodecanoic acid	NS	NS	**0.00031**	**0.00044**	0.000029 U	**0.000067 J**	**0.00011**	**0.00012**	0.000029 U B	0.000031 U	**0.000059 J**	**0.00022**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	**0.00014**	**0.00042**	0.000024 U	0.000025 U	0.000024 U	0.000027 U	0.000024 U	0.000026 U	0.000023 U	0.000028 U
Perfluorododecanoic acid	NS	NS	**0.000068 J**	**0.000072**	0.000027 U	0.000029 U	**0.000043 J**	**0.000056 J**	0.000028 U B	0.00003 U	0.000026 U	**0.000078 J**
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	**0.00015**	**0.00019**	**0.000032 J**	0.000025 U	0.000024 U	**0.000029 J**	0.000024 U	0.000026 U	0.000023 U	0.000028 U
Perfluoroheptanoic acid	NS	NS	**0.0004**	**0.00053**	**0.00017**	**0.00024**	**0.000066 J**	**0.00015**	0.000029 U B	**0.00007 J**	**0.00013**	**0.00024**
Perfluorohexanesulfonic acid	NS	NS	**0.0022 FH FL F**	**0.0032**	**0.00044**	**0.00011**	**0.00006 J**	**0.00024**	0.000023 U B	**0.00009**	**0.00033**	**0.00022**
Perfluorohexanoic acid	NS	NS	**0.00061 F2**	**0.00078**	**0.00034**	**0.0005**	**0.000084**	**0.00023**	0.000023 U B	**0.000094**	**0.00019**	**0.00078**
Perfluorononanesulfonic acid (PFNS)	NS	NS	**0.00022 I**	**0.00081 I**	**0.00015 I**	0.000027 U	0.000027 U	0.000029 U	0.000027 U	0.000028 U	**0.000032 J I**	0.000031 U
Perfluorononanoic acid	NS	NS	**0.00056**	**0.00077**	**0.00011**	**0.00012**	**0.00012**	**0.00017**	0.000028 U B	**0.000046 J**	**0.00011**	**0.00027**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	**0.000047 J**	**0.00027**	0.000025 U	0.000026 U	0.000025 U	0.000028 U	0.000026 U	0.000027 U	0.000024 U	0.000029 U
Perfluorooctanesulfonic acid	4.4	0.007	**0.02 4 F2**	**0.052**	**0.021**	**0.0012**	**0.0012**	**0.0029**	0.000043 U B	**0.0015**	**0.0031**	**0.0039**
Perfluorooctanoic acid	4.4	0.007	**0.00094**	**0.00093**	**0.00012**	**0.00026**	**0.00017**	**0.00033**	0.000027 U B	**0.00011**	**0.00026**	**0.00051**
Perfluoropentanesulfonic acid	NS	NS	**0.00019 FH F2**	**0.00018**	**0.000035 J**	0.000027 U	0.000027 U	0.000029 U	0.000027 U	0.000028 U	**0.000025 J**	0.000031 U
Perfluoropentanoic acid	NS	NS	**0.00065**	**0.0011**	**0.00089**	**0.00069**	**0.000072 J**	**0.00021**	0.000029 U B	**0.00018**	**0.0002**	**0.00037**
Perfluorotetradecanoic acid	NS	NS	0.000028 U	0.000029 U	0.000029 U	0.00003 U	0.000029 U	0.000032 U	0.000029 U	0.000031 U	0.000028 U	0.000033 U
Perfluorotridecanoic acid	NS	NS	**0.00042**	**0.00031**	0.000025 U	0.000026 U	0.000025 U	0.000028 U	0.000026 U	**0.000032 J**	**0.000033 J**	**0.00004 J**
Perfluoroundecanoic acid	NS	NS	**0.0013 FL F2**	**0.0009**	0.000067 U	0.00007 U	0.000068 U	**0.000093 J**	0.000068 U	0.000072 U	**0.000086 J**	**0.00015**
PFECA A	NS	NS	0.000026 U !	0.000026 U !	0.000026 U !	0.000027 U !	0.000027 U !	0.000029 U !	0.000027 U !	0.000028 U !	0.000025 U !	0.000031 U !
PFECA B	NS	NS	0.000028 U !	0.000029 U !	0.000029 U !	0.00003 U !	0.000029 U !	0.000032 U !	0.000029 U !	0.000031 U !	0.000028 U !	0.000033 U !
PFECA F	NS	NS	0.000027 U !	0.000027 U !	0.000027 U !	0.000029 U !	0.000028 U !	0.000031 U !	0.000028 U !	0.00003 U !	0.000026 U !	0.000032 U !
PFEESA	NS	NS	0.000024 U !	0.000024 U !	0.000024 U !	0.000025 U !	0.000024 U !	0.000027 U !	0.000024 U !	0.000026 U !	0.000023 U !	0.000028 U !

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			TA-Comp-10	TA-Comp-11	TA-Comp-12	TA-Comp-13	TA-Comp-14	TA-Comp-15	TA-Comp-16	TA-Comp-17	TA-Comp-18	TA-Comp-18 DUP
Sample Depth (ft bgs)	PADEP	PADEP	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5
Lab Sample ID	RDC 0-15	RUA 100x	410-117335-10	410-117335-11	410-117335-12	410-117335-13	410-117335-14	410-117335-15	410-168247-4	410-168247-8	410-168247-13	410-168247-14
Sample Date	Soil MSCs	SGW MSCs	3/1/2023	3/1/2023	3/1/2023	3/1/2023	3/1/2023	3/1/2023	4/15/2024	4/15/2024	4/15/2024	4/15/2024
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	0.000027 U	0.000026 U	0.000026 U	0.00003 U	0.000026 U	0.000026 U	0.000026 U	0.000028 U	0.000026 U	0.000025 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	0.000021 U	0.00002 U	0.00002 U	0.000023 U	0.00002 U	0.00002 U	**0.000028 J**	0.000021 U	0.00002 U	0.00002 U
3:3 FTCA	NS	NS	0.000025 U ! -	0.000024 U ! -	0.000024 U ! -	0.000027 U ! -	0.000024 U ! -	0.000024 U ! -	0.000023 U	0.000025 U	0.000023 U	0.000023 U
4:2 FTS	NS	NS	0.000021 U	0.00002 U	0.00002 U	0.000023 U	0.00002 U	0.00002 U	0.00002 U	0.000021 U	0.00002 U	0.00002 U
5:3 FTCA	NS	NS	0.000023 U ! -	0.000023 U ! -	0.000022 U ! -	0.000026 U ! -	0.000023 U ! -	0.000023 U ! -	0.000022 U	0.000024 U	0.000022 U	0.000022 U
6:2 FTS	NS	NS	0.00006 U	0.000058 U	0.000058 U	0.000066 U	0.000059 U	0.000059 U	0.000057 U	0.000062 U	0.000057 U	0.000056 U
7:3 FTCA	NS	NS	0.00002 U ! -	0.000019 U ! -	0.000019 U ! -	0.000022 U ! -	0.000019 U ! -	0.000019 U ! -	0.000019 U	0.00002 U	0.000019 U	0.000018 U
9Cl-PF3ONS	NS	NS	0.00003 U	0.000028 U	0.000028 U	0.000033 U	0.000029 U	0.000029 U	0.000028 U	0.00003 U	0.000028 U	0.000028 U
DONA	NS	NS	0.000027 U	0.000026 U	0.000026 U	0.00003 U	0.000026 U	0.000026 U	0.000026 U	0.000028 U	0.000026 U	0.000025 U
HFPODA	NS	NS	0.00025 U	0.00024 U	0.00024 U	0.00027 U	0.00024 U	0.00024 U	0.00047 U	0.0005 U	0.00046 U	0.00046 U
NEtFOSA	NS	NS	0.000031 U	0.00003 U	0.000029 U	0.000034 U	0.00003 U	0.00003 U	0.000029 U	0.000031 U	0.000029 U	0.000029 U
NEtFOSAA	NS	NS	0.000027 U	0.000026 U	0.000026 U	0.00003 U	0.000026 U	0.000026 U	0.000026 U	0.000028 U	0.000026 U	0.000025 U
NEtFOSE	NS	NS	0.000025 U	0.000024 U	0.000024 U	0.000027 U	0.000024 U	0.000024 U	0.000023 U	0.000025 U	0.000023 U	0.000023 U
NMeFOSA	NS	NS	0.000038 U	0.000037 U	0.000037 U	0.000042 U	0.000037 U	0.000037 U	0.000036 U	0.000039 U	0.000036 U	0.000036 U
NMeFOSAA	NS	NS	0.000038 U	0.000037 U	0.000037 U	0.000042 U	0.000037 U	0.000037 U	0.000036 U	0.000039 U	0.000036 U	0.000036 U
NMeFOSE	NS	NS	0.000028 U	0.000027 U	0.000027 U	0.000031 U	0.000028 U	0.000028 U	0.000027 U	0.000029 U	0.000027 U	0.000026 U
Perfluorobutanesulfonic acid	66	1	0.00045 U	0.00043 U	0.00043 U	0.00049 U	0.00043 U	0.00043 U	0.00042 U	0.00046 U	0.00042 U	0.00042 U
Perfluorobutanoic acid	NS	NS	**0.000046 J**	**0.00013**	**0.00012**	**0.00011**	**0.00022**	**0.00026**	**0.0005**	**0.00025**	**0.00018**	**0.00015**
Perfluorodecanesulfonic acid (PFDS)	NS	NS	0.000026 U	0.000025 U	0.000025 U	0.000028 U	**0.000062 J I**	**0.00037 I**	**0.000098**	0.000026 U	0.000024 U	**0.000032 J**
Perfluorodecanoic acid	NS	NS	0.00003 U	**0.000084**	**0.000046 J**	0.000033 U	**0.00011**	**0.0002**	**0.0005**	**0.00013**	**0.00011**	**0.00016**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	0.000025 U	0.000024 U	0.000024 U	0.000027 U	**0.000032 J**	**0.00017**	**0.000025 J**	0.000025 U	0.000023 U	0.000023 U
Perfluorododecanoic acid	NS	NS	0.000028 U	**0.000037 J**	0.000027 U	0.000031 U	**0.000053 J**	**0.000073**	**0.000081**	**0.000044 J**	**0.000044 J**	**0.000069**
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	0.000025 U	0.000024 U	0.000024 U	0.000027 U	**0.000039 J**	**0.00012**	**0.00012**	**0.000046 J**	0.000023 U	0.000023 U
Perfluoroheptanoic acid	NS	NS	**0.000038 J**	**0.000075**	**0.000086**	**0.000084**	**0.00017**	**0.00032**	**0.0005**	**0.00033**	**0.00014**	**0.000087**
Perfluorohexanesulfonic acid	NS	NS	**0.00005 J**	**0.000055 J**	**0.00009**	**0.00014**	**0.0002**	**0.00091**	**0.0017**	**0.00031**	**0.000071**	**0.000064 J**
Perfluorohexanoic acid	NS	NS	**0.000067 J**	**0.000087**	**0.00011**	**0.00013**	**0.00022**	**0.00041**	**0.00055**	**0.00032**	**0.0001**	**0.000077**
Perfluorononanesulfonic acid (PFNS)	NS	NS	0.000027 U	0.000026 U	0.000026 U	0.00003 U	**0.000075 I**	**0.00044 I**	**0.00012**	0.000028 U	0.000026 U	0.000025 U
Perfluorononanoic acid	NS	NS	**0.000063 J**	**0.00013**	**0.000085**	**0.000055 J**	**0.00017**	**0.00045**	**0.00064**	**0.00017**	**0.00013**	**0.00014**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.000026 U	0.000025 U	0.000025 U	0.000028 U	0.000025 U	**0.000079**	**0.000059 J**	0.000026 U	0.000024 U	0.000024 U
Perfluorooctanesulfonic acid	4.4	0.007	**0.00082**	**0.0014**	**0.0014**	**0.0011**	**0.0068**	**0.035**	**0.039 B**	**0.0063 B**	**0.0018 B**	**0.0022 B**
Perfluorooctanoic acid	4.4	0.007	**0.00012**	**0.00025**	**0.00019**	**0.00018**	**0.00034**	**0.0005**	**0.00098**	**0.00026**	**0.00021**	**0.00023**
Perfluoropentanesulfonic acid	NS	NS	0.000027 U	0.000026 U	0.000026 U	0.00003 U	0.000026 U	**0.000044 J**	**0.000083**	0.000028 U	0.000026 U	0.000025 U
Perfluoropentanoic acid	NS	NS	0.00003 U	**0.0001**	**0.00016**	**0.00013**	**0.00026**	**0.00057**	**0.0011**	**0.00066**	**0.00011**	**0.000078**
Perfluorotetradecanoic acid	NS	NS	0.00003 U	0.000028 U	0.000028 U	0.000033 U	0.000029 U	0.000029 U	0.000028 U	0.00003 U	0.000028 U	0.000028 U
Perfluorotridecanoic acid	NS	NS	0.000026 U	0.000025 U	0.000025 U	0.000028 U	**0.000041 J**	**0.00014**	**0.00025**	0.000026 U	0.000024 U	**0.000029 J**
Perfluoroundecanoic acid	NS	NS	0.000069 U	0.000066 U	0.000066 U	0.000076 U	**0.0001 J**	**0.00038**	**0.00084**	0.00007 U	**0.000078 J**	**0.000087 J**
PFECA A	NS	NS	0.000027 U !	0.000026 U !	0.000026 U !	0.00003 U !	0.000026 U !	0.000026 U !	0.000026 U	0.000028 U	0.000026 U	0.000025 U
PFECA B	NS	NS	0.00003 U !	0.000028 U !	0.000028 U !	0.000033 U !	0.000029 U !	0.000029 U !	0.000028 U	0.00003 U	0.000028 U	0.000028 U
PFECA F	NS	NS	0.000028 U !	0.000027 U !	0.000027 U !	0.000031 U !	0.000028 U !	0.000028 U !	0.000027 U	0.000029 U	0.000027 U	0.000026 U
PFEESA	NS	NS	0.000025 U !	0.000024 U !	0.000024 U !	0.000027 U !	0.000024 U !	0.000024 U !	0.000023 U	0.000025 U	0.000023 U	0.000023 U

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			TA-Comp-19	TA-Comp-20	TA-Comp-21	TA-Comp-22	TA-Comp-23	TA-Comp-23 DUP	TA-Comp-24	TA-Comp-25	TA-Comp-26	UPADAM1A01 PSU
Sample Depth (ft bgs)	PADEP	PADEP	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0.5-2
Lab Sample ID	RDC 0-15	RUA 100x	410-168247-19	410-168247-23	410-217875-1	410-217875-2	410-217875-3	410-217875-7	410-217875-4	410-217875-5	410-217875-6	410-95230-3
Sample Date	Soil MSCs	SGW MSCs	4/15/2024	4/16/2024	4/16/2025	4/16/2025	4/16/2025	4/16/2025	4/16/2025	4/16/2025	4/16/2025	8/19/2022
PFAS (mg/kg)												
11Cl-PF3OUdS	NS	NS	0.000026 U	**0.00077 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	0.000024 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	0.00002 U	**0.00092 FL**	0.00002 U	0.00002 U	0.00002 U	0.000021 U	0.00002 U	0.000021 U	0.000021 U	—
3:3 FTCA	NS	NS	0.000024 U	**0.0002 FL**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U F2	—
4:2 FTS	NS	NS	0.00002 U	**0.00089 FL**	0.00002 U	0.00002 U	0.00002 U	0.000021 U	0.00002 U	0.000021 U	0.000021 U	—
5:3 FTCA	NS	NS	0.000023 U	**0.00017 FL**	0.000023 U	0.000022 U	0.000023 U	0.000024 U	0.000022 U	0.000023 U	0.000024 U F2	—
6:2 FTS	NS	NS	0.000058 U	**0.00085 FL**	0.000058 U	0.000057 U	0.000059 U	0.000061 U	0.000057 U	0.00006 U	0.000061 U	—
7:3 FTCA	NS	NS	0.000019 U	**0.00038**	0.000019 U	0.000019 U	0.000019 U	0.00002 U	0.000019 U	0.00002 U	0.00002 U F2	—
9Cl-PF3ONS	NS	NS	0.000028 U	**0.00076 FL**	0.000029 U	0.000028 U	0.000029 U	0.00003 U	0.000028 U	0.000029 U	0.00003 U	0.000026 U
DONA	NS	NS	0.000026 U	**0.00086 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	0.000024 U
HFPODA	NS	NS	0.00047 U	**0.001 J**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U	0.00022 U
NEtFOSA	NS	NS	0.00003 U	**0.0013 FL**	0.00003 U	0.000029 U	0.00003 U	0.000031 U	0.000029 U	0.000031 U	0.000031 U	—
NEtFOSAA	NS	NS	0.000026 U	**0.0009 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	0.000024 U
NEtFOSE	NS	NS	0.000024 U	**0.0012 FL**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U	—
NMeFOSA	NS	NS	0.000037 U	**0.0013 FL**	0.000037 U	0.000036 U	0.000037 U	0.000039 U	0.000036 U	0.000038 U	0.000039 U	—
NMeFOSAA	NS	NS	0.000037 U	**0.00082 FL**	0.000037 U	0.000036 U	0.000037 U	0.000039 U	0.000036 U	0.000038 U	0.000039 U	0.000034 U
NMeFOSE	NS	NS	0.000027 U	**0.0011 FL**	0.000027 U	0.000027 U	0.000028 U	0.000029 U	0.000027 U	0.000028 U	0.000029 U	—
Perfluorobutanesulfonic acid	66	1	0.00043 U	**0.00078 J FL**	0.00043 U	0.00042 U	0.00044 U	0.00045 U	0.00042 U	0.00044 U	0.00045 U	0.0004 U
Perfluorobutanoic acid	NS	NS	**0.00012**	**0.001 FL**	**0.000079**	**0.00005 J**	**0.00012**	**0.00013**	**0.00017**	**0.000059 J**	**0.00015**	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	0.000025 U	**0.00091 FL**	0.000025 U	0.000024 U	0.000025 U	0.000026 U	0.000024 U	0.000026 U	0.000026 U	—
Perfluorodecanoic acid	NS	NS	**0.000081**	**0.00098 FL**	**0.00011**	**0.000028 J**	**0.000046 J**	**0.000071 J**	**0.000061 J**	**0.000071 J**	**0.000069 J**	**0.000062 J**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	0.000024 U	**0.00088 FL**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U	—
Perfluorododecanoic acid	NS	NS	**0.000028 J**	**0.00094 FL**	**0.000055 J**	0.000027 U	0.000028 U	**0.000034 J**	**0.00003 J**	**0.000046 J**	0.000029 U	0.000025 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	0.000024 U	**0.00093 FL**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U	—
Perfluoroheptanoic acid	NS	NS	**0.00011**	**0.001 FL**	**0.00007 J**	**0.000041 J**	**0.0001**	**0.00009**	**0.00014**	**0.000052 J**	**0.00013**	**0.000076**
Perfluorohexanesulfonic acid	NS	NS	**0.00008**	**0.00092 FL**	**0.000062 J**	**0.000029 J**	**0.000096**	**0.0002**	**0.00014**	**0.000056 J**	**0.00029**	**0.000036 J**
Perfluorohexanoic acid	NS	NS	**0.00013**	**0.001 FL**	**0.000097**	**0.000055 J**	**0.00016**	**0.00014**	**0.00023**	**0.000067 J**	**0.0002**	**0.000067**
Perfluorononanesulfonic acid (PFNS)	NS	NS	0.000026 U	**0.00087 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	—
Perfluorononanoic acid	NS	NS	**0.000077**	**0.00089 FL**	**0.00011**	**0.000039 J**	**0.000062 J**	**0.000085**	**0.000092**	**0.00007 J**	**0.00011**	**0.0001**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.000025 U	**0.0012 FL**	0.000025 U	0.000024 U	0.000025 U	0.000026 U	0.000024 U	0.000026 U	0.000026 U	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.0011 B**	**0.0015 B FL**	**0.0015**	**0.0006**	**0.0012**	**0.0015**	**0.0019**	**0.00065**	**0.002**	**0.001**
Perfluorooctanoic acid	4.4	0.007	**0.00015**	**0.00098 FL**	**0.0002**	**0.0001**	**0.00032**	**0.00032**	**0.00039**	**0.00011**	**0.00033**	**0.00018**
Perfluoropentanesulfonic acid	NS	NS	0.000026 U	**0.00087 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	—
Perfluoropentanoic acid	NS	NS	**0.00019**	**0.00099 FL**	**0.000066 J**	**0.000058 J**	**0.00012**	**0.00013**	**0.00023**	**0.000045 J**	**0.00017**	—
Perfluorotetradecanoic acid	NS	NS	0.000028 U	**0.0011 FL**	**0.000034 J**	0.000028 U	0.000029 U	0.00003 U	0.000028 U	**0.00004 J**	0.00003 U	0.000026 U
Perfluorotridecanoic acid	NS	NS	0.000025 U	**0.00093 FL**	0.000025 U	0.000024 U	0.000025 U	0.000026 U	0.000024 U	**0.000027 J**	0.000026 U	0.000023 U
Perfluoroundecanoic acid	NS	NS	0.000066 U	**0.00091 FL**	0.000067 U	0.000065 U	0.000067 U	0.00007 U	0.000065 U	0.000069 U	0.00007 U	0.000062 U
PFECA A	NS	NS	0.000026 U	**0.00079 FL**	0.000026 U	0.000026 U	0.000027 U	0.000028 U	0.000026 U	0.000027 U	0.000028 U	—
PFECA B	NS	NS	0.000028 U	**0.00082 FL**	0.000029 U	0.000028 U	0.000029 U	0.00003 U	0.000028 U	0.000029 U	0.00003 U	—
PFECA F	NS	NS	0.000027 U	**0.0011**	0.000027 U	0.000027 U	0.000028 U	0.000029 U	0.000027 U	0.000028 U	0.000029 U	—
PFEESA	NS	NS	0.000024 U	**0.00087 FL**	0.000024 U	0.000023 U	0.000024 U	0.000025 U	0.000023 U	0.000024 U	0.000025 U	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPADAM1A02 DEP	UPADAM1A02 PSU	UPADAM1A03 DEP	UPADAM1A03 PSU	UPADAM1A03 DUP	UPADAM1ASPILLWAY DEP	UPADAM4A01 DEP	UPADAM4A01 PSU
Sample Depth (ft bgs)	**PADEP**	**PADEP**	**0.5-2**	**0.5-2**	**0.5-2**	**0.5-2**	**0.5-2**	**0.5-1.7**	**0.5-2**	**0.5-2**
Lab Sample ID	**RDC 0-15**	**RUA 100x**	**22208240608**	**410-95230-4**	**22208240609**	**410-95230-5**	**22208240615**	**22208240610**	**22208240611**	**410-95230-6**
Sample Date	**Soil MSCs**	**SGW MSCs**	**8/19/2022**	**8/19/2022**	**8/19/2022**	**8/19/2022**	**8/19/2022**	**8/19/2022**	**8/19/2022**	**8/19/2022**
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	0.00129 U	0.000024 U	0.00111 U	0.000025 U	0.0011 U	0.00107 U	0.00113 U	0.000024 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.00129 U	0.000026 U	0.00111 U	0.000027 U	0.0011 U	0.00107 U	0.00113 U	0.000027 U
DONA	NS	NS	0.00129 U	0.000024 U	0.00111 U	0.000025 U	0.0011 U	0.00107 U	0.00113 U	0.000024 U
HFPODA	NS	NS	0.00258 U	0.00022 U	0.00223 U	0.00023 U	0.00219 U	0.00214 U	0.00226 U	0.00022 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.00129 U	0.000024 U	**0.000055 J**	0.000025 U	**0.000044 J**	0.00107 U	0.00113 U	0.000024 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.00129 U	0.000034 U	0.00111 U	0.000035 U	0.0011 U	0.00107 U	0.00113 U	0.000034 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.00129 U	0.0004 U	0.00111 U	0.00041 U	0.0011 U	0.00107 U	0.00113 U	0.0004 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	**0.000082 J**	**0.000079**	**0.000142 J**	**0.00017**	**0.000117 J**	0.00107 U	0.00113 U	**0.000077**
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	**0.000048 J**	**0.000039 J**	**0.000073 J**	**0.000082**	**0.000061 J**	0.00107 U	0.00113 U	0.000026 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	**0.000075**	—	**0.00004 J**	—	—	—	**0.00016**
Perfluorohexanesulfonic acid	NS	NS	0.00129 U	**0.000033 J**	**0.00013 J**	**0.000042 J**	**0.000038 J**	**0.000034 J**	**0.00011 J**	**0.0002**
Perfluorohexanoic acid	NS	NS	**0.00006 J**	**0.000096**	**0.000044 J**	**0.000052 J**	**0.000023 J**	**0.00003 J**	**0.000111 J**	**0.00017**
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	**0.000065 J**	**0.000078**	**0.000081 J**	**0.000084**	**0.000048 J**	0.00107 U	**0.000088 J**	**0.00011**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.00129 U	—	0.00111 U	—	**0.0011**	0.00107 U	0.00113 U	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.00228**	**0.0017**	**0.00335**	**0.0031**	**0.00252**	**0.00027 J**	**0.00453**	**0.0033**
Perfluorooctanoic acid	4.4	0.007	**0.000125 J**	**0.00018**	**0.000133 J**	**0.00012**	0.0011 U	0.00107 U	0.00113 U	**0.00019**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.00129 U	0.000026 U	**0.000026 J**	**0.000037 J**	**0.000022 J**	0.00107 U	0.00113 U	0.000027 U
Perfluorotridecanoic acid	NS	NS	0.00129 U	0.000023 U	0.00111 U	**0.000079**	0.0011 U	0.00107 U	0.00113 U	0.000023 U
Perfluoroundecanoic acid	NS	NS	**0.000046 J**	0.000062 U	**0.000062 J**	**0.00011 I**	**0.000052 J**	0.00107 U	**0.000023 J**	0.000062 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPADAM4A02 DEP	UPADAM4A02 PSU	UPADAM4A03 DEP	UPADAM4A03 PSU	UPADAM4A03 PSU	UPADAM4ASPILLWAY DEP	UPANEHangar DEP
Sample Depth (ft bgs)	PADEP	PADEP	0.5-1	0.5-1	0.5-1.2	0.5-1.2	0.5-1.2	0.5-2	0.5-2
Lab Sample ID	RDC 0-15	RUA 100x	22208240613	410-95230-9	22208240612	410-95230-8	410-95230-8 RE-ANALYSIS	22208240614	22208258906
Sample Date	Soil MSCs	SGW MSCs	8/19/2022	8/19/2022	8/19/2022	8/19/2022	8/19/2022	8/19/2022	8/22/2022
PFAS (mg/kg)									
11Cl-PF3OUdS	NS	NS	0.00111 U	0.000025 U	0.00119 U	0.000025 U	0.000025 U	0.00111 U	0.00111 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.00111 U	0.000027 U	0.00119 U	0.000027 U	0.000027 U	0.00111 U	0.00111 U
DONA	NS	NS	0.00111 U	0.000025 U	0.00119 U	0.000025 U	0.000025 U	0.00111 U	0.00111 U
HFPODA	NS	NS	0.00222 U	0.00023 U	0.00239 U	0.00022 U	0.00022 U	0.00222 U	0.00221 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.00111 U	0.000025 U	0.00119 U	0.000025 U	0.000025 U	0.00111 U	0.00111 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.00111 U	0.000035 U	0.00119 U	0.000025 U	0.000025 U	0.00111 U	0.00111 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.00111 U	0.00041 U	0.00119 U	0.00041 U	0.00041 U	0.00111 U	**0.000075 J**
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	**0.000046 J**	**0.000049 J**	0.00119 U	0.000027 U	**0.00037 J**	0.00111 U	0.00111 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.00111 U	0.000026 U	0.00119 U	0.000026 U	0.000026 U	0.00111 U	0.00111 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	**0.000083**	—	**0.000028 J**	**0.000052 J**	—	—
Perfluorohexanesulfonic acid	NS	NS	**0.000149 J**	**0.00013**	0.00119 U	0.000021 U	**0.000034 J**	0.00111 U	**0.00149**
Perfluorohexanoic acid	NS	NS	**0.000099 J**	**0.00013**	0.00119 U	0.000021 U	**0.000081**	**0.000023 J**	**0.000149 J**
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	**0.000076 J**	**0.000087**	0.00119 U	**0.000032 J**	**0.000058 J**	0.00111 U	**0.000037 J**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.00111 U	—	0.00119 U	—	—	0.00111 U	0.00111 U
Perfluorooctanesulfonic acid	4.4	0.007	**0.00255**	**0.0044**	**0.000262 J**	**0.00033**	**0.0006**	0.00111 U	**0.00426**
Perfluorooctanoic acid	4.4	0.007	**0.00012 J**	**0.000063 J**	0.00119 U	**0.000056 J**	**0.000083**	0.00111 U	**0.000096 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.00111 U	0.000027 U	0.00119 U	0.000027 U	**0.000029 J**	0.00111 U	0.00111 U
Perfluorotridecanoic acid	NS	NS	0.00111 U	0.000024 U	0.00119 U	0.000024 U	**0.000024 J**	0.00111 U	0.00111 U
Perfluoroundecanoic acid	NS	NS	**0.000033 J**	0.000064 U	0.00119 U	0.000063 U	0.000063 U	0.00111 U	0.00111 U
PFECA A	NS	NS	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPANEHangar PSU	UPAPANGOUTFALL01 DEP	UPAPANGOUTFALL01 DUP	UPARUNWAYDC01 DEP	UPARUNWAYDC01 PSU	UPARUNWAYDC01 PSU
Sample Depth (ft bgs)	PADEP	PADEP	0.5-2	0.5-0.85	0.5-0.85	0.5-2	0.5-2	0.5-2
Lab Sample ID	RDC 0-15	RUA 100x	410-95230-15	22208240604	22208240606	22208258902	410-95230-10	410-95230-11
Sample Date	Soil MSCs	SGW MSCs	8/22/2022	8/18/2022	8/18/2022	8/22/2022	8/22/2022	8/22/2022
PFAS (mg/kg)								
11Cl-PF3OUdS	NS	NS	0.000024 U	0.00112 U	0.00108 U	0.0011 U	0.000026 U	0.000025 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.000027 U	0.00112 U	0.00108 U	0.0011 U	0.000028 U	0.000028 U
DONA	NS	NS	0.000024 U	0.00112 U	0.00108 U	0.0011 U	0.000026 U	0.000025 U
HFPODA	NS	NS	0.00022 U	0.00224 U	0.00215 U	0.0022 U	0.00023 U	0.00023 U
NEtFOSA	NS	NS	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.000024 U	0.00112 U	0.00108 U	0.0011 U	0.000026 U	0.000025 U
NEtFOSE	NS	NS	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.000034 U	0.00112 U	0.00108 U	0.0011 U	0.000036 U	0.000036 U
NMeFOSE	NS	NS	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	**0.00041 J**	0.00112 U	0.00108 U	0.0011 U	0.00042 U	0.00042 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	**0.000056**	0.00112 U	**0.000046 J**	0.0011 U	0.000028 U	0.000028 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.000026 U	0.00112 U	0.00108 U	0.0011 U	0.000027 U	0.000027 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	**0.00069**	—	—	—	**0.000028 J**	0.000028 U
Perfluorohexanesulfonic acid	NS	NS	**0.0083**	0.00112 U	**0.000035 J**	0.0011 U	0.000022 U	0.000022 U
Perfluorohexanoic acid	NS	NS	**0.0008**	**0.000027 J**	**0.000054 J**	0.0011 U	0.000022 U	**0.000023 J**
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	**0.00012**	**0.000053 J**	**0.000079 J**	0.0011 U	0.000027 U	0.000027 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	0.00112 U	0.00108 U	0.0011 U	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.013**	**0.00115**	**0.00153**	**0.000186 J**	**0.00022**	**0.00014**
Perfluorooctanoic acid	4.4	0.007	**0.00045**	**0.000152 J**	**0.00022 J**	0.0011 U	**0.000052 J**	**0.000053 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.000027 U	0.00112 U	0.00108 U	0.0011 U	0.000028 U	0.000028 U
Perfluorotridecanoic acid	NS	NS	0.000023 U	0.00112 U	0.00108 U	0.0011 U	0.000025 U	0.000024 U
Perfluoroundecanoic acid	NS	NS	0.000062 U	0.00112 U	0.000038 U	0.0011 U	0.000065 U	0.000065 U
PFECA A	NS	NS	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPARUNWAYDC01 PSU	UPARUNWAYDC02 DEP	UPA-SB-1 DEP	UPA-SB-1 PSU	UPA-SB-1 DEP	UPA-SB-1 PSU
Sample Depth (ft bgs)	PADEP	PADEP	0.5-2	0.5-2	0-2	0-2	18-20	18-20
Lab Sample ID	RDC 0-15	RUA 100x	410-95230-11 RE-ANALYSIS	22208258901	UPA-SB-1 (0'-2').20220801	410-67976-1	UPA-SB-1 (18'-20').20220801	410-67976-2
Sample Date	Soil MSCs	SGW MSCs	8/22/2022	8/22/2022	12/22/2021	12/22/2021	12/22/2021	12/22/2021
PFAS (mg/kg)								
11Cl-PF3OUdS	NS	NS	0.000026 U	0.00106 U	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.000028 U	0.00106 U	—	—	—	—
DONA	NS	NS	0.000026 U	0.00106 U	—	—	—	—
HFPODA	NS	NS	0.00023 U	0.00212 U	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.000026 U	0.00106 U	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.000036 U	0.00106 U	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.00042 U	0.00106 U	ND	0.00047 U	ND	0.00048 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	0.000028 U	0.00106 U	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.000027 U	0.00106 U	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	0.000028 U	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.000022 U	0.00106 U	**0.0024**	**0.0024**	ND	0.00024 U
Perfluorohexanoic acid	NS	NS	0.000022 U	0.00106 U	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	0.000027 U	0.00106 U	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	0.00106 U	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.00025**	**0.000143 J**	**0.058**	**0.058**	ND	0.00024 U
Perfluorooctanoic acid	4.4	0.007	**0.000046 J**	0.00106 U	**0.00057**	**0.00057 J**	ND	0.00024 U st5-
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.000028 U	0.00106 U	—	—	—	—
Perfluorotridecanoic acid	NS	NS	0.000024 U	0.00106 U	—	—	—	—
Perfluoroundecanoic acid	NS	NS	0.000065 U	0.00106 U	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPA-SB-2 DEP	UPA-SB-2 PSU	UPA-SB-2 PSU DUP	UPA-SB-2 DEP	UPA-SB-2 PSU	UPA-SB-3 DEP	UPA-SB-3 PSU	UPA-SB-3 PSU
Sample Depth (ft bgs)	PADEP	PADEP	0-2	0-2	0-2	18-20	18-20	0-2	0-2	16.5-18.5
Lab Sample ID	RDC 0-15	RUA 100x	UPA-SB-2 (0'-2').20220801	410-67976-3	410-67976-4	UPA-SB-2(18'-20').20220801	410-67976-5	UPA-SB-3(0'-2').20220801	410-67976-6	410-67976-7
Sample Date	Soil MSCs	SGW MSCs	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—	—
HFPODA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	ND	0.00045 U	0.00045 U	ND	0.00052 U	ND	0.00045 U	0.00042 U st5-
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	**0.0013**	**0.0007**	**0.0013**	**0.00066**	**0.00066 J**	**0.0011**	**0.0011**	0.00021 U st5-
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.08**	**0.04**	**0.08**	**0.0014**	**0.0014**	**0.00049**	**0.00049 J**	0.00021 U st5-
Perfluorooctanoic acid	4.4	0.007	**0.00042**	**0.00033 J**	**0.00042 J**	ND	0.00026 U	**0.00032**	**0.00032 J**	0.00021 U st5-
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPA-SB-3 DEP	UPA-SB-4 DEP	UPA-SB-4 PSU	UPA-SB-4 DEP	UPA-SB-4 PSU	UPA-SB-5 PSU	UPA-SB-5 DEP
Sample Depth (ft bgs)	PADEP	PADEP	18-20	0-2	0-2	18-20	18-20	0-2	18-20
Lab Sample ID	RDC 0-15	RUA 100x	UPA-SB-3(18'-20').20220801	UPA-SB-4(0'-2').20220801	410-67976-8	UPA-SB-4(18'-20').20220801	410-67976-9	410-67976-10	UPA-SB-5(18'-20').20220801
Sample Date	Soil MSCs	SGW MSCs	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021	12/21/2021
PFAS (mg/kg)									
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—
HFPODA	NS	NS	—	—	—	—	—	—	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	ND	ND	0.00042 U	ND	0.00051 U	0.00048 U	ND
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	ND	**0.0035**	**0.0035**	ND	0.00025 U	**0.00044 J**	ND
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	ND	**0.068**	**0.068**	ND	0.00025 U	**0.0012**	ND
Perfluorooctanoic acid	4.4	0.007	ND	**0.00058**	**0.00058 J**	ND	0.00025 U	0.00024 U st5-	ND
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—
PFECA A	NS	NS	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPA-SB-5 PSU	UPA-SB-6 DEP	UPA-SB-6 PSU	UPA-SB-6 DEP	UPA-SB-6 PSU	UPASWArea01 DEP	UPASWArea01 PSU	UPASWArea02 DEP
Sample Depth (ft bgs)	PADEP	PADEP	18-20	0-2	0-2	18-20	18-20	0.5-2	0.5-2	0.5-2
Lab Sample ID	RDC 0-15	RUA 100x	410-67976-11	UPA-SB-6(0'-2').20220801	410-67976-12	UPA-SB-6(18'-20').20220801	410-67976-13	22208258904	410-95230-13	22208258903
Sample Date	Soil MSCs	SGW MSCs	12/21/2021	12/22/2021	12/22/2021	12/22/2021	12/22/2021	8/22/2022	8/22/2022	8/22/2022
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	0.00121 U	0.000029 U	0.00101 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	0.00121 U	0.000032 U	0.00101 U
DONA	NS	NS	—	—	—	—	—	0.00121 U	0.000029 U	0.00101 U
HFPODA	NS	NS	—	—	—	—	—	0.00242 U	0.00026 U	0.00202 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	0.00121 U	0.000029 U	0.00101 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	0.00121 U	0.00041 U	0.00101 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.00048 U	ND	0.00046 U	ND	0.00049 U	**0.000035 J**	0.00048 U	0.00101 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	**0.000388 J**	**0.00018**	0.00101 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	**0.00008 J**	**0.000031 J**	0.00101 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	**0.00023**	—
Perfluorohexanesulfonic acid	NS	NS	0.00024 U	**0.0016**	**0.0016**	**0.00036**	**0.00036 J**	**0.000761 J**	**0.00037**	0.00101 U
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	**0.000399 J**	**0.00022**	**0.000029 J**
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—	—	—	**0.000294 J**	**0.00015**	**0.000028 J**
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	0.00121 U	—	0.00101 U
Perfluorooctanesulfonic acid	4.4	0.007	0.00024 U	**0.075**	**0.075**	**0.0097**	**0.0097**	**0.00625**	**0.0025**	**0.000214 J**
Perfluorooctanoic acid	4.4	0.007	0.00024 U st5-	**0.00091**	**0.00091**	ND	0.00025 U	**0.00217**	**0.00088**	**0.000109 J**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	**0.000031 J**	0.000032 U	0.00101 U
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	0.00121 U	0.000028 U	0.00101 U
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	**0.000063 J**	0.000074 U	0.00101 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPASWArea02 PSU	UPASWArea02 PSU	UPASWArea02 DUP	UPASWArea03 DEP	UPASWArea03 PSU	Vacant Lot-09	Vacant Lot-09	Walnut Grove Row-02
Sample Depth (ft bgs)	PADEP	PADEP	0.5-2	0.5-2	0.5-2	0.5-2	0.5-2	0-2	6-8	0-2
Lab Sample ID	RDC 0-15	RUA 100x	410-95230-12	410-95230-12 RE-ANALYSIS	22208258908	22208258905	410-95230-14	410-117577-18	410-117577-19	410-74072-3
Sample Date	Soil MSCs	SGW MSCs	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	3/2/2023	3/2/2023	2/22/2022
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	0.000024 U	0.000024 U	**0.00103**	0.00106 U	0.000025 U	0.00065 U	0.00088 U	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	0.000026 U	0.000027 U	**0.00103**	0.00106 U	0.000027 U	0.0022 U	0.0029 U	—
DONA	NS	NS	0.000024 U	0.000024 U	**0.00103**	0.00106 U	0.000025 U	0.0033 U	0.0044 U	—
HFPODA	NS	NS	0.00022 U	0.00022 U	**0.00206**	0.00212 U	0.00022 U	0.0022 U	0.0029 U	—
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	0.000024 U	0.000024 U	**0.00103**	0.00106 U	0.000025 U	0.0022 U	0.0029 U	—
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	0.000034 U	0.000034 U	**0.00103**	0.00106 U	0.000035 U	0.0022 U	0.0029 U	—
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0004 U	0.0004 U	**0.00103**	0.00106 U	0.0004 U	0.0022 U	0.0029 U	0.0023 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	0.000026 U	0.000027 U	**0.00103**	**0.000096 J**	**0.00012**	0.00065 U	0.00088 U	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	0.000025 U	0.000025 U	**0.00103**	**0.000032 J**	**0.000035 J**	0.00065 U	0.00088 U	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	**0.000026 J**	**0.00004 J**	—	—	**0.00013**	0.00065 U	0.00088 U	—
Perfluorohexanesulfonic acid	NS	NS	0.000021 U	**0.000026 J**	**0.00103**	**0.000034 J**	**0.00003 J**	**0.00037 J**	0.00088 U	0.00069 U
Perfluorohexanoic acid	NS	NS	**0.000039 J**	**0.000047 J**	**0.000041**	**0.000096 J**	**0.00017**	0.00065 U	0.00088 U	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	0.000025 U	**0.000031 J**	**0.000029**	**0.000084 J**	**0.000091**	0.00065 U	0.00088 U	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	**0.00103**	0.00106 U	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	**0.00014**	**0.00024**	**0.00022**	**0.00137**	**0.0015**	**0.0012**	**0.0012**	0.00069 U
Perfluorooctanoic acid	4.4	0.007	**0.000088**	**0.00014**	**0.000114**	**0.000502 J**	**0.00047**	**0.00027 J**	0.00088 U	0.00069 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	0.000026 U	0.000027 U	**0.00103**	0.00106 U	0.000027 U	0.00065 U	0.00088 U	—
Perfluorotridecanoic acid	NS	NS	0.000023 U	0.000023 U	**0.00103**	0.00106 U	0.000023 U	0.00065 U	0.00088 U	—
Perfluoroundecanoic acid	NS	NS	0.000062 U	0.000062 U	**0.00103**	**0.000025 J**	0.000062 U	0.00065 U	0.00088 U	—
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			Walnut Grove Row-02	WGSS-1	WGSS-2	WGSS-3	WGSS-4	WGSS-5	WGSS-6	WGSS-7
Sample Depth (ft bgs)	PADEP	PADEP	8-8.4	0.25-1.0	0.2-1.8	0.3-1.5	0.4-1.25	0.3-2.0	0.25-2.0	0.25-2.0
Lab Sample ID	RDC 0-15	RUA 100x	410-74072-4	WGSS-1.20230718	WGSS-2.20230718	WGSS-3.20230718	WGSS-4.20230718	WGSS-5.20230718	WGSS-6.20230718	WGSS-7.20230718
Sample Date	Soil MSCs	SGW MSCs	2/22/2022	7/18/2023	7/18/2023	7/18/2023	7/18/2023	7/18/2023	7/18/2023	7/18/2023
PFAS (mg/kg)										
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—	—	—	—	—	—
3:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—
5:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—
7:3 FTCA	NS	NS	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—
DONA	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
HFPODA	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
NEtFOSA	NS	NS	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
NEtFOSE	NS	NS	—	—	—	—	—	—	—	—
NMeFOSA	NS	NS	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
NMeFOSE	NS	NS	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	66	1	0.0021 U	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorohexanesulfonic acid	NS	NS	0.00064 U	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorohexanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—	—	—	—	—	—
Perfluorononanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—	—	—	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	0.00064 U	0.00025 U	0.00024 U	**0.0017**	0.00024 U	**0.00046**	**0.00042**	0.00023 U
Perfluorooctanoic acid	4.4	0.007	0.00064 U	0.00025 U	0.00024 U	0.00023 U	0.00024 U	**0.00025**	**0.00027**	0.00023 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluorotridecanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
Perfluoroundecanoic acid	NS	NS	—	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00023 U
PFECA A	NS	NS	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—
PFECA F	NS	NS	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—

Notes:
Notes included on final page of table.

Table A1. Summary of Soil PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			WGSS-8	WGSS-9
Sample Depth (ft bgs)	PADEP	PADEP	0.25-2.0	0.25-1.5
Lab Sample ID	RDC 0-15	RUA 100x	WGSS-8.20230718	WGSS-9.20230718
Sample Date	Soil MSCs	SGW MSCs	7/18/2023	7/18/2023
PFAS (mg/kg)				
11Cl-PF3OUdS	NS	NS	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—
3:3 FTCA	NS	NS	—	—
4:2 FTS	NS	NS	—	—
5:3 FTCA	NS	NS	—	—
6:2 FTS	NS	NS	—	—
7:3 FTCA	NS	NS	—	—
9Cl-PF3ONS	NS	NS	—	—
DONA	NS	NS	0.00027 U	0.00027 U
HFPODA	NS	NS	0.00027 U	0.00027 U
NEtFOSA	NS	NS	—	—
NEtFOSAA	NS	NS	0.00027 U	0.00027 U
NEtFOSE	NS	NS	—	—
NMeFOSA	NS	NS	—	—
NMeFOSAA	NS	NS	0.00027 U	0.00027 U
NMeFOSE	NS	NS	—	—
Perfluorobutanesulfonic acid	66	1	0.00027 U	0.00027 U
Perfluorobutanoic acid	NS	NS	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—
Perfluorodecanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—
Perfluorododecanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—
Perfluoroheptanoic acid	NS	NS	—	—
Perfluorohexanesulfonic acid	NS	NS	0.00027 U	0.00027 U
Perfluorohexanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—
Perfluorononanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—
Perfluorooctanesulfonic acid	4.4	0.007	0.00027 U	**0.0015**
Perfluorooctanoic acid	4.4	0.007	0.00027 U	**0.000045**
Perfluoropentanesulfonic acid	NS	NS	—	—
Perfluoropentanoic acid	NS	NS	—	—
Perfluorotetradecanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluorotridecanoic acid	NS	NS	0.00027 U	0.00027 U
Perfluoroundecanoic acid	NS	NS	0.00027 U	0.00027 U
PFECA A	NS	NS	—	—
PFECA B	NS	NS	—	—
PFECA F	NS	NS	—	—
PFEESA	NS	NS	—	—

Notes:

PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium Specific Concentrations.
RDC = Residential Direct Contact.
RUA = Residential Used Aquifer.
SGW = Soil to Groundwater.
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
Boxed concentrations exceed the PADEP RDC 0-15 ft bgs Soil MSCs.
Shaded concentrations exceed the PADEP RUA 100xGW MSCs.
Bold = Detected concentration.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
! = Laboratory is not accredited for this parameter.
B = Analyte also detected in the laboratory blank.
F2 = MS/MSD RPD exceeds control limits.
F = The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
FL = MS and/or MSD recovery below control limits.
I = Value is EMPC (estimated maximum possible concentration).
st- = LCS and/or LCSD is outside acceptance limits, low biased.
st5- = Isotope dilution analyte is outside acceptance limits, low biased.

APPENDIX A – Table A2

Summary of Asphalt PFAS Sampling Results

Table A2. Summary of Asphalt PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			C-3	C-6	C-7	C-9	C-11	C-12	C-14	C-1-B	C-10-B	C-13-B	C-15-B
Sample Depth (ft bgs)	PADEP	PADEP	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Lab Sample ID	RDC 0-15	RUA 100x	L2526514-03	L2526514-06	L2526514-07	L2526514-09	L2526514-11	L2526514-12	L2526514-14	L2526514-01	L2526514-10	L2526514-13	L2526514-15
Sample Date	Soil MSCs	SGW MSCs	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025
PFAS (mg/kg)													
11Cl-PF3OUdS	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
3:3 FTCA	NS	NS	0.000988 U	0.000996 U	0.000945 U	0.000921 U	0.000956 U	0.000984 U	0.000914 U	0.00096 U	0.000965 U	0.000969 U	0.000976 U
4:2 FTS	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
5:3 FTCA	NS	NS	0.00494 U	0.00498 U	0.00472 U	0.0046 U	0.00483 U	0.00492 U	0.00457 U	0.0048 U	0.00483 U	0.00484 U	0.00488 U
6:2 FTS	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
7:3 FTCA	NS	NS	0.00494 U	0.00498 U	0.00472 U	0.0046 U	0.00478 U	0.00492 U	0.00457 U	0.0048 U	0.00483 U	0.00484 U	0.00488 U
9Cl-PF3ONS	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
DONA	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
HFPODA	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
NEtFOSA	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
NEtFOSAA	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
NEtFOSE	NS	NS	0.00198 U	0.00199 U	0.00189 U	0.00184 U	0.00191 U	0.00197 U	0.00183 U	0.00192 U	0.00193 U	0.00194 U	0.00195 U
NMeFOSA	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
NMeFOSAA	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
NMeFOSE	NS	NS	0.00198 U	0.00199 U	0.00189 U	0.00184 U	0.00191 U	0.00197 U	0.00183 U	0.00192 U	0.00193 U	0.00194 U	0.00195 U
Perfluorobutanesulfonic acid	66	1	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorobutanoic acid	NS	NS	0.00079 U	0.000797 U	0.000756 U	0.000737 U	0.000765 U	0.000787 U	0.000731 U	0.000768 U	0.000772 U	0.000775 U	0.000781 U
Perfluorodecanesulfonic acid (PFDS)	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorodecanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorododecanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluoroheptanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorohexanesulfonic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorohexanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorononanesulfonic acid (PFNS)	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorononanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorooctanesulfonic acid	4.4	0.007	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorooctanoic acid	4.4	0.007	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluoropentanesulfonic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluoropentanoic acid	NS	NS	0.000395 U	0.000398 U	0.000378 U	0.000368 U	0.000382 U	0.000394 U	0.000366 U	0.000384 U	0.000386 U	0.000388 U	0.000391 U
Perfluorotetradecanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluorotridecanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
Perfluoroundecanoic acid	NS	NS	0.000198 U	0.000199 U	0.000189 U	0.000184 U	0.000191 U	0.000197 U	0.000183 U	0.000192 U	0.000193 U	0.000194 U	0.000195 U
PFECA A	NS	NS	0.000395 U	0.000398 U	0.000378 U	0.000368 U	0.000382 U	0.000394 U	0.000366 U	0.000384 U	0.000386 U	0.000388 U	0.000391 U
PFECA B	NS	NS	0.000395 U	0.000398 U	0.000378 U	0.000368 U	0.000382 U	0.000394 U	0.000366 U	0.000384 U	0.000386 U	0.000388 U	0.000391 U
PFECA F	NS	NS	0.000395 U	0.000398 U	0.000378 U	0.000368 U	0.000382 U	0.000394 U	0.000366 U	0.000384 U	0.000386 U	0.000388 U	0.000391 U
PFEESA	NS	NS	0.000395 U	0.000398 U	0.000378 U	0.000368 U	0.000382 U	0.000394 U	0.000366 U	0.000384 U	0.000386 U	0.000388 U	0.000391 U

Notes:

PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium-Specific Concentrations.
RDC = Residential Direct Contact.
RUA = Residential Used Aquifer.
SGW = Soil to Groundwater.
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
Boxed concentrations exceed the PADEP RDC 0-15 ft bgs Soil MSCs.
Shaded concentrations exceed the PADEP RUA 100xGW MSCs.

— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
Bold = Detected concentration.

Table A2. Summary of Asphalt PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			C-2-B	C-4-B	C-5-B	C-8-B	COMP-01	COMP-02	COMP-03	TA4-1	TA4-2	TF	UPA-A1
Sample Depth (ft bgs)	PADEP	PADEP	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Lab Sample ID	RDC 0-15	RUA 100x	L2526514-02	L2526514-04	L2526514-05	L2526514-08	L2526514-16	L2526514-17	L2526514-18	L2524005-02	L2524005-03	L2524005-01	L2444776-01 R1
Sample Date	Soil MSCs	SGW MSCs	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/29/2025	4/17/2025	4/17/2025	4/17/2025	8/1/2024
PFAS (mg/kg)													
11Cl-PF3OUdS	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
3:3 FTCA	NS	NS	0.000976 U	0.000962 U	0.000976 U	0.000958 U	0.000988 U	0.000922 U	0.000984 U	0.000969 U	0.000933 U	0.000922 U	—
4:2 FTS	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
5:3 FTCA	NS	NS	0.00488 U	0.00481 U	0.00488 U	0.00479 U	0.00494 U	0.00461 U	0.00492 U	0.00484 U	0.00466 U	0.00461 U	—
6:2 FTS	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
7:3 FTCA	NS	NS	0.00488 U	0.00481 U	0.00488 U	0.00479 U	0.00494 U	0.00461 U	0.00492 U	0.00484 U	0.00466 U	0.00461 U	—
9Cl-PF3ONS	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
DONA	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
HFPODA	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
NEtFOSA	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
NEtFOSAA	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
NEtFOSE	NS	NS	0.00195 U	0.00192 U	0.00195 U	0.00192 U	0.00198 U	0.00184 U	0.00197 U	0.00194 U	0.00186 U	0.00184 U	—
NMeFOSA	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
NMeFOSAA	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
NMeFOSE	NS	NS	0.00195 U	0.00192 U	0.00195 U	0.00189 U	0.00198 U	0.00184 U	0.00197 U	0.00194 U	0.00186 U	0.00184 U	—
Perfluorobutanesulfonic acid	66	1	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	ND
Perfluorobutanoic acid	NS	NS	0.000781 U	0.000769 U	0.000781 U	0.000766 U	0.00079 U	0.000738 U	0.000787 U	0.000775 U	0.000746 U	0.000738 U	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorodecanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorododecanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluoroheptanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorohexanesulfonic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorohexanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorononanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorooctanesulfonic acid	4.4	0.007	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	ND
Perfluorooctanoic acid	4.4	0.007	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	ND
Perfluoropentanesulfonic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluoropentanoic acid	NS	NS	0.000391 U	0.000385 U	0.000391 U	0.000383 U	0.000395 U	0.000369 U	0.000394 U	0.000388 U	0.000373 U	0.000369 U	—
Perfluorotetradecanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluorotridecanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
Perfluoroundecanoic acid	NS	NS	0.000195 U	0.000192 U	0.000195 U	0.000192 U	0.000198 U	0.000184 U	0.000197 U	0.000194 U	0.000186 U	0.000184 U	—
PFECA A	NS	NS	0.000391 U	0.000385 U	0.000391 U	0.000383 U	0.000395 U	0.000369 U	0.000394 U	0.000388 U	0.000373 U	0.000369 U	—
PFECA B	NS	NS	0.000391 U	0.000385 U	0.000391 U	0.000383 U	0.000395 U	0.000369 U	0.000394 U	0.000388 U	0.000373 U	0.000369 U	—
PFECA F	NS	NS	0.000391 U	0.000385 U	0.000391 U	0.000383 U	0.000395 U	0.000369 U	0.000394 U	0.000388 U	0.000373 U	0.000369 U	—
PFEESA	NS	NS	0.000391 U	0.000385 U	0.000391 U	0.000383 U	0.000395 U	0.000369 U	0.000394 U	0.000388 U	0.000373 U	0.000369 U	—

Notes:

PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium-Specific Concentrations.
RDC = Residential Direct Contact.
RUA = Residential Used Aquifer.
SGW = Soil to Groundwater.
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
Boxed concentrations exceed the PADEP RDC 0-15 ft bgs Soil MSCs.
Shaded concentrations exceed the PADEP RUA 100xGW MSCs.

— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
Bold = Detected concentration.

Table A2. Summary of Asphalt PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID			UPA-A2	UPA-A3	UPA-A4
Sample Depth (ft bgs)	PADEP	PADEP	0-1	0-1	0-1
Lab Sample ID	RDC 0-15	RUA 100x	L2444776-02 R1	L2444776-03 R1	L2444776-04 R1
Sample Date	Soil MSCs	SGW MSCs	8/1/2024	8/1/2024	8/1/2024
PFAS (mg/kg)					
11Cl-PF3OUdS	NS	NS	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	NS	NS	—	—	—
3:3 FTCA	NS	NS	—	—	—
4:2 FTS	NS	NS	—	—	—
5:3 FTCA	NS	NS	—	—	—
6:2 FTS	NS	NS	—	—	—
7:3 FTCA	NS	NS	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—
DONA	NS	NS	—	—	—
HFPODA	NS	NS	—	—	—
NEtFOSA	NS	NS	—	—	—
NEtFOSAA	NS	NS	—	—	—
NEtFOSE	NS	NS	—	—	—
NMeFOSA	NS	NS	—	—	—
NMeFOSAA	NS	NS	—	—	—
NMeFOSE	NS	NS	—	—	—
Perfluorobutanesulfonic acid	66	1	ND	**0.000059 J**	**0.000054 J**
Perfluorobutanoic acid	NS	NS	—	—	—
Perfluorodecanesulfonic acid (PFDS)	NS	NS	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—
Perfluorododecanesulfonic acid (PFDoS)	NS	NS	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—
Perfluorohexanesulfonic acid	NS	NS	—	—	—
Perfluorohexanoic acid	NS	NS	—	—	—
Perfluorononanesulfonic acid (PFNS)	NS	NS	—	—	—
Perfluorononanoic acid	NS	NS	—	—	—
Perfluorooctanesulfonamide (PFOSA)	NS	NS	—	—	—
Perfluorooctanesulfonic acid	4.4	0.007	ND	ND	ND
Perfluorooctanoic acid	4.4	0.007	ND	ND	ND
Perfluoropentanesulfonic acid	NS	NS	—	—	—
Perfluoropentanoic acid	NS	NS	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—
PFECA A	NS	NS	—	—	—
PFECA B	NS	NS	—	—	—
PFECA F	NS	NS	—	—	—
PFEESA	NS	NS	—	—	—

Notes:

PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MSCs = Medium-Specific Concentrations.
RDC = Residential Direct Contact.
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SGW = Soil to Groundwater.
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
Boxed concentrations exceed the PADEP RDC 0-15 ft bgs Soil MSCs.
Shaded concentrations exceed the PADEP RUA 100xGW MSCs.

— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
Bold = Detected concentration.

APPENDIX B

PSW Non-POET, PSW POET, and Monitoring Well PFAS Sample Results (Tables B1, B2, B3, B4, B5 and B6)

APPENDIX B – Table B1

Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation)

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1250_BARN_DOM	1276_BARN_DOM	1276_BARN_DOM	1380_BARN_DOM	1471_BARN_DOM	1550_BARN_DOM	1667_BARN_DOM	1671_BARN_DOM	1679_BARN_DOM
Additional Information	**USEPA**	**PADEP**	**—**	**FRB1**	**Kitchen Cold Tap**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**1265986**	**22092627-02A**	**22092627-01A**	**1265987**	**1265988**	**1265989**	**1265990**	**1265991**	**1265992**
Sample Date	**MCLs**	**GW MSCs**	**2/21/2020**	**9/26/2022**	**9/26/2022**	**2/20/2020**	**2/21/2020**	**2/20/2020**	**2/20/2020**	**2/20/2020**	**2/20/2020**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
DONA	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
HFPODA	0.01	0.01	—	0.002 U	0.002 U	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	0.002 U	**0.0008 J**	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	0.002 U	**0.00083 J**	—	—	—	—	—	—
Perfluorobutanesulfonic acid	2	2	—	0.002 U	**0.0007 J**	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	0.002 U	**0.00072 J**	—	—	—	—	—	—
Perfluorohexanesulfonic acid	0.01	0.01	—	0.002 U	**0.0024**	—	—	—	—	—	—
Perfluorohexanoic acid	NS	NS	—	0.002 U	**0.0018 J**	—	—	—	—	—	—
Perfluorononanoic acid	0.01	0.01	—	0.002 U	0.002 U	—	—	—	—	—	—
Perfluorooctanesulfonic acid	0.004	0.004	0.0017 U	0.002 U	**0.00026 J**	**0.00074 J**	0.0017 U	**0.0022**	**0.0025**	**0.0018**	**0.0015 J**
Perfluorooctanoic acid	0.004	0.004	**0.0018**	0.002 U	**0.00086 J**	**0.00067 J**	0.0017 U	**0.0023**	**0.0022**	**0.0019**	**0.0016 J**
Perfluorotetradecanoic acid	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	0.002 U	0.002 U	—	—	—	—	—	—

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1681_BARN_DOM	1725_BARN_DOM	1725_BARN_DOM	1737_BARN_DOM	2255_BRNL_DOM	2255_BRNL_DOM	122_BGHL_DOM	122_BGHL_DOM	122_BGHL_DOM
Additional Information	**USEPA**	**PADEP**	**—**	**Post Treat**	**Pre Treat**	**—**	**Untreated**	**FRB1**	**Untreated**	**FRB1**	**Untreated**
Lab Sample ID	**Primary**	**RUA**	**1265993**	**0B21014-13**	**0B21014-12**	**1265996**	**22092293-01A**	**22092293-02A**	**22032056-01A**	**22032056-02A**	**23030720-01A**
Sample Date	**MCLs**	**GW MSCs**	**2/20/2020**	**2/20/2020**	**2/20/2020**	**2/20/2020**	**9/21/2022**	**9/21/2022**	**3/22/2022**	**3/22/2022**	**3/7/2023**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	—	—	—	—	**0.00094 J**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.002**	**0.00049 J**	**0.0024**	**0.0014 J**	**0.0005 J**	0.002 U	**0.00052 J**	0.002 U	**0.00074 J**
Perfluorooctanoic acid	0.004	0.004	**0.0021**	**0.00051 J**	**0.0022**	**0.0013 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	—	—	—	—	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			122_BGHL_DOM	147_BGHL_DOM	147_BGHL_DOM	147_BGHL_DOM	168_BGHL_DOM	168_BGHL_DOM	168_BGHL_DOM	168_BGHL_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	Untreated	FRB1	Untreated	FRB1	Untreated	FRB
Lab Sample ID	Primary	RUA	23030720-02A	147 Big Hollow Rd_untreated_20220526	22072573-01A	22072573-02A	22072554-01A	22072554-02A	23080645-01A	23080645-02A
Sample Date	MCLs	GW MSCs	3/7/2023	5/26/2022	7/27/2022	7/27/2022	7/27/2022	7/27/2022	8/4/2023	8/4/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	ND	0.002 U	**0.00052 J**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	ND	**0.00039 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	ND	**0.00078 J**	0.002 U	**0.00025 J**	0.002 U	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			182_BGHL_DOM	182_BGHL_DOM	182_BGHL_DOM	182_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM
Additional Information	USEPA	PADEP	Untreated	FRB	Untreated	FRB	Untreated	Untreated	FRB	Untreated
Lab Sample ID	Primary	RUA	22032055-01A	22032055-02A	23031542-01A	23031542-02A	194 Big Hollow Rd_untreated_20220420	22072630-01A	22072630-02A	22102435-01A
Sample Date	MCLs	GW MSCs	3/22/2022	3/22/2022	3/16/2023	3/16/2023	4/20/2022	7/28/2022	7/28/2022	10/25/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0004 J**	0.002 U	**0.00071 J**	0.002 U	**0.0199**	**0.007**	0.002 U	**0.0062**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	**0.00072 J**	0.002 U	**0.0064**	**0.0035**	0.002 U	**0.0031**
Perfluorohexanesulfonic acid	0.01	0.01	**0.00063 J**	0.002 U	**0.0018 J**	0.002 U	**0.009**	**0.0034**	0.002 U	**0.0037**
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	**0.0022**	0.002 U	**0.0107**	**0.0046**	0.002 U	**0.0072**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0013 J**	0.002 U	**0.0023**	0.002 U	**0.0092 +**	**0.0059 +**	0.002 U	**0.0075 +**
Perfluorooctanoic acid	0.004	0.004	**0.00059 J**	0.002 U	**0.0014 J**	0.002 U	**0.0161 +**	**0.0079 +**	0.002 U	**0.0084 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	0.002 U

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Bold = Detected concentration.
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ND = Not detected.
NS = No standard currently established.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	194_BGHL_DOM	288_BGHL_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	RO, Post-Treatment	FRB	Pre-Treatment	Mid-point	Post-Treatment	FRB	Untreated
Lab Sample ID	Primary	RUA	22102435-02A	23090216-03A	23090216-01A	23090216-04A	3K02461_Pre Treat	3K02461_Mid-point	3K02461_Post Treat	3K02461_FRB	22032137-01A
Sample Date	MCLs	GW MSCs	10/25/2022	9/1/2023	9/1/2023	9/1/2023	11/1/2023	11/1/2023	11/1/2023	11/1/2023	3/23/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00161 U	0.00168 U	0.00164 U	0.00167 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00159 U	0.00166 U	0.00162 U	0.00165 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00161 U	0.00168 U	0.00164 U	0.00167 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.012**	0.002 U	0.002 U	**0.00515**	0.00157 U	0.00154 U	0.00156 U	**0.00077 J**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0037**	0.002 U	0.002 U	**0.00175**	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.0054**	0.002 U	0.002 U	**0.00372**	0.00162 U	0.00159 U	0.00162 U	**0.0073**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0074**	0.002 U	0.002 U	**0.0029**	0.00177 U	0.00174 U	0.00177 U	**0.0011 J**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 B3 U	0.00174 B3 U	0.00177 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.0069 +**	0.002 U	0.002 U	**0.00608 +**	0.00164 B3 U	0.00161 B3 U	0.00163 U	**0.0078 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.01 +**	0.002 U	0.002 U	**0.00474 +**	0.00177 U	0.00174 U	0.00177 U	**0.00087 J**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0017 U	0.00177 U	0.00174 U	0.00177 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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— = Sample not analyzed.
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U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM	288_BGHL_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Untreated	FRB	Untreated	Post-Treatment	FRB	Pre-Treatment
Lab Sample ID	Primary	RUA	22032137-02A	22102434-01A	22102434-02A	23021194-01A	23021194-02A	23091817-02A	23091817-01A	23091817-03A	HN2408116-003
Sample Date	MCLs	GW MSCs	3/23/2022	10/25/2022	10/25/2022	2/14/2023	2/14/2023	9/19/2023	9/19/2023	9/19/2023	10/21/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	—
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	—
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	—
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	**0.00041 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	**0.00069 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0014 J**	0.002 U	**0.0015 J**	0.002 U	**0.001 J**	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.00076 J**	0.002 U	**0.00072 J**	0.002 U	**0.00072 J**	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.01**	0.002 U	**0.011 +**	0.002 U	**0.011 +**	**0.00079 J**	0.002 U	**0.00896**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0017 J**	0.002 U	**0.0017 J**	0.002 U	**0.0015 J**	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.0093 +**	0.002 U	**0.01 +**	0.002 U	**0.0092 +**	0.002 U	0.002 U	**0.00831 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0011 J**	0.002 U	**0.0011 J**	0.002 U	**0.0013 J**	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID Additional Information Lab Sample ID Sample Date	USEPA Primary MCLs	PADEP RUA GW MSCs	288_BGHL_DOM Mid-point HN2408116-002 10/21/2024	288_BGHL_DOM Post-Treatment HN2408116-001 10/21/2024	338_BGHL_DOM Untreated 410-73989-13 2/23/2022	338_BGHL_DOM FRB 410-73989-14 2/23/2022	338_BGHL_DOM Pre-Treatment 22102437-03A 10/25/2022	338_BGHL_DOM POU Kitchen GAC, Post-Treatment 22102437-01A 10/25/2022	338_BGHL_DOM FRB 22102437-02A 10/25/2022	338_BGHL_DOM FRB 22102437-04A 10/25/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	—	—	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	—	—	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	—	—	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	**0.0011 J**	0.0019 U	**0.0011 J**	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	**0.00059 J**	0.0019 U	**0.00071 J**	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	**0.012 +**	0.0019 U	**0.012 +**	**0.00073 J**	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	**0.0013 J**	0.0019 U	**0.0018 J**	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	**0.0077 +**	0.0019 U	**0.01 +**	**0.00049 J**	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	**0.0012 J**	0.0019 U	**0.0011 J**	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM	338_BGHL_DOM
Additional Information	USEPA	PADEP	Pre-Treatment	GAC Kitchen Tap POU, Post-Treatment	FRB	FRB	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	23011858-03A	23011858-01A	23011858-02A	23011858-04A	23050555-01A	23050555-02A	23080647-01A	23080647-02A
Sample Date	MCLs	GW MSCs	1/24/2023	1/24/2023	1/24/2023	1/24/2023	5/3/2023	5/3/2023	8/4/2023	8/4/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00084 J**	**0.00071 J**	0.002 U	0.002 U	**0.00096 J**	0.002 U	**0.0011 J**	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0006 J**	**0.00051 J**	0.002 U	0.002 U	**0.00096 J**	0.002 U	**0.00053 J**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.01**	**0.0077**	0.002 U	0.002 U	**0.01**	0.002 U	**0.011 +**	0.002 U
Perfluorohexanoic acid	NS	NS	**0.0017 J**	**0.0012 J**	0.002 U	0.002 U	**0.0019 J**	0.002 U	**0.0015 J**	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0074 +**	**0.0054 +**	0.002 U	0.002 U	**0.0076 +**	0.002 U	**0.0091 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	**0.0011 J**	**0.00083 J**	0.002 U	0.002 U	**0.0012 J**	0.002 U	**0.0013 J**	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			480_BGHL_DOM	480_BGHL_DOM	480_BGHL_DOM	480_BGHL_DOM	480_BGHL_DOM	480_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM
Additional Information	USEPA	PADEP	Untreated	FRB1	Untreated	FRB1	Untreated	FRB	Untreated	FRB	Untreated
Lab Sample ID	Primary	RUA	22032042-01A	22032042-02A	22032139-01A	22032139-02A	23030723-01A	23030723-02A	22032053-01A	22032053-02A	22111141-01A
Sample Date	MCLs	GW MSCs	3/22/2022	3/22/2022	3/23/2022	3/23/2022	3/7/2023	3/7/2023	3/22/2022	3/22/2022	11/9/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0004 J**	0.002 U	**0.0022**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0054**
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0072**
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.011**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	**0.00027 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0042 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.013 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	754_BGHL_DOM	786_BGHL_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Untreated	FRB	Untreated	FRB	Untreated	Untreated
Lab Sample ID	Primary	RUA	22111141-02A	23020669-01A	23020669-02A	23050554-01A	23050554-02A	23070545-01A	23070545-02A	23070545-01A	22032149-01A
Sample Date	MCLs	GW MSCs	11/9/2022	2/7/2023	2/7/2023	5/3/2023	5/3/2023	7/6/2023	7/6/2023	7/6/2023	3/23/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0013 J**	0.002 U	**0.00094 J**	0.002 U	**0.0015 J**	0.002 U	**0.0015 J**	**0.0015 J**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0021**	0.002 U	**0.0018 J**	0.002 U	**0.0024**	0.002 U	**0.0024**	**0.0046**
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.0027**	0.002 U	**0.0021**	0.002 U	**0.0035**	0.002 U	**0.0035**	**0.0046**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.005**	0.002 U	**0.0037**	0.002 U	**0.0061**	0.002 U	**0.0061**	**0.0099**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.0015 J**	0.002 U	**0.00099 J**	0.002 U	**0.0024**	0.002 U	**0.0024**	**0.0043 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0047 +**	0.002 U	**0.0036**	0.002 U	**0.0066 +**	0.002 U	**0.0066 +**	**0.011 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

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+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_DOM	786_BGHL_DOM	786_BGHL_DOM	135_BLOM_DOM	145_BLOM_DOM	1996_BUFR_DOM	1996_BUFR_DOM	2092_BUFR_DOM	2092_BUFR_DOM
Additional Information	USEPA	PADEP	FRB	FRB	Kitchen Cold Tap, Other	Untreated	—	Untreated	FRB1	Untreated	FRB1
Lab Sample ID	Primary	RUA	22032149-02A	22092626-02A	22092626-01A	22092414-01A	1288094	22092411-01A	22092411-02A	22091404-01A	22091404-02A
Sample Date	MCLs	GW MSCs	3/23/2022	9/26/2022	9/26/2022	9/22/2022	3/24/2020	9/22/2022	9/22/2022	9/13/2022	9/13/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	**0.0018 J**	**0.00039 J**	—	**0.0004 J**	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	**0.0054**	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	**0.0059**	**0.00036 J**	—	0.002 U	0.002 U	**0.00039 J**	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	**0.012**	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	**0.00067 J**	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	**0.0042 +**	**0.00044 J**	**0.00076 J**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	**0.014 +**	0.002 U	0.0019 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	—	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
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MCL = Maximum Contaminant Level.
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+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
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U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2748_BUFR_DOM	2748_BUFR_DOM	2748_BUFR_DOM	2748_BUFR_DOM	1028_ELMN_DOM	1036_ELMN_DOM	1180_ELMN_DOM	1154_ELMN_DOM	1154_ELMN_FRB
Additional Information	USEPA	PADEP	Untreated	FRB1	Untreated	FRB	—	—	—	—	—
Lab Sample ID	Primary	RUA	22092281-01A	22092281-02A	23050560-01A	23050560-02A	3K01202-01	3J05235-01	3J05289-01	3K01204-01	3K01204-02
Sample Date	MCLs	GW MSCs	9/21/2022	9/21/2022	5/3/2023	5/3/2023	11/1/2023	11/1/2023	11/1/2023	11/1/2023	11/1/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00164 U	0.00172 U	0.00166 U	0.00167 U	0.00166 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00162 U	0.0017 U	0.00164 U	0.00165 U	0.00165 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00164 U	0.00172 U	0.00166 U	0.00167 U	0.00166 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorobutanesulfonic acid	2	2	**0.0011 J**	0.002 U	**0.00067 J**	0.002 U	0.00154 U	0.00161 U	0.00155 U	0.00156 U	0.00156 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluoroheptanoic acid	NS	NS	**0.0013 J**	0.002 U	**0.0013 J**	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0039**	0.002 U	**0.0034**	0.002 U	0.00159 U	0.00166 U	0.00161 U	0.00162 U	0.00161 U
Perfluorohexanoic acid	NS	NS	**0.0029**	0.002 U	**0.0027**	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00078 J**	0.002 U	**0.00059 J**	0.002 U	0.00161 U	0.00168 U	0.00162 U	**0.00168**	0.00163 U
Perfluorooctanoic acid	0.004	0.004	**0.0026**	0.002 U	**0.0026**	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.00174 U	0.00182 U	0.00175 U	0.00177 U	0.00176 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1250_ELMN_DOM	1250_ELMN_FRB	153_FRHL_DOM	153_FRHL_DOM	50_FRHL_DOM	50_FRHL_DOM	84_FRHL_DOM	84_FRHL_DOM	1000_FLMR_DOM
Additional Information	USEPA	PADEP	—	—	Untreated	FRB1	Untreated	FRB1	Untreated	FRB	FRB1
Lab Sample ID	Primary	RUA	3J05288-01	3J05288-02	22032304-01A	22032304-02A	22032310-01A	22032310-02A	23091812-01A	23091812-02A	410-73989-12
Sample Date	MCLs	GW MSCs	11/1/2023	11/1/2023	3/24/2022	3/24/2022	3/24/2022	3/24/2022	9/19/2023	9/19/2023	2/23/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00168 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00166 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
DONA	NS	NS	0.00168 U	0.00168 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
HFPODA	0.01	0.01	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
NEtFOSAA	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
NMeFOSAA	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00157 U	**0.00033 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorodecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluoroheptanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00162 U	0.00162 U	**0.00084 J**	0.002 U	**0.00044 J**	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorohexanoic acid	NS	NS	**0.00249**	0.00177 U	**0.00067 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00164 U	0.00164 U	0.002 U	0.002 U	**0.00027 J**	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorooctanoic acid	0.004	0.004	**0.00288**	0.00177 U	**0.00058 J**	0.002 U	**0.00073 J**	0.002 U	**0.00057 J**	0.002 U	0.0018 U
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U

Notes:
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1000_FLMR_DOM	1004_FLMR_DOM	1004_FLMR_DOM	1667_FXHL_DOM	1667_FXHL_DOM	1667_FXHL_DOM	2178_HITC_DOM
Additional Information	USEPA	PADEP	Kitchen Tap	Untreated	FRB1	Untreated	FRB2	Well Hydrant	Pre-filter/Water Softener, Matreya
Lab Sample ID	Primary	RUA	410-73989-11	22032151-01A	22032151-02A	1667 Fox Hill Rd_untreated_20220526	22092930-02A	22092930-01A	High Tech Rd_pre-filter/water softener, matreya_2019
Sample Date	MCLs	GW MSCs	2/23/2022	3/23/2022	3/23/2022	5/26/2022	9/28/2022	9/28/2022	11/21/2019
PFAS (µg/l)									
11Cl-PF3OUdS	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
9Cl-PF3ONS	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
DONA	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
HFPODA	0.01	0.01	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
NEtFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
NMeFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluorobutanesulfonic acid	2	2	**0.00054 J**	**0.00046 J**	0.002 U	ND	0.002 U	0.002 U	**0.0064**
Perfluorodecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluorododecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluoroheptanoic acid	NS	NS	**0.00048 J**	0.002 U	0.002 U	ND	0.002 U	0.002 U	**0.0055**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0022**	**0.0016 J**	0.002 U	ND	0.002 U	**0.0014 J**	**0.0757 +**
Perfluorohexanoic acid	NS	NS	**0.0015 J**	**0.0014 J**	0.002 U	ND	0.002 U	**0.0016 J**	**0.0104**
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluorooctanesulfonic acid	0.004	0.004	0.0018 U	**0.00023 J**	0.002 U	ND	0.002 U	**0.00063 J**	**0.1246 +**
Perfluorooctanoic acid	0.004	0.004	**0.0016 J**	**0.0013 J**	0.002 U	ND	0.002 U	**0.0017 J**	**0.014 +**
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U	ND

Notes:
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2178_HITC_DOM	2178_HITC_DOM	2190_HITC_DOM	2190_HITC_DOM	2190_HITC_DOM	2190_HITC_DOM	2197_HITC_DOM
Additional Information	USEPA	PADEP	FRB2	Pressure Tank	Untreated	FRB1	Untreated	FRB2	Handy Delivery Kitchen Sink
Lab Sample ID	Primary	RUA	22092629-02A	22092629-01A	410-73989-9	410-73989-10	22041808-01A	22041808-02A	2197 High Tech Rd_Handy Delivery Kitchen Sink_20191121
Sample Date	MCLs	GW MSCs	9/26/2022	9/26/2022	2/22/2022	2/22/2022	4/19/2022	4/19/2022	11/21/2019
PFAS (µg/l)									
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
DONA	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
HFPODA	0.01	0.01	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
NEtFOSAA	NS	NS	**0.00045 J**	**0.00045 J**	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
NMeFOSAA	NS	NS	**0.00059 J**	**0.00057 J**	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0039**	**0.0055**	0.0018 U	**0.0046**	0.002 U	**0.0059**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0046**	**0.0031**	0.0018 U	**0.0042**	0.002 U	**0.0047**
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.039 +**	**0.062 +**	0.0018 U	**0.046 +**	0.002 U	**0.0666 +**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0082**	**0.0066**	0.0018 U	**0.012**	0.002 U	**0.0093**
Perfluorononanoic acid	0.01	0.01	0.002 U	**0.0011 J**	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.057 +**	**0.041 +**	0.0018 U	**0.039 +**	0.002 U	**0.1003 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.01 +**	**0.0054 +**	0.0018 U	**0.0052 +**	0.002 U	**0.0118 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND

Notes:
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			2197_HITC_DOM	2197_HITC_DOM	500_KRIS_DOM	500_KRIS_DOM	525_KRIS_DOM	525_KRIS_DOM	549_KRIS_DOM	549_KRIS_DOM	1412_MAJV_DOM
Additional Information	USEPA	PADEP	FRB2	Outdoor Spigot	Untreated	FRB1	FRB	Spigot	Untreated	FRB1	Untreated
Lab Sample ID	Primary	RUA	22092625-02A	22092625-01A	22032159-01A	22032159-02A	O2022000726	O2022000725	22091396-01A	22091396-02A	22032016-01A
Sample Date	MCLs	GW MSCs	9/26/2022	9/26/2022	3/23/2022	3/23/2022	2/23/2022	2/23/2022	9/13/2022	9/13/2022	3/22/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0037 U	0.0034 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0036 U	0.0034 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0037 U	0.0034 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0028**	0.002 U	0.002 U	0.0034 U	0.0032 U	0.002 U	0.002 U	**0.0071**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0015 J**	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	**0.0059**
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.0028**	0.002 U	0.002 U	0.0036 U	0.0033 U	0.002 U	0.002 U	**0.074 +**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0033**	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	**0.013**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.0065 +**	0.002 U	0.002 U	0.0036 U	0.0033 U	0.002 U	**0.00036 J**	**0.12 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0026**	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	**0.0063 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0039 U	0.0036 U	0.002 U	0.002 U	0.002 U

Notes:
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MCL = Maximum Contaminant Level.
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ft bgs = Feet below ground surface.
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Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1412_MAJV_DOM	1413_MAJV_DOM	1413_MAJV_DOM	1418_MAJV_DOM	1418_MAJV_DOM	1419_MAJV_DOM	1419_MAJV_DOM	1424_MAJV_DOM	1424_MAJV_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Untreated	FRB	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	22032016-02A	22032144-01A	22032144-02A	22032138-01A	22032138-02A	22032033-01A	22032033-02A	22032136-01A	22032136-02A
Sample Date	MCLs	GW MSCs	3/22/2022	3/23/2022	3/23/2022	3/23/2022	3/23/2022	3/22/2022	3/22/2022	3/23/2022	3/23/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0039**	0.002 U	**0.0042**	0.002 U	**0.0074**	0.002 U	**0.0043**	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0032**	0.002 U	**0.0046**	0.002 U	**0.0053**	0.002 U	**0.0035**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.038 +**	0.002 U	**0.045 +**	0.002 U	**0.075 +**	0.002 U	**0.057 +**	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0063**	0.002 U	**0.0091**	0.002 U	**0.011**	0.002 U	**0.007**	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00024 J**	**0.098 +**	0.002 U	**0.077 +**	0.002 U	**0.15 +**	0.002 U	**0.081 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0047 +**	0.002 U	**0.0081 +**	0.002 U	**0.007 +**	0.002 U	**0.0053 +**	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID Additional Information Lab Sample ID Sample Date	USEPA Primary MCLs	PADEP RUA GW MSCs	1425_MAJV_DOM Untreated 22032030-01A 3/22/2022	1425_MAJV_DOM FRB 22032030-02A 3/22/2022	1425_MAJV_DOM FRB 22101949-02A 10/19/2022	1425_MAJV_DOM Pressure Tank, Other 22101949-01A 10/19/2022	1430_MAJV_DOM Untreated 22032311-01A 3/24/2022	1430_MAJV_DOM FRB 22032311-02A 3/24/2022	1430_MAJV_DOM 2, Domestic 22041806-01A 4/19/2022	1430_MAJV_DOM FRB 22041806-02A 4/19/2022	1431_MAJV_DOM Untreated 22072628-01A 7/28/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0032**	0.002 U	0.002 U	**0.0035**	**0.0049**	0.002 U	0.002 U	0.002 U	**0.003**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0028**	0.002 U	0.002 U	**0.0028**	**0.007**	0.002 U	0.002 U	0.002 U	**0.0032**
Perfluorohexanesulfonic acid	0.01	0.01	**0.023 +**	0.002 U	0.002 U	**0.034 +**	**0.058 +**	0.002 U	0.002 U	0.002 U	**0.013 +**
Perfluorohexanoic acid	NS	NS	**0.0059**	0.002 U	0.002 U	**0.0061**	**0.012**	0.002 U	**0.0016 J**	0.002 U	**0.007**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.033 +**	0.002 U	0.002 U	**0.045 +**	**0.12 +**	0.002 U	0.002 U	0.002 U	**0.013 +**
Perfluorooctanoic acid	0.004	0.004	**0.0051 +**	0.002 U	0.002 U	**0.0046 +**	**0.0066 +**	0.002 U	0.002 U	0.002 U	**0.0051 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

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µg/l = Micrograms per liter.
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ND = Not detected.
NS = No standard currently established.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1431_MAJV_DOM	1431_MAJV_DOM	1431_MAJV_DOM	1436_MAJV_DOM	1436_MAJV_DOM	1437_MAJV_DOM	1437_MAJV_DOM	1442_MAJV_DOM	1442_MAJV_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Untreated	FRB	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	22072628-02A	22101952-01A	22101952-02A	22032141-01A	22032141-02A	22032142-01A	22032142-02A	22032300-01A	22032300-02A
Sample Date	MCLs	GW MSCs	7/28/2022	10/19/2022	10/19/2022	3/23/2022	3/23/2022	3/23/2022	3/23/2022	3/24/2022	3/24/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0026**	0.002 U	**0.0049**	0.002 U	**0.002 J**	0.002 U	**0.0017 J**	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0019 J**	0.002 U	**0.0051**	0.002 U	**0.0024**	0.002 U	**0.0016 J**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.019 +**	0.002 U	**0.05 +**	0.002 U	**0.02 +**	0.002 U	**0.012 +**	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0047**	0.002 U	**0.0093**	0.002 U	**0.0047**	0.002 U	**0.0035**	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.02 +**	0.002 U	**0.08 +**	0.002 U	**0.03 +**	0.002 U	**0.012 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0036**	0.002 U	**0.0053 +**	0.002 U	**0.0035**	0.002 U	**0.0026**	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1442_MAJV_DOM	1442_MAJV_DOM	1442_MAJV_DOM	1442_MAJV_DOM	1443_MAJV_DOM	1443_MAJV_DOM	1876_MILL_DOM	1876_MILL_DOM
Additional Information	USEPA	PADEP	Pre-Treatment	Post-Treatment	FRB	FRB	Untreated	FRB	Untreated	Untreated
Lab Sample ID	Primary	RUA	22091400-01A	22091400-03A	22091400-02A	22091400-04A	22032147-01A	22032147-02A	1876 Millson Cir_untreated_20220420	22072550-01A
Sample Date	MCLs	GW MSCs	9/13/2022	9/13/2022	9/13/2022	9/13/2022	3/23/2022	3/23/2022	4/20/2022	7/27/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
NEtFOSAA	NS	NS	**0.0004 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	**0.00029 J**
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.003**	**0.0015 J**	0.002 U	0.002 U	**0.0054**	0.002 U	**0.0054**	**0.0044**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0028**	**0.0012 J**	0.002 U	0.002 U	**0.0047**	0.002 U	**0.0042**	**0.0057**
Perfluorohexanesulfonic acid	0.01	0.01	**0.024 +**	**0.0061**	0.002 U	0.002 U	**0.055 +**	0.002 U	**0.0596 +**	**0.049 +**
Perfluorohexanoic acid	NS	NS	**0.0054**	**0.0037**	0.002 U	0.002 U	**0.0093**	0.002 U	**0.0069**	**0.01**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	**0.00066 J**
Perfluorooctanesulfonic acid	0.004	0.004	**0.046 +**	**0.0059 +**	0.002 U	0.002 U	**0.085 +**	0.002 U	**0.113 +**	**0.11 +**
Perfluorooctanoic acid	0.004	0.004	**0.0031**	**0.0012 J**	0.002 U	0.002 U	**0.0055 +**	0.002 U	**0.0084 +**	**0.0083 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND	0.002 U

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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1876_MILL_DOM	1877_MILL_DOM	1877_MILL_DOM	1877_MILL_DOM	1877_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Untreated	FRB	Untreated	Post Treat	Pre Treat
Lab Sample ID	Primary	RUA	22072550-02A	410-73989-3	410-73989-4	22041813-01A	22041813-02A	1882 Milson Circle_untreated_20211215	22092630-03A	22092630-01A
Sample Date	MCLs	GW MSCs	7/27/2022	2/22/2022	2/22/2022	4/19/2022	4/19/2022	12/15/2021	9/26/2022	9/26/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0034**	0.0018 U	**0.0028**	0.002 U	**0.0055**	0.002 U	**0.005**
Perfluorodecanoic acid	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0029**	0.0018 U	**0.0028**	0.002 U	ND	0.002 U	**0.0018 J**
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.036 +**	0.0018 U	**0.029 +**	0.002 U	**0.0358 +**	0.002 U	**0.031 +**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0049**	0.0018 U	**0.005**	0.002 U	**0.0044**	0.002 U	**0.0039**
Perfluorononanoic acid	0.01	0.01	0.002 U	**0.00046 J**	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.059 +**	0.0018 U	**0.059 +**	0.002 U	**0.0036**	0.002 U	**0.0033**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0087 +**	0.0018 U	**0.007 +**	0.002 U	**0.004**	0.002 U	**0.0034**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.0018 U	0.0018 U	0.002 U	0.002 U	ND	0.002 U	0.002 U

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+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1882_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM	1882_MILL_DOM	1883_MILL_DOM	1883_MILL_DOM	258_OLDF_DOM
Additional Information	USEPA	PADEP	FRB2	FRB3	Untreated	FRB	Untreated	FRB1	Untreated	FRB	Untreated
Lab Sample ID	Primary	RUA	22092630-02A	22092630-04A	23031550-01A	23031550-02A	23090217-01A	23090217-02A	22032302-01A	22032302-02A	22032046-01A
Sample Date	MCLs	GW MSCs	9/26/2022	9/26/2022	3/16/2023	3/16/2023	9/1/2023	9/1/2023	3/24/2022	3/24/2022	3/22/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	**0.0041**	0.002 U	**0.0036**	0.002 U	**0.0022**	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	**0.0016 J**	0.002 U	**0.0015 J**	0.002 U	**0.0028**	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	**0.028 +**	0.002 U	**0.032 +**	0.002 U	**0.019 +**	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	**0.0039**	0.002 U	**0.0034**	0.002 U	**0.0047**	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	**0.0031**	0.002 U	**0.0053 +**	0.002 U	**0.021 +**	0.002 U	**0.00045 J**
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	**0.0026**	0.002 U	**0.0042 +**	0.002 U	**0.0074 +**	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			258_OLDF_DOM	258_OLDF_DOM	258_OLDF_DOM	140_QUKF_DOM	140_QUKF_DOM	140_QUKF_DOM	186_QUKF_DOM	186_QUKF_DOM
Additional Information	USEPA	PADEP	FRB1	Untreated	FRB	Untreated	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	22032046-02A	23070546-01A	23070546-02A	140 Quick Farm Ln_untreated_20220526	22072508-01A	22072508-02A	23050549-01A	23050549-02A
Sample Date	MCLs	GW MSCs	3/22/2022	7/6/2023	7/6/2023	5/26/2022	7/27/2022	7/27/2022	5/3/2023	5/3/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	**0.00072 J**	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00028 J**	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	ND	0.002 U	ND	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1250_ROCK_DOM	1250_ROCK_DOM	1250_ROCK_DOM	1250_ROCK_DOM	1250_ROCK_DOM	489_ROCK_DOM	489_ROCK_DOM	577_ROCK_DOM
Additional Information	USEPA	PADEP	Untreated	Untreated	FRB	Untreated	FRB	Untreated	FRB1	—
Lab Sample ID	Primary	RUA	1250 Rock Rd_untreated_20211215	22111143-01A	22111143-02A	23090218-01A	23090218-02A	22092279-01A	22092279-02A	3J05290-01
Sample Date	MCLs	GW MSCs	12/15/2021	11/9/2022	11/9/2022	9/1/2023	9/1/2023	9/21/2022	9/21/2022	11/1/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00166 U
9Cl-PF3ONS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00164 U
DONA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00166 U
HFPODA	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
NEtFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
NMeFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluorobutanesulfonic acid	2	2	ND	**0.0024**	0.002 U	**0.001 J**	0.002 U	0.002 U	0.002 U	0.00155 U
Perfluorodecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluorododecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluoroheptanoic acid	NS	NS	ND	**0.00092 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0157 +**	**0.015 +**	0.002 U	**0.013 +**	0.002 U	0.002 U	0.002 U	0.00161 U
Perfluorohexanoic acid	NS	NS	ND	**0.003**	0.002 U	**0.00095 J**	0.002 U	**0.0013 J**	0.002 U	0.00175 U
Perfluorononanoic acid	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluorooctanesulfonic acid	0.004	0.004	ND	**0.004**	0.002 U	**0.0012 J**	0.002 U	**0.00084 J**	**0.0014 J**	0.00162 U
Perfluorooctanoic acid	0.004	0.004	ND	**0.00079 J**	0.002 U	**0.00072 J**	0.002 U	**0.00071 J**	0.002 U	0.00175 U
Perfluorotetradecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluorotridecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U
Perfluoroundecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00175 U

Notes:
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			580_ROCK_DOM	580_ROCK_DOM	582_ROCK_DOM	582_ROCK_DOM	587_ROCK_DOM	587_ROCK_DOM	587_ROCK_DOM	587_ROCK_DOM
Additional Information	USEPA	PADEP	Untreated	FRB1	Untreated	FRB1	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	22072562-01A	22072562-02A	23020670-01A	23020670-02A	23020671-01A	23020671-02A	23080642-01A	23080642-02A
Sample Date	MCLs	GW MSCs	7/27/2022	7/27/2022	2/7/2023	2/7/2023	2/7/2023	2/7/2023	8/4/2023	8/4/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00043 J**
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00032 J**	0.002 U	0.002 U	0.002 U	**0.0021**	0.002 U	**0.0013 J**	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00042 J**
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00047 J**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00059 J**	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00069 J**	0.002 U	0.002 U	0.002 U	**0.0033**	0.002 U	**0.0046 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	0.002 U	0.002 U	**0.00093 J**	0.002 U	**0.0016 J**	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1000_FLMR_DOM	1004_FLMR_DOM	1841_SBRT_DOM	1735_SHLH_DOM	1735_SHLH_DOM	1735_SHLH_DOM
Additional Information	USEPA	PADEP	Kitchen Tap	Untreated	—	Spring Basin	FRB2	FRB2
Lab Sample ID	Primary	RUA	1000 S_ Fillmore Rd_Kitchen Tap_20220223	1004 Fillmore Rd_untreated_20220323	1265997	1735 Shiloh Rd_spring basin_20211215	22100555-02A	22100557-02A
Sample Date	MCLs	GW MSCs	2/23/2022	3/23/2022	2/21/2020	12/15/2021	10/5/2022	10/5/2022
PFAS (µg/l)								
11Cl-PF3OUdS	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
DONA	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
HFPODA	0.01	0.01	ND	ND	—	ND	0.002 U	0.002 U
NEtFOSAA	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
NMeFOSAA	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00054**	ND	—	ND	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00048**	ND	—	ND	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0022**	ND	—	ND	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	**0.0015**	ND	—	ND	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	ND	ND	—	ND	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	ND	ND	0.0017 U	**0.0382 +**	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	**0.0016**	ND	**0.00098 J**	ND	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	ND	ND	—	ND	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	ND	ND	—	ND	0.002 U	0.002 U

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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1735_SHLH_DOM	1735_SHLH_DOM	1810_WALG_DOM	1810_WALG_DOM	1810_WALG_DOM	1810_WALG_DOM	1811_WALG_DOM	1811_WALG_DOM	1811_WALG_DOM
Additional Information	USEPA	PADEP	Spring Basin	Spring Basin	Untreated	FRB	Untreated	FRB	Untreated	FRB	Untreated
Lab Sample ID	Primary	RUA	22100555-01A	22100557-01A	22032140-01A	22032140-02A	22091402-01A	22091402-02A	22032158-01A	22032158-02A	22092412-01A
Sample Date	MCLs	GW MSCs	10/5/2022	10/5/2022	3/23/2022	3/23/2022	9/13/2022	9/13/2022	3/23/2022	3/23/2022	9/22/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	**0.00031 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	**0.0006 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0018 J**	**0.0016 J**	**0.0024**	0.002 U	**0.0025**	0.002 U	**0.002 J**	0.002 U	**0.0033**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00079 J**	**0.00086 J**	**0.0018 J**	0.002 U	**0.0022**	0.002 U	**0.0011 J**	0.002 U	**0.0016 J**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0019 J**	**0.0017 J**	**0.018 +**	0.002 U	**0.019 +**	0.002 U	**0.0069**	0.002 U	**0.014 +**
Perfluorohexanoic acid	NS	NS	**0.0016 J**	**0.0017 J**	**0.0039**	0.002 U	**0.0042**	0.002 U	**0.0027**	0.002 U	**0.0032**
Perfluorononanoic acid	0.01	0.01	0.002 U	**0.00094 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0037**	**0.018 +**	**0.019 +**	**0.00025 J**	**0.022 +**	**0.00032 J**	**0.0065 +**	0.002 U	**0.012 +**
Perfluorooctanoic acid	0.004	0.004	**0.0019 J**	**0.0019 J**	**0.0037**	0.002 U	**0.003**	0.002 U	**0.0019 J**	0.002 U	**0.0024**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

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ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1811_WALG_DOM	1811_WALG_DOM	1811_WALG_DOM	1811_WALG_DOM	1811_WALG_DOM	1822_WALG_DOM	1822_WALG_DOM	1822_WALG_DOM
Additional Information	USEPA	PADEP	FRB	Untreated	FRB	Outdoor Hydrant	FRB	Untreated	FRB	Untreated
Lab Sample ID	Primary	RUA	22092412-02A	23031548-01A	23031548-02A	23072260-01A	23072260-02A	22032032-01A	22032032-02A	1822 Walnut Grove Dr_untreated_20220526
Sample Date	MCLs	GW MSCs	9/22/2022	3/16/2023	3/16/2023	7/25/2023	7/25/2023	3/22/2022	3/22/2022	5/26/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluorobutanesulfonic acid	2	2	0.002 U	**0.0027**	0.002 U	**0.003**	0.002 U	**0.0039**	0.002 U	**0.0036**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluoroheptanoic acid	NS	NS	0.002 U	**0.0015 J**	0.002 U	**0.0015 J**	0.002 U	**0.0032**	0.002 U	ND
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	**0.0094**	0.002 U	**0.018 +**	0.002 U	**0.033 +**	0.002 U	**0.0304 +**
Perfluorohexanoic acid	NS	NS	0.002 U	**0.0035**	0.002 U	**0.003**	0.002 U	**0.0078**	0.002 U	**0.006**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	**0.0072 +**	0.002 U	**0.016 +**	0.002 U	**0.049 +**	0.002 U	**0.0412 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	**0.0024**	0.002 U	**0.0039**	0.002 U	**0.0054 +**	0.002 U	**0.005 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	ND

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1822_WALG_DOM	1822_WALG_DOM	1822_WALG_DOM	1822_WALG_DOMA	1828_WALG_DOM	1828_WALG_DOM	1828_WALG_DOM	1828_WALG_DOM
Additional Information	USEPA	PADEP	Pre-Treatment	Post-Treatment	FRB	FRB	Untreated	FRB	Outdoor Hydrant, Pre-Treatment	FRB
Lab Sample ID	Primary	RUA	22072549-01A	22072549-03A	22072549-02A	22072549-04A	410-73989-1	410-73989-2	22101951-01A	22101951-02A
Sample Date	MCLs	GW MSCs	7/27/2022	7/27/2022	7/27/2022	7/27/2022	2/22/2022	2/22/2022	10/19/2022	10/19/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	**0.00033 J**	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0042**	**0.00089 J**	0.002 U	0.002 U	**0.0031**	0.0019 U	**0.0031**	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.005**	**0.00077 J**	0.002 U	0.002 U	**0.003**	0.0019 U	**0.0026**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.037 +**	**0.0054**	0.002 U	0.002 U	**0.027 +**	0.0019 U	**0.025 +**	0.002 U
Perfluorohexanoic acid	NS	NS	**0.01**	**0.0026**	0.002 U	0.002 U	**0.0057**	0.0019 U	**0.006**	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.052 +**	**0.012 +**	0.002 U	0.002 U	**0.03 +**	0.0019 U	**0.033 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	**0.0059 +**	**0.0011 J**	0.002 U	0.002 U	**0.0063 +**	0.0019 U	**0.006 +**	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.0019 U	0.0019 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1829_WALG_DOM	1829_WALG_DOM	1834_WALG_DOM	1834_WALG_DOM	1835_WALG_DOM	1835_WALG_DOM	1835_WALG_DOM	1835_WALG_DOM
Additional Information	USEPA	PADEP	Untreated	FRB	Untreated	FRB	Untreated	FRB1	FRB2	Other, Outdoor Spigot
Lab Sample ID	Primary	RUA	22032148-01A	22032148-02A	22032036-01A	22032036-02A	22032145-01A	22032145-02A	22041815-02A	22041815-01A
Sample Date	MCLs	GW MSCs	3/23/2022	3/23/2022	3/22/2022	3/22/2022	3/23/2022	3/23/2022	4/19/2022	4/19/2022
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	**0.00061 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0028**	0.002 U	**0.0021**	0.002 U	**0.0033**	0.002 U	0.002 U	**0.003**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0036**	0.002 U	**0.0018 J**	0.002 U	**0.0029**	0.002 U	0.002 U	**0.0026**
Perfluorohexanesulfonic acid	0.01	0.01	**0.02 +**	0.002 U	**0.017 +**	0.002 U	**0.039 +**	0.002 U	0.002 U	**0.037 +**
Perfluorohexanoic acid	NS	NS	**0.0063**	0.002 U	**0.0044**	0.002 U	**0.0052**	0.002 U	0.002 U	**0.0048**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.028 +**	0.002 U	**0.02 +**	0.002 U	**0.057 +**	0.002 U	0.002 U	**0.048 +**
Perfluorooctanoic acid	0.004	0.004	**0.0068 +**	0.002 U	**0.004**	0.002 U	**0.0052 +**	0.002 U	0.002 U	**0.0051 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1840_WALG_DOM	1840_WALG_DOM	1840_WALG_DOM	1841_WALG_DOM	1841_WALG_DOM	1846_WALG_DOM	1846_WALG_DOM
Additional Information	USEPA	PADEP	Untreated	Post-Treatment	FRB	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	1840 Walnut Grove Dr_untreated_20211215	22080761-01A	22080761-02A	22032146-01A	22032146-02A	22041803-01A	22041803-02A
Sample Date	MCLs	GW MSCs	12/15/2021	8/5/2022	8/5/2022	3/23/2022	3/23/2022	4/19/2022	4/19/2022
PFAS (µg/l)									
11Cl-PF3OUdS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	ND	0.002 U	0.002 U	**0.00033 J**	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0048**	0.002 U	0.002 U	**0.0052**	0.002 U	**0.003**	0.002 U
Perfluorodecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	ND	0.002 U	0.002 U	**0.0027**	0.002 U	**0.0033**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0415 +**	0.002 U	0.002 U	**0.036 +**	0.002 U	**0.038 +**	0.002 U
Perfluorohexanoic acid	NS	NS	**0.0047**	0.002 U	0.002 U	**0.0064**	0.002 U	**0.0063**	0.002 U
Perfluorononanoic acid	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0255 +**	0.002 U	0.002 U	**0.032 +**	0.002 U	**0.065 +**	0.002 U
Perfluorooctanoic acid	0.004	0.004	ND	0.002 U	0.002 U	**0.0028**	0.002 U	**0.004**	0.002 U
Perfluorotetradecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1846_WALG_DOM	1846_WALG_DOM	1846_WALG_DOM	1852_WALG_DOM	1852_WALG_DOM	1853_WALG_DOM	1853_WALG_DOM
Additional Information	USEPA	PADEP	Untreated	Untreated	FRB	Untreated	FRB	Untreated	FRB
Lab Sample ID	Primary	RUA	1846 Walnut Grove Dr_untreated_20220526	22091398-01A	22091398-02A	22032034-01A	22032034-02A	410-73989-7	410-73989-8
Sample Date	MCLs	GW MSCs	5/26/2022	9/13/2022	9/13/2022	3/22/2022	3/22/2022	2/22/2022	2/22/2022
PFAS (µg/l)									
11Cl-PF3OUdS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
9Cl-PF3ONS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
DONA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
HFPODA	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
NEtFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
NMeFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluorobutanesulfonic acid	2	2	ND	**0.0018 J**	0.002 U	**0.0066**	0.002 U	0.0018 U	0.0019 U
Perfluorodecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluorododecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluoroheptanoic acid	NS	NS	ND	**0.00095 J**	0.002 U	**0.0036**	0.002 U	0.0018 U	0.0019 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.028 +**	**0.015 +**	0.002 U	**0.063 +**	0.002 U	0.0018 U	0.0019 U
Perfluorohexanoic acid	NS	NS	**0.0041**	**0.0028**	0.002 U	**0.0088**	0.002 U	0.0018 U	0.0019 U
Perfluorononanoic acid	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0462 +**	**0.016 +**	**0.00037 J**	**0.14 +**	**0.0066 +**	**0.00048 J**	0.0019 U
Perfluorooctanoic acid	0.004	0.004	ND	**0.0017 J**	0.002 U	**0.0057 +**	0.002 U	0.0018 U	0.0019 U
Perfluorotetradecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluorotridecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U
Perfluoroundecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.0018 U	0.0019 U

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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1853_WALG_DOM	1853_WALG_DOM	1853_WALG_DOM	1853_WALG_DOM4	1853_WALG_DOM5	1853_WALG_DOM6	1853_WALG_DOM7
Additional Information	USEPA	PADEP	Untreated	FRB	Kitchen Tap, Water Softener On, Other	FRB	FRB	FRB	FRB
Lab Sample ID	Primary	RUA	1853 Walnut Grove Dr_untreated_20220526	22080759-02A	22080759-01A	22090729-02A	22090729-04A	22090729-06A	22090729-08A
Sample Date	MCLs	GW MSCs	5/26/2022	8/5/2022	8/5/2022	9/7/2022	9/7/2022	9/7/2022	9/7/2022
PFAS (µg/l)									
11Cl-PF3OUdS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	ND	0.002 U	**0.00027 J**	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0071**	0.002 U	**0.0094**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorodecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0037**	0.002 U	**0.0067**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0706 +**	0.002 U	**0.098 +**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorohexanoic acid	NS	NS	**0.007**	0.002 U	**0.016**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorononanoic acid	0.01	0.01	**0.0036**	0.002 U	**0.0006 J**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.2089 +**	0.002 U	**0.19 +**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	**0.0057 +**	0.002 U	**0.0068 +**	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	ND	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

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+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
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Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1853_WALG_DOM	1853_WALG_DOM	1853_WALG_DOM	1853_WALG_DOM
Additional Information	USEPA	PADEP	Garage Spigot, Water Softener Off, Other	Garage Spigot, Water Softener On, Other	Kitchen Tap, Water Softener Off, Other	Kitchen Tap, Water Softener On, Other
Lab Sample ID	Primary	RUA	22090729-01A	22090729-05A	22090729-03A	22090729-07A
Sample Date	MCLs	GW MSCs	9/7/2022	9/7/2022	9/7/2022	9/7/2022
PFAS (µg/l)						
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0064**	**0.0065**	**0.0074**	**0.0068**
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0056**	**0.0061**	**0.0061**	**0.0063**
Perfluorohexanesulfonic acid	0.01	0.01	**0.065 +**	**0.067 +**	**0.072 +**	**0.067 +**
Perfluorohexanoic acid	NS	NS	**0.01**	**0.011**	**0.012**	**0.011**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.19 +**	**0.17 +**	**0.17 +**	**0.17 +**
Perfluorooctanoic acid	0.004	0.004	**0.0048 +**	**0.0053 +**	**0.005 +**	**0.0055 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1858_WALG_DOM	1859_WALG_DOM	1859_WALG_DOM	1864_WALG_DOM	1864_WALG_DOM
Additional Information	USEPA	PADEP	Untreated	Untreated	FRB	Outdoor Wellhead Hydrant, Other	Kitchen Tap, Post-Treatment
Lab Sample ID	Primary	RUA	1858 Walnut Grove Dr_untreated_20211215	22041811-01A	22041811-02A	1864 Walnut Grove Dr_Outdoor wellhead hydrant_20211215	410-73989-5
Sample Date	MCLs	GW MSCs	12/15/2021	4/19/2022	4/19/2022	12/15/2021	2/22/2022
PFAS (µg/l)							
11Cl-PF3OUdS	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
9Cl-PF3ONS	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
DONA	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
HFPODA	0.01	0.01	ND	0.002 U	0.002 U	ND	0.0019 U
NEtFOSAA	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
NMeFOSAA	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluorobutanesulfonic acid	2	2	ND	**0.0053**	0.002 U	**0.009**	**0.0021**
Perfluorodecanoic acid	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluorododecanoic acid	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluoroheptanoic acid	NS	NS	ND	**0.0031**	0.002 U	**0.0039**	**0.00062 J**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0216 +**	**0.053 +**	0.002 U	**0.0903 +**	**0.0026**
Perfluorohexanoic acid	NS	NS	**0.0049**	**0.0064**	0.002 U	**0.0088**	**0.0045**
Perfluorononanoic acid	0.01	0.01	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0253 +**	**0.19 +**	0.002 U	**0.1868 +**	**0.00095 J**
Perfluorooctanoic acid	0.004	0.004	**0.004**	**0.005 +**	0.002 U	**0.008 +**	**0.00074 J**
Perfluorotetradecanoic acid	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluorotridecanoic acid	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U
Perfluoroundecanoic acid	NS	NS	ND	0.002 U	0.002 U	ND	0.0019 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B1. Summary of Private Supply Well PFAS Sampling Results (Pre-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1864_WALG_DOM	1864_WALG_DOM	1864_WALG_DOM	1864_WALG_DOM	1864_WALG_DOM	107_TBRG_DOM	107_TBRG_DOM	101_TBRG_DOM	101_TBRG_DOM
Additional Information	USEPA	PADEP	FRB	Pre-Treatment	Mid-point	Post-Treatment	FRB	Untreated	FRB1	FRB1	Kitchen Tap
Lab Sample ID	Primary	RUA	410-73989-6	22111982-03A	22111982-02A	22111982-01A	22111982-04A	22092277-01A	22092277-02A	22092928-02A	22092928-01A
Sample Date	MCLs	GW MSCs	2/22/2022	11/16/2022	11/16/2022	11/16/2022	11/16/2022	9/21/2022	9/21/2022	9/28/2022	9/28/2022
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DONA	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00058 J**	0.002 U
NMeFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00061 J**	0.002 U
Perfluorobutanesulfonic acid	2	2	0.0018 U	**0.0027**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0004 J**
Perfluorodecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.0018 U	**0.0044**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00069 J**
Perfluorohexanesulfonic acid	0.01	0.01	0.0018 U	**0.014 +**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.00073 J**
Perfluorohexanoic acid	NS	NS	0.0018 U	**0.012**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0018 J**
Perfluorononanoic acid	0.01	0.01	0.0018 U	**0.001 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.0018 U	**0.023 +**	**0.00022 J**	0.002 U	0.002 U	**0.00028 J**	0.002 U	0.002 U	**0.00082 J**
Perfluorooctanoic acid	0.004	0.004	0.0018 U	**0.011 +**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0016 J**
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	**0.0012 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

APPENDIX B – Table B2

Summary of POET Influent (PI) Performance PFAS Sampling Results
(Post-POET Installation)

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			182_BGHL_PI	194_BGHL_PI	194_BGHL_PI	288_BGHL_PI	338_BGHL_PI	338_BGHL_PI	754_BGHL_PI	754_BGHL_PI	786_BGHL_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02963-03	4E06398-01	HN2409764-003	5E02952-03	HN2408119-003	5E02953-03	HN2408199-003	5E02954-03	3E02598_Pre Treat
Sample Date	MCL	GW MSCs	5/13/2025	5/28/2024	11/20/2024	5/14/2025	10/21/2024	5/12/2025	10/22/2024	5/13/2025	5/11/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00164 U	0.00176 U	0.002 U	0.00174 U	—	0.00172 U	—	0.00166 U	0.00176 U
9Cl-PF3ONS	NS	NS	0.00162 U	0.00174 U	0.002 U	0.00172 U	—	0.0017 U	—	0.00164 U	0.00174 U
DONA	NS	NS	0.00164 U	0.00176 U	0.002 U	0.00174 U	—	0.00172 U	—	0.00166 U	0.00176 U
HFPODA	0.01	0.01	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
NEtFOSAA	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
NMeFOSAA	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluorobutanesulfonic acid	2	2	0.00154 U	**0.00547**	**0.00275**	**0.00166**	0.002 U	0.00161 U	0.002 U	0.00155 U	0.00165 U
Perfluorodecanoic acid	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluorododecanoic acid	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluoroheptanoic acid	NS	NS	**0.00186**	**0.00242**	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	**0.00235**
Perfluorohexanesulfonic acid	0.01	0.01	**0.00241**	**0.00367**	**0.00284**	**0.0109 +**	0.002 U	**0.0112 +**	0.002 U	0.00161 U	**0.00242**
Perfluorohexanoic acid	NS	NS	**0.00742**	**0.00298**	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	**0.00408**
Perfluorononanoic acid	0.01	0.01	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00505 +**	**0.00575 +**	**0.00653 +**	**0.011 +**	**0.014 +**	**0.0101 +**	0.002 U	0.00162 U	**0.00273**
Perfluorooctanoic acid	0.004	0.004	**0.00461 +**	**0.00908 +**	**0.00444 +**	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	**0.00809 +**
Perfluorotetradecanoic acid	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluorotridecanoic acid	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U
Perfluoroundecanoic acid	NS	NS	0.00174 U	0.00187 U	0.002 U	0.00184 U	0.002 U	0.00182 U	0.002 U	0.00175 U	0.00187 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
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+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B1 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank at or above the method Reporting Limit, however it was <10% the concentration detected in the sample. Data may be usable based on the intended use.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_PI	786_BGHL_PI	786_BGHL_PI	786_BGHL_PI	1412_MAJV_PI	1412_MAJV_PI	1412_MAJV_PI	1412_MAJV_PI	1412_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02462_Pre Treat	4E02920-01	HN2409762-003	5E02976-03	22111990-03A	3E02569_Pre Treat	3K02442_Pre Treat	4C03346-04	4E02752-01
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/20/2024	5/14/2025	11/17/2022	5/11/2023	11/1/2023	3/12/2024	5/14/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00166 U	0.0017 U	0.002 U	0.00174 U	0.002 U	0.00172 U	0.00168 U	0.00165 U	0.00182 U
9Cl-PF3ONS	NS	NS	0.00164 U	0.00168 U	0.002 U	0.00173 U	0.002 U	0.00171 U	0.00166 U	0.00163 U	0.00181 U
DONA	NS	NS	0.00166 U	0.0017 U	0.002 U	0.00174 U	0.002 U	0.00172 U	0.00168 U	0.00165 U	0.00182 U
HFPODA	0.01	0.01	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
NEtFOSAA	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
NMeFOSAA	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluorobutanesulfonic acid	2	2	0.00155 U	0.00159 U	0.002 U	0.00163 U	**0.007**	**0.00836**	**0.00333**	**0.00526**	**0.00368**
Perfluorodecanoic acid	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluorododecanoic acid	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluoroheptanoic acid	NS	NS	**0.00268**	**0.00348**	**0.00417**	0.00185 U	**0.0051**	**0.00641**	**0.00343**	**0.00499**	**0.0049**
Perfluorohexanesulfonic acid	0.01	0.01	**0.00391**	**0.00449**	**0.00458**	0.00169 U	**0.073 +**	**0.104 +**	**0.0413 +**	**0.0619 +**	**0.0643 +**
Perfluorohexanoic acid	NS	NS	**0.00703**	**0.00827**	**0.00889**	0.00185 U	**0.009**	**0.0139**	**0.00616**	**0.00832**	**0.00771**
Perfluorononanoic acid	0.01	0.01	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00326**	**0.0038**	**0.00411 +**	0.00171 U	**0.1 +**	**0.164 +**	**0.0608 +**	**0.11 +**	**0.109 +**
Perfluorooctanoic acid	0.004	0.004	**0.00702 +**	**0.00887 +**	**0.0112 +**	0.00185 U	**0.0056 +**	**0.00689 +**	**0.00548 +**	**0.0122 +**	**0.0121 +**
Perfluorotetradecanoic acid	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluorotridecanoic acid	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U
Perfluoroundecanoic acid	NS	NS	0.00175 U	0.0018 U	0.002 U	0.00185 U	0.002 U	0.00182 U	0.00177 U	0.00174 U	0.00193 U

Notes:
USEPA = United State Environmental Protection Agency.
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J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1412_MAJV DUP	1412_MAJV_PI	1412_MAJV_PI	1413_MAJV_PI	1413_MAJV_PI	1413_MAJV_PI	1413_MAJV_PI	1413_MAJV_PI	1413_MAJV_PI
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**BD02 - May 2024_20240501**	**HN2409493-003**	**5E02938-03**	**22102432-03A**	**22111989-03A**	**3E02570_Pre Treat**	**3K02443_Pre Treat**	**4E02766-01**	**HN2409552-003**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**11/18/2024**	**5/12/2025**	**10/25/2022**	**11/17/2022**	**5/9/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00181 L1U	—	0.00181 U	0.002 U	0.002 U	0.00167 U	0.00166 U	0.0017 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00179 L1U	—	0.00179 U	0.002 U	0.002 U	0.00165 U	0.00165 U	0.00168 U	0.002 U
DONA	NS	NS	0.00181 U	—	0.00181 U	0.002 U	0.002 U	0.00167 U	0.00166 U	0.0017 U	0.002 U
HFPODA	0.01	0.01	0.00192 U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
NEtFOSAA	NS	NS	0.00192 L1U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
NMeFOSAA	NS	NS	0.00192 L1U	0.002 U	0.00192 U	0.002 U	**0.0006 J**	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00325 L1**	**0.00497**	**0.0048**	0.002 U	0.002 U	0.00156 U	**0.00374**	**0.00361**	**0.00362**
Perfluorodecanoic acid	NS	NS	0.00192 U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00192 L1U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00497**	**0.0048**	**0.00605**	0.002 U	0.002 U	0.00177 U	**0.00287**	**0.00519**	**0.00285**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0629 +**	**0.0561 +**	**0.0666 +**	0.002 U	0.002 U	0.00162 U	**0.0398 +**	**0.0588 +**	**0.0416 +**
Perfluorohexanoic acid	NS	NS	**0.00805**	**0.00847**	**0.00872**	0.002 U	0.002 U	0.00177 U	**0.00579**	**0.00831**	**0.00522**
Perfluorononanoic acid	0.01	0.01	0.00192 U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.107 +**	**0.0775 +**	**0.125 +**	**0.0012 J**	0.002 U	0.00163 U	**0.0601 +**	**0.165 +**	**0.0604 +**
Perfluorooctanoic acid	0.004	0.004	**0.0124 +**	**0.00893 +**	**0.0142 +**	0.002 U	0.002 U	0.00177 U	**0.00384**	**0.00533 +**	**0.00534 +**
Perfluorotetradecanoic acid	NS	NS	0.00192 U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00192 L1U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00192 L1U	0.002 U	0.00192 U	0.002 U	0.002 U	0.00177 U	0.00176 U	0.0018 U	0.002 U

Notes:
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L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1413_MAJV_PI	1418_MAJV_PI	1418_MAJV_PI	1418_MAJV_PI	1418_MAJV_PI	1418_MAJV_PI	1419_MAJV_PI	1419_MAJV_PI	1419_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02937-03	22120677-03A	3K02444_Pre Treat	4E02767-01	HN2409689-003	5E02939-03	22111984-03A	3E02572_Pre Treat	3K02445_Pre Treat
Sample Date	MCL	GW MSCs	5/12/2025	12/6/2022	11/1/2023	5/15/2024	11/20/2024	5/12/2025	11/16/2022	5/9/2023	11/1/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.0018 U	0.002 U	0.00164 U	0.00166 U	0.002 U	0.00181 U	0.002 U	0.00176 U	0.00158 U
9Cl-PF3ONS	NS	NS	0.00178 U	0.002 U	0.00162 U	0.00165 U	0.002 U	0.00179 U	0.002 U	0.00174 U	0.00156 U
DONA	NS	NS	0.0018 U	0.002 U	0.00164 U	0.00166 U	0.002 U	0.00181 U	0.002 U	0.00176 U	0.00158 U
HFPODA	0.01	0.01	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
NEtFOSAA	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
NMeFOSAA	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluorobutanesulfonic acid	2	2	**0.00344**	**0.0052**	**0.00475**	**0.00255**	**0.00431**	**0.00345**	**0.0068**	**0.00818**	**0.0043**
Perfluorodecanoic acid	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluorododecanoic acid	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluoroheptanoic acid	NS	NS	**0.00468**	**0.0062**	**0.00464**	**0.00344**	**0.00529**	**0.00417**	**0.0054**	**0.00575**	**0.00393**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0474 +**	**0.05 +**	**0.0499 +**	**0.0387 +**	**0.0467 +**	**0.041 +**	**0.081 +**	**0.085 +**	**0.0591 +**
Perfluorohexanoic acid	NS	NS	**0.00722**	**0.012**	**0.00928**	**0.00664**	0.002 U	**0.00733**	**0.013**	**0.012**	**0.00683**
Perfluorononanoic acid	0.01	0.01	0.0019 U	**0.00075 J**	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0916 +**	**0.077 +**	**0.0705 +**	**0.0582 +**	**0.07 +**	**0.0652 +**	**0.14 +**	**0.136 +**	**0.109 +**
Perfluorooctanoic acid	0.004	0.004	**0.00487 +**	**0.0088 +**	**0.00713 +**	**0.00569 +**	**0.00866 +**	**0.00682 +**	**0.0072 +**	**0.00772 +**	**0.00541 +**
Perfluorotetradecanoic acid	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluorotridecanoic acid	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U
Perfluoroundecanoic acid	NS	NS	0.0019 U	0.002 U	0.00174 U	0.00176 U	0.002 U	0.00192 U	0.002 U	0.00187 U	0.00167 U

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L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1419_MAJV_PI	1419_MAJV_PI	1419_MAJV_PI	1424_MAJV_PI	1424_MAJV_PI	1424_MAJV_PI	1425_MAJV_PI	1425_MAJV_PI	1425_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02769-01	HN2409682-003	5E02940-03	22120680-03A	3K02446_Pre Treat	HN2409565-003	3E02574_Pre Treat	3K02447_Pre Treat	4E02773-01
Sample Date	MCL	GW MSCs	5/15/2024	11/20/2024	5/12/2025	12/6/2022	11/1/2023	11/19/2024	5/9/2023	11/1/2023	5/14/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00171 U	0.002 U	0.00169 U	0.002 U	0.00163 U	0.002 U	0.00163 U	0.00189 U	0.00167 U
9Cl-PF3ONS	NS	NS	0.00169 U	0.002 U	0.00168 U	0.002 U	0.00161 U	0.002 U	0.00161 U	0.00187 U	0.00165 U
DONA	NS	NS	0.00171 U	0.002 U	0.00169 U	0.002 U	0.00163 U	0.002 U	0.00163 U	0.00189 U	0.00167 U
HFPODA	0.01	0.01	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
NEtFOSAA	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
NMeFOSAA	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	**0.00416**	**0.00629**	**0.00587**	**0.0049**	**0.00448**	**0.00468**	**0.0041**	**0.00412**	**0.00218**
Perfluorodecanoic acid	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	**0.00407**	**0.00621**	**0.00465**	**0.0035**	**0.00275**	0.002 U	**0.00302**	**0.00319**	**0.00249**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0696 +**	**0.0753 +**	**0.0783 +**	**0.055 +**	**0.0503 +**	0.002 U	**0.0389 +**	**0.0385 +**	**0.0261 +**
Perfluorohexanoic acid	NS	NS	**0.00751**	**0.0118**	**0.00842**	**0.0075**	**0.00575**	**0.00653**	**0.00626**	**0.00662**	**0.00478**
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.126 +**	**0.124 +**	**0.131 +**	**0.068 +**	**0.0558 +**	0.002 U	**0.048 +**	**0.0473 +**	**0.0372 +**
Perfluorooctanoic acid	0.004	0.004	**0.00419 +**	**0.00861 +**	**0.00542 +**	**0.0047 +**	**0.00391**	0.002 U	**0.00475 +**	**0.00426 +**	**0.00355**
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00172 U	0.002 U	0.00172 U	0.002 U	0.00177 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1425_MAJV_PI	1425_MAJV_PI	1430_MAJV_PI	1430_MAJV_PI	1430_MAJV_PI	1430_MAJV_PI	1430_MAJV_PI	1430_MAJV_PI	1431_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409685-003	5E02941-03	22111988-03A	3E02575_Pre Treat	3K02448_Pre Treat	4E02774-01	HN2409553-003	5E02957-03	3E02576_Pre Treat
Sample Date	MCL	GW MSCs	11/20/2024	5/12/2025	11/16/2022	5/9/2023	11/1/2023	5/13/2024	11/19/2024	5/13/2025	5/10/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.00183 U	0.002 U	0.0017 U	0.00161 U	0.00166 L1U	0.002 U	0.00166 U	0.00172 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00181 U	0.002 U	0.00168 U	0.00159 U	0.00165 U	0.002 U	0.00165 U	0.00171 U
DONA	NS	NS	0.002 U	0.00183 U	0.002 U	0.0017 U	0.00161 U	0.00166 U	0.002 U	0.00166 U	0.00172 U
HFPODA	0.01	0.01	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 L1U	0.002 U	0.00176 U	0.00182 U
NEtFOSAA	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 L1U	0.002 U	0.00176 U	0.00182 U
NMeFOSAA	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 U	0.002 U	0.00176 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	**0.00337**	**0.00386**	**0.0054**	**0.00715**	**0.00552**	**0.00303**	**0.00492**	**0.00421**	**0.00369**
Perfluorodecanoic acid	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 U	0.002 U	0.00176 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 U	0.002 U	0.00176 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	**0.00306**	**0.00326**	**0.0069**	**0.00771**	**0.00656**	**0.00518**	**0.00623**	**0.0044**	**0.00262**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0333 +**	**0.0379 +**	**0.069 +**	**0.0825 +**	**0.0694 +**	**0.0547 +**	**0.0585 +**	**0.0493 +**	**0.017 +**
Perfluorohexanoic acid	NS	NS	**0.00603**	**0.0068**	**0.013**	**0.013**	**0.0106**	**0.00868**	**0.00908**	**0.00781**	**0.00648**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 U	0.002 U	0.00176 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0445 +**	**0.051 +**	**0.12 +**	**0.124 +**	**0.121 +**	**0.0882 +**	**0.0934 +**	**0.0791 +**	**0.0104 +**
Perfluorooctanoic acid	0.004	0.004	**0.00513 +**	**0.00483 +**	**0.0065 +**	**0.00716 +**	**0.00559 +**	**0.0047 +**	**0.00696 +**	**0.00503 +**	**0.00517 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 L1U	0.002 U	0.00176 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 L1U	0.002 U	0.00176 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00194 U	0.002 U	0.0018 U	0.0017 U	0.00176 L1U	0.002 U	0.00176 U	0.00182 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1431_MAJV_PI	1431_MAJV_PI	1431_MAJV_PI	1431_MAJV_PI	1436_MAJV_PI	1436_MAJV_PI	1436_MAJV_PI	1436_MAJV_PI	1436_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02449_Pre Treat	4E02775-01	HN2409687-003	5E02958-03	22120679-03A	23011850-05A	3E02577_Pre Treat	3K02450_Pre Treat	4E02776-01
Sample Date	MCL	GW MSCs	11/1/2023	5/13/2024	11/20/2024	5/15/2025	12/6/2022	1/24/2023	5/11/2023	11/1/2023	5/13/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00171 U	0.002 U	0.00176 U	0.002 U	0.002 U	0.00169 U	0.00168 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00169 U	0.002 U	0.00174 U	0.002 U	0.002 U	0.00168 U	0.00166 U	0.00169 U
DONA	NS	NS	0.00168 U	0.00171 U	0.002 U	0.00176 U	0.002 U	0.002 U	0.00169 U	0.00168 U	0.00171 U
HFPODA	0.01	0.01	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
NEtFOSAA	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
NMeFOSAA	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	**0.00281**	0.0016 U	**0.00278**	**0.00322**	**0.005**	**0.0039**	**0.00481**	**0.00405**	**0.00269**
Perfluorodecanoic acid	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	**0.00178**	**0.00196**	**0.00229**	**0.00272**	**0.005**	**0.0045**	**0.00516**	**0.00429**	**0.00376**
Perfluorohexanesulfonic acid	0.01	0.01	**0.017 +**	**0.013 +**	**0.0175 +**	**0.0177 +**	**0.05 +**	**0.049 +**	**0.0605 +**	**0.0512 +**	**0.0464 +**
Perfluorohexanoic acid	NS	NS	**0.00447**	**0.00468**	**0.00533**	**0.00622**	**0.009**	**0.0087**	**0.0102**	**0.00809**	**0.00664**
Perfluorononanoic acid	0.01	0.01	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0129 +**	**0.00909 +**	**0.0138 +**	**0.0121 +**	**0.076 +**	**0.062 +**	**0.089 +**	**0.0765 +**	**0.0671 +**
Perfluorooctanoic acid	0.004	0.004	**0.0031**	**0.00409 +**	**0.00519 +**	**0.0051 +**	**0.0051 +**	**0.0046 +**	**0.00507 +**	**0.00389**	**0.00379**
Perfluorotetradecanoic acid	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00178 U	0.00181 U	0.002 U	0.00186 U	0.002 U	0.002 U	0.00179 U	0.00177 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
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ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
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J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1436_MAJV DUP	1436_MAJV_PI	1436_MAJV_PI	1437_MAJV_PI	1437_MAJV_PI	1437_MAJV_PI	1437_MAJV_PI	1437_MAJV_PI	1437_MAJV_PI
Additional Information	USEPA	PADEP	—	—	—	Outdoor Hydrant	—	—	—	—	—
Lab Sample ID	Primary	RUA	BD01 - May 2024_20240501	HN2409517-003	5E02959-03	22101950-03A	3E02578_Pre Treat	23072254-03A	3K02451_Pre Treat	4E02777-01	HN2409557-003
Sample Date	MCL	GW MSCs	5/13/2024	11/18/2024	5/13/2025	10/19/2022	5/9/2023	7/25/2023	11/1/2023	5/14/2024	11/19/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00169 L1U	—	0.0018 U	0.002 U	0.00171 U	0.002 U	0.00169 U	0.00175 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00168 L1U	—	0.00178 U	0.002 U	0.00169 U	0.002 U	0.00167 U	0.00173 U	0.002 U
DONA	NS	NS	0.00169 U	—	0.0018 U	0.002 U	0.00171 U	0.002 U	0.00169 U	0.00175 U	0.002 U
HFPODA	0.01	0.01	0.00179 U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
NEtFOSAA	NS	NS	0.00179 L1U	0.002 U	0.00191 U B3	**0.00047 J**	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
NMeFOSAA	NS	NS	0.00179 L1U	0.002 U	0.00191 U B3	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00268 L1**	**0.00462**	**0.00439**	**0.0015 J**	**0.00231**	**0.0021**	**0.00181**	**0.00221**	0.002 U
Perfluorodecanoic acid	NS	NS	0.00179 U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00179 L1U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0035**	**0.00517**	**0.00476**	**0.0021**	**0.00263**	**0.0021**	**0.0021**	**0.00284**	**0.00228**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0457 +**	**0.0532 +**	**0.0623 +**	**0.014 +**	**0.0236 +**	**0.022 +**	**0.0162 +**	**0.0367 +**	**0.0178 +**
Perfluorohexanoic acid	NS	NS	**0.0067**	**0.00846**	**0.0085**	**0.0046**	**0.00602**	**0.0054**	**0.00521**	**0.00545**	**0.0054**
Perfluorononanoic acid	0.01	0.01	0.00179 U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0647 +**	**0.0782 +**	**0.0954 +**	**0.018 +**	**0.0335 +**	**0.03 +**	**0.0214 +**	**0.0504 +**	**0.0254 +**
Perfluorooctanoic acid	0.004	0.004	**0.00357**	**0.00683 +**	**0.00441 +**	**0.0038**	**0.00486 +**	**0.0042 +**	**0.0036**	**0.0032**	**0.00428 +**
Perfluorotetradecanoic acid	NS	NS	0.00179 U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00179 L1U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00179 L1U	0.002 U	0.00191 U	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00185 U	0.002 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1437_MAJV_PI	1442_MAJV_PI	1442_MAJV_PI	1442_MAJV_PI	1442_MAJV_PI	1442_MAJV_PI DUP	1442_MAJV_PI	1443_MAJV_PI	1443_MAJV_PI
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02960-03**	**3E02579_Pre Treat**	**3K02452_Pre Treat**	**4E02778-01**	**HN2409690-003**	**HN2409766-001**	**5E02961-03**	**22120678-03A**	**3E02580_Pre Treat**
Sample Date	**MCL**	**GW MSCs**	**5/13/2025**	**5/11/2023**	**11/1/2023**	**5/14/2024**	**11/20/2024**	**11/20/2024**	**5/13/2025**	**12/6/2022**	**6/5/2023**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00166 U	0.00171 U	0.00167 U	0.00169 U	0.002 U	0.002 U	0.00168 U	0.002 U	0.00182 U
9Cl-PF3ONS	NS	NS	0.00164 U	0.00169 U	0.00165 U	0.00167 U	0.002 U	0.002 U	0.00166 U	0.002 U	0.0018 U
DONA	NS	NS	0.00166 U	0.00171 U	0.00167 U	0.00169 U	0.002 U	0.002 U	0.00168 U	0.002 U	0.00182 U
HFPODA	0.01	0.01	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
NEtFOSAA	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
NMeFOSAA	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	**0.00048 J**	0.00192 U
Perfluorobutanesulfonic acid	2	2	**0.00363**	**0.00286**	**0.00248**	0.00158 U	**0.00285**	**0.00262**	**0.00298**	**0.006**	**0.00552**
Perfluorodecanoic acid	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
Perfluorododecanoic acid	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
Perfluoroheptanoic acid	NS	NS	**0.00346**	**0.00252**	**0.00189**	0.00179 U	**0.00305**	**0.00266**	**0.00243**	**0.0052**	**0.00412**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0484 +**	**0.0282 +**	**0.0231 +**	**0.0134 +**	**0.0271 +**	**0.0264 +**	**0.0306 +**	**0.064 +**	**0.0609 +**
Perfluorohexanoic acid	NS	NS	**0.00659**	**0.00547**	**0.00432**	**0.00284**	**0.00567**	**0.00472**	**0.00469**	**0.011**	**0.0082**
Perfluorononanoic acid	0.01	0.01	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0641 +**	**0.0347 +**	**0.0291 +**	**0.0169 +**	**0.0304 +**	**0.0284 +**	**0.0351 +**	**0.084 +**	**0.0784 +**
Perfluorooctanoic acid	0.004	0.004	**0.00414 +**	**0.00344**	**0.00246**	**0.0022**	**0.00426 +**	**0.00395**	**0.00312**	**0.0053 +**	**0.0047 +**
Perfluorotetradecanoic acid	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
Perfluorotridecanoic acid	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U
Perfluoroundecanoic acid	NS	NS	0.00175 U	0.00181 U	0.00177 U	0.00179 U	0.002 U	0.002 U	0.00177 U	0.002 U	0.00192 U

Notes:
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1443_MAJV_PI	1443_MAJV_PI	1443_MAJV_PI	1443_MAJV_PI	1876_MILL_PI	1876_MILL_PI	1876_MILL_PI	1876_MILL_PI	1876_MILL_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02453_Pre Treat	4E02779-01	HN2409556-003	5E02942-03	22120671-03A	3E02595_Influent	3K02465_Influent	4A04640-05	4E02915-01
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/19/2024	5/12/2025	12/6/2022	5/9/2023	11/1/2023	1/17/2024	5/14/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00167 U	0.00176 U	0.002 U	0.00179 U	0.002 U	0.00171 U	0.00172 U	0.00176 U	0.00172 U
9Cl-PF3ONS	NS	NS	0.00165 U	0.00174 U	0.002 U	0.00177 U	0.002 U	0.00169 U	0.0017 U	0.00174 U	0.00171 U
DONA	NS	NS	0.00167 U	0.00176 U	0.002 U	0.00179 U	0.002 U	0.00171 U	0.00172 U	0.00176 U	0.00172 U
HFPODA	0.01	0.01	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
NEtFOSAA	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
NMeFOSAA	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	**0.00043 J**	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	**0.0046**	**0.00308**	**0.00555**	**0.0045**	**0.004**	**0.0066**	**0.00544**	**0.00319**	**0.003**
Perfluorodecanoic acid	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	**0.00333**	**0.00328**	**0.00459**	**0.00381**	**0.0037**	**0.00348**	**0.00367**	**0.00257**	**0.00252**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0494 +**	**0.0489 +**	**0.0556 +**	**0.0558 +**	**0.045 +**	**0.0668 +**	**0.0612 +**	**0.0401 +**	**0.0439 +**
Perfluorohexanoic acid	NS	NS	**0.00727**	**0.00654**	**0.00878**	**0.00697**	**0.0067**	**0.00691**	**0.00665**	**0.00456**	**0.00477**
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.00186 U	0.002 U	0.00189 U	**0.00072 J**	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0664 +**	**0.0625 +**	**0.0745 +**	**0.072 +**	**0.093 +**	**0.14 +**	**0.129 +**	**0.0768 +**	**0.115 +**
Perfluorooctanoic acid	0.004	0.004	**0.00366**	**0.00353**	**0.00625 +**	**0.00404 +**	**0.0065 +**	**0.00635 +**	**0.00559 +**	**0.00477 +**	**0.00484 +**
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.00186 U	0.002 U	0.00189 U	0.002 U	0.00181 U	0.00182 U	0.00187 U	0.00182 U

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U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1876_MILL DUP	1876_MILL_PI	1876_MILL_PI	1877_MILL_PI	1877_MILL_PI	1877_MILL_PI	1877_MILL_PI	1877_MILL_PI	1882_MILL_PI
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**BD03 - May 2024_20240501**	**HN2409515-003**	**5E02950-03**	**3E02596_Pre Treat**	**3K02464_Pre Treat**	**4E02916-01**	**HN2409765-003**	**5E02971-03**	**4E02921-01**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**11/18/2024**	**5/12/2025**	**5/10/2023**	**11/1/2023**	**5/15/2024**	**11/20/2024**	**5/14/2025**	**5/15/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00163 U	—	0.00172 U	0.00169 U	0.0016 U	0.00169 U	0.002 U	0.00173 U	0.00161 U
9Cl-PF3ONS	NS	NS	0.00162 U	—	0.0017 U	0.00168 U	0.00158 U	0.00167 U	0.002 U	0.00171 U	0.0016 U
DONA	NS	NS	0.00163 U	—	0.00172 U	0.00169 U	0.0016 U	0.00169 U	0.002 U	0.00173 U	0.00161 U
HFPODA	0.01	0.01	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
NEtFOSAA	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
NMeFOSAA	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluorobutanesulfonic acid	2	2	**0.00215**	**0.00401**	**0.0059**	**0.00311**	**0.00404**	**0.0037**	**0.0034**	**0.00354**	**0.00163**
Perfluorodecanoic acid	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluorododecanoic acid	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluoroheptanoic acid	NS	NS	**0.00242**	**0.00325**	**0.00391**	**0.00278**	**0.00285**	**0.00287**	**0.00285**	**0.00221**	0.00171 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0376 +**	**0.0458 +**	**0.0818 +**	**0.0381 +**	**0.0408 +**	**0.0532 +**	**0.0408 +**	**0.0447 +**	**0.0205 +**
Perfluorohexanoic acid	NS	NS	**0.00404**	**0.0054**	**0.00757**	**0.00532**	**0.00562**	**0.00542**	**0.00482**	**0.00461**	**0.00275**
Perfluorononanoic acid	0.01	0.01	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0948 +**	**0.0991 +**	**0.138 +**	**0.103 +**	**0.0673 +**	**0.107 +**	**0.075 +**	**0.073 +**	**0.0113 +**
Perfluorooctanoic acid	0.004	0.004	**0.00407 +**	**0.00679 +**	**0.0058 +**	**0.00548 +**	**0.00589 +**	**0.00505 +**	**0.00741 +**	**0.00497 +**	**0.00471 +**
Perfluorotetradecanoic acid	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluorotridecanoic acid	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U
Perfluoroundecanoic acid	NS	NS	0.00173 U	0.002 U	0.00182 U	0.00179 U	0.00169 U	0.00179 U	0.002 U	0.00183 U	0.00171 U

Notes:
USEPA = United State Environmental Protection Agency.
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B1 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank at or above the method Reporting Limit, however it was <10% the concentration detected in the sample. Data may be usable based on the intended use.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1882_MILL DUP	1882_MILL_PI	1882_MILL_PI DUP	1882_MILL_PI	1883_MILL_PI	1883_MILL_PI	1883_MILL_PI	1883_MILL_PI	1883_MILL_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	BD04 - May 2024_20240501	HN2409513-003	HN2409518-001	5E02951-03	3E02597_Pre Treat	3K02463_Pre Treat	4E02917-01	HN2409558-003	5E02972-03
Sample Date	MCL	GW MSCs	5/15/2024	11/18/2024	11/18/2024	5/14/2025	5/10/2023	11/1/2023	5/14/2024	11/19/2024	5/14/2025
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.0017 U	—	—	0.00161 U	0.0017 U	0.00169 U	0.00163 U	0.002 U	0.00168 U
9Cl-PF3ONS	NS	NS	0.00168 U	—	—	0.00159 U	0.00168 U	0.00168 U	0.00161 U	0.002 U	0.00166 U
DONA	NS	NS	0.0017 U	—	—	0.00161 U	0.0017 U	0.00169 U	0.00163 U	0.002 U	0.00168 U
HFPODA	0.01	0.01	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
NEtFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
NMeFOSAA	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	**0.00166**	**0.00458**	**0.00452**	**0.00389**	0.00159 U	0.00159 U	0.00153 U	0.002 U	0.00157 U
Perfluorodecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	**0.00183**	0.002 U	**0.00207**	**0.00204**	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0219 +**	**0.0374 +**	**0.0366 +**	**0.0382 +**	0.00165 U	0.00164 U	0.00158 U	0.002 U	0.00162 U
Perfluorohexanoic acid	NS	NS	**0.00303**	**0.00417**	**0.00428**	**0.00417**	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0121 +**	**0.00437 +**	**0.00468 +**	**0.0105 +**	0.00166 U	0.00166 U	0.00159 U	0.002 U	0.00164 U
Perfluorooctanoic acid	0.004	0.004	**0.00523 +**	**0.00474 +**	**0.00461 +**	**0.00484 +**	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.002 U	0.002 U	0.0017 U	0.0018 U	0.00179 U	0.00172 U	0.002 U	0.00177 U

Notes:
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ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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NS = No standard currently established.
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F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1250_ROCK_PI	1250_ROCK_PI	587_ROCK_PI	1810_WALG_PI	1810_WALG_PI	1810_WALG_PI	1810_WALG_PI	1810_WALG_PI	1811_WALG_PI
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**HN2408197-003**	**5E02955-03**	**5E02975-03**	**3E02581_Pre Treat**	**3K02454_Pre Treat**	**4E02790-01**	**HN2409568-003**	**5E02943-03**	**HN2408121-003**
Sample Date	**MCL**	**GW MSCs**	**10/22/2024**	**5/15/2025**	**5/14/2025**	**5/10/2023**	**11/1/2023**	**5/12/2024**	**11/19/2024**	**5/12/2025**	**10/21/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.00168 U	0.00174 U	0.0018 U	0.00164 U	0.00172 U	0.002 U	0.0018 U	—
9Cl-PF3ONS	NS	NS	—	0.00166 U	0.00172 U	0.00178 U	0.00162 U	0.00171 U	0.002 U	0.00178 U	—
DONA	NS	NS	—	0.00168 U	0.00174 U	0.0018 U	0.00164 U	0.00172 U	0.002 U	0.0018 U	—
HFPODA	0.01	0.01	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00227**	0.00157 U	**0.00221**	**0.00324**	**0.00273**	0.00161 U	**0.00307**	**0.00287**	**0.00348**
Perfluorodecanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	**0.00265**	**0.00191**	0.00182 U	**0.00252**	**0.00228**	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0162 +**	**0.00697**	0.00168 U	**0.0321 +**	**0.0216 +**	**0.0158 +**	**0.0219 +**	**0.0263 +**	**0.0166 +**
Perfluorohexanoic acid	NS	NS	**0.00268**	0.00178 U	0.00184 U	**0.0059**	**0.00401**	**0.00363**	**0.00463**	**0.00469**	**0.00339**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00318**	0.00165 U	**0.00414 +**	**0.0737 +**	**0.023 +**	**0.0197 +**	**0.0262 +**	**0.0294 +**	**0.0173 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00178 U	0.00184 U	**0.00449 +**	**0.00311**	**0.00309**	**0.00471 +**	**0.00386**	**0.00347**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00178 U	0.00184 U	0.00191 U	0.00174 U	0.00182 U	0.002 U	0.0019 U	0.002 U

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U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1811_WALG_PI	1822_WALG_PI	1822_WALG_PI	1822_WALG_PI	1822_WALG_PI	1822_WALG_PI	1828_WALG_PI	1828_WALG_PI	1828_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02962-03	3E02582_Pre Treat	3K02455_Pre Treat	4E02791-01	HN2409763-003	5E02964-03	3E02583_Pre Treat	3K02456_Pre Treat	4E02792-01
Sample Date	MCL	GW MSCs	5/14/2025	5/11/2023	11/1/2023	5/15/2024	11/20/2024	5/15/2025	5/9/2023	11/1/2023	5/13/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00169 U	0.00172 U	0.00165 U	0.00176 U	0.002 U	0.00169 U	0.00174 U	0.00169 U	0.00173 U
9Cl-PF3ONS	NS	NS	0.00168 U	0.0017 U	0.00163 U	0.00174 U	0.002 U	0.00168 U	0.00173 U	0.00167 U	0.00171 U
DONA	NS	NS	0.00169 U	0.00172 U	0.00165 U	0.00176 U	0.002 U	0.00169 U	0.00174 U	0.00169 U	0.00173 U
HFPODA	0.01	0.01	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
NEtFOSAA	NS	NS	0.00179 U B3	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
NMeFOSAA	NS	NS	0.00179 U B3	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluorobutanesulfonic acid	2	2	**0.00171**	0.00161 U	0.00155 U	0.00164 U	0.002 U	0.00159 U	**0.00362**	**0.00317**	0.00162 U
Perfluorodecanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluorododecanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluoroheptanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	**0.00314**	**0.00326**	**0.00214**
Perfluorohexanesulfonic acid	0.01	0.01	**0.00469**	0.00166 U	0.0016 U	0.0017 U	0.002 U	0.00164 U	**0.0304 +**	**0.0286 +**	**0.0196 +**
Perfluorohexanoic acid	NS	NS	**0.003**	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	**0.0065**	**0.00664**	**0.00443**
Perfluorononanoic acid	0.01	0.01	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00503 +**	0.00168 U	0.00162 U	0.00172 U	0.002 U	0.00166 U	**0.0398 +**	**0.0362 +**	**0.0254 +**
Perfluorooctanoic acid	0.004	0.004	**0.00215**	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	**0.00609 +**	**0.00626 +**	**0.00442 +**
Perfluorotetradecanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluorotridecanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U
Perfluoroundecanoic acid	NS	NS	0.00179 U	0.00182 U	0.00175 U	0.00186 U	0.002 U	0.00179 U	0.00185 U	0.00179 U	0.00183 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1828_WALG_PI	1828_WALG_PI	1829_WALG_PI	1829_WALG_PI	1829_WALG_PI	1829_WALG_PI	1829_WALG_PI	1834_WALG_PI	1834_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409514-003	5E02944-03	3E02584_Pre Treat	3K02457_Pre Treat	4E02793-01	HN2409561-003	5E02965-03	3E02585_Pre Treat	3K02458_Pre Treat
Sample Date	MCL	GW MSCs	11/18/2024	5/12/2025	5/9/2023	11/1/2023	5/14/2024	11/19/2024	5/15/2025	5/9/2023	11/1/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.00166 U	0.00173 U	0.0017 U	0.00165 U	0.002 U	0.00166 U	0.00171 U	0.00166 U
9Cl-PF3ONS	NS	NS	—	0.00165 U	0.00171 U	0.00168 U	0.00163 U	0.002 U	0.00164 U	0.00169 U	0.00165 U
DONA	NS	NS	—	0.00166 U	0.00173 U	0.0017 U	0.00165 U	0.002 U	0.00166 U	0.00171 U	0.00166 U
HFPODA	0.01	0.01	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
NEtFOSAA	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
NMeFOSAA	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluorobutanesulfonic acid	2	2	**0.00304**	**0.00289**	**0.0035**	**0.00312**	**0.00164**	**0.00332**	**0.00295**	**0.00377**	**0.00201**
Perfluorodecanoic acid	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluoroheptanoic acid	NS	NS	**0.00316**	**0.00283**	**0.00315**	**0.00334**	**0.00245**	**0.00314**	**0.0031**	**0.00226**	0.00176 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.0255 +**	**0.0267 +**	**0.0265 +**	**0.024 +**	**0.0179 +**	**0.0196 +**	**0.0252 +**	**0.032 +**	**0.0168 +**
Perfluorohexanoic acid	NS	NS	**0.00617**	**0.00567**	**0.00661**	**0.00686**	**0.00484**	**0.00648**	**0.00599**	**0.00522**	**0.0031**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0309 +**	**0.0351 +**	**0.0321 +**	**0.0283 +**	**0.0243 +**	**0.0271 +**	**0.0338 +**	**0.0291 +**	**0.0152 +**
Perfluorooctanoic acid	0.004	0.004	**0.00741 +**	**0.00511 +**	**0.00639 +**	**0.00633 +**	**0.00478 +**	**0.00664 +**	**0.00587 +**	**0.00475 +**	**0.00259**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00176 U	0.00183 U	0.0018 U	0.00175 U	0.002 U	0.00175 U	0.00181 U	0.00176 U

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J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1834_WALG_PI	1834_WALG_PI	1834_WALG_PI	1834_WALG_PI	1835_WALG_PI	1835_WALG_PI	1835_WALG_PI	1835_WALG_PI	1835_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4C03347-04	4E02794-01	HN2409688-003	5E02945-03	23021196-05A	3E02586_Pre Treat	3K02459_Pre Treat	4E02795-01	HN2409510-003
Sample Date	MCL	GW MSCs	3/12/2024	5/15/2024	11/20/2024	5/12/2025	2/14/2023	5/10/2023	11/1/2023	5/13/2024	11/18/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00167 U	0.00169 U	0.002 U	0.00169 U	0.002 U	0.00203 U	0.00162 U	0.00186 U	—
9Cl-PF3ONS	NS	NS	0.00165 U	0.00167 U	0.002 U	0.00168 U	0.002 U	0.00201 U	0.00161 U	0.00184 U	—
DONA	NS	NS	0.00167 U	0.00169 U	0.002 U	0.00169 U	0.002 U	0.00203 U	0.00162 U	0.00186 U	—
HFPODA	0.01	0.01	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
NEtFOSAA	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
NMeFOSAA	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.0026**	0.00158 U	**0.00216**	**0.00233**	**0.0043**	**0.00699**	**0.00336**	**0.00317**	**0.00295**
Perfluorodecanoic acid	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00178**	0.00179 U	0.002 U	**0.00316**	**0.0032**	**0.00458**	**0.0024**	**0.00303**	**0.00258**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0225 +**	**0.0177 +**	**0.0169 +**	**0.024 +**	**0.055 +**	**0.0691 +**	**0.0432 +**	**0.0464 +**	**0.0395 +**
Perfluorohexanoic acid	NS	NS	**0.00386**	**0.00309**	**0.00316**	**0.00617**	**0.0061**	**0.00997**	**0.00481**	**0.00626**	**0.0043**
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0198 +**	**0.0188 +**	**0.0186 +**	**0.033 +**	**0.061 +**	**0.0854 +**	**0.045 +**	**0.0529 +**	**0.0414 +**
Perfluorooctanoic acid	0.004	0.004	**0.00338**	**0.00306**	**0.0033**	**0.00623 +**	**0.005 +**	**0.00469 +**	**0.00425 +**	**0.00287**	**0.00561 +**
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.00179 U	0.002 U	0.00179 U	0.002 U	0.00215 U	0.00172 U	0.00197 U	0.002 U

Notes:
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RUA = Residential Used Aquifer.
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ft bgs = Feet below ground surface.
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U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1835_WALG_PI	1840_WALG_PI	1840_WALG_PI	1840_WALG_PI	1840_WALG_PI	1840_WALG_PI	1841_WALG_PI	1841_WALG_PI	1841_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02946-03	3E02587_Pre Treat	3K02466_Pre Treat	4E02796-01	HN2409566-003	5E02947-03	3E02588_Pre Treat	3K02469_Pre Treat	4E02797-01
Sample Date	MCL	GW MSCs	5/13/2025	5/10/2023	11/1/2023	5/15/2024	11/19/2024	5/13/2025	5/10/2023	11/1/2023	5/14/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00169 U	0.00176 U	0.00162 U	0.00172 U	0.002 U	0.00173 U	0.00167 U	0.00162 U	0.00163 U
9Cl-PF3ONS	NS	NS	0.00167 U	0.00174 U	0.0016 U	0.0017 U	0.002 U	0.00171 U	0.00165 U	0.00161 U	0.00161 U
DONA	NS	NS	0.00169 U	0.00176 U	0.00162 U	0.00172 U	0.002 U	0.00173 U	0.00167 U	0.00162 U	0.00163 U
HFPODA	0.01	0.01	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
NEtFOSAA	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
NMeFOSAA	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluorobutanesulfonic acid	2	2	**0.00524**	**0.00557**	**0.00477**	**0.00238**	**0.00387**	**0.00348**	**0.00696**	**0.00418**	**0.00378**
Perfluorodecanoic acid	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluorododecanoic acid	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluoroheptanoic acid	NS	NS	**0.0043**	**0.0021**	**0.00205**	0.00182 U	0.002 U	0.00183 U	**0.00274**	**0.00195**	**0.00225**
Perfluorohexanesulfonic acid	0.01	0.01	**0.059 +**	**0.0471 +**	**0.0418 +**	**0.0283 +**	**0.033 +**	**0.0346 +**	**0.0518 +**	**0.0373 +**	**0.0464 +**
Perfluorohexanoic acid	NS	NS	**0.00781**	**0.00541**	**0.00508**	**0.00312**	**0.00416**	**0.00375**	**0.00703**	**0.00515**	**0.00578**
Perfluorononanoic acid	0.01	0.01	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0645 +**	**0.0354 +**	**0.0307 +**	**0.0173 +**	**0.0249 +**	**0.0247 +**	**0.0376 +**	**0.0246 +**	**0.0318 +**
Perfluorooctanoic acid	0.004	0.004	**0.00359**	**0.00309**	**0.00269**	0.00182 U	**0.00331**	**0.0024**	**0.00306**	**0.00202**	**0.00255**
Perfluorotetradecanoic acid	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluorotridecanoic acid	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U
Perfluoroundecanoic acid	NS	NS	0.00179 U	0.00187 U	0.00171 U	0.00182 U	0.002 U	0.00183 U	0.00177 U	0.00172 U	0.00172 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1841_WALG_PI	1841_WALG_PI	1846_WALG_PI	1846_WALG_PI	1846_WALG_PI	1846_WALG_PI	1846_WALG_PI	1852_WALG_PI	1852_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409506-003	5E02948-03	3E02589_Pre Treat	3K02470_Pre Treat	4E02798-01	HN2409505-003	5E02966-03	22111993-03A	3E02590_Pre Treat
Sample Date	MCL	GW MSCs	11/18/2024	5/13/2025	6/5/2023	11/1/2023	5/15/2024	11/18/2024	5/13/2025	11/16/2022	5/9/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.00175 U	0.00169 F1 U	0.00159 U	0.00163 U	—	0.00164 U	0.002 U	0.00173 U
9Cl-PF3ONS	NS	NS	—	0.00173 U	0.00167 F1 U	0.00157 U	0.00161 U	—	0.00162 U	0.002 U	0.00171 U
DONA	NS	NS	—	0.00175 U	0.00169 F1 U	0.00159 U	0.00163 U	—	0.00164 U	0.002 U	0.00173 U
HFPODA	0.01	0.01	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
NEtFOSAA	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U B3	0.002 U	0.00183 U
NMeFOSAA	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U B3	**0.00046 J**	0.00183 U
Perfluorobutanesulfonic acid	2	2	**0.00594**	**0.00428**	**0.00158 F1**	**0.00158**	**0.00282**	0.002 U	**0.00239**	**0.005**	**0.00439**
Perfluorodecanoic acid	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
Perfluoroheptanoic acid	NS	NS	**0.0026**	**0.00264**	0.00179 F1 U	0.00168 U	**0.00525**	0.002 U	**0.0022**	**0.0035**	**0.00236**
Perfluorohexanesulfonic acid	0.01	0.01	**0.044 +**	**0.0458 +**	**0.0224 F1+**	**0.0171 +**	**0.0593 +**	**0.0203 +**	**0.0325 +**	**0.06 +**	**0.0483 +**
Perfluorohexanoic acid	NS	NS	**0.00579**	**0.00416**	**0.00265 F1**	**0.00216**	**0.00836**	**0.00249**	**0.00392**	**0.0085**	**0.00579**
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00185 U	0.00179 F1 U	0.00168 B3 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0303 +**	**0.0338 +**	**0.028 F1+**	**0.0224 B1+**	**0.0822 +**	**0.0239 +**	**0.0454 +**	**0.11 +**	**0.0706 +**
Perfluorooctanoic acid	0.004	0.004	**0.00362**	**0.00266**	**0.00295 F1**	0.00168 U	**0.00506 +**	**0.00215**	**0.00274**	**0.0048 +**	**0.0042 +**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00185 U	0.00179 F1 U	0.00168 U	0.00172 U	0.002 U	0.00174 U	0.002 U	0.00183 U

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µg/l = Micrograms per liter.
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L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1852_WALG_PI	1852_WALG_PI	1852_WALG_PI	1852_WALG_PI	1853_WALG_PI	1853_WALG_PI	1853_WALG_PI	1853_WALG_PI	1853_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02471_Pre Treat	4E02908-01	HN2409562-003	5E02967-03	22111991-03A	3E02591_Pre Treat	3K02474_Pre Treat	4E02910-01	HN2409759-003
Sample Date	MCL	GW MSCs	11/1/2023	5/13/2024	11/19/2024	5/15/2025	11/17/2022	5/10/2023	11/1/2023	5/14/2024	11/20/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00174 U	0.00176 U	0.002 U	0.00164 U	0.002 U	0.00175 U	0.00166 U	0.00172 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00172 U	0.00174 U	0.002 U	0.00162 U	0.002 U	0.00173 U	0.00165 U	0.0017 U	0.002 U
DONA	NS	NS	0.00174 U	0.00176 U	0.002 U	0.00164 U	0.002 U	0.00175 U	0.00166 U	0.00172 U	0.002 U
HFPODA	0.01	0.01	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
NEtFOSAA	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
NMeFOSAA	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00348**	**0.0041**	**0.00396**	**0.00609**	**0.0067**	**0.0103**	**0.00587**	**0.00442**	**0.00662**
Perfluorodecanoic acid	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00188**	**0.00402**	**0.00266**	**0.0033**	**0.0058**	**0.00564**	**0.00343**	**0.00295**	**0.00484**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0404 +**	**0.0791 +**	**0.042 +**	**0.0763 +**	**0.074 +**	**0.106 +**	**0.0708 +**	**0.0724 +**	**0.0759 +**
Perfluorohexanoic acid	NS	NS	**0.00452**	**0.00761**	**0.0055**	**0.00734**	**0.011**	**0.0107**	**0.00723**	**0.00625**	**0.00812**
Perfluorononanoic acid	0.01	0.01	0.00184 U	0.00186 U	0.002 U	0.00174 U	**0.00065 J**	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.0584 +**	**0.187 +**	**0.0754 +**	**0.167 +**	**0.21 +**	**0.232 +**	**0.19 +**	**0.342 +**	**0.182 +**
Perfluorooctanoic acid	0.004	0.004	**0.0037**	**0.00455 +**	**0.0054 +**	**0.00451 +**	**0.0066 +**	**0.00648 +**	**0.00405 +**	**0.00363**	**0.00636 +**
Perfluorotetradecanoic acid	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00184 U	0.00186 U	0.002 U	0.00174 U	0.002 U	0.00185 U	0.00176 U	0.00182 U	0.002 U

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Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1853_WALG_PI	1858_WALG_PI	1858_WALG_PI	1858_WALG_PI	1858_WALG_PI	1858_WALG_PI	1858_WALG_PI	1859_WALG_PI	1859_WALG_PI
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02968-03	22090736-01A	3E02592_Pre Treat	3K02475_Pre Treat	4E02911-01	HN2409550-003	5E02949-03	22111992-03A	3E02593_Pre Treat
Sample Date	MCL	GW MSCs	5/15/2025	9/7/2022	5/10/2023	11/14/2023	5/14/2024	11/19/2024	5/13/2025	11/16/2022	5/10/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00175 U	0.002 U	0.00166 U	0.00171 U	0.0017 U	0.002 U	0.00172 U	0.002 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00173 U	0.002 U	0.00165 U	0.00169 U	0.00168 U	0.002 U	0.00171 U	0.002 U	0.00169 U
DONA	NS	NS	0.00175 U	0.002 U	0.00166 U	0.00171 U	0.0017 U	0.002 U	0.00172 U	0.002 U	0.00171 U
HFPODA	0.01	0.01	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
NMeFOSAA	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	**0.00046 J**	0.00181 U
Perfluorobutanesulfonic acid	2	2	**0.0105**	**0.0026**	**0.00312**	0.0016 U	0.00159 U	**0.00216**	**0.00302**	**0.00084 J**	**0.00395**
Perfluorodecanoic acid	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	**0.00558**	**0.0014 J**	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	**0.00061 J**	**0.0022**
Perfluorohexanesulfonic acid	0.01	0.01	**0.131 +**	**0.017 +**	**0.0187 +**	**0.00557**	**0.0136 +**	**0.00668**	**0.0179 +**	**0.0096**	**0.0371 +**
Perfluorohexanoic acid	NS	NS	**0.0119**	**0.0033**	**0.0034**	**0.0025**	**0.00192**	**0.0026**	**0.00269**	**0.0017 J**	**0.00532**
Perfluorononanoic acid	0.01	0.01	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.258 +**	**0.015 +**	**0.0173 +**	0.00167 U	**0.0177 +**	**0.00654 +**	**0.0168 +**	**0.023 +**	**0.0724 M3+**
Perfluorooctanoic acid	0.004	0.004	**0.00586 +**	**0.0011 J**	0.00176 U	0.00181 U	0.0018 U	**0.00229**	0.00182 U	**0.001 J**	**0.00257**
Perfluorotetradecanoic acid	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00185 U	0.002 U	0.00176 U	0.00181 U	0.0018 U	0.002 U	0.00182 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B1 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank at or above the method Reporting Limit, however it was <10% the concentration detected in the sample. Data may be usable based on the intended use.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1859_WALG_PI	1859_WALG_PI	1859_WALG_PI	1859_WALG_PI	1864_WALG_PI	1864_WALG_PI	1864_WALG_PI	1864_WALG_PI	1864_WALG_PI DUP
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02476_Pre Treat	4E02913-01	HN2409507-003	5E02969-03	3E02594_Pre Treat	3K02477_Pre Treat	4E02914-01	HN2409567-003	HN2409559-001
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/18/2024	5/13/2025	5/11/2023	11/1/2023	5/1/2024	11/19/2024	11/19/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00163 U	0.00171 U	—	0.00169 U	0.0018 U	0.00161 U	0.00169 U	0.002 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00161 U	0.00169 U	—	0.00167 U	0.00178 U	0.0016 U	0.00168 U	0.002 U	0.002 U
DONA	NS	NS	0.00163 U	0.00171 U	—	0.00169 U	0.0018 U	0.00161 U	0.00169 U	0.002 U	0.002 U
HFPODA	0.01	0.01	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
NEtFOSAA	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
NMeFOSAA	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluorobutanesulfonic acid	2	2	**0.00673**	**0.00479**	**0.00696**	**0.00636**	**0.00668**	**0.00249**	**0.00463**	**0.00378**	**0.00328**
Perfluorodecanoic acid	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.00407**	**0.0032**	**0.00372**	**0.00368**	**0.00247**	**0.00388**	**0.00308**	**0.0041**	**0.00402**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0636 +**	**0.0606 +**	**0.0675 +**	**0.0816 +**	**0.0696 +**	**0.0154 +**	**0.0768 +**	**0.0195 +**	**0.0178 +**
Perfluorohexanoic acid	NS	NS	**0.00788**	**0.00635**	**0.00648**	**0.00676**	**0.0067**	**0.00969**	**0.00747**	**0.0101**	**0.00976**
Perfluorononanoic acid	0.01	0.01	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.111 +**	**0.179 +**	**0.138 +**	**0.215 +**	**0.0955 +**	**0.0119 +**	**0.155 +**	**0.0244 +**	**0.0192 +**
Perfluorooctanoic acid	0.004	0.004	**0.00468 +**	**0.00425 +**	**0.00633 +**	**0.00436 +**	**0.00404 +**	**0.00891 +**	**0.0048 +**	**0.0101 +**	**0.0102 +**
Perfluorotetradecanoic acid	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00172 U	0.00181 U	0.002 U	0.00179 U	0.0019 U	0.00171 U	0.00179 U	0.002 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
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F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

Table B2. Summary of POET Influent (PI) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1864_WALG_PI
Additional Information	USEPA	PADEP	—
Lab Sample ID	Primary	RUA	5E02970-03
Sample Date	MCL	GW MSCs	5/15/2025
PFAS (µg/l)			
11Cl-PF3OUdS	NS	NS	0.00169 U
9Cl-PF3ONS	NS	NS	0.00168 U
DONA	NS	NS	0.00169 U
HFPODA	0.01	0.01	0.00179 U
NEtFOSAA	NS	NS	0.00179 U
NMeFOSAA	NS	NS	0.00179 U
Perfluorobutanesulfonic acid	2	2	**0.00749**
Perfluorodecanoic acid	NS	NS	0.00179 U
Perfluorododecanoic acid	NS	NS	0.00179 U
Perfluoroheptanoic acid	NS	NS	**0.00282**
Perfluorohexanesulfonic acid	0.01	0.01	**0.0723 +**
Perfluorohexanoic acid	NS	NS	**0.00672**
Perfluorononanoic acid	0.01	0.01	0.00179 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.104 +**
Perfluorooctanoic acid	0.004	0.004	**0.00442 +**
Perfluorotetradecanoic acid	NS	NS	0.00179 U
Perfluorotridecanoic acid	NS	NS	0.00179 U
Perfluoroundecanoic acid	NS	NS	0.00179 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B1 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank at or above the method Reporting Limit, however it was <10% the concentration detected in the sample. Data may be usable based on the intended use.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
F1 = Sample was filtered prior to extraction procedure because of visible particulates, results should be considered dissolved.
J = Result below the reporting limit (estimated value).
L1 = The Laboratory Control Sample for the analysis batch associated with this sample was below acceptance criteria. Results may have greater uncertainty.
M3 = The Matrix Spike associated with this sample is above established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased high.
U = Not detected above laboratory detection limit.

APPENDIX B – Table B3

Summary of POET Mid-Point (PM) Performance PFAS Sampling Results
(Post-POET Installation)

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			182_BGHL_PM1	194_BGHL_PM1	194_BGHL_PM1	288_BGHL_PM1	338_BGHL_PM1	338_BGHL_PM1	338_BGHL_PM1	754_BGHL_PM1	754_BGHL_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02963-02**	**4E06398-02**	**HN2409764-002**	**5E02952-02**	**HN2408119-002**	**HN2409570-001**	**5E02953-02**	**HN2408199-002**	**5E02954-02**
Sample Date	**MCL**	**GW MSCs**	**5/13/2025**	**5/28/2024**	**11/20/2024**	**5/14/2025**	**10/21/2024**	**11/19/2024**	**5/12/2025**	**10/22/2024**	**5/13/2025**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00171 U	0.00175 U	0.002 U	0.00175 U	—	0.002 U	0.00166 U	—	0.00176 U
9Cl-PF3ONS	NS	NS	0.00169 U	0.00173 U	0.002 U	0.00173 U	—	0.002 U	0.00164 U	—	0.00174 U
DONA	NS	NS	0.00171 U	0.00175 U	0.002 U	0.00175 U	—	0.002 U	0.00166 U	—	0.00176 U
HFPODA	0.01	0.01	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
NEtFOSAA	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
NMeFOSAA	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorobutanesulfonic acid	2	2	0.0016 U	0.00164 U	0.002 U	0.00164 U	0.002 U	0.002 U	0.00155 U	0.002 U	0.00165 U
Perfluorodecanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluoroheptanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.00169 U	0.002 U	0.00169 U	0.002 U	0.002 U	0.00161 U	0.002 U	0.00171 U
Perfluorohexanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00167 U	0.00171 U	0.002 U	0.00171 U	**0.00333**	0.002 U	0.00162 U	0.002 U	0.00173 U
Perfluorooctanoic acid	0.004	0.004	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.00185 U	0.002 U	0.00185 U	0.002 U	0.002 U	0.00175 U	0.002 U	0.00187 U

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USEPA = United State Environmental Protection Agency.
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M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_PM1	786_BGHL_PM1	786_BGHL_PM1	786_BGHL_PM1	786_BGHL_PM1	1412_MAJV_PM1	1412_MAJV_PM1	1412_MAJV_PM1	1412_MAJV_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3E02598_Mid-point**	**3K02462_Mid-point**	**4E02920-02**	**HN2409762-002**	**5E02976-02**	**22111990-02A**	**3E02569_Mid-point**	**3K02442_Mid-point**	**4C03346-03**
Sample Date	**MCL**	**GW MSCs**	**5/11/2023**	**11/1/2023**	**5/14/2024**	**11/20/2024**	**5/14/2025**	**11/17/2022**	**5/11/2023**	**11/1/2023**	**3/12/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00173 U	0.00168 U	0.0017 U	0.002 U	0.0017 U	0.002 U	0.00169 U	0.00164 U	0.00165 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.00166 U	0.00168 U	0.002 U	0.00168 U	0.002 U	0.00168 U	0.00162 U	0.00163 U
DONA	NS	NS	0.00173 U	0.00168 U	0.0017 U	0.002 U	0.0017 U	0.002 U	0.00169 U	0.00164 U	0.00165 U
HFPODA	0.01	0.01	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
NEtFOSAA	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
NMeFOSAA	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorobutanesulfonic acid	2	2	0.00162 U	0.00157 U	0.00159 U	0.002 U	0.00159 U	0.002 U	0.00159 U	0.00154 U	0.00154 U
Perfluorodecanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorododecanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluoroheptanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.00163 U	0.00165 U	0.002 U	0.00165 U	0.002 U	0.00164 U	0.00159 U	0.00159 U
Perfluorohexanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorononanoic acid	0.01	0.01	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.00165 U	0.00166 U	0.002 U	0.00166 U	**0.00056 J**	0.00166 U	0.00161 U	0.00161 U
Perfluorooctanoic acid	0.004	0.004	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorotetradecanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorotridecanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluoroundecanoic acid	NS	NS	0.00183 U	0.00178 U	0.0018 U	0.002 U	0.0018 U	0.002 U	0.00179 U	0.00174 U	0.00174 U

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J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1412_MAJV_PM1	1412_MAJV_PM1	1412_MAJV_PM1	1412_MAJV_PM1	1413_MAJV_PM1	1413_MAJV_PM1	1413_MAJV_PM1	1413_MAJV_PM1	1413_MAJV_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**4E02752-02**	**HN2409493-002**	**3L04952_Mid-point**	**5E02938-02**	**22111989-02A**	**3E02570_Mid-point**	**3K02443_Mid-point**	**4E02766-02**	**HN2409552-002**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**11/18/2024**	**12/1/2024**	**5/12/2025**	**11/17/2022**	**5/9/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00174 U	—	0.00171 U	0.00178 U	0.002 U	0.00174 U	0.00164 U	0.00178 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00172 U	—	0.00169 U	0.00176 U	0.002 U	0.00172 U	0.00162 U	0.00176 U	0.002 U
DONA	NS	NS	0.00174 U	—	0.00171 U	0.00178 U	0.002 U	0.00174 U	0.00164 U	0.00178 U	0.002 U
HFPODA	0.01	0.01	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
NEtFOSAA	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	**0.00037 J**	0.00184 U	0.00174 U	0.00188 U	0.002 U
NMeFOSAA	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	**0.00062 J**	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00163 U	0.002 U	0.0016 B3 U	0.00167 U	0.002 U	0.00163 U	0.00154 U	0.00166 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.002 U	0.00165 U	0.00173 U	0.002 U	0.00168 U	0.00159 U	0.00172 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.0017 U	0.002 U	**0.00335**	0.00175 U	**0.00089 J**	0.0017 U	0.00161 U	0.00174 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00184 U	0.002 U	0.00181 U	0.00189 U	0.002 U	0.00184 U	0.00174 U	0.00188 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1413_MAJV_PM1	1418_MAJV_PM1	1418_MAJV_PM1	1418_MAJV_PM1	1418_MAJV_PM1	1418_MAJV_PM1	1419_MAJV_PM1	1419_MAJV_PM1	1419_MAJV_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02937-02**	**22120677-02A**	**3K02444_Mid-point**	**4E02767-02**	**HN2409689-002**	**5E02939-02**	**22111984-02A**	**3E02572_Mid-point**	**3K02445_Mid-point**
Sample Date	**MCL**	**GW MSCs**	**5/12/2025**	**12/6/2022**	**11/1/2023**	**5/15/2024**	**11/20/2024**	**5/12/2025**	**11/16/2022**	**5/9/2023**	**11/1/2023**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00174 U	0.002 U	0.00165 U	0.0018 U	0.002 U	0.00177 U	0.002 U	0.00174 U	0.00163 U
9Cl-PF3ONS	NS	NS	0.00172 U	0.002 U	0.00163 U	0.00178 U	0.002 U	0.00175 U	0.002 U	0.00172 U	0.00161 U
DONA	NS	NS	0.00174 U	0.002 U	0.00165 U	0.0018 U	0.002 U	0.00177 U	0.002 U	0.00174 U	0.00163 U
HFPODA	0.01	0.01	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
NEtFOSAA	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
NMeFOSAA	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	**0.00048 J**	0.00184 U	0.00172 U
Perfluorobutanesulfonic acid	2	2	0.00163 U	0.002 U	0.00155 U	0.00168 U	0.002 U	0.00166 U	0.002 U	0.00163 U	0.00153 U
Perfluorodecanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorododecanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluoroheptanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.002 U	0.0016 U	0.00174 U	0.002 U	0.00171 U	0.002 U	0.00168 U	0.00158 U
Perfluorohexanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorononanoic acid	0.01	0.01	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorooctanesulfonic acid	0.004	0.004	0.0017 U	**0.0013 J**	0.00162 U	0.00176 U	0.002 U	0.00173 U	**0.00022 J**	0.0017 U	0.00159 U
Perfluorooctanoic acid	0.004	0.004	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorotetradecanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluorotridecanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U
Perfluoroundecanoic acid	NS	NS	0.00184 U	0.002 U	0.00175 U	0.0019 U	0.002 U	0.00187 U	0.002 U	0.00184 U	0.00172 U

Notes:
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1419_MAJV_PM1	1419_MAJV_PM1	1419_MAJV_PM1	1424_MAJV_PM1	1424_MAJV_PM1	1424_MAJV_PM1	1425_MAJV_PM1	1425_MAJV_PM1	1425_MAJV_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02769-02	HN2409682-002	5E02940-02	22120680-02A	3K02446_Mid-point	HN2409565-002	3E02574_Mid-point	3K02447_Mid-point	4E02773-02
Sample Date	MCL	GW MSCs	5/15/2024	11/20/2024	5/12/2025	12/6/2022	11/1/2023	11/19/2024	5/9/2023	11/1/2023	5/14/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00171 U	0.002 U	0.00166 U	0.002 U	0.00165 U	0.002 U	0.00172 U	0.00175 U	0.00169 U
9Cl-PF3ONS	NS	NS	0.00169 U	0.002 U	0.00164 U	0.002 U	0.00163 U	0.002 U	0.0017 U	0.00173 U	0.00168 U
DONA	NS	NS	0.00171 U	0.002 U	0.00166 U	0.002 U	0.00165 U	0.002 U	0.00172 U	0.00175 U	0.00169 U
HFPODA	0.01	0.01	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
NEtFOSAA	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
NMeFOSAA	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorobutanesulfonic acid	2	2	0.0016 U	0.002 U	0.00155 U	0.002 U	0.00155 U	0.002 U	0.00161 U	0.00164 U	0.00159 U
Perfluorodecanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluoroheptanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.002 U	0.00161 U	0.002 U	0.0016 U	0.002 U	0.00166 U	0.00169 U	0.00164 U
Perfluorohexanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00167 U	0.002 U	0.00162 U	0.002 U	0.00162 U	0.002 U	0.00168 U	0.00171 U	0.00166 U
Perfluorooctanoic acid	0.004	0.004	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.002 U	0.00175 U	0.002 U	0.00175 U	0.002 U	0.00182 U	0.00185 U	0.00179 U

Notes:
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M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1425_MAJV_PM1	1425_MAJV_PM1	1430_MAJV_PM1	1430_MAJV_PM1	1430_MAJV_PM1	1430_MAJV_PM1	1430_MAJV_PM1	1430_MAJV_PM1	1431_MAJV_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409685-002	5E02941-02	22111988-02A	3E02575_Mid-point	3K02448_Mid-point	4E02774-02	HN2409553-002	5E02957-02	3E02576_Mid-point
Sample Date	MCL	GW MSCs	11/20/2024	5/12/2025	11/16/2022	5/9/2023	11/1/2023	5/13/2024	11/19/2024	5/13/2025	5/10/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.00169 U	0.002 U	0.00171 U	0.00169 U	0.00181 U	0.002 U	0.0018 U	0.00174 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00168 U	0.002 U	0.00169 U	0.00167 U	0.00179 U	0.002 U	0.00178 U	0.00172 U
DONA	NS	NS	0.002 U	0.00169 U	0.002 U	0.00171 U	0.00169 U	0.00181 U	0.002 U	0.0018 U	0.00174 U
HFPODA	0.01	0.01	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
NEtFOSAA	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
NMeFOSAA	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00159 U	0.002 U	0.0016 U	0.00158 U	0.0017 U	0.002 U	0.00169 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00164 U	0.002 U	0.00166 U	0.00163 U	0.00175 U	0.002 U	0.00175 U	0.00168 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00166 U	0.002 U	0.00168 U	0.00165 U	0.00177 U	0.002 U	0.00177 U	0.0017 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00179 U	0.00192 U	0.002 U	0.00191 U	0.00184 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
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— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1431_MAJV_PM1	1431_MAJV_PM1	1431_MAJV_PM1	1431_MAJV_PM1	1436_MAJV_PM1	1436_MAJV_PM1	1436_MAJV_PM1	1436_MAJV_PM1	1436_MAJV_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02449_Mid-point	4E02775-02	HN2409687-002	5E02958-02	22120679-02A	23011850-03A	3E02577_Mid-point	3K02450_Mid-point	4E02776-02
Sample Date	MCL	GW MSCs	11/1/2023	5/13/2024	11/20/2024	5/15/2025	12/6/2022	1/24/2023	5/11/2023	11/1/2023	5/13/2024
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00166 U	0.00168 U	0.002 U	0.00171 U	0.002 U	0.002 U	0.00169 U	0.00165 U	0.00178 U
9Cl-PF3ONS	NS	NS	0.00165 U	0.00166 U	0.002 U	0.00169 U	0.002 U	0.002 U	0.00167 U	0.00163 U	0.00176 U
DONA	NS	NS	0.00166 U	0.00168 U	0.002 U	0.00171 U	0.002 U	0.002 U	0.00169 U	0.00165 U	0.00178 U
HFPODA	0.01	0.01	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
NEtFOSAA	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
NMeFOSAA	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorobutanesulfonic acid	2	2	0.00156 U	0.00157 U	0.002 U	0.0016 U	0.002 U	0.002 U	0.00158 U	0.00154 U	0.00167 U
Perfluorodecanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorododecanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluoroheptanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00161 U	0.00163 U	0.002 U	0.00166 U	0.002 U	0.002 U	0.00163 U	0.00159 U	0.00173 U
Perfluorohexanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorononanoic acid	0.01	0.01	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00163 U	0.00165 U	0.002 U	0.00168 U	**0.0024**	**0.00089 J**	0.00165 U	0.00161 U	0.00175 U
Perfluorooctanoic acid	0.004	0.004	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorotetradecanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluorotridecanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U
Perfluoroundecanoic acid	NS	NS	0.00176 U	0.00178 U	0.002 U	0.00181 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00189 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1436_MAJV_PM1	1436_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1	1437_MAJV_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**HN2409517-002**	**5E02959-02**	**3E02578_Mid-point**	**23061431-01A**	**23072254-02A**	**3K02451_Mid-point**	**4E02777-02**	**HN2409557-002**	**5E02960-02**
Sample Date	**MCL**	**GW MSCs**	**11/18/2024**	**5/13/2025**	**5/9/2023**	**6/14/2023**	**7/25/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**	**5/13/2025**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.00173 U	0.0017 U	0.002 U	0.002 U	0.00172 U	0.00172 U	0.002 U	0.00176 U
9Cl-PF3ONS	NS	NS	—	0.00171 U	0.00168 U	0.002 U	0.002 U	0.00171 U	0.0017 U	0.002 U	0.00174 U
DONA	NS	NS	—	0.00173 U	0.0017 U	0.002 U	0.002 U	0.00172 U	0.00172 U	0.002 U	0.00176 U
HFPODA	0.01	0.01	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
NEtFOSAA	NS	NS	0.002 U	0.00183 U B3	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
NMeFOSAA	NS	NS	0.002 U	0.00183 U B3	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00162 U	0.00159 U	0.002 U	0.002 U	0.00161 U	0.00161 U	0.002 U	0.00164 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00168 U	0.00165 U	0.002 U	0.002 U	0.00167 U	0.00166 U	0.002 U	0.0017 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00169 U	**0.00295**	**0.0023**	**0.00095 J**	0.00169 U	0.00168 U	0.002 U	0.00172 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.002 U	0.002 U	0.00182 U	0.00182 U	0.002 U	0.00186 U

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RUA = Residential Used Aquifer.
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ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
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Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1442_MAJV_PM1	1442_MAJV_PM1	1442_MAJV_PM1	1442_MAJV_PM1	1442_MAJV_PM1	1443_MAJV_PM1	1443_MAJV_PM1	1443_MAJV_PM1	1443_MAJV_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3E02579_Mid-point**	**3K02452_Mid-point**	**4E02778-02**	**HN2409690-002**	**5E02961-02**	**22120678-02A**	**3E02580_Mid-point**	**3K02453_Mid-point**	**4E02779-02**
Sample Date	**MCL**	**GW MSCs**	**5/11/2023**	**11/1/2023**	**5/14/2024**	**11/20/2024**	**5/13/2025**	**12/6/2022**	**6/5/2023**	**11/1/2023**	**5/14/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00173 U	0.00172 U	0.00177 U	0.002 U	0.00169 U	0.002 U	0.00171 U	0.00165 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.0017 U	0.00175 U	0.002 U	0.00167 U	0.002 U	0.00169 U	0.00163 U	0.00169 U
DONA	NS	NS	0.00173 U	0.00172 U	0.00177 U	0.002 U	0.00169 U	0.002 U	0.00171 U	0.00165 U	0.00171 U
HFPODA	0.01	0.01	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
NEtFOSAA	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
NMeFOSAA	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00162 U	0.00161 U	0.00166 U	0.002 U	0.00158 U	0.002 U	0.0016 U	0.00154 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.00166 U	0.00171 U	0.002 U	0.00163 U	0.002 U	0.00166 U	0.00159 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.00168 U	0.00173 U	0.002 U	0.00165 U	0.002 U	0.00168 U	0.00161 U	0.00167 U
Perfluorooctanoic acid	0.004	0.004	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00183 U	0.00182 U	0.00187 U	0.002 U	0.00179 U	0.002 U	0.00181 U	0.00174 U	0.00181 U

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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
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M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1443_MAJV_PM1	1443_MAJV_PM1	1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**HN2409556-002**	**5E02942-02**	**22120671-02A**	**3E02595_Mid-point**	**3K02465_Mid-point**	**3L02577_Mid-point**	**23L3797-04**	**3L05033-04**	**4A04640-04**
Sample Date	**MCL**	**GW MSCs**	**11/19/2024**	**5/12/2025**	**12/6/2022**	**5/9/2023**	**11/1/2023**	**12/1/2023**	**12/27/2023**	**12/27/2023**	**1/17/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.00169 U	0.002 U	0.00178 U	0.00164 U	0.00163 U	0.0019 U	0.00167 U	0.00166 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00167 U	0.002 U	0.00176 U	0.00162 U	0.00161 U	0.0019 U	0.00165 U	0.00164 U
DONA	NS	NS	0.002 U	0.00169 U	0.002 U	0.00178 U	0.00164 U	0.00163 U	0.0019 U	0.00167 U	0.00166 U
HFPODA	0.01	0.01	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
NEtFOSAA	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
NMeFOSAA	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00158 U	0.002 U	0.00167 U	0.00154 U	0.00153 U	0.0019 U	0.00156 U	0.00155 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00163 U	0.002 U	0.00173 U	0.00159 U	0.00158 U	0.0019 U	0.00162 U	0.00161 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	**0.0115 +**	0.0019 U	0.00177 U	0.00175 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00165 U	0.002 U	0.00175 U	0.00161 U	**0.0407 +**	0.0019 U	0.00163 U	0.00162 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	**0.00422 +**	0.0019 U	0.00177 U	0.00175 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00179 U	0.002 U	0.00189 U	0.00174 U	0.00172 U	0.0019 U	0.00177 U	0.00175 U

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Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1876_MILL_PM1	1876_MILL_PM1	1876_MILL_PM1	1877_MILL_PM1	1877_MILL_PM1	1877_MILL_PM1	1877_MILL_PM1	1877_MILL_PM1	1882_MILL_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**4E02915-02**	**HN2409515-002**	**5E02950-02**	**3E02596_Mid-point**	**3K02464_Mid-point**	**4E02916-02**	**HN2409765-002**	**5E02971-02**	**4E02921-02**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**11/18/2024**	**5/12/2025**	**5/10/2023**	**11/1/2023**	**5/15/2024**	**11/20/2024**	**5/14/2025**	**5/15/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00176 U	—	0.00169 U	0.00171 U	0.00163 U	0.00173 U	0.002 U	0.00171 U	0.00178 U
9Cl-PF3ONS	NS	NS	0.00174 U	—	0.00167 U	0.00169 U	0.00162 U	0.00171 U	0.002 U	0.00169 U	0.00176 U
DONA	NS	NS	0.00176 U	—	0.00169 U	0.00171 U	0.00163 U	0.00173 U	0.002 U	0.00171 U	0.00178 U
HFPODA	0.01	0.01	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
NEtFOSAA	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U B3	0.00188 U
NMeFOSAA	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U B3	0.00188 U
Perfluorobutanesulfonic acid	2	2	0.00165 U	0.002 U	0.00158 U	0.0016 U	0.00153 U	0.00162 U	0.002 U	0.0016 U	0.00166 U
Perfluorodecanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorododecanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluoroheptanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00171 U	0.002 U	0.00163 U	0.00165 U	0.00158 U	0.00168 U	0.002 U	0.00165 U	0.00172 U
Perfluorohexanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorononanoic acid	0.01	0.01	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00173 U	0.002 U	0.00165 U	0.00167 U	0.0016 U	0.00169 U	0.002 U	0.00167 U	0.00174 U
Perfluorooctanoic acid	0.004	0.004	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorotetradecanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluorotridecanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U
Perfluoroundecanoic acid	NS	NS	0.00187 U	0.002 U	0.00179 U	0.00181 U	0.00173 U	0.00183 U	0.002 U	0.00181 U	0.00188 U

Notes:
USEPA = United State Environmental Protection Agency.
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J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1882_MILL_PM1	1882_MILL_PM1	1883_MILL_PM1	1883_MILL_PM1	1883_MILL_PM1	1883_MILL_PM1	1883_MILL_PM1	1250_ROCK_PM1	1250_ROCK_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409513-002	5E02951-02	3E02597_Mid-point	3K02463_Mid-point	4E02917-02	HN2409558-002	5E02972-02	HN2408197-002	5E02955-02
Sample Date	MCL	GW MSCs	11/18/2024	5/14/2025	5/10/2023	11/1/2023	5/14/2024	11/19/2024	5/14/2025	10/22/2024	5/15/2025
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	0.00173 U	0.0017 U	0.00162 U	0.00169 U	0.002 U	0.00172 U	—	0.00171 U
9Cl-PF3ONS	NS	NS	—	0.00171 U	0.00168 U	0.0016 U	0.00167 U	0.002 U	0.00171 U	—	0.00169 U
DONA	NS	NS	—	0.00173 U	0.0017 U	0.00162 U	0.00169 U	0.002 U	0.00172 U	—	0.00171 U
HFPODA	0.01	0.01	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
NMeFOSAA	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00162 U	0.00159 U	0.00152 U	0.00158 U	0.002 U	0.00161 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00168 U	0.00165 U	0.00157 U	0.00163 U	0.002 U	0.00167 U	0.002 U	0.00166 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00169 U	**0.00212**	0.00158 U	0.00165 U	0.002 U	0.00169 U	0.002 U	0.00168 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00183 U	0.0018 U	0.00171 U	0.00179 U	0.002 U	0.00182 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			587_ROCK_PM1	1810_WALG_PM1	1810_WALG_PM1	1810_WALG_PM1	1810_WALG_PM1	1810_WALG_PM1	1811_WALG_PM1	1811_WALG_PM1	1822_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02975-02**	**3E02581_Mid-point**	**3K02454_Mid-point**	**4E02790-02**	**HN2409568-002**	**5E02943-02**	**HN2408121-002**	**5E02962-02**	**3E02582_Mid-point**
Sample Date	**MCL**	**GW MSCs**	**5/14/2025**	**5/10/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**	**5/12/2025**	**10/21/2024**	**5/14/2025**	**5/11/2023**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00172 U	0.00169 U	0.00163 U	0.00172 U	0.002 U	0.00171 U	—	0.00173 U	0.00166 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.00167 U	0.00162 U	0.00171 U	0.002 U	0.00169 U	—	0.00171 U	0.00164 U
DONA	NS	NS	0.00172 U	0.00169 U	0.00163 U	0.00172 U	0.002 U	0.00171 U	—	0.00173 U	0.00166 U
HFPODA	0.01	0.01	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
NEtFOSAA	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U B3	0.00175 U
NMeFOSAA	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U B3	0.00175 U
Perfluorobutanesulfonic acid	2	2	0.00161 U	0.00158 U	0.00153 U	0.00161 U	0.002 U	0.0016 U	0.002 U	0.00162 U	0.00155 U
Perfluorodecanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorododecanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluoroheptanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00167 U	0.00163 U	0.00158 U	0.00167 U	0.002 U	0.00165 U	0.002 U	0.00168 U	0.00161 U
Perfluorohexanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorononanoic acid	0.01	0.01	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.00165 U	0.0016 U	0.00169 U	0.002 U	0.00167 U	0.002 U	0.00169 U	0.00162 U
Perfluorooctanoic acid	0.004	0.004	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorotetradecanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluorotridecanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U
Perfluoroundecanoic acid	NS	NS	0.00182 U	0.00179 U	0.00173 U	0.00182 U	0.002 U	0.00181 U	0.002 U	0.00183 U	0.00175 U

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USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1822_WALG_PM1	1822_WALG_PM1	1822_WALG_PM1	1822_WALG_PM1	1828_WALG_PM1	1828_WALG_PM1	1828_WALG_PM1	1828_WALG_PM1	1828_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3K02455_Mid-point**	**4E02791-02**	**HN2409763-002**	**5E02964-02**	**3E02583_Mid-point**	**3K02456_Mid-point**	**4E02792-02**	**HN2409514-002**	**5E02944-02**
Sample Date	**MCL**	**GW MSCs**	**11/1/2023**	**5/15/2024**	**11/20/2024**	**5/15/2025**	**5/9/2023**	**11/1/2023**	**5/13/2024**	**11/18/2024**	**5/12/2025**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00165 U	0.00171 U	0.002 U	0.00168 U	0.00174 U	0.0017 U	0.00185 U	—	0.00182 U
9Cl-PF3ONS	NS	NS	0.00163 U	0.00169 U	0.002 U	0.00166 U	0.00172 U	0.00168 U	0.00183 U	—	0.00181 U
DONA	NS	NS	0.00165 U	0.00171 U	0.002 U	0.00168 U	0.00174 U	0.0017 U	0.00185 U	—	0.00182 U
HFPODA	0.01	0.01	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
NEtFOSAA	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
NMeFOSAA	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorobutanesulfonic acid	2	2	0.00154 U	0.0016 U	0.002 U	0.00157 U	0.00163 U	0.00159 U	0.00174 U	0.002 U	0.00171 U
Perfluorodecanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorododecanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluoroheptanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00159 U	0.00166 U	0.002 U	0.00163 U	0.00168 U	0.00165 U	0.00179 U	0.002 U	0.00177 U
Perfluorohexanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorononanoic acid	0.01	0.01	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00161 U	0.00168 U	0.002 U	0.00165 U	0.0017 U	0.00166 U	0.00181 U	0.002 U	0.00179 U
Perfluorooctanoic acid	0.004	0.004	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorotetradecanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluorotridecanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U
Perfluoroundecanoic acid	NS	NS	0.00174 U	0.00181 U	0.002 U	0.00178 U	0.00184 U	0.0018 U	0.00196 U	0.002 U	0.00193 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1829_WALG_PM1	1829_WALG_PM1	1829_WALG_PM1	1829_WALG_PM1	1829_WALG_PM1	1834_WALG_PM1	1834_WALG_PM1	1834_WALG_PM1	1834_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3E02584_Mid-point**	**3K02457_Mid-point**	**4E02793-02**	**HN2409561-002**	**5E02965-02**	**3E02585_Mid-point**	**3K02458_Mid-point**	**4C03347-03**	**4E02794-02**
Sample Date	**MCL**	**GW MSCs**	**5/9/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**	**5/15/2025**	**5/9/2023**	**11/1/2023**	**3/12/2024**	**5/15/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00173 U	0.00165 U	0.00168 U	0.002 U	0.00168 U	0.00178 U	0.00163 U	0.00166 U	0.00168 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.00163 U	0.00166 U	0.002 U	0.00166 U	0.00176 U	0.00162 U	0.00165 U	0.00166 U
DONA	NS	NS	0.00173 U	0.00165 U	0.00168 U	0.002 U	0.00168 U	0.00178 U	0.00163 U	0.00166 U	0.00168 U
HFPODA	0.01	0.01	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
NEtFOSAA	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
NMeFOSAA	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	0.00162 U	0.00155 U	0.00157 U	0.002 U	0.00157 U	0.00167 U	0.00153 U	0.00156 U	0.00157 U
Perfluorodecanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.0016 U	0.00162 U	0.002 U	0.00163 U	0.00173 U	0.00158 U	0.00161 U	0.00162 U
Perfluorohexanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorononanoic acid	0.01	0.01	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.00162 U	0.00164 U	0.002 U	0.00165 U	0.00175 U	0.0016 U	0.00163 U	0.00164 U
Perfluorooctanoic acid	0.004	0.004	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorotetradecanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.00183 U	0.00175 U	0.00177 U	0.002 U	0.00178 U	0.00189 U	0.00173 U	0.00176 U	0.00177 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
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B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1834_WALG_PM1	1834_WALG_PM1	1835_WALG_PM1	1835_WALG_PM1	1835_WALG_PM1	1835_WALG_PM1	1835_WALG_PM1	1835_WALG_PM1	1840_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**HN2409688-002**	**5E02945-02**	**23021196-03A**	**3E02586_Mid-point**	**3K02459_Mid-point**	**4E02795-02**	**HN2409510-002**	**5E02946-02**	**3E02587_Mid-point**
Sample Date	**MCL**	**GW MSCs**	**11/20/2024**	**5/12/2025**	**2/14/2023**	**5/10/2023**	**11/1/2023**	**5/13/2024**	**11/18/2024**	**5/13/2025**	**5/10/2023**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.00171 U	0.002 U	0.00169 U	0.00163 U	0.00188 U	—	0.00178 U	0.00172 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00169 U	0.002 U	0.00167 U	0.00162 U	0.00186 U	—	0.00176 U	0.00171 U
DONA	NS	NS	0.002 U	0.00171 U	0.002 U	0.00169 U	0.00163 U	0.00188 U	—	0.00178 U	0.00172 U
HFPODA	0.01	0.01	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
NEtFOSAA	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
NMeFOSAA	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.0016 U	0.002 U	0.00158 U	0.00153 U	0.00176 U	0.002 U	0.00166 U	0.00161 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00166 U	0.002 U	0.00163 U	0.00158 U	0.00182 U	0.002 U	0.00172 U	0.00167 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00168 U	**0.00072 J**	0.00165 U	0.0016 U	0.00184 U	0.002 U	0.00174 U	0.00169 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00181 U	0.002 U	0.00179 U	0.00173 U	0.00199 U	0.002 U	0.00188 U	0.00182 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1840_WALG_PM1	1840_WALG_PM1	1840_WALG_PM1	1840_WALG_PM1	1841_WALG_PM1	1841_WALG_PM1	1841_WALG_PM1	1841_WALG_PM1	1841_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3K02466_Mid-point**	**4E02796-02**	**HN2409566-002**	**5E02947-02**	**3E02588_Mid-point**	**3K02469_Mid-point**	**4E02797-02**	**HN2409506-002**	**5E02948-02**
Sample Date	**MCL**	**GW MSCs**	**11/1/2023**	**5/15/2024**	**11/19/2024**	**5/13/2025**	**5/10/2023**	**11/1/2023**	**5/14/2024**	**11/18/2024**	**5/13/2025**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00162 U	0.00174 U	0.002 U	0.00174 U	0.00174 U	0.00166 U	0.00171 U	—	0.00174 U
9Cl-PF3ONS	NS	NS	0.0016 U	0.00172 U	0.002 U	0.00172 U	0.00173 U	0.00164 U	0.00169 U	—	0.00173 U
DONA	NS	NS	0.00162 U	0.00174 U	0.002 U	0.00174 U	0.00174 U	0.00166 U	0.00171 U	—	0.00174 U
HFPODA	0.01	0.01	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
NEtFOSAA	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
NMeFOSAA	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorobutanesulfonic acid	2	2	0.00152 U	0.00163 U	0.002 U	0.00163 U	0.00163 U	0.00155 U	0.0016 U	0.002 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorododecanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluoroheptanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00157 U	0.00168 U	0.002 U	0.00168 U	0.00169 U	0.00161 U	0.00165 U	0.002 U	0.00169 U
Perfluorohexanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorononanoic acid	0.01	0.01	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00158 U	0.0017 U	0.002 U	0.0017 U	0.00171 U	0.00162 U	0.00167 U	0.002 U	0.00171 U
Perfluorooctanoic acid	0.004	0.004	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorotetradecanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluorotridecanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U
Perfluoroundecanoic acid	NS	NS	0.00171 U	0.00184 U	0.002 U	0.00184 U	0.00185 U	0.00175 U	0.00181 U	0.002 U	0.00185 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1846_WALG_PM1	1846_WALG_PM1	1846_WALG_PM1	1846_WALG_PM1	1846_WALG_PM1	1852_WALG_PM1	1852_WALG_PM1	1852_WALG_PM1	1852_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3E02589_Mid-point**	**3K02470_Mid-point**	**4E02798-02**	**HN2409505-002**	**5E02966-02**	**22111993-02A**	**3E02590_Mid-point**	**3K02471_Mid-point**	**4E02908-02**
Sample Date	**MCL**	**GW MSCs**	**6/5/2023**	**11/1/2023**	**5/15/2024**	**11/18/2024**	**5/13/2025**	**11/16/2022**	**5/9/2023**	**11/1/2023**	**5/13/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.0017 U	0.00169 U	0.00171 U	—	0.00171 U	0.002 U	0.00178 U	0.00167 U	0.0018 U
9Cl-PF3ONS	NS	NS	0.00168 U	0.00168 U	0.00169 U	—	0.00169 U	0.002 U	0.00176 U	0.00165 U	0.00178 U
DONA	NS	NS	0.0017 U	0.00169 U	0.00171 U	—	0.00171 U	0.002 U	0.00178 U	0.00167 U	0.0018 U
HFPODA	0.01	0.01	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
NEtFOSAA	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U B3	0.002 U	0.00188 U	0.00177 U	0.00191 U
NMeFOSAA	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U B3	**0.00046 J**	0.00188 U	0.00177 U	0.00191 U
Perfluorobutanesulfonic acid	2	2	0.00159 U	0.00159 U	0.0016 U	0.002 U	0.0016 U	0.002 U	0.00166 U	0.00156 U	0.00169 U
Perfluorodecanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluoroheptanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.00164 U	0.00166 U	0.002 U	0.00166 U	0.002 U	0.00172 U	0.00162 U	0.00175 U
Perfluorohexanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.00179 B3 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00166 U	0.00166 B3 U	0.00168 U	0.002 U	0.00168 U	0.002 U	0.00174 U	0.00163 U	0.00177 U
Perfluorooctanoic acid	0.004	0.004	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.00179 U	0.00181 U	0.002 U	0.00181 U	0.002 U	0.00188 U	0.00177 U	0.00191 U

Notes:
USEPA = United State Environmental Protection Agency.
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
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Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1852_WALG_PM1	1852_WALG_PM1	1853_WALG_PM1	1853_WALG_PM1	1853_WALG_PM1	1853_WALG_PM1	1853_WALG_PM1	1853_WALG_PM1	1858_WALG_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409562-002	5E02967-02	22111991-02A	3E02591_Mid-point	3K02474_Mid-point	4E02910-02	HN2409759-002	5E02968-02	3E02592_Mid-point
Sample Date	MCL	GW MSCs	11/19/2024	5/15/2025	11/17/2022	5/10/2023	11/1/2023	5/14/2024	11/20/2024	5/15/2025	5/10/2023
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.002 U	0.00174 U	0.002 U	0.00177 U	0.00168 U	0.00171 U	0.002 U	0.00174 U	0.00172 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00172 U	0.002 U	0.00175 U	0.00166 U	0.00169 U	0.002 U	0.00173 U	0.00171 U
DONA	NS	NS	0.002 U	0.00174 U	0.002 U	0.00177 U	0.00168 U	0.00171 U	0.002 U	0.00174 U	0.00172 U
HFPODA	0.01	0.01	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
NEtFOSAA	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
NMeFOSAA	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00163 U	0.002 U	0.00166 U	0.00157 U	0.0016 U	0.002 U	0.00163 U	0.00161 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00168 U	0.002 U	0.00171 U	0.00162 U	0.00166 U	0.002 U	0.00169 U	0.00167 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.0017 U	**0.00053 J**	0.00173 U	0.00164 U	0.00168 U	0.002 U	0.00171 U	0.00169 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00187 U	0.00177 U	0.00181 U	0.002 U	0.00185 U	0.00182 U

Notes:
USEPA = United State Environmental Protection Agency.
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M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1858_WALG_PM1	1858_WALG_PM1	1858_WALG_PM1	1858_WALG_PM1	1859_WALG_PM1	1859_WALG_PM1	1859_WALG_PM1	1859_WALG_PM1	1859_WALG_PM1
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3K02475_Mid-point**	**4E02911-02**	**HN2409550-002**	**5E02949-02**	**22111992-02A**	**3E02593_Mid-point**	**3K02476_Mid-point**	**4E02913-02**	**HN2409507-002**
Sample Date	**MCL**	**GW MSCs**	**11/14/2023**	**5/14/2024**	**11/19/2024**	**5/13/2025**	**11/16/2022**	**5/10/2023**	**11/1/2023**	**5/14/2024**	**11/18/2024**
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	0.00162 U	0.00171 U	0.002 U	0.00169 U	0.002 U	0.00173 U	0.00162 U	0.00177 U	—
9Cl-PF3ONS	NS	NS	0.0016 U	0.00169 U	0.002 U	0.00168 U	0.002 U	0.00171 U	0.00161 U	0.00175 U	—
DONA	NS	NS	0.00162 U	0.00171 U	0.002 U	0.00169 U	0.002 U	0.00173 U	0.00162 U	0.00177 U	—
HFPODA	0.01	0.01	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
NEtFOSAA	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
NMeFOSAA	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00152 U	0.0016 U	0.002 U	0.00159 U	0.002 U	0.00162 U	0.00152 U	0.00166 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00157 U	0.00166 U	0.002 U	0.00164 U	0.002 U	0.00168 U	0.00157 U	0.00171 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00158 U	0.00168 U	0.002 U	0.00166 U	**0.00028 J**	0.00169 U	0.00159 U	0.00173 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00171 U	0.00181 U	0.002 U	0.00179 U	0.002 U	0.00183 U	0.00172 U	0.00187 U	0.002 U

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U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B3. Summary of POET Mid-Point (PM) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1859_WALG_PM1	1864_WALG_PM1	1864_WALG_PM1	1864_WALG_PM1	1864_WALG_PM1	1864_WALG_PM1
Additional Information	USEPA	PADEP	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02969-02	3E02594_Mid-point	3K02477_Mid-point	4E02914-02	HN2409567-002	5E02970-02
Sample Date	MCL	GW MSCs	5/13/2025	5/11/2023	11/1/2023	5/1/2024	11/19/2024	5/15/2025
PFAS (µg/l)								
11Cl-PF3OUdS	NS	NS	0.00176 U	0.00171 U	0.00163 U	0.00172 U	0.002 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00174 U	0.00169 U	0.00162 U	0.0017 U	0.002 U	0.00169 U
DONA	NS	NS	0.00176 U	0.00171 U	0.00163 U	0.00172 U	0.002 U	0.00171 U
HFPODA	0.01	0.01	0.00187 U M2	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
NMeFOSAA	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00165 U	0.0016 U	0.00153 U	0.00161 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00171 U	0.00165 U	0.00158 U	0.00166 U	0.002 U	0.00166 U
Perfluorohexanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00173 U	0.00167 U	0.0016 U	0.00168 U	0.002 U	0.00168 U
Perfluorooctanoic acid	0.004	0.004	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00187 U	0.00181 U	0.00173 U	0.00182 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
M2 = The Matrix Spike associated with this sample is below established acceptance criteria, indicating potential matrix interference. Results of this sample may be biased low.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

APPENDIX B – Table B4

Summary of POET Effluent (PE) Performance PFAS Sampling Results
(Post-POET Installation)

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			182_BGHL_PE	194_BGHL_PE	194_BGHL_PE	288_BGHL_PE	338_BGHL_PE	338_BGHL_PE	754_BGHL_PE	754_BGHL_PE
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02963-01**	**4E06398-03**	**HN2409764-001**	**5E02952-01**	**HN2408119-001**	**5E02953-01**	**HN2408199-001**	**5E02954-01**
Sample Date	**MCL**	**GW MSCs**	**5/13/2025**	**5/28/2024**	**11/20/2024**	**5/14/2025**	**10/21/2024**	**5/12/2025**	**10/22/2024**	**5/13/2025**
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.0017 U	0.0017 U	0.002 U	0.00174 U	—	0.00162 U	—	0.00171 U
9Cl-PF3ONS	NS	NS	0.00168 U	0.00168 U	0.002 U	0.00172 U	—	0.00161 U	—	0.00169 U
DONA	NS	NS	0.0017 U	0.0017 U	0.002 U	0.00174 U	—	0.00162 U	—	0.00171 U
HFPODA	0.01	0.01	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
NMeFOSAA	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00159 U	0.00159 U	0.002 U	0.00163 U	0.002 U	0.00152 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.00165 U	0.002 U	0.00168 U	0.002 U	0.00157 U	0.002 U	0.00166 U
Perfluorohexanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00166 U	0.00166 U	0.002 U	0.0017 U	0.002 U	0.00159 U	0.002 U	0.00168 U
Perfluorooctanoic acid	0.004	0.004	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.0018 U	0.002 U	0.00184 U	0.002 U	0.00172 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_PE	786_BGHL_OTHER	786_BGHL_OTHER	786_BGHL_PE	786_BGHL_PE	786_BGHL_PE	786_BGHL_PE	786_BGHL_PE
Additional Information	USEPA	PADEP	—	Basement	Kitchen Tap	Basement	Garage	—	—	—
Lab Sample ID	Primary	RUA	3E02598_Post Treat	23061435-02A	23061435-01A	23072251-01A	23072251-02A	3K02462_Post Treat	4E02920-03	HN2409762-001
Sample Date	MCL	GW MSCs	5/11/2023	6/14/2023	6/14/2023	7/25/2023	7/25/2023	11/1/2023	5/14/2024	11/20/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00174 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00169 U	0.00163 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00173 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00168 U	0.00161 U	0.002 U
DONA	NS	NS	0.00174 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00169 U	0.00163 U	0.002 U
HFPODA	0.01	0.01	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
NEtFOSAA	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
NMeFOSAA	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00163 U	**0.0015 J**	0.002 U	0.002 U	0.002 U	0.00159 U	0.00153 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluoroheptanoic acid	NS	NS	**0.0037**	**0.0042**	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	**0.00404**	**0.0057**	0.002 U	0.002 U	0.002 U	0.00164 U	0.00158 U	0.002 U
Perfluorohexanoic acid	NS	NS	**0.00774**	**0.0095**	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00185 U	**0.00065 J**	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	**0.00358**	**0.0046 +**	0.002 U	0.002 U	0.002 U	0.00166 U	0.00159 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	**0.00927 +**	**0.012 +**	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00172 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**Bathoom**	**Kitchen**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02976-01**	**22111990-01A**	**22120672-02A**	**22120672-01A**	**23030724-01A**	**3E02569_Post Treat**	**3K02442_Post Treat**	**4C03346-01**
Sample Date	**MCL**	**GW MSCs**	**5/14/2025**	**11/17/2022**	**12/6/2022**	**12/6/2022**	**3/7/2023**	**5/11/2023**	**11/1/2023**	**3/12/2024**
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00175 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00169 U	0.00164 U	0.00164 U
9Cl-PF3ONS	NS	NS	0.00173 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00167 U	0.00162 U	0.00162 U
DONA	NS	NS	0.00175 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00169 U	0.00164 U	0.00164 U
HFPODA	0.01	0.01	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
NEtFOSAA	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
NMeFOSAA	NS	NS	0.00185 U	0.002 U	0.002 U	**0.00056 J**	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorobutanesulfonic acid	2	2	0.00164 U	**0.0074**	0.002 U	**0.0077**	0.002 U	0.00158 U	0.00154 U	0.00154 U
Perfluorodecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorododecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluoroheptanoic acid	NS	NS	0.00185 U	**0.005**	0.002 U	**0.0072**	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00169 U	**0.073 +**	0.002 U	**0.088 +**	0.002 U	0.00163 U	0.00159 U	0.00159 U
Perfluorohexanoic acid	NS	NS	0.00185 U	**0.0095**	0.002 U	**0.013**	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorononanoic acid	0.01	0.01	0.00185 U	0.002 U	0.002 U	**0.00063 J**	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00171 U	**0.1 +**	0.002 U	**0.14 +**	0.002 U	0.00165 U	**0.00564 +**	0.00161 U
Perfluorooctanoic acid	0.004	0.004	0.00185 U	**0.0051 +**	0.002 U	**0.0066 +**	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorotetradecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluorotridecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U
Perfluoroundecanoic acid	NS	NS	0.00185 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00179 U	0.00174 U	0.00174 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1412_MAJV_PE	1413_MAJV_PE	1413_MAJV_PE	1413_MAJV_PE	1413_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02752-03	HN2409493-001	3L04952_Post Treat	5E02938-01	22102432-01A	22111989-01A	3E02570_Post Treat	3K02443_Post Treat
Sample Date	MCL	GW MSCs	5/14/2024	11/18/2024	12/1/2024	5/12/2025	10/25/2022	11/17/2022	5/9/2023	11/1/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.0017 U	—	0.00162 U	0.00165 U	0.002 U	0.002 U	0.00172 U	0.00169 U
9Cl-PF3ONS	NS	NS	0.00168 U	—	0.0016 U	0.00163 U	0.002 U	0.002 U	0.0017 U	0.00168 U
DONA	NS	NS	0.0017 U	—	0.00162 U	0.00165 U	0.002 U	0.002 U	0.00172 U	0.00169 U
HFPODA	0.01	0.01	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
NEtFOSAA	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
NMeFOSAA	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	**0.00046 J**	0.00182 U	0.00179 U
Perfluorobutanesulfonic acid	2	2	0.00159 U	0.002 U	0.00152 B3 U	0.00155 U	0.002 U	0.002 U	0.00161 U	0.00159 U
Perfluorodecanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluoroheptanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.002 U	0.00157 U	0.0016 U	0.002 U	0.002 U	0.00166 U	0.00164 U
Perfluorohexanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00166 U	0.002 U	0.00158 U	0.00162 U	0.002 U	**0.00063 J**	0.00168 U	0.00166 U
Perfluorooctanoic acid	0.004	0.004	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.002 U	0.00171 U	0.00175 U	0.002 U	0.002 U	0.00182 U	0.00179 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1413_MAJV_PE	1413_MAJV_PE	1413_MAJV_PE	1418_MAJV_PE	1418_MAJV_PE	1418_MAJV_PE	1418_MAJV_PE	1418_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02766-03	HN2409552-001	5E02937-01	22120677-01A	3K02444_Post Treat	4E02767-03	HN2409689-001	5E02939-01
Sample Date	MCL	GW MSCs	5/14/2024	11/19/2024	5/12/2025	12/6/2022	11/1/2023	5/15/2024	11/20/2024	5/12/2025
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00171 U	0.002 U	0.00174 U	0.002 U	0.00166 U	0.00166 U	0.002 U	0.00167 U
9Cl-PF3ONS	NS	NS	0.00169 U	0.002 U	0.00172 U	0.002 U	0.00165 U	0.00164 U	0.002 U	0.00165 U
DONA	NS	NS	0.00171 U	0.002 U	0.00174 U	0.002 U	0.00166 U	0.00166 U	0.002 U	0.00167 U
HFPODA	0.01	0.01	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
NEtFOSAA	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
NMeFOSAA	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	0.0016 U	0.002 U	0.00163 U	0.002 U	0.00156 U	0.00155 U	0.002 U	0.00156 U
Perfluorodecanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00166 U	0.002 U	0.00168 U	0.002 U	0.00161 U	0.00161 U	0.002 U	0.00162 U
Perfluorohexanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00168 U	0.002 U	0.0017 U	0.002 U	0.00163 U	0.00162 U	0.002 U	0.00163 U
Perfluorooctanoic acid	0.004	0.004	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.002 U	0.00184 U	0.002 U	0.00176 U	0.00175 U	0.002 U	0.00177 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1419_MAJV_PE	1419_MAJV_PE	1419_MAJV_PE	1419_MAJV_PE	1419_MAJV_PE	1419_MAJV_PE	1424_MAJV_PE	1424_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	22111984-01A	3E02572_Post Treat	3K02445_Post Treat	4E02769-03	HN2409682-001	5E02940-01	22120680-01A	3K02446_Post Treat
Sample Date	MCL	GW MSCs	11/16/2022	5/9/2023	11/1/2023	5/15/2024	11/20/2024	5/12/2025	12/6/2022	11/1/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00166 U	0.00162 U	0.00168 U	0.002 U	0.00168 U	0.002 U	0.00163 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00164 U	0.0016 U	0.00166 U	0.002 U	0.00166 U	0.002 U	0.00162 U
DONA	NS	NS	0.002 U	0.00166 U	0.00162 U	0.00168 U	0.002 U	0.00168 U	0.002 U	0.00163 U
HFPODA	0.01	0.01	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
NEtFOSAA	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
NMeFOSAA	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00155 U	0.00152 U	0.00157 U	0.002 U	0.00157 U	0.002 U	0.00153 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00161 U	0.00157 U	0.00163 U	0.002 U	0.00163 U	0.002 U	0.00158 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00162 U	0.00158 U	0.00165 U	0.002 U	0.00165 U	0.002 U	0.0016 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00175 U	0.00171 U	0.00178 U	0.002 U	0.00178 U	0.002 U	0.00173 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1424_MAJV_PE	1425_MAJV_PE	1425_MAJV_PE	1425_MAJV_PE	1425_MAJV_PE	1425_MAJV_PE	1430_MAJV_PE	1430_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409565-001	3E02574_Post Treat	3K02447_Post Treat	4E02773-03	HN2409685-001	5E02941-01	22111988-01A	3E02575_Post Treat
Sample Date	MCL	GW MSCs	11/19/2024	5/9/2023	11/1/2023	5/14/2024	11/20/2024	5/12/2025	11/16/2022	5/9/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00173 U	0.00175 U	0.00175 U	0.002 U	0.00171 U	0.002 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00171 U	0.00173 U	0.00173 U	0.002 U	0.00169 U	0.002 U	0.00169 U
DONA	NS	NS	0.002 U	0.00173 U	0.00175 U	0.00175 U	0.002 U	0.00171 U	0.002 U	0.00171 U
HFPODA	0.01	0.01	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	**0.00029 J**	0.00181 U
NMeFOSAA	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	**0.00046 J**	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00162 U	0.00164 U	0.00164 U	0.002 U	0.0016 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00168 U	0.00169 U	0.00169 U	0.002 U	0.00165 U	0.002 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00169 U	0.00171 U	0.00171 U	0.002 U	0.00167 U	0.002 U	0.00167 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00183 U	0.00185 U	0.00185 U	0.002 U	0.00181 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1430_MAJV_PE	1430_MAJV_PE	1430_MAJV_PE	1430_MAJV_PE	1431_MAJV_PE	1431_MAJV_PE	1431_MAJV_PE	1431_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02448_Post Treat	4E02774-03	HN2409553-001	5E02957-01	3E02576_Post Treat	3K02449_Post Treat	4E02775-03	HN2409687-001
Sample Date	MCL	GW MSCs	11/1/2023	5/13/2024	11/19/2024	5/13/2025	5/10/2023	11/1/2023	5/13/2024	11/20/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00167 U	0.00165 U	0.002 U	0.00168 U	0.00174 U	0.00163 U	0.00172 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00165 U	0.00163 U	0.002 U	0.00166 U	0.00173 U	0.00161 U	0.00171 U	0.002 U
DONA	NS	NS	0.00167 U	0.00165 U	0.002 U	0.00168 U	0.00174 U	0.00163 U	0.00172 U	0.002 U
HFPODA	0.01	0.01	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
NEtFOSAA	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
NMeFOSAA	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00156 U	0.00155 U	0.002 U	0.00157 U	0.00163 U	0.00153 U	0.00161 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00162 U	0.0016 U	0.002 U	0.00163 U	0.00169 U	0.00158 U	0.00167 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00163 U	0.00162 U	0.002 U	0.00165 U	0.00171 U	0.00159 U	0.00169 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.00175 U	0.002 U	0.00178 U	0.00185 U	0.00172 U	0.00182 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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U = Not detected above laboratory detection limit.
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Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1431_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE	1436_MAJV_PE
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02958-01**	**22120679-01A**	**23011850-01A**	**3E02577_Post Treat**	**3K02450_Post Treat**	**4E02776-03**	**HN2409517-001**	**5E02959-01**
Sample Date	**MCL**	**GW MSCs**	**5/15/2025**	**12/6/2022**	**1/24/2023**	**5/11/2023**	**11/1/2023**	**5/13/2024**	**11/18/2024**	**5/13/2025**
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00168 U	0.002 U	0.002 U	0.00173 U	0.00168 U	0.0017 U	—	0.00171 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.002 U	0.002 U	0.00171 U	0.00166 U	0.00168 U	—	0.00169 U
DONA	NS	NS	0.00168 U	0.002 U	0.002 U	0.00173 U	0.00168 U	0.0017 U	—	0.00171 U
HFPODA	0.01	0.01	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.00178 U	**0.00038 J**	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
NMeFOSAA	NS	NS	0.00178 U	**0.00064 J**	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.002 U	0.002 U	0.00162 U	0.00157 U	0.00159 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00163 U	0.002 U	0.002 U	0.00168 U	0.00162 U	0.00165 U	0.002 U	0.00166 U
Perfluorohexanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00165 U	0.002 U	0.002 U	0.00169 U	0.00164 U	0.00166 U	0.002 U	0.00168 U
Perfluorooctanoic acid	0.004	0.004	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00178 U	0.002 U	0.002 U	0.00183 U	0.00177 U	0.0018 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
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Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1437_MAJV_OTHER	1437_MAJV_PE	1437_MAJV_PE	1437_MAJV_PE	1437_MAJV_PE	1437_MAJV_PE	1437_MAJV_PE	1442_MAJV_PE
Additional Information	**USEPA**	**PADEP**	**Kitchen Tap**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**22101950-01A**	**3E02578_Post Treat**	**23072254-01A**	**3K02451_Post Treat**	**4E02777-03**	**HN2409557-001**	**5E02960-01**	**3E02579_Post Treat**
Sample Date	**MCL**	**GW MSCs**	**10/19/2022**	**5/9/2023**	**7/25/2023**	**11/1/2023**	**5/14/2024**	**11/19/2024**	**5/13/2025**	**5/11/2023**
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00174 U	0.002 U	0.00178 U	0.00172 U	0.002 U	0.00173 U	0.00169 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00173 U	0.002 U	0.00176 U	0.00171 U	0.002 U	0.00171 U	0.00167 U
DONA	NS	NS	0.002 U	0.00174 U	0.002 U	0.00178 U	0.00172 U	0.002 U	0.00173 U	0.00169 U
HFPODA	0.01	0.01	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
NEtFOSAA	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
NMeFOSAA	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00163 U	0.002 U	0.00167 U	0.00161 U	0.002 U	0.00162 U	0.00158 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00169 U	0.002 U	0.00173 U	0.00167 U	0.002 U	0.00168 U	0.00163 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00171 U	0.002 U	0.00175 U	0.00169 U	0.002 U	0.00169 U	0.00165 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00189 U	0.00182 U	0.002 U	0.00183 U	0.00179 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1442_MAJV_PE	1442_MAJV_PE	1442_MAJV_PE	1442_MAJV_PE	1443_MAJV_PE	1443_MAJV_PE	1443_MAJV_PE	1443_MAJV_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02452_Post Treat	4E02778-03	HN2409690-001	5E02961-01	22120678-01A	3E02580_Post Treat	3K02453_Post Treat	4E02779-03
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/20/2024	5/13/2025	12/6/2022	6/5/2023	11/1/2023	5/14/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00171 U	0.00169 U	0.002 U	0.0017 U	0.002 U	0.00168 U	0.00165 U	0.00167 U
9Cl-PF3ONS	NS	NS	0.00169 U	0.00167 U	0.002 U	0.00168 U	0.002 U	0.00166 U	0.00163 U	0.00165 U
DONA	NS	NS	0.00171 U	0.00169 U	0.002 U	0.0017 U	0.002 U	0.00168 U	0.00165 U	0.00167 U
HFPODA	0.01	0.01	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
NEtFOSAA	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
NMeFOSAA	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	0.0016 U	0.00158 U	0.002 U	0.00159 U	0.002 U	0.00157 U	0.00154 U	0.00156 U
Perfluorodecanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.00163 U	0.002 U	0.00165 U	0.002 U	0.00162 U	0.00159 U	0.00162 U
Perfluorohexanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00167 U	0.00165 U	0.002 U	0.00166 U	0.002 U	0.00164 U	0.00161 U	0.00163 U
Perfluorooctanoic acid	0.004	0.004	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.00179 U	0.002 U	0.0018 U	0.002 U	0.00177 U	0.00174 U	0.00177 U

Notes:
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1443_MAJV_PE	1443_MAJV_PE	1876_MILL_PE	1876_MILL_PE	1876_MILL_PE	1876_MILL_PE	1876_MILL_OTHER	1876_MILL_OTHER
Additional Information	USEPA	PADEP	—	—	—	—	—	—	Basement	Basement
Lab Sample ID	Primary	RUA	HN2409556-001	5E02942-01	22120671-01A	3E02595_Post Treat	3K02465_Post Treat	3L02577_Post Treat	23L3797-03	3L05033-03
Sample Date	MCL	GW MSCs	11/19/2024	5/12/2025	12/6/2022	5/9/2023	11/1/2023	12/1/2023	12/27/2023	12/27/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00174 U	0.002 U	0.00171 U	0.00159 U	0.00158 U	0.0019 U	0.00166 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00172 U	0.002 U	0.00169 U	0.00157 U	0.00156 U	0.0019 U	0.00165 U
DONA	NS	NS	0.002 U	0.00174 U	0.002 U	0.00171 U	0.00159 U	0.00158 U	0.0019 U	0.00166 U
HFPODA	0.01	0.01	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
NEtFOSAA	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
NMeFOSAA	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00163 U	0.002 U	0.0016 U	0.00148 U	0.00148 U	0.0019 U	0.00156 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	**0.002**	0.00176 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00168 U	0.002 U	0.00166 U	**0.0224 +**	**0.00685**	**0.043 +**	**0.0247 +**
Perfluorohexanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	**0.0021**	0.00176 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.0017 U	0.002 U	0.00168 U	**0.0135 +**	**0.00534 +**	**0.023 +**	**0.0117 +**
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	**0.003**	**0.00178**
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00184 U	0.002 U	0.00181 U	0.00168 U	0.00167 U	0.0019 U	0.00176 U

Notes:
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1876_MILL_OTHER	1876_MILL_OTHER	1876_MILL_OTHER	1876_MILL_OTHER	1876_MILL_PE	1876_MILL_PE	1876_MILL_PE	1877_MILL_PE
Additional Information	USEPA	PADEP	Kitchen	Kitchen	Basement	Kitchen	—	—	—	—
Lab Sample ID	Primary	RUA	23L3797-01	3L05033-01	4A04640-03	4A04640-01	4E02915-03	HN2409515-001	5E02950-01	3E02596_Post Treat
Sample Date	MCL	GW MSCs	12/27/2023	12/27/2023	1/17/2024	1/17/2024	5/14/2024	11/18/2024	5/12/2025	5/10/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.0019 U	0.00164 U	0.00166 U	0.00167 U	0.00165 U	—	0.00165 U	0.00174 U
9Cl-PF3ONS	NS	NS	0.0019 U	0.00162 U	0.00164 U	0.00165 U	0.00163 U	—	0.00163 U	0.00173 U
DONA	NS	NS	0.0019 U	0.00164 U	0.00166 U	0.00167 U	0.00165 U	—	0.00165 U	0.00174 U
HFPODA	0.01	0.01	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
NEtFOSAA	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
NMeFOSAA	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorobutanesulfonic acid	2	2	0.0019 U	0.00154 B3 U	0.00155 U	0.00156 U	0.00155 U	0.002 U	0.00154 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorododecanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluoroheptanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorohexanesulfonic acid	0.01	0.01	0.0019 U	0.00159 U	0.00161 U	0.00162 U	0.0016 U	0.002 U	0.00159 U	0.00169 U
Perfluorohexanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorononanoic acid	0.01	0.01	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorooctanesulfonic acid	0.004	0.004	0.0019 U	0.00161 U	0.00162 U	0.00163 U	0.00162 U	0.002 U	0.00161 U	0.00171 U
Perfluorooctanoic acid	0.004	0.004	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorotetradecanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluorotridecanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U
Perfluoroundecanoic acid	NS	NS	0.0019 U	0.00174 U	0.00175 U	0.00177 U	0.00175 U	0.002 U	0.00174 U	0.00185 U

Notes:
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
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D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
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Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1877_MILL_PE	1877_MILL_PE	1877_MILL_PE	1877_MILL_PE	1882_MILL_PE	1882_MILL_PE	1882_MILL_PE	1883_MILL_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02464_Post Treat	4E02916-03	HN2409765-001	5E02971-01	4E02921-03	HN2409513-001	5E02951-01	3E02597_Post Treat
Sample Date	MCL	GW MSCs	11/1/2023	5/15/2024	11/20/2024	5/14/2025	5/15/2024	11/18/2024	5/14/2025	5/10/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00165 U	0.0016 U	0.002 U	0.00172 U	0.00164 U	—	0.00171 U	0.00173 U
9Cl-PF3ONS	NS	NS	0.00163 U	0.00158 U	0.002 U	0.00171 U	0.00162 U	—	0.00169 U	0.00171 U
DONA	NS	NS	0.00165 U	0.0016 U	0.002 U	0.00172 U	0.00164 U	—	0.00171 U	0.00173 U
HFPODA	0.01	0.01	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
NEtFOSAA	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U B3	0.00174 U	0.002 U	0.00181 U	0.00183 U
NMeFOSAA	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U B3	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorobutanesulfonic acid	2	2	0.00155 U	0.00149 U	0.002 U	0.00161 U	0.00154 U	0.002 U	0.0016 U	0.00162 U
Perfluorodecanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorododecanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluoroheptanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorohexanesulfonic acid	0.01	0.01	0.0016 U	0.00155 U	0.002 U	0.00167 U	0.00159 U	0.002 U	0.00166 U	0.00168 U
Perfluorohexanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorononanoic acid	0.01	0.01	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00162 U	0.00156 U	0.002 U	0.00169 U	0.00161 U	0.002 U	0.00168 U	0.00169 U
Perfluorooctanoic acid	0.004	0.004	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorotetradecanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluorotridecanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U
Perfluoroundecanoic acid	NS	NS	0.00175 U	0.00169 U	0.002 U	0.00182 U	0.00174 U	0.002 U	0.00181 U	0.00183 U

Notes:
USEPA = United State Environmental Protection Agency.
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Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1883_MILL_PE	1883_MILL_PE	1883_MILL_PE	1883_MILL_PE	1250_ROCK_PE	1250_ROCK_PE	587_ROCK_PE	1810_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02463_Post Treat	4E02917-03	HN2409558-001	5E02972-01	HN2408197-001	5E02955-01	5E02975-01	3E02581_Post Treat
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/19/2024	5/14/2025	10/22/2024	5/15/2025	5/14/2025	5/10/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00165 U	0.00165 U	0.002 U	0.00168 U	—	0.0017 U	0.0017 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00163 U	0.00163 U	0.002 U	0.00166 U	—	0.00168 U	0.00168 U	0.00169 U
DONA	NS	NS	0.00165 D1 U	0.00165 U	0.002 U	0.00168 U	—	0.0017 U	0.0017 U	0.00171 U
HFPODA	0.01	0.01	0.00175 D1 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
NEtFOSAA	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
NMeFOSAA	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00155 D1 U	0.00155 U	0.002 U	0.00157 U	0.002 U	0.00159 U	0.00159 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00175 D1 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.0016 U	0.0016 U	0.002 U	0.00163 U	0.002 U	0.00165 U	0.00165 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.00175 D1 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00162 U	0.00162 U	0.002 U	0.00165 U	0.002 U	0.00166 U	0.00166 U	0.00167 U
Perfluorooctanoic acid	0.004	0.004	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00175 U	0.00175 U	0.002 U	0.00178 U	0.002 U	0.0018 U	0.0018 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1810_WALG_PE	1810_WALG_PE	1810_WALG_PE	1810_WALG_PE	1811_WALG_PE	1811_WALG_PE	1822_WALG_PE	1822_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02454_Post Treat	4E02790-03	HN2409568-001	5E02943-01	HN2408121-001	5E02962-01	3E02582_Post Treat	3K02455_Post Treat
Sample Date	MCL	GW MSCs	11/1/2023	5/12/2024	11/19/2024	5/12/2025	10/21/2024	5/14/2025	5/11/2023	11/1/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00168 U	0.002 U	0.00163 U	—	0.00172 U	0.00173 U	0.00162 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00166 U	0.002 U	0.00161 U	—	0.00171 U	0.00171 U	0.00161 U
DONA	NS	NS	0.00168 U	0.00168 U	0.002 U	0.00163 U	—	0.00172 U	0.00173 U	0.00162 U
HFPODA	0.01	0.01	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
NEtFOSAA	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U B3	0.00183 U	0.00172 U
NMeFOSAA	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U B3	0.00183 U	0.00172 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00157 U	0.002 U	0.00153 U	0.002 U	0.00161 U	0.00162 U	0.00152 U
Perfluorodecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluoroheptanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00162 U	0.00162 U	0.002 U	0.00158 U	0.002 U	0.00167 U	0.00168 U	0.00157 U
Perfluorohexanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00164 U	0.00164 U	0.002 U	0.00159 U	0.002 U	0.00169 U	0.00169 U	0.00159 U
Perfluorooctanoic acid	0.004	0.004	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.00177 U	0.002 U	0.00172 U	0.002 U	0.00182 U	0.00183 U	0.00172 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1822_WALG_PE	1822_WALG_PE	1822_WALG_PE	1828_WALG_PE	1828_WALG_PE	1828_WALG_PE	1828_WALG_PE	1828_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02791-03	HN2409763-001	5E02964-01	3E02583_Post Treat	3K02456_Post Treat	4E02792-03	HN2409514-001	5E02944-01
Sample Date	MCL	GW MSCs	5/15/2024	11/20/2024	5/15/2025	5/9/2023	11/1/2023	5/13/2024	11/18/2024	5/12/2025
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00173 U	0.002 U	0.00166 U	0.00173 U	0.00161 U	0.00162 U	—	0.00172 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.002 U	0.00164 U	0.00171 U	0.0016 U	0.00161 U	—	0.00171 U
DONA	NS	NS	0.00173 U	0.002 U	0.00166 U	0.00173 U	0.00161 U	0.00162 U	—	0.00172 U
HFPODA	0.01	0.01	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
NEtFOSAA	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
NMeFOSAA	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	0.00162 U	0.002 U	0.00155 U	0.00162 U	0.00151 U	0.00152 U	0.002 U	0.00161 U
Perfluorodecanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00168 U	0.002 U	0.00161 U	0.00168 U	0.00156 U	0.00157 U	0.002 U	0.00167 U
Perfluorohexanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorononanoic acid	0.01	0.01	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.002 U	0.00162 U	0.00169 U	0.00158 U	0.00159 U	0.002 U	0.00169 U
Perfluorooctanoic acid	0.004	0.004	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorotetradecanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.00183 U	0.002 U	0.00175 U	0.00183 U	0.00171 U	0.00172 U	0.002 U	0.00182 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1829_WALG_PE	1829_WALG_PE	1829_WALG_PE	1829_WALG_PE	1829_WALG_PE	1834_WALG_PE	1834_WALG_PE	1834_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3E02584_Post Treat	3K02457_Post Treat	4E02793-03	HN2409561-001	5E02965-01	3E02585_Post Treat	3K02458_Post Treat	4C03347-01
Sample Date	MCL	GW MSCs	5/9/2023	11/1/2023	5/14/2024	11/19/2024	5/15/2025	5/9/2023	11/1/2023	3/12/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00172 U	0.00165 U	0.00172 U	0.002 U	0.00169 U	0.00176 U	0.00171 U	0.00162 U
9Cl-PF3ONS	NS	NS	0.00171 U	0.00163 U	0.0017 U	0.002 U	0.00168 U	0.00174 U	0.00169 U	0.0016 U
DONA	NS	NS	0.00172 U	0.00165 U	0.00172 U	0.002 U	0.00169 U	0.00176 U	0.00171 U	0.00162 U
HFPODA	0.01	0.01	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
NEtFOSAA	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
NMeFOSAA	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorobutanesulfonic acid	2	2	0.00161 U	0.00155 U	0.00161 U	0.002 U	0.00159 U	0.00165 U	0.0016 U	0.00152 U
Perfluorodecanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorododecanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluoroheptanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00167 U	0.0016 U	0.00166 U	0.002 U	0.00164 U	0.00171 U	0.00166 U	0.00157 U
Perfluorohexanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorononanoic acid	0.01	0.01	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	**0.00383**	0.00171 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00169 U	0.00162 U	0.00168 U	0.002 U	0.00166 U	0.00173 U	**0.00853 +**	0.00158 U
Perfluorooctanoic acid	0.004	0.004	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorotetradecanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluorotridecanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U
Perfluoroundecanoic acid	NS	NS	0.00182 U	0.00175 U	0.00182 U	0.002 U	0.00179 U	0.00187 U	0.00181 U	0.00171 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
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D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1834_WALG_PE	1834_WALG_PE	1834_WALG_PE	1835_WALG_PE	1835_WALG_PE	1835_WALG_PE	1835_WALG_PE	1835_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02794-03	HN2409688-001	5E02945-01	23021196-01A	3E02586_Post Treat	3K02459_Post Treat	4E02795-03	HN2409510-001
Sample Date	MCL	GW MSCs	5/15/2024	11/20/2024	5/12/2025	2/14/2023	5/10/2023	11/1/2023	5/13/2024	11/18/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00176 U	0.002 U	0.00166 U	0.002 U	0.00175 U	0.00165 U	0.00172 U	—
9Cl-PF3ONS	NS	NS	0.00174 U	0.002 U	0.00165 U	0.002 U	0.00173 U	0.00163 U	0.0017 U	—
DONA	NS	NS	0.00176 U	0.002 U	0.00166 U	0.002 U	0.00175 U	0.00165 U	0.00172 U	—
HFPODA	0.01	0.01	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
NEtFOSAA	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
NMeFOSAA	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00165 U	0.002 U	0.00156 U	0.002 U	0.00164 U	0.00154 U	0.00161 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00171 U	0.002 U	0.00161 U	0.002 U	0.00169 U	0.00159 U	0.00166 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00173 U	0.002 U	0.00163 U	0.002 U	0.00171 U	0.00161 U	0.00168 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00187 U	0.002 U	0.00176 U	0.002 U	0.00185 U	0.00174 U	0.00182 U	0.002 U

Notes:
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PADEP = Pennsylvania Department of Environmental Protection.
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ft bgs = Feet below ground surface.
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D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
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Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1835_WALG_PE	1840_WALG_PE	1840_WALG_PE	1840_WALG_PE	1840_WALG_PE	1840_WALG_PE	1841_WALG_PE	1841_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	5E02946-01	3E02587_Post Treat	3K02466_Post Treat	4E02796-03	HN2409566-001	5E02947-01	3E02588_Post Treat	3K02469_Post Treat
Sample Date	MCL	GW MSCs	5/13/2025	5/10/2023	11/1/2023	5/15/2024	11/19/2024	5/13/2025	5/10/2023	11/1/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.0017 U	0.00174 U	0.00165 U	0.00178 U	0.002 U	0.00171 U	0.00179 U	0.00167 U
9Cl-PF3ONS	NS	NS	0.00168 U	0.00172 U	0.00163 U	0.00176 U	0.002 U	0.00169 U	0.00177 U	0.00165 U
DONA	NS	NS	0.0017 U	0.00174 U	0.00165 U	0.00178 U	0.002 U	0.00171 U	0.00179 U	0.00167 U
HFPODA	0.01	0.01	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
NEtFOSAA	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
NMeFOSAA	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorobutanesulfonic acid	2	2	0.00159 U	0.00163 U	0.00154 U	0.00166 U	0.002 U	0.0016 U	0.00168 U	0.00156 U
Perfluorodecanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorododecanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluoroheptanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.00168 U	0.00159 U	0.00172 U	0.002 U	0.00165 U	0.00173 U	0.00162 U
Perfluorohexanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorononanoic acid	0.01	0.01	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00166 U	0.0017 U	0.00161 U	0.00174 U	0.002 U	0.00167 U	0.00175 U	0.00163 U
Perfluorooctanoic acid	0.004	0.004	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorotetradecanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluorotridecanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U
Perfluoroundecanoic acid	NS	NS	0.0018 U	0.00184 U	0.00174 U	0.00188 U	0.002 U	0.00181 U	0.00189 U	0.00177 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1841_WALG_PE	1841_WALG_PE	1841_WALG_PE	1846_WALG_PE	1846_WALG_PE	1846_WALG_PE	1846_WALG_PE	1846_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02797-03	HN2409506-001	5E02948-01	3E02589_Post Treat	3K02470_Post Treat	4E02798-03	HN2409505-001	5E02966-01
Sample Date	MCL	GW MSCs	5/14/2024	11/18/2024	5/13/2025	6/5/2023	11/1/2023	5/15/2024	11/18/2024	5/13/2025
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00171 U	—	0.0017 U	0.0017 U	0.00174 U	0.0017 U	—	0.00171 U
9Cl-PF3ONS	NS	NS	0.00169 U	—	0.00168 U	0.00168 U	0.00172 U	0.00168 U	—	0.00169 U
DONA	NS	NS	0.00171 U	—	0.0017 U	0.0017 U	0.00174 U	0.0017 U	—	0.00171 U
HFPODA	0.01	0.01	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
NEtFOSAA	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U B3
NMeFOSAA	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U B3
Perfluorobutanesulfonic acid	2	2	0.0016 U	0.002 U	0.00159 U	0.00159 U	0.00163 U	0.00159 U	0.002 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00165 U	0.002 U	0.00165 U	0.00165 U	0.00168 U	0.00165 U	0.002 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 B3 U	0.0018 U	0.002 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00167 U	0.002 U	0.00166 U	0.00166 U	0.0017 B3 U	0.00166 U	0.002 U	0.00167 U
Perfluorooctanoic acid	0.004	0.004	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00181 U	0.002 U	0.0018 U	0.0018 U	0.00184 U	0.0018 U	0.002 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1852_WALG_PE	1852_WALG_PE	1852_WALG_PE	1852_WALG_PE	1852_WALG_PE	1852_WALG_PE	1853_WALG_PE	1853_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	22111993-01A	3E02590_Post Treat	3K02471_Post Treat	4E02908-03	HN2409562-001	5E02967-01	22111991-01A	3E02591_Post Treat
Sample Date	MCL	GW MSCs	11/16/2022	5/9/2023	11/1/2023	5/13/2024	11/19/2024	5/15/2025	11/17/2022	5/10/2023
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00178 U	0.00168 U	0.00172 U	0.002 U	0.00168 U	0.002 U	0.00174 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00176 U	0.00166 U	0.0017 U	0.002 U	0.00166 U	0.002 U	0.00172 U
DONA	NS	NS	0.002 U	0.00178 U	0.00168 U	0.00172 U	0.002 U	0.00168 U	0.002 U	0.00174 U
HFPODA	0.01	0.01	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
NEtFOSAA	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
NMeFOSAA	NS	NS	**0.00052 J**	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00166 U	0.00157 U	0.00161 U	0.002 U	0.00157 U	0.002 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00172 U	0.00163 U	0.00166 U	0.002 U	0.00163 U	0.002 U	0.00168 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00174 U	0.00165 U	0.00168 U	0.002 U	0.00165 U	0.002 U	0.0017 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00188 U	0.00178 U	0.00182 U	0.002 U	0.00178 U	0.002 U	0.00184 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1853_WALG_PE	1853_WALG_PE	1853_WALG_PE	1853_WALG_PE	1858_WALG_PE	1858_WALG_PE	1858_WALG_PE	1858_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02474_Post Treat	4E02910-03	HN2409759-001	5E02968-01	22090736-03A	3E02592_Post Treat	3K02475_Post Treat	4E02911-03
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	11/20/2024	5/15/2025	9/7/2022	5/10/2023	11/14/2023	5/14/2024
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.00168 U	0.0017 U	0.002 U	0.00169 U	0.002 U	0.00172 U	0.00168 U	0.00179 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00168 U	0.002 U	0.00167 U	0.002 U	0.00171 U	0.00166 U	0.00177 U
DONA	NS	NS	0.00168 U	0.0017 U	0.002 U	0.00169 U	0.002 U	0.00172 U	0.00168 U	0.00179 U
HFPODA	0.01	0.01	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
NEtFOSAA	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	**0.00034 J**	0.00182 U	0.00178 U	0.00189 U
NMeFOSAA	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00159 U	0.002 U	0.00158 U	0.002 U	0.00161 U	0.00157 U	0.00168 U
Perfluorodecanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluoroheptanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00162 U	0.00165 U	0.002 U	0.00163 U	**0.00047 J**	0.00167 U	0.00163 U	0.00173 U
Perfluorohexanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00164 U	0.00166 U	0.002 U	0.00165 U	**0.0011 J**	0.00169 U	0.00165 U	0.00175 U
Perfluorooctanoic acid	0.004	0.004	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.0018 U	0.002 U	0.00179 U	0.002 U	0.00182 U	0.00178 U	0.00189 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1858_WALG_PE	1858_WALG_PE	1859_WALG_PE	1859_WALG_PE	1859_WALG_PE	1859_WALG_PE	1859_WALG_PE	1859_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	HN2409550-001	5E02949-01	22111992-01A	3E02593_Post Treat	3K02476_Post Treat	4E02913-03	HN2409507-001	5E02969-01
Sample Date	MCL	GW MSCs	11/19/2024	5/13/2025	11/16/2022	5/10/2023	11/1/2023	5/14/2024	11/18/2024	5/13/2025
PFAS (µg/l)										
11Cl-PF3OUdS	NS	NS	0.002 U	0.00174 U	0.002 U	0.00182 U	0.00162 U	0.00171 U	—	0.0017 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00173 U	0.002 U	0.0018 U	0.0016 U	0.00169 U	—	0.00168 U
DONA	NS	NS	0.002 U	0.00174 U	0.002 U	0.00182 U	0.00162 U	0.00171 U	—	0.0017 U
HFPODA	0.01	0.01	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
NEtFOSAA	NS	NS	0.002 U	0.00185 U	**0.00029 J**	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
NMeFOSAA	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00163 U	0.002 U	0.0017 U	0.00152 U	0.0016 U	0.002 U	0.00159 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00169 U	0.002 U	0.00176 U	0.00157 U	0.00165 U	0.002 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00171 U	0.002 U	0.00178 U	0.00158 U	0.00167 U	0.002 U	0.00166 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00185 U	0.002 U	0.00192 U	0.00171 U	0.00181 U	0.002 U	0.0018 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
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MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

Table B4. Summary of POET Effluent (PE) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1864_WALG_PE	1864_WALG_PE	1864_WALG_PE	1864_WALG_PE	1864_WALG_PE
Additional Information	USEPA	PADEP	—	—	—	—	—
Lab Sample ID	Primary	RUA	3E02594_Post Treat	3K02477_Post Treat	4E02914-03	HN2409567-001	5E02970-01
Sample Date	MCL	GW MSCs	5/11/2023	11/1/2023	5/1/2024	11/19/2024	5/15/2025
PFAS (µg/l)							
11Cl-PF3OUdS	NS	NS	0.00169 U	0.00164 U	0.00167 U	0.002 U	0.00165 U
9Cl-PF3ONS	NS	NS	0.00168 U	0.00162 U	0.00165 U	0.002 U	0.00163 U
DONA	NS	NS	0.00169 U	0.00164 U	0.00167 U	0.002 U	0.00165 U
HFPODA	0.01	0.01	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
NEtFOSAA	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
NMeFOSAA	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorobutanesulfonic acid	2	2	0.00159 U	0.00154 U	0.00156 U	0.002 U	0.00154 U
Perfluorodecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorododecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluoroheptanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00164 U	0.00159 U	0.00162 U	0.002 U	0.00159 U
Perfluorohexanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorononanoic acid	0.01	0.01	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00166 U	0.00161 U	0.00163 U	0.002 U	0.00161 U
Perfluorooctanoic acid	0.004	0.004	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorotetradecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluorotridecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U
Perfluoroundecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00177 U	0.002 U	0.00174 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
D1 = The Duplicate for this sample was not within the established acceptance criteria.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).

APPENDIX B – Table B5

Summary of POET QA/QC (FRB) Performance PFAS Sampling Results
(Post-POET Installation)

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			182_BGHL_FRB	194_BGHL_FRB	288_BGHL_FRB	338_BGHL_FRB	338_BGHL_FRB	786_BGHL_FRB	786_BGHL_FRB	786_BGHL_FRB	786_BGHL_FRB	786_BGHL_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**BSMT**	**KIT**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02963-04**	**4E06398-04**	**5E02952-04**	**HN2408119-004**	**5E02953-04**	**3E02598_FRB**	**23061435-03A**	**23061435-04A**	**23072251-03A**	**3K02462_FRB**
Sample Date	**MCL**	**GW MSCs**	**5/13/2025**	**5/28/2024**	**5/14/2025**	**10/21/2024**	**5/12/2025**	**5/11/2023**	**6/14/2023**	**6/14/2023**	**7/25/2023**	**11/1/2023**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.0018 U	0.00166 U	0.00178 U	—	0.00174 U	0.00172 U	0.002 U	0.002 U	0.002 U	0.0016 U
9Cl-PF3ONS	NS	NS	0.00178 U	0.00165 U	0.00176 U	—	0.00173 U	0.00171 U	0.002 U	0.002 U	0.002 U	0.00158 U
DONA	NS	NS	0.0018 U	0.00166 U	0.00178 U	—	0.00174 U	0.00172 U	0.002 U	0.002 U	0.002 U	0.0016 U
HFPODA	0.01	0.01	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
NEtFOSAA	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U B3	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
NMeFOSAA	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U B3	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorobutanesulfonic acid	2	2	0.00169 U	0.00156 U	0.00167 U	0.002 U	0.00163 U	0.00161 U	0.002 U	0.002 U	0.002 U	0.00149 U
Perfluorodecanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorododecanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluoroheptanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00175 U	0.00161 U	0.00173 U	0.002 U	0.00169 U	0.00167 U	0.002 U	0.002 U	0.002 U	0.00155 U
Perfluorohexanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorononanoic acid	0.01	0.01	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00177 U	0.00163 U	0.00175 U	0.002 U	0.00171 U	0.00169 U	0.002 U	0.002 U	0.002 U	0.00156 U
Perfluorooctanoic acid	0.004	0.004	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorotetradecanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluorotridecanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U
Perfluoroundecanoic acid	NS	NS	0.00191 U	0.00176 U	0.00189 U	0.002 U	0.00185 U	0.00182 U	0.002 U	0.002 U	0.002 U	0.00169 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			786_BGHL_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1412_MAJV_FRB	1413_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**4E02920-04**	**22111990-04A**	**23030724-02A**	**3E02569_FRB**	**3K02442_FRB**	**4C03346-02**	**4E02752-04**	**3L04952_FRB**	**5E02938-04**	**22102432-02A**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**11/17/2022**	**3/7/2023**	**5/11/2023**	**11/1/2023**	**3/12/2024**	**5/14/2024**	**12/1/2024**	**5/12/2025**	**10/25/2022**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00159 U	0.002 U	0.002 U	0.00171 U	0.00161 U	0.0016 U	0.00171 U	0.00166 U	0.00178 U	0.002 U
9Cl-PF3ONS	NS	NS	0.00157 U	0.002 U	0.002 U	0.00169 U	0.0016 U	0.00158 U	0.00169 U	0.00165 U	0.00176 U	0.002 U
DONA	NS	NS	0.00159 U	0.002 U	0.002 U	0.00171 U	0.00161 U	0.0016 U	0.00171 U	0.00166 U	0.00178 U	0.002 U
HFPODA	0.01	0.01	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
NEtFOSAA	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U B3	0.002 U
NMeFOSAA	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U B3	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00149 U	0.002 U	0.002 U	0.0016 U	0.00151 U	0.00149 U	0.0016 U	0.00156 U	0.00166 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00154 U	0.002 U	0.002 U	0.00165 U	0.00156 U	0.00155 U	0.00166 U	0.00161 U	0.00172 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00156 U	0.002 U	0.002 U	0.00167 U	0.00158 U	0.00156 U	0.00168 U	0.00163 U	0.00174 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.00168 U	0.002 U	0.002 U	0.00181 U	0.00171 U	0.00169 U	0.00181 U	0.00176 U	0.00188 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1413_MAJV_FRB	1413_MAJV_FRB	1413_MAJV_FRB	1413_MAJV_FRB	1413_MAJV_FRB	1418_MAJV_FRB	1418_MAJV_FRB	1418_MAJV_FRB	1418_MAJV_FRB	1419_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**22102432-04A**	**22111989-04A**	**3K02443_FRB**	**4E02766-04**	**5E02937-04**	**22120677-04A**	**3K02444_FRB**	**4E02767-04**	**5E02939-04**	**22111984-04A**
Sample Date	**MCL**	**GW MSCs**	**10/25/2022**	**11/17/2022**	**11/1/2023**	**5/14/2024**	**5/12/2025**	**12/6/2022**	**11/1/2023**	**5/15/2024**	**5/12/2025**	**11/16/2022**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.00166 U	0.00163 U	0.00175 U	0.002 U	0.00169 U	0.00162 U	0.00179 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.00165 U	0.00162 U	0.00173 U	0.002 U	0.00168 U	0.0016 U	0.00177 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.00166 U	0.00163 U	0.00175 U	0.002 U	0.00169 U	0.00162 U	0.00179 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U B3	0.002 U	0.00179 U	0.00171 U	0.00189 U B3	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U B3	0.002 U	0.00179 U	0.00171 U	0.00189 U B3	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	0.00156 U	0.00153 U	0.00164 U	0.002 U	0.00159 U	0.00152 U	0.00168 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	0.00161 U	0.00158 U	0.00169 U	0.002 U	0.00164 U	0.00157 U	0.00173 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	0.00163 U	0.0016 U	0.00171 U	0.002 U	0.00166 U	0.00158 U	0.00175 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.00176 U	0.00173 U	0.00185 U	0.002 U	0.00179 U	0.00171 U	0.00189 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1419_MAJV_FRB	1419_MAJV_FRB	1419_MAJV_FRB	1419_MAJV_FRB	1424_MAJV_FRB	1424_MAJV_FRB	1425_MAJV_FRB	1425_MAJV_FRB	1425_MAJV_FRB	1425_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3E02572_FRB**	**3K02445_FRB**	**4E02769-04**	**5E02940-04**	**22120680-04A**	**3K02446_FRB**	**3E02574_FRB**	**3K02447_FRB**	**4E02773-04**	**5E02941-04**
Sample Date	**MCL**	**GW MSCs**	**5/9/2023**	**11/1/2023**	**5/15/2024**	**5/12/2025**	**12/6/2022**	**11/1/2023**	**5/9/2023**	**11/1/2023**	**5/14/2024**	**5/12/2025**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00169 U	0.00165 U	0.00158 U	0.00169 U	0.002 U	0.00163 U	0.00174 U	0.00176 U	0.00161 U	0.00178 U
9Cl-PF3ONS	NS	NS	0.00167 U	0.00163 U	0.00156 U	0.00167 U	0.002 U	0.00162 U	0.00172 U	0.00174 U	0.00159 U	0.00176 U
DONA	NS	NS	0.00169 U	0.00165 U	0.00158 U	0.00169 U	0.002 U	0.00163 U	0.00174 U	0.00176 U	0.00161 U	0.00178 U
HFPODA	0.01	0.01	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
NEtFOSAA	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U B3	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
NMeFOSAA	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U B3	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluorobutanesulfonic acid	2	2	0.00158 U	0.00154 U	0.00148 U	0.00158 U	0.002 U	0.00153 U	0.00163 U	0.00165 U	0.00151 U	0.00167 U
Perfluorodecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluorododecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluoroheptanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00163 U	0.00159 U	0.00153 U	0.00163 U	0.002 U	0.00158 U	0.00168 U	0.00171 U	0.00156 U	0.00173 U
Perfluorohexanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluorononanoic acid	0.01	0.01	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 Y U	0.0017 U	0.00189 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00165 U	0.00161 U	0.00155 U	0.00165 U	0.002 U	0.0016 U	0.0017 U	0.00173 Y U	0.00157 U	0.00175 U
Perfluorooctanoic acid	0.004	0.004	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 Y U	0.0017 U	0.00189 U
Perfluorotetradecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluorotridecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U
Perfluoroundecanoic acid	NS	NS	0.00179 U	0.00174 U	0.00167 U	0.00179 U	0.002 U	0.00173 U	0.00184 U	0.00187 U	0.0017 U	0.00189 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
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µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1430_MAJV_FRB	1430_MAJV_FRB	1430_MAJV_FRB	1430_MAJV_FRB	1430_MAJV_FRB	1431_MAJV_FRB	1431_MAJV_FRB	1431_MAJV_FRB	1431_MAJV_FRB	1436_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**22111988-04A**	**3E02575_FRB**	**3K02448_FRB**	**4E02774-04**	**5E02957-04**	**3E02576_FRB**	**3K02449_FRB**	**4E02775-04**	**5E02958-04**	**22120679-04A**
Sample Date	**MCL**	**GW MSCs**	**11/16/2022**	**5/9/2023**	**11/1/2023**	**5/13/2024**	**5/13/2025**	**5/10/2023**	**11/1/2023**	**5/13/2024**	**5/15/2025**	**12/6/2022**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.002 U	0.00174 U	0.00167 U	0.00165 U	0.00178 U	0.00172 U	0.00164 U	0.00166 U	0.00175 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00173 U	0.00165 U	0.00163 U	0.00176 U	0.00171 U	0.00162 U	0.00165 U	0.00173 U	0.002 U
DONA	NS	NS	0.002 U	0.00174 U	0.00167 U	0.00165 U	0.00178 U	0.00172 U	0.00164 U	0.00166 U	0.00175 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00163 U	0.00156 U	0.00154 U	0.00166 U	0.00161 U	0.00154 U	0.00156 U	0.00164 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00169 U	0.00162 U	0.00159 U	0.00172 U	0.00167 U	0.00159 U	0.00161 U	0.00169 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00171 U	0.00163 U	0.00161 U	0.00174 U	0.00169 U	0.00161 U	0.00163 U	0.00171 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00185 U	0.00177 U	0.00174 U	0.00188 U	0.00182 U	0.00174 U	0.00176 U	0.00185 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1436_MAJV_FRB	1436_MAJV_FRB2	1436_MAJV_FRB	1436_MAJV_FRB	1436_MAJV_FRB	1436_MAJV_FRB	1437_MAJV_FRB2	1437_MAJV_FRB3	1437_MAJV_FRB	1437_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**23011850-04A**	**23011850-06A**	**3E02577_FRB**	**3K02450_FRB**	**4E02776-04**	**5E02959-04**	**22101950-02A**	**22101950-04A**	**3E02578_FRB**	**23061431-02A**
Sample Date	**MCL**	**GW MSCs**	**1/24/2023**	**1/24/2023**	**5/11/2023**	**11/1/2023**	**5/13/2024**	**5/13/2025**	**10/19/2022**	**10/19/2022**	**5/9/2023**	**6/14/2023**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.002 U	0.002 U	0.00171 U	0.00166 U	0.00163 U	0.00178 U	0.002 U	0.002 U	0.00168 U	0.002 U
9Cl-PF3ONS	NS	NS	0.002 U	0.002 U	0.00169 U	0.00164 U	0.00162 U	0.00176 U	0.002 U	0.002 U	0.00166 U	0.002 U
DONA	NS	NS	0.002 U	0.002 U	0.00171 U	0.00166 U	0.00163 U	0.00178 U	0.002 U	0.002 U	0.00168 U	0.002 U
HFPODA	0.01	0.01	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
NEtFOSAA	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
NMeFOSAA	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.002 U	0.0016 U	0.00155 U	0.00153 U	0.00166 U	0.002 U	0.002 U	0.00157 U	0.002 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.002 U	0.00165 U	0.00161 U	0.00158 U	0.00172 U	0.002 U	0.002 U	0.00162 U	0.002 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.002 U	0.00167 U	0.00162 U	0.0016 U	0.00174 U	0.002 U	0.002 U	0.00164 U	0.002 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.002 U	0.00181 U	0.00175 U	0.00173 U	0.00188 U	0.002 U	0.002 U	0.00177 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1437_MAJV_FRB	1437_MAJV_FRB	1437_MAJV_FRB	1437_MAJV_FRB	1442_MAJV_FRB	1442_MAJV_FRB	1442_MAJV_FRB	1442_MAJV_FRB	1443_MAJV_FRB	1443_MAJV_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**23072254-04A**	**3K02451_FRB**	**4E02777-04**	**5E02960-04**	**3E02579_FRB**	**3K02452_FRB**	**4E02778-04**	**5E02961-04**	**22120678-04A**	**3E02580_FRB**
Sample Date	**MCL**	**GW MSCs**	**7/25/2023**	**11/1/2023**	**5/14/2024**	**5/13/2025**	**5/11/2023**	**11/1/2023**	**5/14/2024**	**5/13/2025**	**12/6/2022**	**6/5/2023**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.002 U	0.00169 U	0.00162 U	0.0018 U	0.00171 U	0.00162 U	0.00161 U	0.0018 U	0.002 U	0.00169 L4 U
9Cl-PF3ONS	NS	NS	0.002 U	0.00167 U	0.00161 U	0.00178 U	0.00169 U	0.0016 U	0.0016 U	0.00178 U	0.002 U	0.00167 L4 U
DONA	NS	NS	0.002 U	0.00169 U	0.00162 U	0.0018 U	0.00171 U	0.00162 U	0.00161 U	0.0018 U	0.002 U	0.00169 L4 U
HFPODA	0.01	0.01	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
NEtFOSAA	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
NMeFOSAA	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorobutanesulfonic acid	2	2	0.002 U	0.00158 U	0.00152 U	0.00168 U	0.0016 U	0.00152 U	0.00151 U	0.00169 U	0.002 U	0.00158 L4 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorohexanesulfonic acid	0.01	0.01	0.002 U	0.00163 U	0.00157 U	0.00174 U	0.00166 U	0.00157 U	0.00156 U	0.00175 U	0.002 U	0.00163 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorooctanesulfonic acid	0.004	0.004	0.002 U	0.00165 U	0.00159 U	0.00176 U	0.00168 U	0.00158 U	0.00158 U	0.00177 U	0.002 U	0.00165 L4 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00179 U	0.00172 U	0.0019 U	0.00181 U	0.00171 U	0.00171 U	0.00191 U	0.002 U	0.00179 L4 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1443_MAJV_FRB	1443_MAJV_FRB	1443_MAJV_FRB	1876_MILL_FRB	1876_MILL_FRB	1876_MILL_FRB	1876_MILL_FRB	1876_MILL_FRB1	1876_MILL_FRB2	1876_MILL_FRB2
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	3K02453_FRB	4E02779-04	5E02942-04	22120671-04A	3E02595_FRB	3K02465_FRB	3L02577_FRB	23L3797-02	23L3797-05	3L05033-05
Sample Date	MCL	GW MSCs	11/1/2023	5/14/2024	5/12/2025	12/6/2022	5/9/2023	11/1/2023	12/1/2023	12/27/2023	12/27/2023	12/27/2023
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00163 U	0.00176 U	0.002 U	0.0018 U	0.00165 U	0.00167 U	0.0018 U	0.0018 U	0.00165 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00161 U	0.00174 U	0.002 U	0.00178 U	0.00163 U	0.00165 U	0.0018 U	0.0018 U	0.00163 U
DONA	NS	NS	0.00168 U	0.00163 U	0.00176 U	0.002 U	0.0018 U	0.00165 U	0.00167 U	0.0018 U	0.0018 U	0.00165 U
HFPODA	0.01	0.01	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
NEtFOSAA	NS	NS	0.00178 U	0.00172 U	0.00186 U B3	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
NMeFOSAA	NS	NS	0.00178 U	0.00172 U	0.00186 U B3	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00153 U	0.00164 U	0.002 U	0.00168 U	0.00154 U	0.00156 U	0.0018 U	0.0018 U	0.00154 U
Perfluorodecanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorododecanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluoroheptanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00163 U	0.00158 U	0.0017 U	0.002 U	0.00174 U	0.00159 U	0.00162 U	0.0018 U	0.0018 U	0.00159 U
Perfluorohexanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorononanoic acid	0.01	0.01	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	**0.00215**	0.0018 U	0.0018 U	0.00174 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00165 U	0.00159 U	0.00172 U	0.002 U	0.00176 U	0.00161 U	**0.00466 +**	0.0018 U	0.0018 U	0.00161 U
Perfluorooctanoic acid	0.004	0.004	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorotetradecanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluorotridecanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U
Perfluoroundecanoic acid	NS	NS	0.00178 U	0.00172 U	0.00186 U	0.002 U	0.0019 U	0.00174 U	0.00177 U	0.0018 U	0.0018 U	0.00174 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1876_MILL_FRB	1876_MILL_FRB	1876_MILL_FRB	1877_MILL_FRB	1877_MILL_FRB	1877_MILL_FRB	1877_MILL_FRB	1882_MILL_FRB	1882_MILL_FRB	1883_MILL_FRB
Additional Information	USEPA	PADEP	—	—	—	—	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4A04640-02	4E02915-04	5E02950-04	3E02596_FRB	3K02464_FRB	4E02916-04	5E02971-04	4E02921-04	5E02951-04	3E02597_FRB
Sample Date	MCL	GW MSCs	1/17/2024	5/14/2024	5/12/2025	5/10/2023	11/1/2023	5/15/2024	5/14/2025	5/15/2024	5/14/2025	5/10/2023
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00189 U	0.00176 U	0.00172 U	0.00166 U	0.00189 U	0.00178 U	0.00163 U	0.00181 U	0.00171 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00187 U	0.00174 U	0.00171 U	0.00164 U	0.00187 U	0.00176 U	0.00161 U	0.00179 U	0.00169 U
DONA	NS	NS	0.00168 U	0.00189 U	0.00176 U	0.00172 U	0.00166 U	0.00189 U	0.00178 U	0.00163 U	0.00181 U	0.00171 U
HFPODA	0.01	0.01	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
NEtFOSAA	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
NMeFOSAA	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00177 U	0.00165 U	0.00161 U	0.00155 U	0.00177 U	0.00166 U	0.00153 U	0.0017 U	0.0016 U
Perfluorodecanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorododecanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluoroheptanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00162 U	0.00183 U	0.00171 U	0.00167 U	0.00161 U	0.00183 U	0.00172 U	0.00158 U	0.00175 U	0.00165 U
Perfluorohexanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorononanoic acid	0.01	0.01	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00164 U	0.00185 U	0.00173 U	0.00169 U	0.00162 U	0.00185 U	0.00174 U	0.00159 U	0.00177 U	0.00167 U
Perfluorooctanoic acid	0.004	0.004	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorotetradecanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluorotridecanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U
Perfluoroundecanoic acid	NS	NS	0.00177 U	0.002 U	0.00187 U	0.00182 U	0.00175 U	0.002 U	0.00188 U	0.00172 U	0.00192 U	0.00181 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1883_MILL_FRB	1250_ROCK_FRB	587_ROCK_FRB	1810_WALG_FRB	1810_WALG_FRB	1810_WALG_FRB	1810_WALG_FRB	1811_WALG_FRB	1822_WALG_FRB	1828_WALG_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**4E02917-04**	**5E02955-04**	**5E02975-04**	**3E02581_FRB**	**3K02454_FRB**	**4E02790-04**	**5E02943-04**	**5E02962-04**	**4E02791-04**	**3E02583_FRB**
Sample Date	**MCL**	**GW MSCs**	**5/14/2024**	**5/15/2025**	**5/14/2025**	**5/10/2023**	**11/1/2023**	**5/12/2024**	**5/12/2025**	**5/14/2025**	**5/15/2024**	**5/9/2023**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.0016 U	0.00183 U	0.00183 U	0.00171 U	0.00164 U	0.00159 U	0.00178 U	0.00182 U	0.00163 U	0.00169 U
9Cl-PF3ONS	NS	NS	0.00158 U	0.00181 U	0.00181 U	0.00169 U	0.00162 U	0.00157 U	0.00176 U	0.0018 U	0.00162 U	0.00168 U
DONA	NS	NS	0.0016 U	0.00183 U	0.00183 U	0.00171 U	0.00164 U	0.00159 U	0.00178 U	0.00182 U	0.00163 U	0.00169 U
HFPODA	0.01	0.01	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
NEtFOSAA	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
NMeFOSAA	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorobutanesulfonic acid	2	2	0.0015 U	0.00172 U	0.00172 U	0.0016 U	0.00154 U	0.00149 U	0.00166 U	0.0017 U	0.00153 U	0.00159 U
Perfluorodecanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorododecanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluoroheptanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00155 U	0.00177 U	0.00177 U	0.00166 U	0.00159 U	0.00154 U	0.00172 U	0.00176 U	0.00158 U	0.00164 U
Perfluorohexanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorononanoic acid	0.01	0.01	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00157 U	0.00179 U	0.00179 U	0.00168 U	0.00161 U	0.00156 U	0.00174 U	0.00178 U	0.0016 U	0.00166 U
Perfluorooctanoic acid	0.004	0.004	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorotetradecanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluorotridecanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U
Perfluoroundecanoic acid	NS	NS	0.00169 U	0.00194 U	0.00194 U	0.00181 U	0.00174 U	0.00168 U	0.00188 U	0.00192 U	0.00173 U	0.00179 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1828_WALG_FRB	1828_WALG_FRB	1828_WALG_FRB	1829_WALG_FRB	1829_WALG_FRB	1829_WALG_FRB	1829_WALG_FRB	1834_WALG_FRB	1834_WALG_FRB	1834_WALG_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3K02456_FRB**	**4E02792-04**	**5E02944-04**	**3E02584_FRB**	**3K02457_FRB**	**4E02793-04**	**5E02965-04**	**3E02585_FRB**	**3K02458_FRB**	**4C03347-02**
Sample Date	**MCL**	**GW MSCs**	**11/1/2023**	**5/13/2024**	**5/12/2025**	**5/9/2023**	**11/1/2023**	**5/14/2024**	**5/15/2025**	**5/9/2023**	**11/1/2023**	**3/12/2024**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00168 U	0.00166 U	0.00176 U	0.00171 U	0.00163 U	0.00161 U	0.00172 U	0.00171 U	0.00166 U	0.00163 U
9Cl-PF3ONS	NS	NS	0.00166 U	0.00165 U	0.00174 U	0.00169 U	0.00162 U	0.00159 U	0.00171 U	0.00169 U	0.00164 U	0.00161 U
DONA	NS	NS	0.00168 U	0.00166 U	0.00176 U	0.00171 U	0.00163 U	0.00161 U	0.00172 U	0.00171 U	0.00166 U	0.00163 U
HFPODA	0.01	0.01	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
NEtFOSAA	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
NMeFOSAA	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorobutanesulfonic acid	2	2	0.00157 U	0.00156 U	0.00165 U	0.0016 U	0.00153 U	0.00151 U	0.00161 U	0.0016 U	0.00155 U	0.00153 U
Perfluorodecanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorododecanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluoroheptanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00163 U	0.00161 U	0.00171 U	0.00165 U	0.00158 U	0.00156 U	0.00167 U	0.00165 U	0.00161 U	0.00158 U
Perfluorohexanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorononanoic acid	0.01	0.01	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00165 U	0.00163 U	0.00173 U	0.00167 U	0.0016 U	0.00157 U	0.00169 U	0.00167 U	0.00162 U	0.00159 U
Perfluorooctanoic acid	0.004	0.004	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorotetradecanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluorotridecanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U
Perfluoroundecanoic acid	NS	NS	0.00178 U	0.00176 U	0.00187 U	0.00181 U	0.00173 U	0.0017 U	0.00182 U	0.00181 U	0.00175 U	0.00172 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1834_WALG_FRB	1834_WALG_FRB	1835_WALG_FRB	1835_WALG_FRB	835_WALG_PM1_FR	1835_WALG_FRB	1835_WALG_FRB	1835_WALG_FRB	1835_WALG_FRB	1840_WALG_FRB
Additional Information	USEPA	PADEP	—	—	Ktap	Pre	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02794-04	5E02945-04	23021196-02A	23021196-06A	23021196-04A	3E02586_FRB	3K02459_FRB	4E02795-04	5E02946-04	3E02587_FRB
Sample Date	MCL	GW MSCs	5/15/2024	5/12/2025	2/14/2023	2/14/2023	2/14/2023	5/10/2023	11/1/2023	5/13/2024	5/13/2025	5/10/2023
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00159 U	0.00176 U	0.002 U	0.002 U	0.002 U	0.00173 U	0.00166 U	0.00162 U	0.0017 U	0.00172 U
9Cl-PF3ONS	NS	NS	0.00157 U	0.00174 U	0.002 U	0.002 U	0.002 U	0.00171 U	0.00164 U	0.0016 U	0.00168 U	0.0017 U
DONA	NS	NS	0.00159 U	0.00176 U	0.002 U	0.002 U	0.002 U	0.00173 U	0.00166 U	0.00162 U	0.0017 U	0.00172 U
HFPODA	0.01	0.01	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
NEtFOSAA	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
NMeFOSAA	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorobutanesulfonic acid	2	2	0.00148 U	0.00165 U	0.002 U	0.002 U	0.002 U	0.00162 U	0.00155 U	0.00152 U	0.00159 U	0.00161 U
Perfluorodecanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorododecanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluoroheptanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00154 U	0.00171 U	0.002 U	0.002 U	0.002 U	0.00168 U	0.00161 U	0.00157 U	0.00165 U	0.00166 U
Perfluorohexanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorononanoic acid	0.01	0.01	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00155 U	0.00173 U	0.002 U	0.002 U	0.002 U	0.00169 U	0.00162 U	0.00158 U	0.00166 U	0.00168 U
Perfluorooctanoic acid	0.004	0.004	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorotetradecanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluorotridecanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U
Perfluoroundecanoic acid	NS	NS	0.00168 U	0.00187 U	0.002 U	0.002 U	0.002 U	0.00183 U	0.00175 U	0.00171 U	0.0018 U	0.00182 U

Notes:
USEPA = United State Environmental Protection Agency.
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MCL = Maximum Contaminant Level.
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ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1840_WALG_FRB	1840_WALG_FRB	1840_WALG_FRB	1841_WALG_FRB	1841_WALG_FRB	1841_WALG_FRB	1841_WALG_FRB	1846_WALG_FRB	1846_WALG_FRB	1846_WALG_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**3K02466_FRB**	**4E02796-04**	**5E02947-04**	**3E02588_FRB**	**3K02469_FRB**	**4E02797-04**	**5E02948-04**	**3E02589_FRB**	**3K02470_FRB**	**4E02798-04**
Sample Date	**MCL**	**GW MSCs**	**11/1/2023**	**5/15/2024**	**5/13/2025**	**5/10/2023**	**11/1/2023**	**5/14/2024**	**5/13/2025**	**6/5/2023**	**11/1/2023**	**5/15/2024**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00164 U	0.0016 U	0.00179 U	0.00173 U	0.00163 U	0.00165 U	0.00172 U	0.00166 L4 U	0.00165 U	0.00165 U
9Cl-PF3ONS	NS	NS	0.00162 U	0.00158 U	0.00177 U	0.00171 U	0.00162 U	0.00163 U	0.0017 U	0.00164 L4 U	0.00163 U	0.00163 U
DONA	NS	NS	0.00164 U	0.0016 U	0.00179 U	0.00173 U	0.00163 U	0.00165 U	0.00172 U	0.00166 L4 U	0.00165 U	0.00165 U
HFPODA	0.01	0.01	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
NEtFOSAA	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
NMeFOSAA	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorobutanesulfonic acid	2	2	0.00154 U	0.0015 U	0.00168 U	0.00162 U	0.00153 U	0.00155 U	0.00161 U	0.00155 L4 U	0.00155 U	0.00155 U
Perfluorodecanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorododecanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluoroheptanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00159 U	0.00155 U	0.00173 U	0.00168 U	0.00158 U	0.0016 U	0.00166 U	0.00161 U	0.0016 U	0.0016 U
Perfluorohexanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorononanoic acid	0.01	0.01	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00161 U	0.00157 U	0.00175 U	0.00169 U	0.0016 U	0.00162 U	0.00168 U	0.00162 L4 U	0.00162 U	0.00162 U
Perfluorooctanoic acid	0.004	0.004	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorotetradecanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluorotridecanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U
Perfluoroundecanoic acid	NS	NS	0.00174 U	0.00169 U	0.00189 U	0.00183 U	0.00173 U	0.00175 U	0.00182 U	0.00175 L4 U	0.00175 U	0.00175 U

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1846_WALG_FRB	1852_WALG_FRB	1852_WALG_FRB	1852_WALG_FRB	1852_WALG_FRB	1852_WALG_FRB	1853_WALG_FRB	1853_WALG_FRB	1853_WALG_FRB	1853_WALG_FRB
Additional Information	**USEPA**	**PADEP**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Lab Sample ID	**Primary**	**RUA**	**5E02966-04**	**22111993-04A**	**3E02590_FRB**	**3K02471_FRB**	**4E02908-04**	**5E02967-04**	**22111991-04A**	**3E02591_FRB**	**3K02474_FRB**	**4E02910-04**
Sample Date	**MCL**	**GW MSCs**	**5/13/2025**	**11/16/2022**	**5/9/2023**	**11/1/2023**	**5/13/2024**	**5/15/2025**	**11/17/2022**	**5/10/2023**	**11/1/2023**	**5/14/2024**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.0018 U	0.002 U	0.00172 U	0.00163 U	0.00166 U	0.00178 U	0.002 U	0.00171 U	0.00165 U	0.00189 U
9Cl-PF3ONS	NS	NS	0.00178 U	0.002 U	0.00171 U	0.00162 U	0.00164 U	0.00176 U	0.002 U	0.00169 U	0.00163 U	0.00187 U
DONA	NS	NS	0.0018 U	0.002 U	0.00172 U	0.00163 U	0.00166 U	0.00178 U	0.002 U	0.00171 U	0.00165 U	0.00189 U
HFPODA	0.01	0.01	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
NEtFOSAA	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	**0.00043 J**	0.00181 U	0.00174 U	0.002 U
NMeFOSAA	NS	NS	0.0019 U	**0.0006 J**	0.00182 U	0.00173 U	0.00175 U	0.00189 U	**0.00061 J**	0.00181 U	0.00174 U	0.002 U
Perfluorobutanesulfonic acid	2	2	0.00168 U	0.002 U	0.00161 U	0.00153 U	0.00155 U	0.00167 U	0.002 U	0.0016 U	0.00154 U	0.00177 U
Perfluorodecanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorododecanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluoroheptanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00174 U	0.002 U	0.00167 U	0.00158 U	0.00161 U	0.00173 U	0.002 U	0.00166 U	0.00159 U	0.00183 U
Perfluorohexanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorononanoic acid	0.01	0.01	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00176 U	0.002 U	0.00169 U	0.0016 U	0.00162 U	0.00175 U	0.002 U	0.00168 U	0.00161 U	0.00185 U
Perfluorooctanoic acid	0.004	0.004	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorotetradecanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluorotridecanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U
Perfluoroundecanoic acid	NS	NS	0.0019 U	0.002 U	0.00182 U	0.00173 U	0.00175 U	0.00189 U	0.002 U	0.00181 U	0.00174 U	0.002 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1853_WALG_FRB	1858_WALG_FRB2	1858_WALG_FRB3	1858_WALG_FRB	1858_WALG_FRB	1858_WALG_FRB	1858_WALG_FRB	1859_WALG_FRB	1859_WALG_FRB	1859_WALG_FRB
Additional Information	**USEPA**	**PADEP**	—	—	—	—	—	—	—	—	—	—
Lab Sample ID	**Primary**	**RUA**	**5E02968-04**	**22090736-02A**	**22090736-04A**	**3E02592_FRB**	**3K02475_FRB**	**4E02911-04**	**5E02949-04**	**22111992-04A**	**3E02593_FRB**	**3K02476_FRB**
Sample Date	**MCL**	**GW MSCs**	**5/15/2025**	**9/7/2022**	**9/7/2022**	**5/10/2023**	**11/14/2023**	**5/14/2024**	**5/13/2025**	**11/16/2022**	**5/10/2023**	**11/1/2023**
PFAS (µg/l)												
11Cl-PF3OUdS	NS	NS	0.00179 U	0.002 U	0.002 U	0.00171 U	0.00168 U	0.0016 U	0.00171 U	0.002 U	0.00174 U	0.00174 U
9Cl-PF3ONS	NS	NS	0.00177 U	0.002 U	0.002 U	0.00169 U	0.00166 U	0.00158 U	0.00169 U	0.002 U	0.00173 U	0.00173 U
DONA	NS	NS	0.00179 U	0.002 U	0.002 U	0.00171 U	0.00168 U	0.0016 U	0.00171 U	0.002 U	0.00174 U	0.00174 U
HFPODA	0.01	0.01	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
NEtFOSAA	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
NMeFOSAA	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	**0.00061 J**	0.00185 U	0.00185 U
Perfluorobutanesulfonic acid	2	2	0.00168 U	0.002 U	0.002 U	0.0016 U	0.00157 U	0.0015 U	0.0016 U	0.002 U	0.00163 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorododecanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluoroheptanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00173 U	0.002 U	0.002 U	0.00166 U	0.00162 U	0.00155 U	0.00165 U	0.002 U	0.00169 U	0.00169 U
Perfluorohexanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorononanoic acid	0.01	0.01	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00175 U	0.002 U	0.002 U	0.00168 U	0.00164 U	0.00157 U	0.00167 U	0.002 U	0.00171 U	0.00171 U
Perfluorooctanoic acid	0.004	0.004	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorotetradecanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluorotridecanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U
Perfluoroundecanoic acid	NS	NS	0.00189 U	0.002 U	0.002 U	0.00181 U	0.00177 U	0.00169 U	0.00181 U	0.002 U	0.00185 U	0.00185 U

Notes:
USEPA = United State Environmental Protection Agency.
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PFAS = Per- and polyfluoroalkyl substances.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
ft bgs = Feet below ground surface.
µg/l = Micrograms per liter.
Bold = Detected concentration.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

Table B5. Summary of POET QA/QC (FRB) Performance PFAS Sampling Results (Post-POET Installation). The Pennsylvania State University; State College, Pennsylvania.

Sample ID			1859_WALG_FRB	1859_WALG_FRB	1864_WALG_FRB	1864_WALG_FRB	1864_WALG_FRB	1864_WALG_FRB
Additional Information	USEPA	PADEP	—	—	—	—	—	—
Lab Sample ID	Primary	RUA	4E02913-04	5E02969-04	3E02594_FRB	3K02477_FRB	4E02914-04	5E02970-04
Sample Date	MCL	GW MSCs	5/14/2024	5/13/2025	5/11/2023	11/1/2023	5/1/2024	5/15/2025
PFAS (µg/l)								
11Cl-PF3OUdS	NS	NS	0.00189 U	0.00172 U	0.00171 U	0.00162 U	0.00167 U	0.00174 U
9Cl-PF3ONS	NS	NS	0.00187 U	0.0017 U	0.00169 U	0.00161 U	0.00165 U	0.00172 U
DONA	NS	NS	0.00189 U	0.00172 U	0.00171 U	0.00162 U	0.00167 U	0.00174 U
HFPODA	0.01	0.01	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
NEtFOSAA	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
NMeFOSAA	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorobutanesulfonic acid	2	2	0.00177 U	0.00161 U	0.0016 U	0.00152 U	0.00156 U	0.00163 U
Perfluorodecanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorododecanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluoroheptanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorohexanesulfonic acid	0.01	0.01	0.00183 U	0.00166 U	0.00166 U	0.00157 U	0.00162 U	0.00168 U
Perfluorohexanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorononanoic acid	0.01	0.01	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorooctanesulfonic acid	0.004	0.004	0.00185 U	0.00168 U	0.00168 U	0.00159 U	0.00163 U	0.0017 U
Perfluorooctanoic acid	0.004	0.004	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorotetradecanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluorotridecanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U
Perfluoroundecanoic acid	NS	NS	0.002 U	0.00182 U	0.00181 U	0.00172 U	0.00177 U	0.00184 U

Notes:
USEPA = United State Environmental Protection Agency.
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— = Sample not analyzed.
NS = No standard currently established.
B3 = The target analyte was detected in the Method, Dilution Water, Instrument or Extraction Blank or Sterility Check at or above the MRL or applicable method, client, or regulatory requirement. Possibility of high bias in the sample result, however it is ND.
J = Result below the reporting limit (estimated value).
U = Not detected above laboratory detection limit.

APPENDIX B – Table B6

Summary of Airport and Proximate Wells PFAS Sampling Results

Table B6. Summary of Airport and Proximate Wells PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID	USEPA	PADEP	Entry Point 101	SOTA 1	SOTA 2	UN-36	APT-2	APT-2	Fed Ex	Fed Ex	Haller Farm South
Lab Sample ID	Primary	RUA	Entry Point 101_201986	1138958	1138959	9J14001-01	1258725	APT-2_20200324	1258726	Fed_Ex_20200324	1258727
Sample Date	MCL	GW MSCs	8/6/2019	8/28/2019	8/28/2019	10/13/2019	2/11/2020	3/24/2020	2/11/2020	3/24/2020	2/11/2020
PFAS (µg/l)											
11Cl-PF3OUdS	NS	NS	—	—	—	—	—	—	—	—	—
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	NS	NS	—	—	—	—	—	—	—	—	—
4:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—
6:2 FTS	NS	NS	—	—	—	—	—	—	—	—	—
9Cl-PF3ONS	NS	NS	—	—	—	—	—	—	—	—	—
DONA	NS	NS	—	—	—	—	—	—	—	—	—
HFPODA	0.01	0.01	—	—	—	—	—	—	—	—	—
NEtFOSAA	NS	NS	—	—	—	—	—	—	—	—	—
NMeFOSAA	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoro-3-methoxypropanoic acid (PFMPA)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoro-4-methoxybutanoic acid (PFMBA)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorobutanesulfonic acid	2	2	**0.0072**	—	—	0.0017 U	—	—	—	—	—
Perfluorobutanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorodecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorododecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoroheptanoic acid	NS	NS	—	—	—	0.0017 U	—	—	—	—	—
Perfluorohexanesulfonic acid	0.01	0.01	**0.073 +**	—	—	0.0017 U	—	—	—	—	—
Perfluorohexanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorononanoic acid	0.01	0.01	**0.0024**	—	—	0.0017 U	—	—	—	—	—
Perfluorooctanesulfonic acid	0.004	0.004	**0.094 +**	**0.079 +**	**0.075 +**	0.0017 U	**0.019 +**	**0.017 +**	**0.0025**	**0.0029**	0.0018 U
Perfluorooctanoic acid	0.004	0.004	**0.02 +**	**0.021 +**	**0.008 +**	0.0017 U	**0.0065 +**	**0.0058 +**	**0.0029**	**0.0033**	0.0018 U
Perfluoropentanesulfonic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoropentanoic acid (PFPeA)	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluorotridecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
Perfluoroundecanoic acid	NS	NS	—	—	—	—	—	—	—	—	—
PFECA B	NS	NS	—	—	—	—	—	—	—	—	—
PFEESA	NS	NS	—	—	—	—	—	—	—	—	—

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RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
µg/l = Micrograms per liter.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
Bold = Detected concentration.

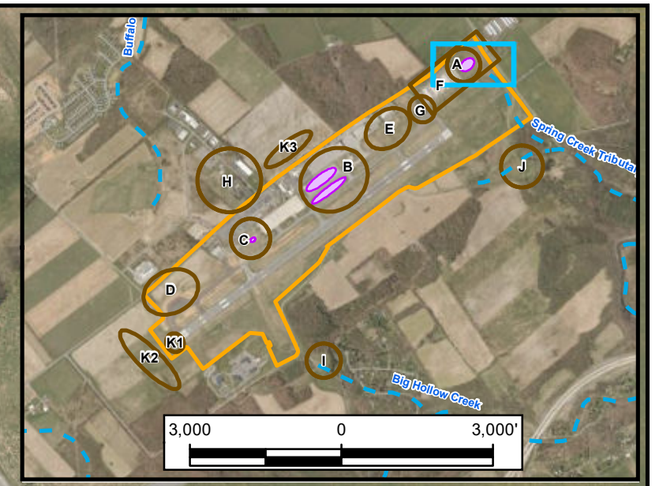
Table B6. Summary of Airport and Proximate Wells PFAS Sampling Results. The Pennsylvania State University; State College, Pennsylvania.

Sample ID	USEPA	PADEP	Haller Farm North	GAT-1	GAT-1	UN-36/Test Track	Hatchery Well #2
Lab Sample ID	Primary	RUA	1265998	410-5249-1	410-10191-1	410-194782-1	1735 Shiloh Rd_Hatchery well #2_20211215
Sample Date	MCL	GW MSCs	2/21/2020	6/19/2020	8/6/2020	10/30/2024	12/15/2021
PFAS (µg/l)							
11Cl-PF3OUdS	NS	NS	—	—	—	0.0017 U	ND
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	NS	NS	—	—	—	0.0017 U	—
4:2 FTS	NS	NS	—	—	—	0.0017 U	—
6:2 FTS	NS	NS	—	—	—	0.0017 U	—
9Cl-PF3ONS	NS	NS	—	—	—	0.0017 U	ND
DONA	NS	NS	—	—	—	0.0017 U	ND
HFPODA	0.01	0.01	—	—	—	0.0017 U	ND
NEtFOSAA	NS	NS	—	—	—	—	ND
NMeFOSAA	NS	NS	—	—	—	—	ND
Perfluoro-3-methoxypropanoic acid (PFMPA)	NS	NS	—	—	—	0.0017 U	—
Perfluoro-4-methoxybutanoic acid (PFMBA)	NS	NS	—	—	—	0.0017 U	—
Perfluorobutanesulfonic acid	2	2	—	—	—	0.0017 U	ND
Perfluorobutanoic acid	NS	NS	—	—	—	0.0017 U	—
Perfluorodecanoic acid	NS	NS	—	—	—	0.0017 U	ND
Perfluorododecanoic acid	NS	NS	—	—	—	0.0017 U	ND
Perfluoroheptanesulfonic acid (PFHpS)	NS	NS	—	—	—	0.0017 U	—
Perfluoroheptanoic acid	NS	NS	—	—	—	0.0017 U	ND
Perfluorohexanesulfonic acid	0.01	0.01	—	—	—	0.0017 U	**0.0107 +**
Perfluorohexanoic acid	NS	NS	—	—	—	0.0017 U	**0.0063**
Perfluorononanoic acid	0.01	0.01	—	—	—	0.0017 U	ND
Perfluorooctanesulfonic acid	0.004	0.004	0.0017 U	**0.059 +**	**0.1 +**	0.0017 U	**0.0081 +**
Perfluorooctanoic acid	0.004	0.004	0.0017 U	**0.014 J+**	**0.016 +**	0.0017 U	**0.0049 +**
Perfluoropentanesulfonic acid	NS	NS	—	—	—	0.0017 U	—
Perfluoropentanoic acid (PFPeA)	NS	NS	—	—	—	**0.00058 J**	—
Perfluorotetradecanoic acid	NS	NS	—	—	—	—	ND
Perfluorotridecanoic acid	NS	NS	—	—	—	—	ND
Perfluoroundecanoic acid	NS	NS	—	—	—	0.0017 U	ND
PFECA B	NS	NS	—	—	—	0.0017 U	—
PFEESA	NS	NS	—	—	—	0.0017 U	—

Notes:
USEPA = United State Environmental Protection Agency.
PADEP = Pennsylvania Department of Environmental Protection.
MCL = Maximum Contaminant Level.
RUA = Residential Used Aquifer.
MSCs = Medium-Specific Concentrations.
µg/l = Micrograms per liter.
+ = Concentrations exceed the USEPA Primary MCLs and the PADEP RUA GW MSCs.
— = Sample not analyzed.
ND = Not detected.
NS = No standard currently established.
U = Not detected above laboratory detection limit.
J = Result below the reporting limit (estimated value).
Bold = Detected concentration.

APPENDIX C

Site Plans Showing Preliminary Soil Sampling Locations



LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

100 0 100'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA A

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-1
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-1(BL)		

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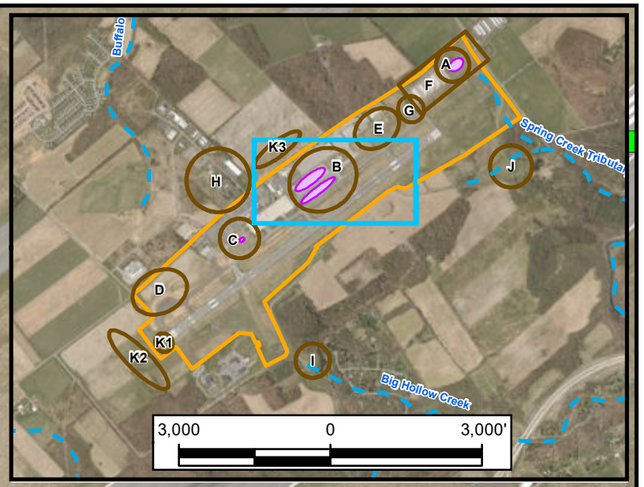

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA B

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-2
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-2(BL)		

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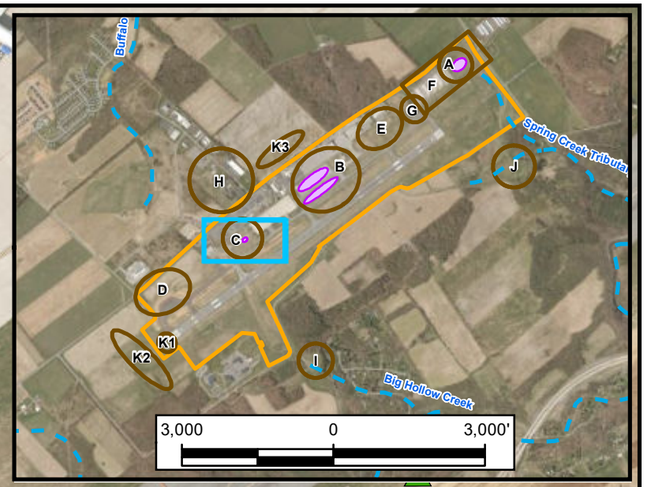

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

100 0 100'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA C

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-3
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-3(BL)		

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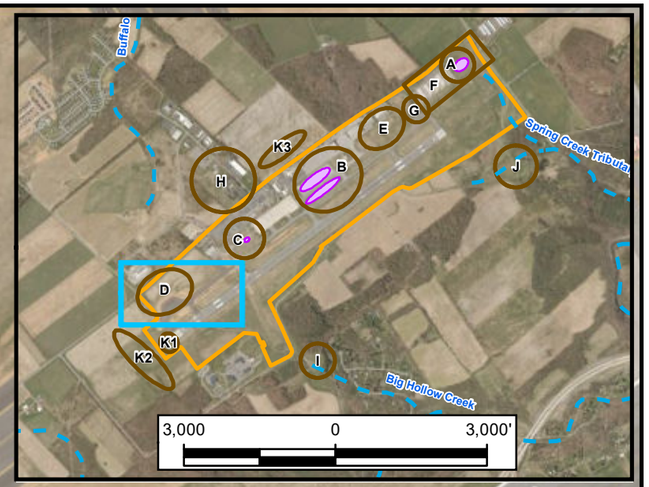

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

150 0 150'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA D

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-4
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-4(BL)		

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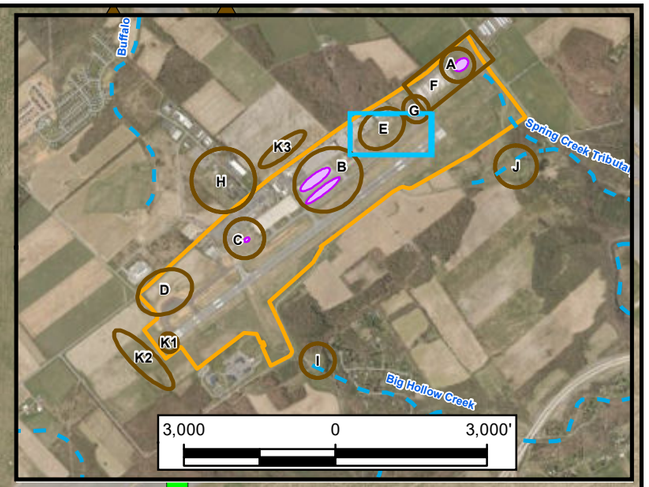

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

100 0 100'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA E

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-5
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-5(BL)		

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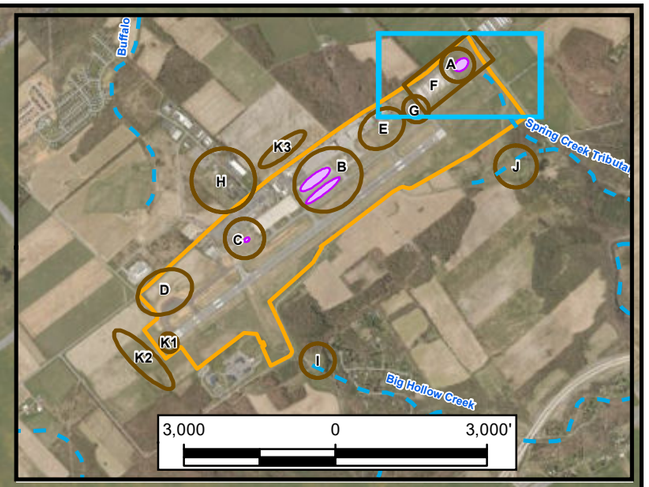

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA F

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/21/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-6
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-6(BL)		

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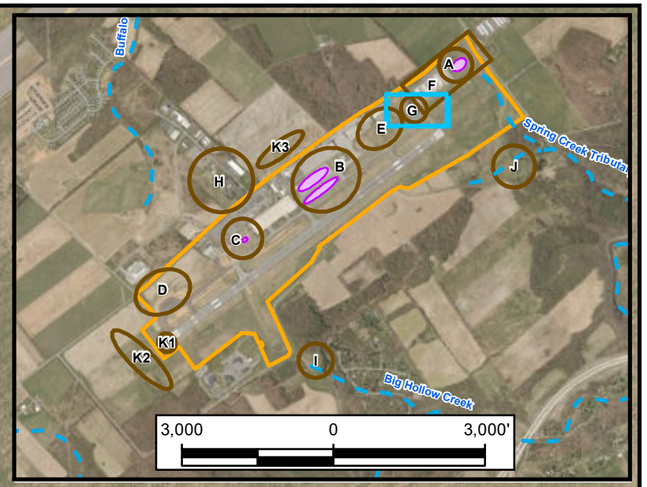

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

75 0 75'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA G

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-7
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-7(BL)		

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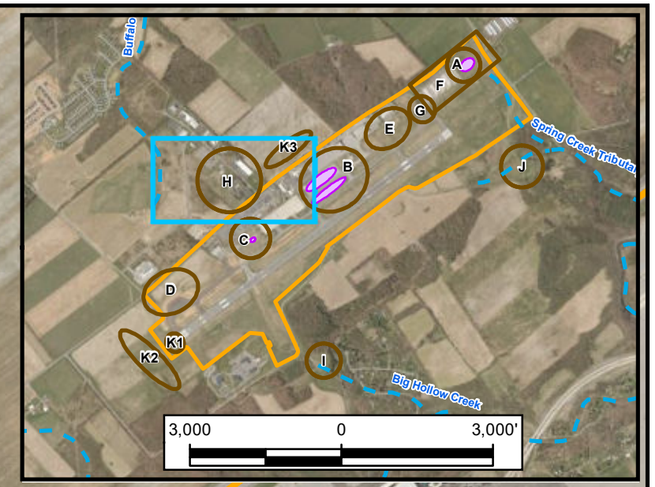

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA H

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-8
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-8(BL)		

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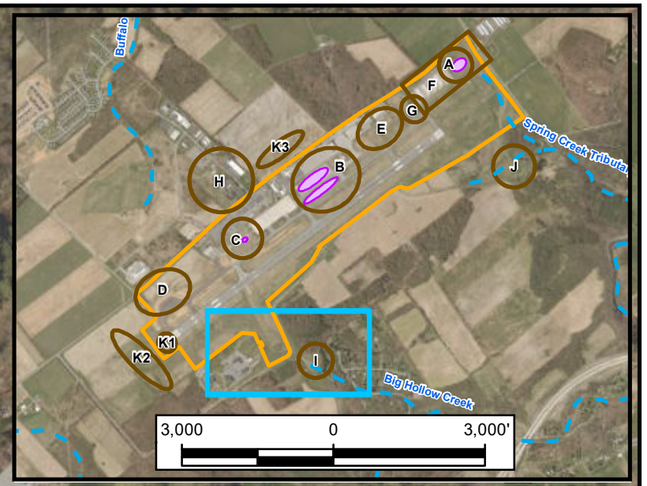


LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA I

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-9
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-9(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\C-9(BL)PROPOSED SOIL BORINGS - AREA I.MXD

C:\USERS\DMARTINONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\C-10(BL)\PROPOSED SOIL BORINGS - AREA J.MXD

LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA J

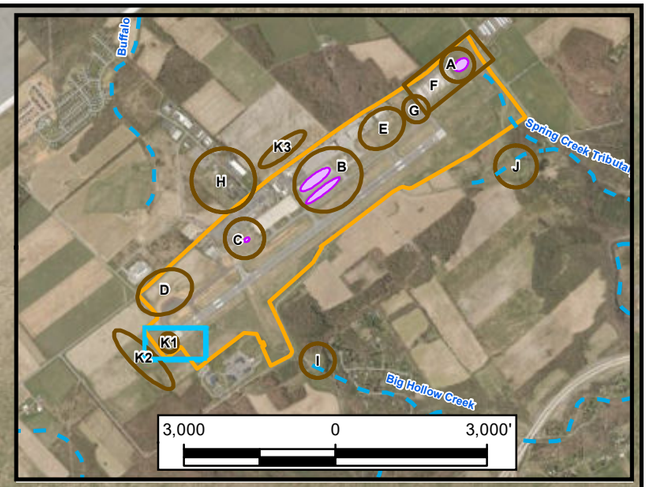
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-10
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-10(BL)		



LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

75 0 75'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA K1

STATE COLLEGE, PA

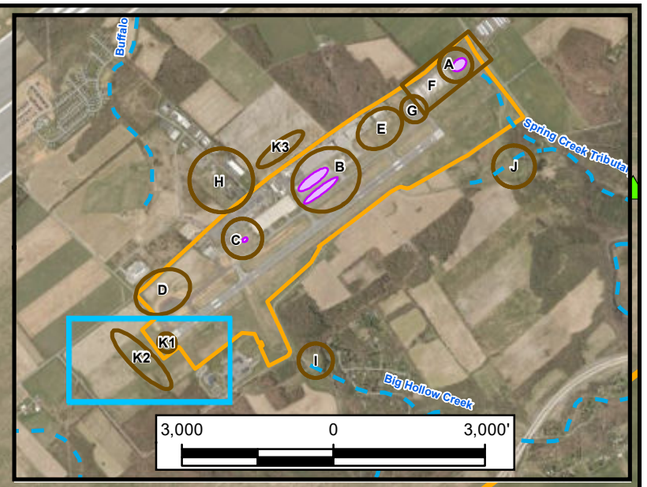
Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-11.1
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-11.1(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\C-11.1(BL)\PROPOSED SOIL BORINGS - AREA K1.MXD



LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

200 0 200'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA K2

STATE COLLEGE, PA

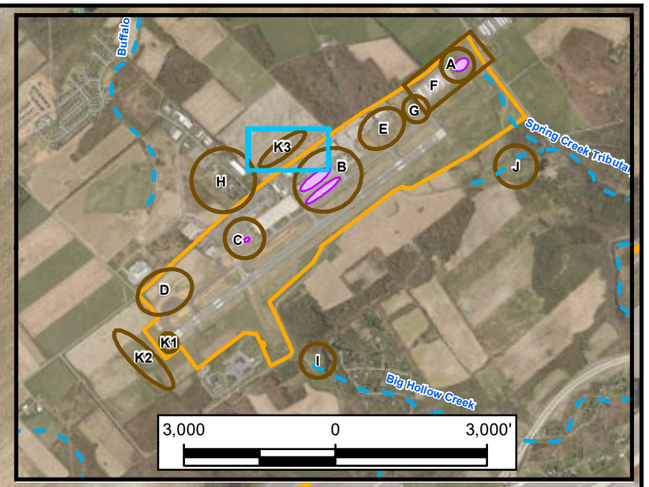
Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-11.2
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-11.2(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\C-11.2(BL)\PROPOSED SOIL BORINGS - AREA K2.MXD



LEGEND

Soil PFOS Results

- < 0.0004 (mg/kg) (Anticipated MGW MSC)
- 0.0004 (mg/kg) - < 0.007 (mg/kg) (Current MGW RUA MSC)
- 0.007 (mg/kg) - < 4.4 (mg/kg) (Current DC Res MSC)
- 4.4 (mg/kg) - < 64 (mg/kg) (Current DC Non-Res MSC)
- ≥ 64 (mg/kg) (Current DC Non-Res MSC)
- Not Analyzed for PFAS

- Proposed Soil Boring (Approximate Location)
- Stream Centerlines
- Soil Investigation Area
- State College Regional Airport
- Reported AFFF Discharge Areas

NOTES

1. Layer sources: World Imagery (ESRI), State College Regional Airport (ESRI), Stream Centerlines (PSU) and Reported AFFF Discharge Areas (HDR Due Diligence Report).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. PFOS = Perfluorooctanesulfonic Acid.
4. AFFF = Aqueous Film-Forming Foam.
5. Location of composite sample, if depicted on figure, selected based on central most location of 4 grab samples that make up composite sample.
6. Triangle = Soil Boring. Circle = Soil Composite. Square = Asphalt.
7. mg/kg = milligrams per kilogram.
8. MSC = Medium Specific Concentration. MGW = Migration to Groundwater. DC = Direct Contact. RES = Residential. Non-Res = Non-Residential.
9. Soil boring locations are approximate and subject to revision based on field inspection and access.

N

100 0 100'

Title:

APPROXIMATE LOCATION OF PROPOSED SOIL BORINGS - AREA K3

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/24/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	C-11.3
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: C-11.3(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\C-11.3(BL)\PROPOSED SOIL BORINGS - AREA K3.MXD

APPENDIX D

Standard Operating Procedures

1. SOP for Collection of Samples for PFAS Analysis
2. SOP for Soil Classification and Logging Procedures
3. SOP 3.1 for Collection of Quality Control Samples for Water-Quality Data
4. SOP 3.2 for Field Record Keeping and Quality Assurance/Quality Control
5. SOP 3.3 for Sample Handling
6. SOP 4.3 for Purging a Well
7. SOP 4.4 for Sampling Ground-Water Monitoring Wells for Dissolved Constituents Using Low Stress (Low Flow) Methods
8. SOP 4.10 for Sampling Potable Water Systems
9. SOP 5.1 for Collection of Soil Samples for Laboratory Analysis
10. SOP 9.1 for Decontamination of Field Equipment
11. SOP 10.1 for Rock Coring, Formation Sampling, and Corehole Abandonment in Consolidated Formations
12. SOP 10.2 for the Construction, Development, and Abandonment of Monitoring or Observation Wells in Consolidated Formations
13. SOP 10.3 for Soil Boring and/or Monitoring or Observation Well Drilling, Formation Sampling and Borehole Abandonment in Unconsolidated Formations

STANDARD OPERATING PROCEDURE
FOR COLLECTION OF SAMPLES FOR PFAS ANALYSIS

Prepared: Revised November 2025

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish guidelines and procedures for the collection of soil, sediment, and/or water samples for laboratory analysis of Per- and Polyfluorinated Alkyl Substances (PFAS). This SOP describes the procedures and equipment to be considered to collect field samples for PFAS analysis to minimize the risk of cross-contamination.[1]

2.0 CONSIDERATIONS

PFAS are a large group of synthetic compounds that are widely used in industrial and commercial processes and consumer products. Due to the prevalent nature of PFAS and the low laboratory detection limits (on the order of nanograms per liter [ng/L)]; or parts per trillion [ppt]), the relative probability of false positives is high compared to traditional environmental constituents of concern. Therefore, careful planning, sampling, and shipping techniques must be utilized to ensure the integrity of the samples collected. Following the procedures in this SOP will help ensure the collection of a valid sample.

3.0 EQUIPMENT AND MATERIALS

3.1 GENERAL FIELD SUPPLIES, CLOTHING, AND PERSONAL PROTECTIVE EQUIPMENT

a. Safety first. Obtain the appropriate Job Safety Analysis (JSA) and personal protection equipment (PPE), as specified in the site Health and Safety Plan (HASP).

b. PPE and field clothing should be free of PFAS-containing materials. Nitrile gloves should be powderless. Allowable clothing materials include well-laundered (not using fabric softeners or anti-static dryer sheets) synthetic or 100% cotton clothing.

c. Waterproof clothing made of/with polyurethane, polyvinyl chloride (PVC), wax-coating, rubber, or neoprene is acceptable, however **Gore- Tex® or Tyvek® material should be avoided.**

d. Steel/Safety-toed boots should not have waterproofing (Over-boots may be donned prior to sampling if PFAS-free boots are not available).

e. Use and application of cosmetics, moisturizers, sun blocks, insect repellants, fragrances, creams, or other personal care products (including hair products) should be avoided during the 24 hours prior to the sampling event. Below is a list of sunscreens and insect repellants that have been analyzed and found to be PFAS-free and may be used on the day that sampling is conducted:

<u>Allowable Insect Repellants:</u>

- OFF Deep Woods
- Sawyer Permethrin
- Jason Natural Quit Bugging Me
- Repel Lemon Eucalyptus Insect repellant
- Herbal Armor
- California Baby Natural Bug Spray

[1] This SOP is intended to supplement other non-PFAS specific SOPs. In the event of a conflict between SOPs, this SOP takes precedence for matters where PFAS samples are collected.

Allowable Sunscreens:

- 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 SPF70
- 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+

If any non-approved sunscreens or insect repellants are used, an equipment blank sample must be collected to verify that it is PFAS-free.

f. Field notebook, field form(s), maps, chain-of-custody (COC) forms.

Note: Do NOT use waterproof paper/notebooks, adhesive paper products (e.g. Post-It Notes), or plastic clipboards.

g. Ballpoint pens. Fine or Ultra-Fine Sharpie® markers are acceptable to use while in the staging area but should not be used in the sampling area.

Note: Do NOT use regular/thick size Sharpie® markers.

h. No food or beverage should be consumed in the sampling area. Pre- packaged food, fast food wrappers, and aluminum foil are likely to contain PFAS. All food and beverage consumption should be done outside of the sampling area. Hands must be washed thoroughly with Alconox® or Liquinox® soap and PFAS-free deionized water prior to beginning/returning to sampling activities.

3.2 DECONTAMINATION EQUIPMENT

a. Laboratory-supplied, PFAS-free deionized water is preferred for decontamination.

Note: Commercially available deionized water or municipal drinking water may be used for decontamination purposes if they are known to be PFAS-free.

b. Alconox®, Liquinox®, and Citranox® can be used for equipment decontamination.

Note: Do NOT use Decon 90®.

c. Polyethylene or PVC brushes should be used for removing particulates.

3.3 SAMPLING AND SHIPPING EQUIPMENT

a. Allowable materials include high-density polyethylene (HDPE), polypropylene, silicone, stainless steel, nylon, PVC, acetate, and cotton. **Note: Do NOT use any equipment (specifically bailers or other water sampling equipment or thread joints) that contains**

known fluoropolymers including:

- **Polytetrafluoroethylene (PTFE) – Teflon®, Hostaflon®**
- **Polyvinylidene fluoride (PVDF) – Kynar®**
- **Polychlorotrifluoroethylene (PCTFE) – Neoflon®**
- **Ethylene-tetrafluoro-ethylene (ETFE) – Tefzel®**
- **Fluorinated ethylene propylene (FEP) – Teflon® FEP, Hostaflon®FEP, Neoflon®**
- **Low density polyethylene (LDPE)**

b. Sample bottles/jars. All sample containers should come from the laboratory. Be sure to request enough sample containers for all primary samples and quality control samples (field duplicates, field reagent blanks, equipment blanks). Sample containers for PFAS analysis consist of the following (unless otherwise specified by the qualified laboratory):

- Soil: 8 oz. HDPE/polypropylene jar
- Water: 250 mL HDPE/polypropylene bottle
- Drinking water: 250 mL HDPE/polypropylene bottles preserved withTrizma®

c. Laboratory-provided sample labels. Bottles should be labeled prior to sample collection. Affix the labels to the sample bottles prior to shipping in order to avoid the handling of adhesive labels at the sampling site.

d. Sealable bags. Only ultra-clean polypropylene or HDPE material sealable bags are allowed. These should be requested from the laboratory when the bottle order is made.

e. Coolers/Ice Chests. Ensure that the interior of the coolers/ice chests are clean, and if needed, clean with PFAS-free soap such as Alconox® and PFAS-free deionized water.

f. Wet ice. To avoid water from the ice seeping into the samples, the collected samples should be stored in new clean polyethylene sealable bags.

Note: Chemical ice, blue ice, or dry ice should NOT be used.

g. Tape for sealing the cooler for shipment. Uline® Strapping Tape is recommended.

4.0 PROCEDURE

4.1 SAMPLE COLLECTION

a. Hands should be washed with Alconox® or Liquinox® soap and PFAS-free deionized water before sampling. Clean, powderless nitrile gloves must be donned before collecting samples, handling sample containers, and/or handling sampling equipment. A new pair of nitrile gloves should be used at each sampling location.

b. Prior to collecting samples, ensure that all sampling equipment has been thoroughly cleaned. Decontamination procedures should include triple rinsing with PFAS-free water.

c. Sample containers should be kept sealed and only opened during sample collection. The sampling container cap or lid should never be placed on the ground or on any other surface unless the surface is PFAS-free. When transporting samples, do not place samples/bottles directly on vehicle upholstery, office upholstery, or floor rugs since they most likely have been stain-, fire-, and/or water-resistant treated. Sample containers should be labeled prior to sample collection with the appropriate information (client name/project site, sample ID, date, time, and sampler's initials).

d. For water/drinking water samples collected from a tap or pumped well, an effort should be made to avoid plumbing and joints containing Teflon® (although this cannot be avoided in all situations).

e. Place the sample in the laboratory-supplied, pre-cleaned sample container (HDPE or polypropylene). Avoid contact with the inside of the sample bottle and cap during sample collection. When collecting water/drinking water samples, reduce the flow to a slow stream to reduce air entrainment and avoid overfilling the bottle.

f. Following sample collection, sample containers should be placed in an individual sealed plastic bag (ultra-clean polypropylene or HDPE material provided by the laboratory) then into the ice chest with ice surrounding the bottles.

g. Record the samples on the COC.

h. After sampling, remove nitrile gloves and place them in a sealable plastic bag. Wash hands with Alconox® or Liquinox® soap and rinse with PFAS-free deionized water.

4.2 QUALITY CONTROL FIELD SAMPLE COLLECTION

The type of quality control samples to be collected for the sampling event may include the following:

a. Field Duplicate Samples: Field duplicate samples are used to evaluate field and laboratory precision. Field duplicates are replicate or split samples collected from the source at the same time and treated exactly the same as the primary field sample throughout the field and laboratoryprocedures.

b. Field Reagent Blank Samples: Field reagent blank samples are used to evaluate the potential of PFAS cross-contamination being introduced during the sampling process. A field reagent blank sample may be collected at one or more sampling locations prior to the collection of the primary field sample and any field duplicate samples to be collected. The field reagent blank sample is collected by opening the sample container, pouring the laboratory-provided reagent water into the sample container, and sealing the sample container. Field reagent blanks must be treated the same as the samples collected and stored and shipped in the same ice chest used for all other samples.

c. Equipment Blank Samples: Equipment blank samples are used to assess the adequacy of the decontamination process and evaluate potential contamination from the equipment used during sampling. Equipment blank samples are collected by pouring laboratory-provided, PFAS-free water over or through the decontaminated field sampling equipment and into a sample container.

d. Trip Blank Samples: Trip blank samples are optional for PFAS sampling as they provide information similar to the field reagent blank samples.

4.3 SAMPLE SHIPPING

a. Sample containers (placed inside individual sealed plastic bags) should be packed upright in the ice chest. Ensure that the bottles cannot move sideways at all. Any extra space around the containers should be packed with wet ice to 1/3 the depth of the ice chest (**Do NOT use chemical ice, blue ice, or dry ice**). Put additional ice inside double sealed plastic bags and place on top of the bottles.

b. Samples must arrive at the laboratory within 48 hours of sampling or within the hold time window (based on the analytical method), and at a temperature between 10ºC (50ºF) and

0ºC (32ºF), but not frozen. If samples are received by the laboratory more than 48 hours after sampling, they must be between 6ºC (42.8ºF) and 0ºC (32ºF), but not frozen. Water samples and soil samples must be extracted within 14 days of sample collection.

c. Check that all samples within the ice chest are included on the COC form (each ice chest should include a COC). The COC should be signed by the shipping carrier personnel prior to sealing the ice chest. Retain the signed sampler's/sender's copy of the COC. Place the COC in a sealed plastic bag inside the cooler.

d. Seal the ice chest firmly using PFAS-free shipping tape, wrapping it around the ice chest multiple times. Uline® Strapping Tape is acceptable.

e. Samples should be shipped via overnight service to the laboratory (hand delivery or courier pick-up are acceptable). Provide shipping tracking information to the laboratory and communicate the potential delivery date/time of the samples.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidance to obtain accurate and consistent descriptions of soil characteristics during soil sampling operations. The characterization is based on visual examination and manual tests, not on laboratory determinations.

2.0 MATERIALS/EQUIPMENT

a. Black Pens.

b. Tape measure or ruler.

c. Field notebook.

d. Squirt bottle/spray bottle with PFAS-free water.

e. Rock- or soil-color chart (e.g., Munsell).

f. Grain-size chart.

g. Hand lens.

h. Unified Soil Classification System index charts and tables to help with soil classification.

i. Event-specific sampling and analysis plan, workplan or event-specific field instructions. Planned borehole depth, proposed well construction/specifications, and field sampling summary table, if available.

3.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned according to the decontamination SOP. Where possible, thoroughly pre-cleaned and wrapped sampling equipment should be used and dedicated to individual sampling locations. Disposable items such as sampling gloves, aluminum foil, and plastic sheeting will be changed after each use and discarded in an appropriate manner.

4.0 PROCEDURE

This section covers several aspects of the soil characterization: instructions for completing soil boring logs.

4.1 Heading Information.

1) Boring/Well ID. Enter the boring/well number. A numbering system should be chosen that does not conflict with information recorded for previous

exploratory work done at the site. Number the sheets consecutively for each boring.

2) Client/Project Name.
3) Site Location.
4) Drilling Contractor. Enter the name of the drilling company and the city and state where the company is based.
5) Drilling Method and Equipment. Identify the bit size and type, drilling fluid (if used), and method of drilling (e.g., rotary, hollow-stem auger, sonic). Information on the drilling equipment (e.g., CME 55, Mobile B61) should be noted.
6) Date and Time. Include Start time and End time.
7) Logged by.

4.2 Technical Data.

1) Depth Below Surface.
2) Sample Interval.
3) Blow Counts.
4) Sample Recovery.
5) Soil Description.
6) Soil Classification.

4.3 Soil Classification

The Unified Soil Classification System (USCS) is based on numerical values of certain soil properties that are measured by laboratory tests (ASTM D 2487). It is possible, however, to estimate these values in the field with reasonable accuracy using visual-manual procedures (ASTM D 2488). In addition, some elements of a complete soil description, such as the presence of cobbles or boulders, changes in strata, and the relative proportions of soil types in a bedded deposit can be obtained only in the field.

Soil descriptions should be precise and comprehensive without being verbose. The correct overall impression of the soil should not be distorted by excessive emphasis on insignificant details. In general, both similarities and differences between consecutive samples should be identified.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to explain the quality control (QC) measures taken to ensure the integrity of the samples collected and to establish the guidelines for the collection of QC samples. The objective of the QC program is to ensure that water-quality data of known and reliable quality are developed.[1]

Because valid water-chemistry data are integral to a hydrogeologic investigation that characterizes water-quality conditions, the data will be confirmed by QC samples. Without checks on the sampling and analytical procedures, the potential exists for contradictory or incorrect results. The acceptance of water-quality data by regulatory agencies and in litigation-support investigations depends heavily on the proper QC program to justify the results presented. The QC sampling requirements must be determined by the project manager and be clearly defined in the work plan.

2.0 QUALITY CONTROL SAMPLES

2.1 Samples taken for analysis of compounds require the use of quality control samples to monitor sampling activities and laboratory performance. Types of quality control samples may include duplicate and/or duplicate split, field reagent blank, equipment blank, and trip blank, matrix spike and matrix spike duplicate, and fortification. A discussion pertaining to each quality control sample follows:

a. Field Duplicate Samples - Duplicate sample analysis is done to check on the reproducibility of results either within a laboratory or between laboratories. A duplicate sample is called a split sample when it is collected with or turned over to a second party (e.g., regulatory agency, consulting firm) for an independent analysis. Duplicate samples are aliquots (equal portions) from a sample in a common container.

To collect a duplicate sample, water from the bailer or pump will be distributed first to fill one container and then to fill the second container. Adequate water should be available to fill the bottles completely before they are capped. If the water is insufficient to fill all the bottles at once, then incrementally fill each bottle with water from two or more bailer volumes or pump cycles.

For some test substances, water may have to be accumulated in a common container and then decanted slowly into the sample bottles. The work plan should be checked for a description of how duplicate samples are to be collected. Additionally, in the case of wells that recover slowly and

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

produce insufficient water to fill all the duplicate sample containers, the containers should be filled incrementally and kept on ice in the cooler in between filling periods.

b. Field Reagent Blank Samples - Field reagent blank samples are used to evaluate the potential of PFAS cross-contamination being introduced during the sampling process. A field reagent blank sample may be collected at one or more sampling locations prior to the collection of the primary field sample and any field duplicate samples to be collected. The field reagent blank sample is collected by opening the sample container, pouring the laboratory-provided reagent water into the sample container, and sealing the sample container. Field reagent blanks must be treated the same as the samples collected and stored and shipped in the same ice chest used for all other samples

c. Equipment Blank Samples - An equipment blank sample is collected to evaluate the potential for cross-contamination being introduced during the sampling process and assess the adequacy of the decontamination process used during the field investigation. Equipment blank samples are collected by pouring "clean" (e.g., distilled/deionized/demonstrated analyte free) water over or through the decontaminated field sampling equipment and into a sample container. Sample containers should be identical to the sampling equipment used for the primary samples and analyzed for the same suite of analyses as the primary samples.

d. Trip Blank - Trip blank samples are optional for PFAS sampling as they provide information similar to the field reagent blank samples.

e. Matrix Spike and Matrix Spike Duplicate - Spikes of compounds (e.g., standard compound, test substance, etc.) may be added to samples in the laboratory to determine if the ground-water matrix is interfering with constituent identification or quantification, as well as a check for systematic errors and lack of sensitivity of analytical equipment. Samples for spikes are collected in the identical manner as for standard analysis, and shipped to the laboratory for spiking. Matrix spike duplicate sample collection, and laboratory spiking and analysis is done to check on the reproducibility of matrix spike results.

f. Fortification - A fortification, which is performed in the field, is used to check on the laboratory's ability to recover the test substance (analyte) added as well as its stability between fortification and analysis.

A field fortification (spike) is prepared by filling the container(s) with field or distilled/deionized/demonstrated analyte free water (as specified by the laboratory) to a predetermined volume (as specified by the laboratory) and adding the spike (supplied by the laboratory). The predetermined volume of water is measured with a clean (decontaminated) graduated cylinder. Field spikes will be prepared following the collection,

labeling, and sealing of nonspiked samples in a separate cooler. The spike is kept at a safe distance from the sampling point (e.g., in the hotel room).

2.2 The work plan must be referred to for details regarding the type of QC samples to be collected and the QC sample collection method.

3.0 PROCEDURE

3.1 Implement QC sampling as outlined above, depending on the type of QC sample(s) specified in the work plan.

3.2 Ensure unbiased handling and analysis of duplicate and blank QC samples by concealing their identity by means of coding so that the analytical laboratory cannot determine which samples are included for QC purposes. Attempt to use a code that will not cause confusion if additional samples are collected or additional monitoring wells are installed. For example, if there are three existing monitoring wells (MW-1, 2 and 3), do not label the QC blank MW-4. If an additional monitoring well were installed, confusion could result.

3.3 Label matrix spike and field fortification (spike) QC samples so that the analytical laboratory knows which samples are to be spiked in the laboratory and which samples were fortified (spiked) in the field, respectively. In certain situations, the field fortification will be "blind" or undisclosed to the laboratory to independently verify their analytical ability.

3.4 Verify that each sample is placed in an individual laboratory-provided plastic bag and placed in its appropriate container (holder) in the cooler, and that the cooler has sufficient ice to preserve the samples for transportation to the analytical laboratory. Consult the site work plan to determine if a particular ice is specified as the preservative for transportation (e.g., during PFAS investigations).

3.5 Document the QC samples on the appropriate field form and in the field notebook. On the chain-of-custody form, duplicate and blank QC samples will be labeled using the codes (Number 3.2, above), and matrix spike and field fortification QC samples will be identified as such (Number 3.3, above).

3.6 Follow standard shipping procedures for samples (i.e., retain one copy of the chain-of-custody form, secure the cooler with sufficient packing tape and a custody seal, forward the samples via overnight [express] mail or hand deliver to the designated analytical laboratory preferably within 24 hours but no later than 48 hours after sampling). However, check the site work plan for information on the analyte(s), as some have to be analyzed immediately (e.g., CN).

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide procedures and standards for record keeping and maintenance for field activities conducted by Roux Associates, Inc. (Roux Associates).[1]

Strict quality assurance/quality control (QA/QC) is necessary to properly and accurately document and preserve all project-related information. Quality assurance is implemented to corroborate that quality control procedures are followed. Quality control provides a means to monitor investigation activities (e.g., sampling and laboratory performance) as a check on the quality of the data.

Valid data and information are integral to all aspects of Roux Associates' field activities. These aspects include, but are not necessarily limited to, activities that involve: drilling; sediment, sludge, and soil sampling (lithologic, and soil-quality and analysis); well construction and development; aquifer testing and analysis; water-quality sampling and analysis (surface water and ground water); free-product sampling and analysis; air-quality sampling and analysis; geophysical testing; demolition activities; waste removal operations; engineering installations; etc. The data will be confirmed by QA/QC methods established and set forth in the work plan/scope of work. Without checks on the field and analytical procedures, the potential exists for contradictory results and associated incomplete or incorrect results from the interpretation of potentially questionable data.

Information must be recorded while onsite because it may be difficult to recall details at a later date. Furthermore, information must be documented immediately as it provides unbiased information which will be used for writing the report when the field activities are completed. Project-related documentation is an irreplaceable, important record for other individuals who may become involved in the project, and provides the project manager with a complete history of project-related activities. Written information must be accompanied by maps, sketches, and photographs where appropriate, especially if these supplemental sources of information assist in the documentation process. A new page must be used in the field notebook for each new day's entries (i.e., unused portions of a previous page must have an "X" placed through it). The end of the day's records must be initialed and dated.

2.0 MATERIALS

In order to track investigation activities, specific materials are required. These materials include the following:

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

a. A field notebook (For PFAS investigations, waterproof paper may not be used).

b. Appropriate Roux Associates' forms (e.g., daily log, geologic log, monitoring well construction log, well sampling data form, location sketch, chain of custody, telephone conversation record, meeting notes, etc.).

c. Appropriate labels (e.g., sample, Roux Associates' Custody Seal, etc.)

d. Work plan/scope of work.

e. Health and safety plan (HASP).

f. Appropriate Roux Associates' SOPs.

g. Black pens.

h. Camera.

3.0 DOCUMENTATION

3.1 Before the Roux Associates personnel leave the field, they must ensure that their field notes include comprehensive descriptions of the hydrogeologic conditions, and all investigation-related activities and results (onsite and offsite). This will safeguard against the inability to reconstruct and comprehend all aspects of the field investigation after its completion, and will serve to facilitate the writing of an accurate report. Properly documented information provides the QA/QC tracking (back-up) required for all Roux Associates' projects. General types of information that must be recorded (where pertinent to the investigation being conducted) include, but may not necessarily be limited to, the following:

a. List of Roux Associates personnel on site.

b. Name, date, and time of arrival on site by Roux Associates personnel, including temporary departures from, and returns to, the site during the work day.

c. Client and project number.

d. Name and location of study area.

e. Date and time of arrival on site by non-Roux Associates personnel (names and affiliation) and equipment (e.g., subcontractors and facility personnel, and drilling equipment, respectively, etc.), including temporary departures from, and returns to, the site during the work day, and departure at the end of the work day.

f. List of non-Roux Associates personnel on site.

g. Weather conditions at the beginning of the day as well as any changes in weather that occur during the working day.

h. Health and safety procedures including level of protection, monitoring of vital signs, frequency of air monitoring, and any change (i.e., downgrade or upgrade) in the level of protection for Roux Associates and other on-site personnel (e.g., subcontractors, facility personnel, etc.).

i. Health and safety procedures not in compliance with the HASP (for all on-site personnel).

j. Site reconnaissance information (e.g., topographic features, geologic features, surface-water bodies, seeps, areas of apparent contamination, facility/plant structures, etc.).

k. Air monitoring results (i.e., photoionization detector [PID], etc. measurements).

l. Task designation and work progress.

m. Work-related and site-related discussions with subcontractors, regulatory agency personnel, plant personnel, the general public, and Roux Associates personnel.

n. Delays, unusual situations, problems and accidents.

o. Field work not conducted in accordance with the work plan/scope of work, and rationale and justification for any change(s) in field procedures including discussions with personnel regarding the change(s) and who authorized the change(s).

p. QA/QC procedures not conducted in accordance with the QA/QC procedures established in the work plan/scope of work and rationale and justification for any change(s) in QA/QC procedures including discussions with personnel regarding the change(s) and who authorized the change(s).

q. Equipment and instrument problems.

r. Decontamination and calibration procedures.

s. Activities in and around the site and work area by any and all on-site personnel which may impact field activities.

t. Sketches, maps, and/or photographs (with dates and times) of the site, structures, equipment, etc. that would facilitate explanations of site conditions.

u. Contamination evidenced as a result of work-related activities (e.g., visible contaminants [sheen] in drilling fluids or on drilling equipment; sheen on,

or staining of, sediments; color of, or separate [nonaqueous] phase on, water from borehole or well; vapors or odors emanating from a borehole or well; etc.); make all observations as objectively as possible (e.g., grey-blue, oil-like sheen; black and orange, rust-like stain; fuel-like odor; etc.) and avoid using nontechnical terms (e.g., slimy, goopy, foul-smelling).

v. Date and time of final departure from the site of all personnel at the end of the work day.

3.2 In addition to the general types of information that must be recorded (as presented in Section 3.1), task-specific information must also be properly documented. Task-specific information which is required is provided in each respective task-oriented SOP, and the documentation procedures outlined in each SOP must be followed.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sample handling which will allow consistent and accurate results. Valid chemistry data are integral to investigations that characterize media-quality conditions. Thus, this SOP is designed to ensure that once samples are collected, they are preserved, packed and delivered in a manner which will maintain sample integrity to as great an extent as possible. The procedures outlined are applicable to most sampling events and any required modifications must be clearly described in the work plan.[1]

2.0 CONSIDERATIONS

PFAS are a large group of synthetic compounds that are widely used in industrial and commercial processes and consumer products. Studies indicate that continued exposure to low levels of PFAS may result in adverse health effects. Due to the prevalent nature of PFAS and the low laboratory detection limits (on the order of nanograms per liter [ng/L]; or ppt), the relative probability of false positives is high compared to traditional environmental constituents of concern. Therefore, careful planning, sampling, and shipping techniques must be utilized to ensure the integrity of the samples collected. Following the procedures in this SOP will help ensure the collection of a valid sample.

Sample containers, sampling equipment decontamination, quality assurance/quality control (QA/QC), sample preservation, and sample handling are all components of this SOP.

2.1 Sample Containers

Prior to collection of a sample, considerations must be given to the type of container that will be used to store and transport the sample. The type and number of containers selected is usually based on factors such as sample matrix, potential contaminants to be encountered, analytical methods requested, and the laboratory's internal quality assurance requirements. In most cases, the overriding considerations will be the analytical methodology, or the state or federal regulatory requirements because these regulations generally encompass the other factors. The sample container selected is usually based on some combination of the following criteria:

a. Allowable materials include high-density polyethylene (HDPE), polypropylene, silicone, stainless steel, nylon, PVC, acetate, and cotton. Note: Do NOT use any equipment (specifically bailers or other water sampling equipment or thread joints) that contains known fluoropolymers including:

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

- Polytetrafluoroethylene (PTFE) – Teflon®, Hostaflon®
- Polyvinylidene fluoride (PVDF) – Kynar®
- Polychlorotrifluoroethylene (PCTFE) – Neoflon®
- Ethylene-tetrafluoro-ethylene (ETFE) – Tefzel®
- Fluorinated ethylene propylene (FEP) – Teflon® FEP, Hostaflon® FEP, Neoflon®
- Low density polyethylene (LDPE)

b. Sample bottles/jars. All sample containers should come from the laboratory. Be sure to request enough sample containers for all primary samples and quality control samples (field duplicates, field reagent blanks, equipment blanks). Sample containers for PFAS analysis are the following:

- Soil: 8 oz. HDPE/polypropylene jar;
- Water: 250 mL HDPE/polypropylene bottle; and,
- Drinking water: 250 mL HDPE/polypropylene bottles preserved with Trizma®

c. Laboratory-provided sample labels. Bottles should be labeled prior to sample collection.

d. Sealable bags. Only ultra-clean polypropylene or HDPE material sealable bags are allowed. These should be requested from the laboratory when the bottle order is made.

e. Coolers/Ice Chests. Ensure that the interior of the coolers/ice chests are clean.

f. Wet ice.

Note: Chemical ice, blue ice, or dry ice should NOT be used.

g. Tape for sealing the cooler for shipment. Uline® Strapping Tape is recommended.

h. Sample Bottle Storage and Transport

No matter where the sample bottles are, whether at the laboratory waiting to be packed for shipment or in the field waiting to be filled with sample, care must be taken to avoid contamination. Sample shuttles or coolers, and sample bottles must be stored and transported in clean environments. Sample bottles and clean sampling equipment must never be stored near solvents, gasoline, or other equipment that is a potential source of cross contamination. When under chain of custody, sample bottles must be secured in locked vehicles, and custody sealed in shuttles or in the presence of authorized personnel. Information which documents that proper storage and transport procedures have been followed must be included in the field notebook and on appropriate field forms.

2.2 Decontamination of Sampling Equipment

Proper decontamination of all re-usable sampling equipment is critical for all sampling episodes. The SOP for Decontamination of Field Equipment and SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for decontamination of various types of equipment.

2.3 Quality Assurance/Quality Control Samples

QA/QC samples are intended to provide control over the proper collection and tracking of environmental measurements, and subsequent review, interpretation and validation of generated analytical data. The SOPs for Collection of Quality Control Samples, for Evaluation and Validation of Data, and for Field Record Keeping and Quality Assurance/Quality Control must be referred to for detailed guidance regarding these respective procedures. SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for QA/QC procedures.

2.4 Sample Preservation Requirements

Certain analytical methodologies for specific analytes require chemical additives in order to stabilize and maintain sample integrity. Generally, this is accomplished under the following two scenarios:

a. Sample bottles are preserved at the laboratory prior to shipment into the field.

b. Preservatives are added in the field immediately after the samples are collected.

Many laboratories provide pre-preserved bottles as a matter of convenience and to help ensure that samples will be preserved immediately upon collection. A problem associated with this method arises if not enough sample could be collected, resulting in too much preservative in the sample. More commonly encountered problems with this method include the possibility of insufficient preservative provided to achieve the desired pH level or the need for additional preservation due to chemical reactions caused by the addition of sample liquids to pre-preserved bottles. The use of pre-preserved bottles is acceptable; however, field sampling teams must always be prepared to add additional preservatives to samples if the aforementioned situations occur. Furthermore, care must be exercised not to overfill sample bottles containing preservatives to prevent the sample and preservative from spilling and therefore diluting the preservative (i.e., not having enough preservative for the volume of sample).

When samples are preserved after collection, special care must be taken. The transportation and handling of concentrated acids in the field requires additional preparation and adherence to appropriate preservation procedures. All preservation acids used in the field should be trace-metal or higher-grade.

2.5 Sample Handling

After the proper sample bottles have been received under chain-of-custody, properly decontaminated equipment has been used to collect the sample, and appropriate preservatives have been added to maintain sample integrity, the final step for the field personnel is checking the sample bottles prior to proper packing and delivery of the samples to the laboratory.

All samples should be organized and the labels checked for accuracy. The caps should be checked for tightness and any 40-ml volatile organic compound (VOC) bottles must be checked for bubbles. Each sample bottle must be placed in an individual "zip-lock" bag to protect the label, and placed on ice. The bottles must be carefully packed to prevent breakage during transport. When several bottles have been collected for an individual sample, they should not be placed adjacent to each other in the cooler to prevent possible breakage of all bottles for a given sample. If there are any samples which are known or suspected to be highly contaminated, these should be placed in an individual cooler under separate chain-of-custody to prevent possible cross contamination. Sufficient ice (wet or blue packs) should be placed in the cooler to maintain the temperature at 4 degrees Celsius (°C) until delivery at the laboratory. Consult the work plan to determine if a particular ice is specified as the preservation for transportation (e.g., the United States Environmental Protection Agency does not like the use of blue packs because they claim that the samples will not hold at 4°C). If additional coolers are required, then they should be purchased. The chain-of-custody form should be properly completed, placed in a "zip-lock" bag, and placed in the cooler. One copy must be maintained for the project files. The cooler should be sealed with packing tape and a custody seal. The custody seal number should be noted in the field book. Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time. If overnight mail is utilized, then the shipping bill must be maintained for the files and the laboratory must be called the following day to confirm receipt.

3.0 EQUIPMENT AND MATERIALS

3.1 General Field Supplies, Clothing, and Personal Protective Equipment

a. Safety first. Obtain the appropriate Job Safety Analysis (JSA) and personal protection equipment (PPE), as specified in the site Health and Safety Plan (HASP).

b. A workplan which describes the sampling and analysis plan and a Quality Assurance Project Plan (QAPP) which outline sampling requirements including the site-specific data quality objectives (DQOs).

c. PPE and field clothing should be free of PFAS-containing materials. Nitrile gloves should be powderless. Allowable clothing materials include

well-laundered (not using fabric softeners or anti-static dryer sheets) synthetic or 100% cotton clothing.

d. Waterproof clothing made of/with polyurethane, polyvinyl chloride (PVC), wax-coating, rubber, or neoprene is acceptable, however **Gore-Tex® or Tyvek® material should be avoided**.

e. Steel/Safety-toed boots should not have waterproofing (Over-boots may be donned prior to sampling if PFAS-free boots are not available).

f. Use and application of cosmetics, moisturizers, sun blocks, insect repellants, fragrances, creams, or other personal care products (including hair products) should be avoided during the 24 hours prior to the sampling event. Below is a list of sunscreens and insect repellants that have been analyzed and found to be PFAS-free(SWRCB, 2019A) and may be used on the day that sampling is conducted:

Allowable Insect Repellants:

- OFF Deep Woods;
- Sawyer Permethrin;
- Jason Natural Quit Bugging Me;
- Repel Lemon Eucalyptus Insect repellant;
- Herbal Armor; and,
- California Baby Natural Bug Spray.

Allowable Sunscreens:

- 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; and,
- Neutrogena Pure & Free Baby Sunscreen Broad Spectrum SPF 60+.

If any non-approved sunscreens or insect repellants are used, an equipment blank sample must be collected to verify that it is PFAS-free.

g. Field notebook, field form(s), maps, chain-of-custody (COC) forms.

Note: Do NOT use waterproof paper/notebooks, adhesive paper products (e.g. Post-It Notes), or plastic clipboards.

h. Ballpoint pens. Fine or Ultra-Fine Sharpie® markers are acceptable to use while in the staging area but should not be used in the sampling area.

Note: Do NOT use regular/thick size Sharpie® markers.

i. **No food or beverage should be consumed in the sampling area**. Prepackaged food, fast food wrappers, and aluminum foil are likely to contain PFAS. All food and beverage consumption should be done outside of the sampling area. Hands must be washed thoroughly with Alconox® or Liquinox® soap and PFAS-free deionized water prior to beginning/returning to sampling activities.

3.2 Decontamination Equipment

a. Laboratory-supplied, PFAS-free deionized water is preferred for decontamination.

Note: Commercially available deionized water or municipal drinking water may be used for decontamination purposes if they are known to be PFAS-free.

b. Alconox®, Liquinox®, and Citranox® can be used for equipment decontamination.

Note: Do NOT use Decon 90®.

c. Polyethylene or PVC brushes should be used for removing particulates.

3.3 Miscellaneous equipment and materials including, but not necessarily limited to, the following:

a. Graduated pipettes.

b. Pipette bulbs.

c. Litmus paper.

d. Glass stirring rods.

e. Protective goggles.

f. Disposable gloves.

g. Lab apron.

h. First aid kit.

i. Portable eye wash station.

4.0 PROCEDURE

4.1 Sample Collection

a. Hands should be washed with Alconox® or Liquinox® soap and PFAS-free deionized water before sampling. Clean, powderless nitrile gloves must be donned before collecting samples, handling sample containers, and/or handling sampling equipment. A new pair of nitrile gloves should be used at each sampling location.

b. Prior to collecting samples, ensure that all sampling equipment has been thoroughly cleaned. Decontamination procedures should include triple rinsing with PFAS-free water.

c. Sample containers should be kept sealed and only opened during sample collection. The sampling container cap or lid should never be placed on the ground or on any other surface unless it is PFAS-free.

d. Sample containers should be labeled prior to sample collection with the appropriate information (client name/project site, sample ID, date, time, and sampler's initials).

e. For water/drinking water samples collected from a tap or pumped well, an effort should be made to avoid plumbing and joints containing Teflon® (although this cannot be avoided in all situations). It is recommended that wells be allowed to flow for a minimum of 15 minutes before sampling.

Additionally, sample taps should be flushed for a minimum of 5 minutes to ensure the impact of local sources of PFAS cross-contamination are minimized.

f. Place the sample in the laboratory-supplied, pre-cleaned sample container (HDPE or polypropylene). Avoid contact with the inside of the sample bottle and cap during sample collection. When collecting water/drinking water samples, reduce the flow to a slow stream to reduce air entrainment and overfilling the bottle.

g. Following sample collection, sample container should be placed in an individual sealed plastic bag (ultra-clean polypropylene or HDPE material provided by the laboratory) and then into the ice chest with ice surrounding the bottles.

h. Record the samples on the COC.

i. After sampling, remove nitrile gloves and place them in a sealable plastic bag. Wash hands with Alconox® or Liquinox® soap and rinse with PFAS-free deionized water.

4.2 Consult the project-specific workplan, QAPP, and/or SAP regarding the quantity and type of quality control samples to be collected for the sampling event.

a. Field Duplicate Samples: Field duplicate samples are used to evaluate field and laboratory precision. Field duplicates are replicate or split samples collected from the source at the same time and treated exactly the same as the primary field sample throughout the field and laboratory procedures.

b. Field Reagent Blank Samples: Field reagent blank samples are used to evaluate the potential of PFAS cross-contamination being introduced during the sampling process. A field reagent blank sample must be collected at each sampling location prior to the collection of the primary field sample and any duplicate samples to be collected. The field reagent blank sample is collected by opening the sample container, pouring the laboratory-provided reagent water into the sample container, and sealing the sample container. Field reagent blanks must be treated the same and stored and shipped in the same ice chest used for all other samples.

c. Equipment Blank Samples: Equipment blank samples are used to assess the adequacy of the decontamination process and evaluate potential contamination from the equipment used during sampling. Equipment blank samples are collected by pouring laboratory-provided, PFAS-free water over or through the decontaminated field sampling equipment and into a sample container.

d. Trip Blank Samples: Trip blank samples are not required for PFAS sampling.

4.3 Sample Shipping

a. Sample containers (placed inside individual sealed plastic bags) should be packed upright in the ice chest. Ensure that the bottles cannot move sideways at all. Any extra space around the containers should be packed with wet ice to 1/3 the depth of the ice chest (Do NOT use chemical ice, blue ice, or dry ice). Put additional ice inside double sealed plastic bags and place on top of the bottles.

b. Samples must arrive at the laboratory within 48 hours of sampling, and at a temperature between 10ºC (50ºF) and 0ºC (32ºF) but not frozen. If samples are received by the laboratory more than 48 hours after sampling, they must be between 6ºC (42.8ºF) and 0ºC (32ºF) but not frozen. Water samples and soil samples must be extracted within 14 days of sample collection.

c. Check that all samples within the ice chest are included on the COC form (each ice chest should include a COC). COC should be signed by the shipping carrier personnel prior to sealing the ice chest. Retain the signed sampler's/sender's copy of the COC. Place the COC in a sealed plastic bag inside the cooler.

d. Seal the ice chest firmly using PFAS-free shipping tape, wrapping it around the ice chest multiple times. Uline® Strapping Tape is recommended.

e. Samples should be shipped via overnight service to the laboratory. Provide shipping tracking information to the laboratory and communicate the potential delivery date/time of the samples.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for purging a well prior to the collection of a ground-water sample. Purging (evacuating) a well involves the removal of the standing column of water in the well to allow "fresh" (representative) formation water to enter the well. Two conventionally used methods for well purging include: 1) discharge of a specified number of casing volumes of water (which is more commonly used); and 2) pumping until specific indicator parameters (e.g., specific conductance, pH, temperature) stabilize. Wells must be purged prior to sampling to ensure the collection of representative formation ground water for water-quality analysis.[1]

2.0 EQUIPMENT AND MATERIALS

2.1 The following equipment may be needed to purge a monitoring well before sampling:

a. Bailers.

b. Centrifugal pumps.

c. Electrical submersible pumps.

d. Peristaltic pumps.

e. Positive gas-displacement devices.

f. Bladder pumps.

g. Hand-operated diaphragm or bilge pump(s).

h. Teflon™ tape, electrical tape (Teflon™ tape may not be used for PFAS investigations).

i. Water-level meter.

j. Appropriate discharge hose and valves.

k. Appropriate discharge tubing (e.g., polypropylene) if using a peristaltic pump.

l. Appropriate compressed gas if using bladder-type or gas-displacement device.

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

m. Extension cord(s) or portable generator (and fuel) if using an electric submersible pump.

n. Non-absorbent cord (e.g., polypropylene, etc.), cotton (absorbent) cord.

o. Tripod(s).

q. Flow meter.

2.2 Bailers or centrifugal pumps are recommended for shallow, small diameter monitoring wells. For deep wells, or large diameter wells, a submersible pump is recommended.

3.0 DECONTAMINATION

Each piece of equipment that is used to evacuate wells (e.g., bailers, pumps, hoses) will be decontaminated thoroughly prior to the introduction of the equipment into the well and prior to leaving the site. Additionally, disposable items (e.g., cord, tubing) will be changed between each well purged and discarded in an appropriate manner.

4.0 PROCEDURE

4.1 The depth to water (DTW) is measured and subtracted from the sounded (total) depth of the well to calculate the length of the column of standing water in the well (in feet).

4.2 The volume of the standing water in the well is calculated by multiplying the length of standing water by a coefficient which equates the diameter of the well to gallons per linear foot. (Refer to the attached table from the Water Well Handbook for the coefficient or use the following equation [V=(7.48 gal/ft3)(r2h), where V is volume of water in gallons, r is the radius of the well casing in feet, and h is the height of the water column in the well in feet].)

4.3 If purging is performed by evacuating a specified number of casing volumes, then three to five volumes are purged (typical regulatory agency requirement).

4.4 If wells are screened in low permeability formations, then the well may go dry prior to removing the specified volume of water. If the recovery rate is fairly rapid and time allows, then remove more than one casing volume; otherwise, the evacuation of one casing volume may suffice.

4.5 Evacuation will occur from the top of the water column in the well to ensure that “fresh” formation water enters the bottom of the well through the screen, moves up as standing water is removed from the top, and all standing water is removed (i.e., only representative formation water is in the well).

4.6 The volume of water purged from the well must be measured and can be calculated directly by discharging into containers of known volume or can be calculated by multiplying rate of flow by time.

4.7 If a submersible or centrifugal pump is used, then the intake is set just below the dynamic (pumping) water level in the well. The rate of flow in gallons per minute (gpm) can be measured using a calibrated bucket (e.g., 5-gallon) if the rate is relatively low, or a 55-gallon drum if the rate is relatively high, and a watch capable of measuring time in second intervals. A precalibrated flow meter may also be used if available.

4.8 After the specified number of casing volumes have been evacuated from the well, the pump intake is lifted slowly until it breaks suction to confirm that any standing water above the intake has been purged.

4.9 If a bailer is used, then the bailer is lowered only deep enough to remove water from the top of the water column and a 5-gallon bucket is used to measure the volume of water evacuated.

4.10 If purging is not executed by evacuating a specified number of well volumes, then purging is performed by pumping or bailing the well until specific indicator parameters (e.g., specific conductance, pH, temperature) stabilize. The volume of water removed is documented on an appropriate field form or in the field notebook.

4.11 Water purged from the well will be disposed of in accordance with the appropriate method outlined in the site workplan.

4.12 If historic site data indicate that explosive gases could be present and accumulate in the well, then an explosimeter will be used to check vapor concentrations in wells at the site prior to beginning the purging procedure. Vapor concentrations in a well that exceed the 25 percent lower explosive limit (LEL) will require specific precautionary measures to allow purging the well without danger of explosion or fire (e.g., use of cotton cord for bailers or lowering pumping devices, non-electric powered pumps). These conditions will be addressed in the site health and safety plan (HASP).

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sampling monitoring wells for dissolved constituents in groundwater using low flow (low stress) techniques. Low flow purging and sampling results in the collection of groundwater samples from monitoring wells that are representative of groundwater conditions in the geological formation by minimizing stress on the geological formation and minimizing the disturbance of sediment in the bottom of the well.[1]

As part of the SOP for the sampling of groundwater monitoring wells, sample collection equipment and devices must be considered, and equipment decontamination and pre-sampling procedures (e.g., measuring water levels, and purging wells) must be implemented. The sampling objectives will be provided in specific investigation work plans.

2.0 EQUIPMENT AND MATERIALS

2.1 In order to sample ground water from monitoring wells, specific equipment and materials are required. The equipment and materials list may include, but not necessarily be limited to, the following:

a. Safety first. Obtain the appropriate Job Safety Analysis (JSA) and personal protection equipment (PPE), as specified in the site Health and Safety Plan (HASP).

b. Adjustable rate, positive displacement groundwater sampling pump (e.g., low-flow centrifugal submersible pump or bladder pump constructed of stainless steel or other inert material).

c. High-density polyethylene (HDPE), polypropylene, nylon, silicone, or polyvinyl chloride (PVC) tubing with ¼-inch or 3/8-inch inner diameter will be used to collect samples for PFAS analysis. Tubing and sampling equipment that come in direct contact with the sample should not contain Teflon or other PFAS-containing materials. Sufficient tubing of the appropriate material must be available so that each well has dedicated tubing.

d. Appropriate power source (compressor or compressed gas tank, controller, generator, etc.).

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

e. Monitoring instrument for water quality indicator parameters (Horiba U-22 or equivalent) including temperature, dissolved oxygen, turbidity, specific conductance, pH and redox potential (Eh).

f. Flow measurement supplies (e.g., graduated cylinder and stop watch or inline flow meter).

g. Electronic interface probe with a minimum of 0.01 foot accuracy.

h. Decontamination supplies including Non-phosphate laboratory-grade detergent, distilled/deionized water and potable water.

i. Roux's low flow well sampling/purging data form.

j. Well construction data logs, field data from previous sampling event, and site map with well locations.

k. Well security keys.

l. Plastic sheeting.

m. Paper towels, clean rags.

n. Packing Tape, electrical tape. (Teflon tape should not be used for PFAS investigations.)

o. Calculator.

p. Black pen and water-proof marker (Fine-point Sharpie approved for PFAS investigations).

q. Tools (e.g., wrenches, screwdrivers, hammer, pliers, flashlight, etc.) or alternatives recommended in the JSAs.

r. Disposable powderless Nitrile gloves.

s. Laboratory-supplied PFAS-free sample containers with labels.

t. Cooler(s).

u. Ice (wet). Do not use blue ice for PFAS samples.

v. Chain-of-custody form(s) and custody seal(s).

w. Workplan and Quality Assurance Project Plan (QAPP) or equivalent summary.

x. Packing material (e.g., bubble wrap)

y. "Zip-lock" plastic bags.

z. Overnight (express) mail forms (or schedule courier pickup if available).

3.0 DECONTAMINATION

3.1 Make sure all equipment is decontaminated and cleaned before use (refer to the SOP for Decontamination of Field Equipment for detailed decontamination methods, a summary of pump decontamination procedures is provided below). Use new, clean materials when decontamination is not appropriate (e.g., tubing, disposable gloves). Document, and initial and date the decontamination procedures on the appropriate field form and in the field notebook.

A. Before sampling:

The manufacturer recommendations on pump disassembly for cleaning, if any, should take precedence to the disassembly recommendations presented below.

1) Wear disposable Nitrile and cut proof gloves.

2) Pre-rinse: Operate the pump first in an appropriate container with potable water for 5 minutes.

3) Wash: Operate the pump in an appropriate container with a nonphosphate, laboratory-grade detergent such as Alconox and potable water solution for 5 minutes.

4) Rinse: Operate the pump in an appropriate container for 5 minutes with laboratory-provided PFAS-free water.

5) Disassemble pump (refer to manufacturer's manual).

6) Wash pump parts: Place the disassembled parts of the pump into an appropriate container with non-phosphate detergent solution. Scrub the disassembled pump parts with an appropriate brush.

7) Rinse pump parts with laboratory-provided PFAS-free water.

B. After each sample collection, decontaminate by:

1) Wear disposable Nitrile gloves.

2) Pre-rinse: Operating the pump first with potable water for 5 minutes.

3) Wash: Operate the pump in an appropriate container with a nonphosphate, laboratory-grade detergent such as Alconox and potable water solution for 5 minutes.

4) Rinse: Operate the pump in an appropriate container for 5 minutes with laboratory-provided PFAS-free water.

5) Final Rinse: Operate the pump in an appropriate container to pump out 1 to 2 gallons of laboratory-provided PFAS-free water.

3.2 Note that the decontamination procedures for pumps are the minimum that must be performed. Check the work plan to determine if additional chemicals specified by individual state regulatory agencies also must be used for decontamination procedures (e.g., hexane, nitric acid, acetone, isopropanol, etc.).

4.0 CALIBRATION OF FIELD ANALYSIS EQUIPMENT

Calibrate field analysis equipment before use (e.g., thermometers, pH and conductivity meters, etc.) according to the Manufacturer's calibration instructions. Document, and initial and date the calibration procedures on the appropriate field form, in the field notebook, and in the calibration log book.

5.0 PROCEDURE

5.1 As practicable under field conditions, start at the well that is known or believed to have the least contaminated groundwater and proceed systematically to the well that is known or believed to have the most contaminated groundwater.

5.2 Document, initial and date well identification, pre-sampling information, and problems encountered on the appropriate field form and in the field notebook as needed.

5.3 Inspect the protective casing of the well and the well casing, and note any items of concern such as a missing lock, or bent or damaged casing(s).

5.4 When vapor concerns are present, measure the VOCs at the rim of the unopened well utilizing a photoionization detector (PID) or flame ionization detector (FID) instrument and record the reading in the field notebook.

5.5 Remove the well cap or plug and, if necessary, clean the top of the well off with a clean rag. If the well is not vented, allow several minutes for the water level in the well to equilibrate. Never inhale the vapors.

5.6 Measure the depth to water (DTW) to 0.01 ft from the measuring point (MP) on the well (top of well casing) using an electronic interface probe or water level meter. Calculate the water-level elevation. Document, initial and date the information on the appropriate field form and in the field notebook.

5.7 Decontaminate the interface probe or water level meter with a non-phosphate, laboratory-grade detergent solution followed by a PFAS-free water rinse.

5.8 Install Pump: Slowly lower the pump, safety cable, tubing and electrical lines into the well at midpoint of the water column or at the most permeable zone within the saturated well screen. The pump intake is to be kept at least two feet above the bottom of the well to prevent disturbance and re-suspension of any sediment in the bottom of the well.

5.9 Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the electronic interface probe in the well.

5.10 Purge well: Start pumping the well at 200 to 500 milliliters per minute (mL/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should be, if needed, reduced to the minimum capabilities of the pump to ensure stabilization of the water level. The flow rate should, however, be sufficient to maintain pump suction and to avoid cascading or air bubble formation in the tubing. Record each adjustment made in the pump rate and the water level measured immediately after each adjustment.

5.11 Record the physical appearance of the water (i.e., color, turbidity, odor, etc.) on the appropriate field form and in the field notebook, as it is purged. Note any changes that occur during purging.

5.12 Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, redox potential, and dissolved oxygen) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

±0.1 for pH
±3% for specific conductance and temperature
±10 mV for redox potential (ORP)
±0.3 milligrams per liter for dissolved oxygen (DO)
±10% for turbidity
<u>And turbidity to be less than 50 NTU prior to sampling</u>

The pump must not be removed from the well between purging and sampling.

ADDRESSING POTENTIAL PROBLEMS

<u>Insufficient Yield</u>
If the formation cannot produce enough water to sustain purging, then the well should be pumped to "near-dry" conditions (i.e., leaving some water in the well).

Purging should be interrupted before the water level in the well drops below the top of the pump, as this may induce cascading of the sand pack. Pumping the well dry should be avoided to the extent possible in all cases. When preparing to conduct a sampling round, review drilling, well development and previous

sampling information (if available) to identify low-yielding wells in order to purge them first, and potentially allow time for the well to recover for sampling.

Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples. However, depending on the rate of recovery and the time needed to complete the sampling round, one of the following procedures may have to be implemented:

1) The well may have to be sampled over a period of more than one day.
2) The well may not yield enough water to collect a complete suite of samples and only select (most important) samples will be collected.
3) The well may not recover, which will preclude sampling.

Regardless of the option that must be followed, the sampling procedure must be fully documented in the field notes.

Failure to Stabilize Key Indicator Parameters

If one or more key indicator parameters fail to stabilize, one of four options should be considered:

1) Continue purging in an attempt to achieve stabilization.

2) Discontinue purging, do not collect samples, and document attempts to reach stabilization in the field notebook.

3) Discontinue purging, collect samples, and document attempts to reach stabilization in the field notebook.

4) Secure the well, purge and collect samples the next day.

Regardless of the option that is followed, the sampling procedure must be fully documented in the field notes.

5.13 Collect Samples: Collect samples at a flow rate between 100 and 250 mL/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft.

VOC samples must be collected first. If a bladder pump is used, best practice would have it to match one compression stroke to the fill one VOC sampling vial.

Remove each appropriate container's cap only when ready to fill each with the water sample and then replace and secure the cap immediately.

5.14 During sample collection, make sure that the pump discharge line or the bailer does not contact the sample container. Fill each appropriate, pre-labeled sample container by allowing the ground water to flow from the tubing gently down the inside of the container to prevent: 1) agitating or creating turbulence; 2) breaking the container; 3) entry of, or contact with, any other medium; and 4) spilling/splashing the sample and exposing the sampling team to contaminated

water. Immediately place the filled sample container in an ice-filled (wet ice) cooler for storage. It is recommended that wet ice be repackaged in zip-lock bags to help keep the cooler dry and the sample labels secure. Blue ice packs should not be used for PFAS investigations.

5.15 Consult the work plan if filtered sampled should also be collected for dissolved metals analysis. Samples for PFAS analysis should not be filtered.

5.16 Collect quality control (QC) samples as required in the work plan to monitor sampling and laboratory performance.

5.17 Note and record the "final" physical appearance of the water (after purging and sampling) on an appropriate field form and in the field notebook.

5.18 Remove pump and tubing.

5.19 Measure the total depth of the well from the MP with an interface probe. Document, initial and date the information on the appropriate field form and in the field notebook.

5.20 Wipe the well cap/j-plug with a clean rag, replace the well cap/j-plug and protective cover. Lock the protective cover.

5.21 Verify that each sample is placed in an individual "zip-lock" bag, placed in the cooler, and that the cooler has sufficient ice (wet ice) to preserve the samples for transportation to the analytical laboratory and prevent movement of samples within the cooler during transport/shipping.

5.22 Decontaminate field equipment following the SOP for Decontamination of Field Equipment. Wrap decontaminated equipment with a suitable material (e.g., clean plastic bag). Discard rags, gloves, etc. in a manner consistent with site conditions.

5.23 Complete all necessary field forms, field notebook entries, and the chain-of custody forms. Retain one copy of each chain-of-custody form. Secure the cooler with sufficient packing tape and a custody seal.

5.24 Samples will be delivered according to the QAPP schedule.

END OF PROCUDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sampling potable water systems.[1]

2.0 CONSIDERATIONS

Depending upon the data requirements, one or more sampling points may be needed for a given potable water system. The data requirements and sampling locations should be described in the work plan. It should be noted that the regulatory-required analytical methods for potable supply wells are different from waste-water methods.

After approval from the client and project manager, sampling personnel should contact the homeowner in advance of the planned sampling, unless an on-going sampling schedule has been established. Plumbing modifications must not be made without prior approval of the project manager and the homeowner. If influent quality is desired, then the sampling point must be prior to any treatment equipment or filters.

3.0 MATERIALS/EQUIPMENT

a. A work plan which outlines sampling requirements.

b. Field notes, field form(s), maps, chain-of-custody forms, custody seals.

c. Laboratory-supplied sample containers with labels.

d. Cooler with wet ice.

e. Disposable sampling gloves.

f. Zip-lock bags and packing material.

g. Black pens.

h. Masking and packing tape.

h. Overnight (express) mail forms.

4.0 DECONTAMINATION

Decontamination is typically not necessary, since samples are generally collected directly into laboratory-supplied sample containers. If, however, site conditions require that

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

samples be collected in containers and transferred to sample bottles, then all reusable collection equipment must be of proper construction material and thoroughly cleaned according to the decontamination SOP.

5.0 CALIBRATION

There are no anticipated calibration procedures for this SOP.

6.0 PROCEDURE

6.1 Estimate the volume of water to be purged from the system. The object is to purge all standing water in pipes, storage tanks, the well, etc., as appropriate, and collect a representative sample of ground water. Make sure the sample is collected before treatment or filtration and do not sample from existing garden hoses.

6.2 After the purge is complete, adjust the discharge rate to obtain a manageable, non-turbulent flow from the desired sampling port.

6.3 Collect the sample directly into the pre-cleaned, laboratory-supplied container. Do not actually touch the sample containers to the sampling port. Do not overfill and wash any preservatives that may be needed out of the container. Volatile organic containers must be filled to the top creating a convex surface with no air bubbles present. Ensure that no bubbles are present by turning the container upside down and tapping gently.

6.4 Label all bottles with client name, site location, sample identification, date and time collected, and sampler's initials.

6.5 After the samples have been collected, labeled, and described, they are placed in zip-lock bags and stored in a cooler at 4°C.

6.6 A chain-of-custody form is completed for all samples collected. One copy is retained and two are sent with the samples in a zip-lock bag to the laboratory. A custody seal is placed on the cooler prior to shipment.

6.7 Samples collected from Monday to Friday are delivered to the laboratory within 24 hours of collection. If Saturday delivery is unavailable, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if any analytes require delivery in a shorter period of time.

6.8 The field notes and appropriate forms should include, but not necessarily be limited to the following: client name, site location, sample location, sample identification, date and time collected, sampler's name, purge procedure and volume, method of sample collection, number and type of containers, and description of sample quality (e.g., odor, color, etc.), etc.

6.9 Discard any gloves, foil, plastic, etc. in an appropriate manner that is consistent with site conditions.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish guidelines for the collection of soil samples for laboratory analysis. This SOP is applicable to soil samples collected from split-spoon samplers during drilling, hand auger samples, grab samples from stockpiled soils, surface samples, test pit samples, etc.[1]

2.0 CONSIDERATIONS

Soil samples may be collected in either a random or biased manner. Random samples can be based on a grid system or statistical methodology. Biased samples can be collected in areas of visible impact or suspected source areas. Soil samples can be collected at the surface, shallow subsurface, or at depth. When samples are collected at depth the water content should be noted. Equipment selection will be determined by the depth of the sample to be collected. A thorough description of the sampling locations and proposed methods of sample collection should be included in the work plan.

Commonly, surface sampling refers to the collection of samples at a 0 to 6 inch depth interval. Collection of surface soil samples is most efficiently accomplished with the use of a stainless steel trowel or scoop. For samples at greater depths a decontaminated bucket auger or power auger may be needed to advance the hole to the point of sample collection. Another clean bucket auger should then be used to collect the sample. To collect samples at depths of greater than approximately six feet the use of a drill rig and split spoon samples may be necessary. In some situations, sample locations are accessed with the use of a backhoe.

3.0 MATERIALS/EQUIPMENT

a. A work plan which outlines soil sampling requirements.

b. Field notes, field form(s), maps, chain-of-custody forms, and custody seals.

c. Decontamination supplies (including: non-phosphate, laboratory grade detergent, buckets, brushes, potable water, distilled water, regulatory-required reagents, aluminum foil, plastic sheeting, etc.).

d. Sampling device (split-spoon sampler, stainless steel hand auger, stainless steel trowel, etc.).

e. Stainless steel spoons or spatulas.

f. Disposable sampling gloves.

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

g. Laboratory-supplied sample containers with labels.

h. Cooler wet ice.

i. Plastic sheeting.

j. Black pen.

k. Zip-lock bags and packing material.

l. Tape measure.

m. Paper towels or clean rags.

n. Masking and packing tape.

o. Overnight (express) mail forms.

4.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned according to the decontamination SOP. Where possible, thoroughly pre-cleaned and wrapped sampling equipment should be used and dedicated to individual sampling locations. Disposable items such as sampling gloves, aluminum foil, and plastic sheeting will be changed after each use and discarded in an appropriate manner.

5.0 PROCEDURE

5.1 Prior to collecting soil samples, ensure that all sampling equipment has been thoroughly cleaned according to the decontamination SOP. If samples are to be collected at depth, then the boring must be advanced with thoroughly cleaned equipment to the desired sampling horizon and a different thoroughly cleaned sampler must be used to collect the sample.

5.2 Using disposable gloves and a pre-cleaned, stainless steel spatula or spoon, extract the soil sample from the sampler, measure the recovery, and separate the wash from the true sample.

5.3 Place the sample in a laboratory-supplied, pre-cleaned sample container. This should be done as quickly as possible and this is especially important when sampling for volatile organic compounds (VOCs). Samples to be analyzed for VOCs must be collected prior to other constituents.

5.4 The sample container will be labeled with appropriate information such as, client name, site location, sample identification (location, depth, etc.), date and time of collection, and sampler’s initials.

5.5 Using the remaining portion of soil from the sampler, log the sample in detail and record sediment characteristics (color, odor, moisture, texture, density, consistency, organic content, layering, grain size, etc.).

5.6 If soil samples are to be composited in the field, then equal portions from selected locations will be placed on a clean plastic sheet or in a stainless steel bowl and homogenized. Alternately, several samples may be submitted to the laboratory for compositing by weight. Specific compositing procedures shall be described in the work plan. Samples to be analyzed for VOCs typically will not be composited.

5.7 After the sample has been collected, labeled, and logged in detail, it is placed in a zip-lock bag and stored in a cooler at 4°C.

5.8 A chain-of-custody form is completed for all samples collected. One copy is retained and two are sent with the samples in a zip-lock bag to the laboratory. A custody seal is placed on the cooler prior to shipment.

5.9 Samples collected from Monday to Friday are to be delivered to the laboratory within 24 hours of collection. If Saturday delivery is unavailable, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if any analytes require a shorter delivery time.

5.10 The field notes and appropriate forms should include, but not be limited to the following: client name, site location, sample location, sample depth, sample identification, date and time collected, sampler's name, method of sample collection, number and type of containers, geologic description of material, description of decontamination procedures, etc. A site map should be prepared with exact measurements to each sample location in case follow-up sampling is necessary.

5.11 All reusable sampling equipment must be thoroughly cleaned in accordance with the decontamination SOP. Following the final decontamination (after all samples are collected) the sampling equipment is wrapped in aluminum foil. Discard any gloves, foil, plastic, etc. in an appropriate manner that is consistent with site conditions.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for decontamination of field equipment potentially exposed to contamination during drilling, and soil and water sampling. The objective of decontamination is to ensure that all drilling, and soil-sampling and water-sampling equipment is decontaminated (free of potential contaminants): 1) prior to being brought onsite to avoid the introduction of potential contaminants to the site; 2) between drilling and sampling events/activities onsite to eliminate the potential for cross-contamination between boreholes and/or wells; and 3) prior to the removal of equipment from the site to prevent the transportation of potentially contaminated equipment offsite.[1]

2.0 DECONTAMINATION EQUIPMENT

a. Laboratory-supplied, PFAS-free deionized water is preferred for decontamination.

> Note: Commercially available deionized water or municipal drinking water may be used for decontamination purposes if they are known to be PFAS free.

b. Alconox®, Liquinox®, and Citranox® can be used for equipment decontamination.

> **Note: Do NOT use Decon 90®.**

c. Polyethylene or PVC brushes should be used for removing particulates.

3.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

3.1 The rig and all associated equipment should be properly decontaminated by the contractor before arriving at the test site.

3.2 The augers, drilling casings, rods, samplers, tools, rig, and any piece of equipment that can come in contact (directly or indirectly) with the soil, will be steam cleaned onsite prior to set up for drilling to ensure proper decontamination.

3.3 The same steam cleaning procedures will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the study.

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3.4 All on-site steam cleaning (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Associates, Inc.

3.5 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

3.6 Containment of decontamination fluids may be necessary (e.g., rinseate from steam cleaning) or will be required (e.g., hexane), and disposal must be in accordance with state and/or federal procedures.

4.0 PROCEDURE FOR SOIL-SAMPLING EQUIPMENT

The following is a minimum decontamination procedure for soil-sampling equipment (e.g., split spoons, stainless-steel spatulas). Soil-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

4.1 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

4.2 Clean the sampler and rinse with PFAS-free water.

4.3 Prepare an Alconox®, Liquinox®, and Citranox® detergent solution and PFAS-free water in a clean bucket.

4.4 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

4.5 Scrub all equipment in the bucket with a brush to remove any adhering particles.

4.6 Rinse all equipment with PFAS-free water.

4.7 Reassemble the cleaned sampler, as necessary.

4.8 Transfer the sampler to the driller (or helper) making sure that this individual is also wearing clean gloves, or wrap the equipment with a suitable material (e.g., PFAS-free plastic bag).

As part of the decontamination procedure for soil-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

5.0 PROCEDURE FOR WATER-SAMPLING EQUIPMENT

The following is a decontamination procedure for water-sampling equipment (e.g., bailers, pumps). Water-sampling equipment decontamination procedures, especially any

variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

5.1 Decontamination procedures for bailers follow:

a. Wear disposable gloves while cleaning bailer to avoid cross-contamination and change gloves as needed.

b. Prepare an Alconox®, Liquinox®, and Citranox® detergent solution and PFAS-free water in a clean bucket.

c. Disassemble bailer (if applicable) and discard cord in an appropriate manner, and scrub each part of the bailer with a brush and solution.

d. Rinse with PFAS-free water and reassemble bailer.

e. Air dry.

f. Wrap equipment with a suitable material (e.g., PFAS-free plastic bag).

g. Rinse bailer at least three times with PFAS-free water before use.

5.2 Decontamination procedures for pumps follow:

a. Wear disposable gloves while cleaning pump to avoid cross-contamination and change gloves as needed.

b. Prepare an Alconox®, Liquinox®, and Citranox® detergent solution and PFAS-free water in a clean bucket, clean garbage can, or clean 55-gallon drum.

c. Flush the pump and discharge hose (if not disposable) with the detergent solution, and discard disposable tubing and/or cord in an appropriate manner.

d. Flush the pump and discharge hose (if not disposable) with potable water.

e. Place the pump on clear plastic sheeting.

f. Wipe any pump-related equipment (e.g., electrical lines, cables, discharge hose) that entered the well with a clean cloth and detergent solution, and rinse or wipe with a clean cloth and potable water.

g. Air dry.

h. Wrap equipment with a suitable material (e.g., PFAS-free plastic bag).

As part of the decontamination procedure for water-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of

decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to describe the considerations and procedures, and to establish the guidelines for coring (drilling) and formation sampling activities in consolidated (bedrock) formations. Corehole abandonment (closure) procedures will also be addressed in this SOP.[1]

The objective of coring is to collect accurate subsurface information; consequently, the core is the all important product and the most essential piece of information that can be recovered. Thus, procedures for rock coring and formation sampling will be presented in the work plan/scope of work.

Data can be obtained through the physical examination and testing of the core, as well as knowledge regarding bedrock unit elevations, water levels, and the presence of voids (e.g., the rock classification, whether the formation is shattered [fractures, joints, faults, and/or cavities] or sound [competent], the permeability, other physical properties, and chemical and metallurgical composition). In order to realize these objectives, it is important to achieve the maximum core recovery and to minimize the effects of the drilling process upon core recovery. Thus, drill fluid mix, speed of rotation, down pressure on the core barrel, pressure on the drill fluid, and length of an individual core run must be closely monitored by the on-site hydrogeologist/geologist.

2.0 DRILLING TECHNIQUE

Verify that the drilling technique is the one specified in the investigation work plan, and that the drilling equipment mobilized by the driller is in good condition and proper working order. Do not permit the driller to use a drilling rig that appears to be substandard, in disrepair, etc., and/or is questionable as to whether or not the rig and/or technique have the capabilities to accomplish the goals of the drilling program. These goals will include some, if not all, of the following:

a. Penetration of all anticipated subsurface consolidated formations at an appropriate rate is essential to maintain the integrity of the corehole, and allow the construction of a corehole of the desired diameter for an anticipated well, if applicable.

b. Collection of accurate, characteristic cores of the consolidated formation(s).

c. Identification of the lithology for the development of a detailed geologic log of all consolidated formations penetrated.

d. Collection of samples of aquifer fluids during the drilling process (and prior to well construction, if applicable), while at the same time minimizing potential for

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cross-contamination. The method used should prevent cross-contamination within and between geologic units.

e. Completion of the corehole into a monitoring well, if applicable, during the initial construction process.

f. Implementation of borehole geophysical logging (when applicable and possible) to enable more accurate vertical and horizontal extrapolation of corehole data to the lithology of the hydrogeologic system.

g. Completion of a monitoring well, if applicable, in the corehole following a time lapse for interpretation of geologic or geophysical data from the corehole.

3.0 DECONTAMINATION

Drilling equipment decontamination procedures are outlined in the field equipment decontamination SOP. Proper decontamination in accordance with regulatory guidelines must be clearly documented in the field notebook.

4.0 PROCEDURE

4.1. Document all coring-related activities (e.g., starting, stopping, footage, problems, decontamination, etc.) on the daily log form and in the field notes. Record dates and times of activities, and names of Roux Associates personnel providing oversight.

4.2. Begin coring activities when consolidated materials are evidenced at land surface or when the soil boring is terminated due to bedrock refusal. Ensure that a sewer line, underground tank, building footer, etc. is not the cause of auger refusal.

4.3. Ensure that core borings are made through appropriate size casing (e.g., 4-inch diameter) which has been driven, seated, and grouted into the top of the consolidated formation to prevent seepage into the borehole from the overburden, and that the core barrel is in efficient operating condition.

4.4. Monitor and record drill fluid mix, speed of rotation, down pressure on the core barrel, pressure on the drill fluid, and length of an individual core run during drilling.

4.5. Pay particular attention to the advancement of the boring in order that the top of the weathered portion of the consolidated formation (rock) and the top of the competent portion of rock are carefully indicated in the log.

4.6. Confirm that the drill rods and core barrel are straight, or discontinue drilling.

4.7. Maintain a continuous dialogue with the driller to track and keep informed of all drilling/coring activities (e.g., the speed of the drill and drilling pressure, amount and pressure of water, length of core run) to secure maximum core recovery.

4.8. Pay attention that blockage of the core barrel is not occurring. If blockage occurs, then the barrel must be removed from the boring, the core removed, and the coring stopped until care has been taken to assure that the core barrel and bit are in satisfactory operating condition.

4.9. Ream the boring with flush joint casing to a point below broken or open formation (rock) if soft or broken formations are encountered that cause pieces of rock to fall into the boring and result in unsatisfactory coring, or if voids are encountered that restrict the continued downward progress of the boring.

4.10. Remove the rock core from the core barrel immediately upon recovery and place it in the core box. Core removal and placement should be done with extreme care. Make sure that the driller-supplied core boxes are well constructed wooden boxes with longitudinal spacers the length of the box to provide separate rows for the cores.

4.11. Place spacer blocks between each core run to separate runs. Additionally, if portions of the core run have not been recovered, then a partition must be placed and permanently secured immediately above the spacer block at the end of a core run showing the length of core lost.

4.12. Label core boxes with an indelible marker on each end and on the inside and outside of the lid. Labeling of the inside must include the project number and name, site location, boring number, initials, date, and depths from which the core was recovered. The exterior of the box must include the project number and name, site location, boring number, box sequence, and depths covered.

4.13. Record geologic information on the geologic log form and in the study notebook.

4.14. Place only one boring in a core box and do not transfer core samples between boxes (unless a problem develops, [e.g., box cracks or breaks, etc.]). If transferring is unavoidable, then exercise extreme caution in moving the core and verify that the new core box is labeled properly.

4.15. Photograph all core boxes as soon as possible, especially if the boxes are to be removed from the site. The photographs must clearly show the core and the information printed on the inside of the box.

4.16. Handle and ship core boxes carefully to minimize disturbance of the core.

5.0 COREHOLE ABANDONMENT OR CLOSURE

5.1 Upon the completion of the investigation, a determination will be made as whether to maintain the corehole (for a well, piezometer, etc.) or to close it (i.e., abandon and seal it). The abandonment of any corehole will be in accordance with local, state and/or Federal regulations.

5.2 For each abandoned corehole, the procedure will be documented on an appropriate field form or in the study notes. Documentation may include, where appropriate, the following:

a. Corehole designation.

b. Location with respect to the replacement corehole, if replaced (e.g., 30 feet north and 40 feet west of Corehole 1). A location sketch should be prepared.

c. Open depth prior to grouting and any other relevant circumstances (e.g., formation collapse).

d. Drill casing and/or coring equipment left in the borehole by depth, size, and composition.

e. A copy of the geologic log.

f. A revised log of the abandoned corehole using a supplemental geologic log form.

g. Additional items left in the hole by depth, description, and composition (e.g., lost tools, bailers, etc.).

h. A description and daily quantities of grout used to compensate for settlement.

i. The date of grouting.

j. The level of water prior to grouting and the date and time measured.

k. Any other state or local corehole abandonment reporting requirements.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures for constructing ground-water monitoring or observation wells in consolidated (bedrock) formations. Well development and abandonment (closure) procedures will also be addressed in this SOP. The well construction and, if necessary, abandonment will be detailed in the work plan or established based on field observations.[1]

Monitoring wells typically will be completed in bedrock formations for the purposes of measuring ground-water levels and collecting ground-water samples. Ground-water level data will be used to calculate ground-water elevations which may be used, if appropriate for the bedrock system, to describe head and flow relationships. Ground-water samples will also be used to quantify water-quality conditions.

2.0 PROCEDURE FOR WELL CONSTRUCTION

The installation of each bedrock well will begin after borehole completion and geophysical logging, if implemented. The original rock coring (corehole) may have to be enlarged (reamed) to accommodate appropriate-sized casing (and screen, if necessary).

2.1 The well will be constructed with the appropriate type and diameter steel casing (and/or steel or PVC casing and screen, if conditions necessitate this)

2.2 Fittings (couplings) will not restrict the inside well diameter, as steel casing will be welded and/or flush-joint threaded, and PVC joints will be internally threaded. Glues, solvents, or chemical cleaners will not be used in the construction of the wells. All casings, fittings, and screens will be new material. The well screens will be fabricated and have an inside diameter equal to the well casing. The lengths of casing and screen will be measured and recorded on an appropriate field form and in the field notebook by the field hydrogeologist prior to installation.

2.3 It is anticipated that wells in consolidated formations will be completed as open hole wells and therefore be installed as follow:

a. An appropriate size steel casing will be set a minimum of 5 feet into competent bedrock and pressure grouted through the inside of the casing using a cement and bentonite mixture. The grout will first fill the well

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

casing, and then fill the annular space from the bottom of the borehole up, to seal-off overlying formations.

b. After the grout solidifies, the casing will be drilled out (using a bit of equal diameter as the casing) and an open hole will be drilled below the steel casing to the appropriate depth in the bedrock.

c. If a discrete depth in the bedrock is to be tapped by the well (open to the formation), then overlying portions of the formation(s) will be cased off with a steel casing to permit well completion in the zone of interest.

d. If the bedrock cannot support an open hole (i.e., formation collapse) then a cased and screened well will be installed as described below (Section 2.4).

e. A locking steel protective casing or curb box will be set over the well and cemented in place, or welded to the steel casing to prevent water from ponding at the top of the well or directly entering the well, and safeguard the well from accidental damage or vandalism.

2.4 Bedrock wells in noncompetent or void-filled consolidated formations that are subject to collapse will be installed as follow:

a. An appropriate size steel casing will be set and grouted into competent bedrock and drilled-out (as described above in Sections 2.3 a, b and c).

b. The screen and casing will be lowered into the steel-cased borehole to the appropriate depth. Screen and casing materials may be either stainless steel or PVC. A bottom plug, well cap, and flush-joint sections will be used.

c. A gravel pack (quartz sand or pea gravel) will be emplaced around the screen from a few feet below the bottom of the screen to several feet (approximately 5) above the screen to avoid applying the weight of the casing on the screen (i.e., support the well until the grout solidifies) and to allow for potential settlement during subsequent development. The placement of the gravel pack may require the use of a tremie pipe.

d. An approximate 3-foot bentonite seal (powder or pellets) will be placed on top of the gravel pack.

e. The remaining annulus will be grouted to within a few feet of land surface. If PVC casing is used inside the steel outer casing, then extreme care must be taken in grouting the annular space in lifts (specified lengths) to avoid deformation of the PVC casing by the heat of curing and/or the weight of the grout.

f. A locking steel protective casing or curb box will be set over the well and cemented in place, or welded to the steel casing to prevent water from ponding at the top of the well or directly entering the well, and to safeguard the well from accidental damage or vandalism.

2.5 Each well will be properly identified with the appropriate information (e.g., local well number, state permit number [if applicable], etc.). The top of the well casing will serve as the measuring point (MP) for ground-water level measurements. The MP will be surveyed to the nearest 0.01 foot relative to a common datum (e.g., mean sea level) by trained Roux Associates, Inc. personnel or a professional, state-licensed surveyor, as defined in the work plan.

2.6 If required, well clusters will be constructed. A well cluster is defined as a group of two or more wells, located adjacent to or very near each other, which penetrate different depths of the aquifer or formation. Each well is open to, or screened at, a different depth to obtain data defining the vertical distribution of water levels and water quality in the aquifer or formation. In the event that a well cluster is drilled, one large-diameter (e.g., 8-inch, 10-inch, etc.) borehole may be drilled and each well in the cluster may be individually cased within that one borehole; however, the preferred method is to drill individual boreholes for each well in the cluster.

2.7 Each well will have a location sketch, a well construction log, and a geologic log showing the casing placement and materials used to fill the annular space between the well casing and borehole. The appropriate log will show the depths of each casing material and discuss the geologic variability at the site. A description of the surface soils, if present, and the unsaturated zone materials down to and including the ground water is required.

The following information, if applicable, will be included on the well log:

a. Project number.

b. Date and initials of scientist documenting the well information.

c. Date and time of construction.

d. Well location.

e. Well and permit number.

f. Borehole diameter.

g. Well depth.

h. Casing material.

i. Screen material.

j. Screen slot size and length.

k. Gravel pack type and size (depths from _____ to _____).

l. Bentonite pellets (depths from _____ to _____).

m. Bentonite grout (depths from _____ to _____).

n. Cement grout (depths from _____ to _____).

o. Ground-surface elevation.

p. Measuring point elevation.

q. Well height above or depth below land surface.

r. Depth ground water encountered.

3.0 DESCRIPTION OF WELL DEVELOPMENT

3.1 Before a newly constructed well can be used for water-quality sampling, measuring water levels, or aquifer testing, it must be developed. Well development refers to the procedure used to clear the well and formation around the screen of fine-grained materials (sands, silts, and clays) produced during drilling or naturally occurring in the formation. Well development continues until the well responds to water-level changes in the formation (i.e, a good hydraulic connection is established between the well and formation) and the well produces clear, sediment-free water to the extent practical.

3.2 Depending on the drilling technique used, composition of the formation screened, and well diameter and construction materials, well development may include one or more of the following techniques.

a. Bailing.

b. Pumping (centrifugal, submersible, or air).

c. Backwashing.

d. Surging (mechanical).

e. Jetting.

f. A combination of the above.

3.3 Well development procedures will be recorded on the well construction log form and will also be documented in the field notes.

3.4 Dispersing agents, acids, disinfectants, or other additives will not be used during development nor will they be introduced into the well at any other time unless specifically stipulated in the work plan. During development, water will be removed from the entire column of water standing in the well by periodically lowering and raising the pump intake. Well development will include the rinsing of the interior well casing above the water column in the well using only water from that well.

4.0 WELL ABANDONMENT OR CLOSURE

4.1 Upon the completion of the investigation, a determination will be made as whether to maintain the well or to close it (i.e., abandon and seal it). Upon state approval to seal the well, appropriate state well abandonment forms will be completed, as applicable. Following state approval, the abandonment of any well will be in accordance with local, state and/or Federal regulations.

4.2 For each abandoned well, the procedure will be documented on an appropriate field form and in the field notebook. Documentation may include, where appropriate, the following:

a. Well designation.

b. Location with respect to the replacement well, if replaced (e.g., 30 feet north and 40 feet west of Well MW-1). A location sketch should be prepared.

c. Open depth prior to grouting and any other relevant circumstances (e.g., formation collapse).

d. Well casing left in the borehole by depth, size, and composition.

e. A copy of the geologic log.

f. A revised diagram of the abandoned well using the well construction log form.

g. Additional items left in hole by depth, description, and composition (e.g., lost tools, bailers, etc.).

h. A description and daily quantities of grout used to compensate for settlement.

i. The date of grouting.

j. The level of water prior to grouting and the date and time measured.

k. The remaining casing, size, and composition above or below ground surface reported in depths or heights from ground surface.

l. Any other state or local well abandonment reporting requirements.

END OF PROCEDURE

Date: Revised November 2025

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures, and to establish the guidelines for drilling (soil borings, wells, or piezometers) and formation sampling activities in unconsolidated formations. There are several drilling techniques available which include direct push, hollow-stem auger, cable tool, hydraulic rotary, cased-hole rotary, air rotary, and sonic. Formation (sediment/soil) sample collection include disturbed (drill cuttings), intact (split-spoon), and undisturbed (Shelby-tube or Denison-core). Borehole abandonment (closure) procedures will also be addressed in this SOP.[1]

The objective of drilling is to collect accurate subsurface information and to prepare a borehole for potential completion as a well or piezometer. Consequently, the lithologic data is the all important, most essential information that can be collected. The lithologic data characterizes subsurface conditions, describes hydrogeologic coefficients qualitatively and/or quantitatively, and identifies optimum locations for screen zones if wells are constructed.

Data can be obtained through the physical examination and testing of formation samples, as well as knowledge regarding ground-water levels. Thus, drill fluid mix, fluid loss, rate of drilling, lengths of split-spoon and Shelby-tube/Denison-core recovery, etc. must be monitored by the on-site hydrogeologist or geologist.

2.0 DRILLING TECHNIQUE-SELECTION

Verify that the drilling technique is the one specified in the investigation work plan, and that the drilling equipment mobilized by the driller is in good condition and proper working order. Do not permit the driller to use a drilling rig that appears to be substandard, in disrepair, etc., and/or is questionable as to whether or not the rig has the capabilities to accomplish the goals of the drilling program. The drilling rig must be capable of:

a. Penetration of all anticipated subsurface materials and formations at a desired rate, and construction of a borehole of desired diameter (for the anticipated well, if applicable, including the placement of a gravel or sand pack through a tremie pipe and necessary formation sealing material such as bentonite or cement).

[1] This SOP shall be modified, as applicable, to conform to the procedures outlined in the PFAS SOP. The PFAS SOP will take precedence, where necessary, to maintain sampling integrity. Any questions that may arise during field implementation should be raised to the field team leader for resolution with the project team.

b. Identification of lithology for development of a geologic log of all unconsolidated formations and materials penetrated, including physical characteristics and visual description of color, grain sizes, sorting and mineralogy.

c. Collection of samples of aquifer fluids during the drilling process and prior to well construction, while at the same time minimizing potential for cross-contamination. The method used should prevent cross-contamination between surface soils and ground water or between different hydrogeologic units.

d. Collection of intact and/or undisturbed soil samples from the center line of the borehole. This objective requires the drilling to be halted while soil samples are taken from the bottom of the incomplete borehole.

e. Completion of the borehole into a well (monitoring or observation) or piezometer during the initial construction process (i.e., constructing a well or piezometer as the borehole is drilled, or constructing a well or piezometer in the borehole immediately after the drilling tools are removed).

f. Implementation of borehole geophysical logging (when applicable and possible) to enable more accurate vertical and horizontal extrapolation of borehole data to the lithology of the hydrogeologic system.

g. Completion of a well or piezometer, if applicable, in the borehole following a time lapse for interpretation of geologic or geophysical data from the borehole.

3.0 DECONTAMINATION

Drilling equipment decontamination procedures are outlined in the field equipment decontamination SOP. Proper decontamination in accordance with regulatory guidelines must be clearly documented in the field notes.

4.0 PROCEDURE FOR DRILLING

4.1 Document all drilling-related activities (e.g., starting, stopping, footage, problems, decontamination, etc.) on the daily log form and in the field notes. Record dates and times of activities, and names of Roux Associates personnel providing oversight.

4.2 Monitor and record drill fluid mix, speed of rotation, pressure on the drill fluid, rate of drilling, and length of drill rods or casing in the borehole, as applicable.

4.3 Confirm that the drill rods, core barrel, or casings are straight, or discontinue drilling.

4.4 Pay particular attention to the advancement of the boring because differences in the rate of drilling may be indicative of differences in subsurface geologic conditions (e.g., sand and gravel versus clay).

4.5 Maintain a continuous dialogue with the driller to track and keep informed of all drilling activities (e.g., the speed of the drill and drilling pressure, difficult and easy drilling conditions, etc.).

4.6 Collect formation samples as described below in Section 5.0 as defined in the workplan. Sample jars must be labeled appropriately (e.g., project number and name, site location, boring number, date, sample interval, blow counts, and initials of Roux Associates personnel collecting sample).

4.7 Record geologic information in the geologic log form and in the field notes.

4.8 Handle and ship split-spoon sample jars carefully to avoid breakage and handle and ship tubes or cores carefully to prevent disturbance.

5.0 PROCEDURE FOR FORMATION SAMPLING

5.1 Intact formation sampling will be implemented using split-spoon samplers (which are driven), Shelby-tube samplers (which are pushed), or Denison-core samplers (which are rotated) depending on the drilling technique employed as may or may not be required by the workplan. Formation samples will be retained in suitable size (e.g., 1-pint or 0.5-pint) jars for physical descriptions and potential physical and chemical analysis. The appropriately labeled jars and tubes will be stored in a safe place to avoid breakage, agitation, and freezing. Intact formation samples will be collected as described in the work plan at specified intervals (e.g., at 5-foot increments below land surface) and at each major change in subsurface materials. Hydrogeologic information will be recorded on a geologic log form and in the field notebook. Detailed descriptions of the type(s) of intact sample(s) collected, sampling intervals and conditions, and objective(s) of the sample collection will be provided in the work plan.

5.2 Disturbed formation samples (drill cuttings) will be examined continuously throughout the entire depth of the borehole. If applicable to the study and/or stated in the work plan, borehole cuttings will be collected from the circulating auger flights which lift cuttings to land surface (hollow-stem auger technique), from the sand bailer (cable-tool technique), from the recirculating drilling fluid (mudflume) which transports cuttings to land surface (mud-rotary and related techniques), or from the compressed air used to carry cuttings to land surface (air-rotary and related techniques). If applicable, formation samples will be retained in appropriate size (e.g., 1-pint or 0.5-pint), properly labeled jars and stored in a safe place to avoid breakage, agitation, and freezing. Hydrogeologic data will be recorded on a geologic log form and in the field notes.

5.3 The soil cores from the wells drilled at the site are used for lithologic identification. The conditions for sampling will be specified in the work plan.

5.4 Before collecting and retaining soil and/or sediments collected with the split-spoon sampler, the top several inches will be removed from the sampler and discarded to eliminate any sediment that may have caved into the bottom of the borehole.

5.5 Sediment sampling equipment such as split-spoon samplers, spatulas, etc. (but not including Shelby-tube or Denison-core samplers, which area not re-usable) will be decontaminated in accordance with the decontamination SO)P..

7.0 BOREHOLE ABANDONMENT OR CLOSURE

7.1 Upon the completion of the investigation, a determination will be made as whether to maintain the borehole (for a well or piezometer) or to close it (i.e., abandon and seal it). Upon state approval to seal the borehole, appropriate state borehole abandonment forms will be completed, if required. Following state approval, the abandonment of any borehole (or boring) will be in accordance with local, state and/or Federal regulations.

7.2 For each abandoned borehole, the procedure will be documented on an appropriate field form or in the study notebook. Documentation may include, where appropriate, the following:

a. Borehole designation.

b. Location with respect to the replacement borehole, if replaced (e.g., 30 ft north and 40 ft west of Borehole B-1). A location sketch should be prepared.

c. Open depth prior to grouting and any other relevant circumstances (e.g., formation collapse).

d. Drill casing left in the borehole by depth, size, and composition.

e. A copy of the geologic log.

f. A revised diagram of the abandoned borehole using a supplemental geologic log form.

g. Additional items left in hole by depth, description, and composition (e.g., lost tools, bailers, etc.).

h. A description and daily quantities of grout used to compensate for settlement.

i. The date of grouting.

j. The level of water or mud prior to grouting and the date and time measured.

k. Any other state or local well abandonment reporting requirements.

END OF PROCEDURE

APPENDIX E

Quality Assurance Project Plan

Quality Assurance Project Plan

Benner Township PFAS Investigation Area
2535 Fox Hill Road
State College, Pennsylvania

Prepared: November 2025

Prepared for:

The Pennsylvania State University
200 Office of Physical Plant
Physical Plant Bldg.
108 Stewardship Drive
University Park, PA 16802

Prepared by:

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1. Introduction

On behalf of The Pennsylvania State University, Roux Associates, Inc. (“Roux”) has prepared this project-specific Quality Assurance Project Plan (“QAPP”) for the investigation of potential per- and poly-fluoroalkyl substances (“PFAS”) releases from the State College Regional Airport (“Airport”) within the Benner Township PFAS Investigation Area (“Department Investigation Area”), as defined in Exhibit A of the November 13, 2024 Consent Order and Agreement (“COA”).

The Department Investigation Area includes the Airport, located at 2535 Fox Hill Road, State College, Pennsylvania 16803, and certain surrounding residential, commercial, and agricultural areas as depicted in Exhibit A of the COA. Pursuant to the COA, potential releases of perfluorooctane sulfonic acid ("PFOS"), perfluorooctanoic acid ("PFOA"), perfluorobutane sulfonic acid ("PFBS"), perfluorononanoic acid ("PFNA") and perfluorohexane sulfonic acid ("PFHxS") at or from the Airport will be investigated and remediated under the Pennsylvania Land Recycling and Environmental Remediation Standards Act of 1995 (“Act 2”), associated regulations (PA Code Title 25 Chapter 250), the Act 2 Technical Guidance Manual (“TGM”), and the concurrently submitted Remedial Investigation Work Plan (“RIWP”).

This QAPP identifies the data collection activities and associated quality assurance/quality control (“QA/QC”) measures specific to the investigation being conducted by Roux in accordance with the RIWP. This QAPP presents the protocols that should be followed to ensure that environmental data collected are the correct type and quality required for the intended use. The background of the Department Investigation Area is further discussed in Section 3 of the RIWP.

2. Title and Approval Page

Document Title: Quality Assurance Project Plan, Benner Township PFAS Investigation Area, 2535 Fox Hill Road, State College, Pennsylvania, Remedial Investigation Work Plan

1. **Project Identifying Information**
   i. **Project Name**: Benner Township PFAS Investigation Area
   ii. **Project Location**: The State College Regional Airport, located at 2535 Fox Hill Road, State College, Pennsylvania 16803, and surrounding residential, commercial, and agricultural areas.
   iii. **Contract/Work Assignment Number**: 4470.0001J000
2. **Lead Organization**

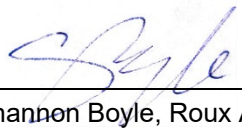
i. Project Managers

11/24/2025

Greg Martin, Roux Associates, Inc. — Date
Professional Geologist
Principal Hydrogeologist/Executive Vice President

11/24/2025

Peter Downham, Roux Associates, Inc. — Date
Professional Geologist
Principal Scientist/Vice President



11/24/2025

Shannon Boyle, Roux Associates, Inc. — Date
Project Scientist

ii. Quality Manager

11/21/2025

James Hauri, Roux Associates, Inc. — Date
Senior Scientist I

3. **Federal Regulatory Agency**: Not applicable
4. **State Regulatory Agency**: the Pennsylvania Department of Environmental Protection (“PADEP”)

3. Names and Contact Information of Project Personnel

3.1 Project Team Information

Title	Name	Company	Contact Information
Principal Director	Greg Martin	Roux Associates, Inc.	gmartin@rouxinc.com
Project Principal	Peter Downham	Roux Associates, Inc.	pdownham@rouxinc.com
Project Manager	Shannon Boyle	Roux Associates, Inc.	sboyle@rouxinc.com
Quality Assurance Coordinator	James Hauri	Roux Associates, Inc.	jhauri@rouxinc.com

3.2 Laboratory Information

Laboratory Name	Address and Certification	Contact Information	Matrices
Suburban Testing Labs	1037 MacArthur Rd, Reading, Pennsylvania. Cert #06-00208	John Weisman (610) 207-8154	Soil, Groundwater, Drinking water
Eurofins Lancaster Laboratories Environment Testing, LLC	2425 New Holland Pike, Lancaster, Pennsylvania. Cert #36-00037	Megan Moeller (717) 556-7261	Soil, Groundwater, Drinking water
Pace Analytical Services., LLC	8 Walkup Drive, Westborough, Massachusetts. Cert #MA935	Paul Simms (908) 968-3029	Soil, Groundwater, Drinking water

4. Data Quality Objectives and Criteria for Measurement Data

The data quality objective ("DQO") process is designed to clarify the objectives of data collection and maximize efficiency during data collection. It consists of a multi-step, iterative process that ensures that the type, quantity, and quality of environmental data used in the decision-making process are appropriate for its intended application. The following steps were completed at part of the DQO process in general accordance with the United States Environmental Protection Agency ("USEPA") Guidance on Systematic Planning Using the Data Quality Objectives Process (February 2006).

- Define the Problem;
- Identify the Goals/Decisions of the Study;
- Identify Information Inputs;
- Define the Study Boundaries;
- Develop the Analytical Approach;
- Specify Performance or Acceptance Criteria; and
- Develop the Plan for Obtaining Data.

The following sections summarize each step of the DQO process.

4.1 Define the Problem

Per the COA, the RIWP must include the following:

- Proposed work to characterize soil, groundwater, and surface water contamination caused by any release of PFOS, PFOA, PFBS, PFNA, and PFHxS at the Airport; and
- A schedule for implementation of the characterization activities specified in the RIWP.

4.2 Identify the Goals/Decisions of the Study

The goal of this investigation is to perform an iterative investigation to comply with the COA and complete the characterization of potential PFAS in soil, groundwater, and surface water within the Department Investigation Area.

4.3 Identify Information Inputs

To support the objectives discussed in the RIWP, the data listed below will be assessed and/or collected.

- Information related to current and historical conditions and operations within the Department Investigation Area, focused on the Airport and adjacent areas.
- A geophysical investigation of the subsurface near the Airport.
- PFAS analytical data for soil, groundwater, and drinking water samples.
- Geospatial referencing for geophysical transects, monitoring wells, and sampling locations.

- Field documentation of investigation activities.

4.4 Define the Study Boundaries

The horizontal boundaries for the remedial investigation ("RI") are initially focused within the Department Investigation Area, as defined in Exhibit A of the November 13, 2024 COA. As recognized in the COA, this area is expected to be refined based on the results of the RI.

4.5 Develop the Analytical Approach

In accordance with Table 8 of the RIWP, soil, groundwater, and drinking water samples will be analyzed as follows:

- Soil samples will be analyzed for PFOS, PFOA, PFNA, PFHxS, and PFBS via USEPA Method 1633 and will be compared to the following standards:
    - PADEP's Residential Direct Contact ("RDC") 0-15 feet below ground surface ("bgs") Medium Specific Concentrations ("MSCs");
    - PADEP's Non-Residential Direct Contact ("NRDC") 0-2 feet bgs and 2-15 feet bgs MSCs (referenced herein as "NRDC MSCs"); and
    - PADEP's Residential Used Aquifer ("RUA") Migration to Groundwater ("MGW") MSCs.
- Groundwater samples will be analyzed for PFOS, PFOA, PFNA, PFHxS, and PFBS via USEPA Method 1633 and will be compared to the following standard:
    - PADEP's RUA MSCs.
- Drinking water samples will be analyzed for the PFAS 18 List via USEPA Method 537.1 and will be compared to the following standard:
    - PADEP's Maximum Contaminant Levels ("MCLs").[1]

4.6 Specify Performance or Acceptance Criteria

Performance or Acceptance Criteria are addressed by the QA/QC aspects of the project, as well as by an assessment of potential decision error and uncertainty evaluations. QA/QC measures will be implemented through the course of the activities described in the RIWP as detailed herein. These measures will minimize variability, mitigate the potential for false positives and/or false negative error, and increase the accuracy and defensibility of collected data. These measures include, but are not limited to, the following:

- Ensuring that the project personnel have the proper qualifications and training;
- Establishing a process for management of project documents, data, and records;
- Requirements for testing, inspection, maintenance, and calibration of field and laboratory instrumentation;

[1] PADEP's MCLs are derived from USEPA's MCLs and are adopted by PADEP as the RUA MSCs.

- Collection and analysis of field QC samples;
- Analysis of laboratory QC samples; and
- Assessment and oversight.

4.6.1 Data Quality Indicators

The analytical results of sampling activities will be evaluated with respect to the following data quality indicators ("DQI"):

- **Precision**: Analytical data quality indicators for each method are consistent with the selected USEPA method.
- **Accuracy**: Analytical data quality indicators for each method are consistent with the selected USEPA method.
- **Representativeness**: Sampling plan; procedures and protocols for sample collection, preservation, and transportation; and sample analytical methods are designed to yield data that is appropriately representative of Investigation Area conditions for each media.
- **Completeness**: Project decisions will consider the amount of valid data available.
- **Sensitivity**: To the extent practical, appropriate methods will be selected to achieve laboratory reporting limits at or below the applicable and relevant numeric regulatory standards and/or criteria, including but not limited to the standards in **Section 4.1.5**.
- **Comparability**: Comparable methods of sampling and analysis will be used throughout the project.

Compliance with data quality indicators will be evaluated by the laboratory in accordance with the laboratory Standard Operating Procedures ("SOPs") and quality assurance procedures and any non-conformity identified shall be addressed in the lab reports. These criteria will also be evaluated during data verification and validation processes.

4.7 Develop the Plan for Obtaining Data

The locations and numbers of sampling points were selected based on the available historical and current information for the project. Due to the size of the Department Investigation Area and since the purpose of the investigation is to delineate potential PFAS impacts detected in the Department Investigation Area, the RI activities will target select features identified in Section 5.1 of the RIWP.

Sampling design, rationale, and procedures are presented in the RIWP. Data from the laboratories will be delivered in an electronic data deliverable ("EDD") and an Adobe® portable document format ("PDF"). The data will be documented in the Remedial Investigation Report ("RIR").

5. Investigation Design Process and Methods

The matrix type and analytical parameters for each project-specific sampling event will be considered in accordance with the standards applicable under Act 2, associated regulations (PA Code Title 25 Chapter 250), the Act 2 TGM, and the RIWP. The proposed number of samples and analyses are described in the RIWP. Equipment and supplies needed to perform the investigation described in the RIWP may include, but may not limited to:

- Personal Protective Equipment ("PPE") as defined in the project Health and Safety Plan;
- Field logs and groundwater sampling logs;
- Photoionization detector ("PID") to record headspace readings from monitoring wells during Site gauging events and to screen soils during soil investigations;
- Electronic water-level indicator accurate to one-hundredth of one foot to determine the depth to water and depth to bottom of wells being gauged and/or sampled;
- High density polyethylene ("HDPE") tubing (¼-inch diameter) for well sampling during monitoring events where groundwater samples are being analyzed for PFAS compounds[2];
- Variable speed, low-flow 2-inch diameter stainless steel submersible bladder pump, support cable, submersible bladder pump control box, and an energy source (i.e., 12-volt portable marine battery, vehicle battery, or compressed air cylinders);
- HDPE bladders for PFAS monitoring events;
- Graduated cylinder and stopwatch to measure purge flow;
- A flow-through field parameter meter cell (flow-through cell) for measuring pH, specific conductivity, temperature, dissolved oxygen ("DO"), oxidation-reduction potential ("ORP"), and turbidity, along with calibration standards;
- Water sample containers;
- Plastic coolers for the storage and shipment of sampling containers;
- Ice and PFAS-free plastic bags as needed to properly preserve and protect samples until they are accepted at the laboratory;
- Alconox®, scrub brushes, and sufficient quantities of PFAS-free distilled/deionized water for the decontamination of equipment;
- Hand-held Global Positioning System ("GPS") unit, as needed depending on the list and location of wells, soil borings and surface water sampling points to be sampled;
- Stainless steel hand auger; and
- Shovel.

Prior to mobilization, Roux will determine the sequence for sample collection from the selected Site monitoring wells. In accordance with the USEPA Low Flow (Minimum Drawdown) Groundwater Sampling

[2] USEPA standard operating procedures indicates Teflon materials should be avoided for PFAS sampling, and HDPE materials should be used instead.

Procedures (USEPA, 1996), sampling will begin with the historically least impacted monitoring well and proceed systematically toward the historically most impacted monitoring well.

Sampling conducted during RI activities will be in general accordance with Roux Associates' SOPs provided in Appendix D of the RIWP and the Act 2 TGM. Procedures described below will be modified, as needed and described in the applicable SOPs, to address PFAS-specific procedures.

Data acquisition, processing and analysis will occur as described below.

- **Soil Sampling**: Soil sample PID screening and logging will be manually (or electronically) recorded in the field. Soil logging information will be transferred to a boring log produced by gINT®. Soil analytical data will be processed in Microsoft Access® and Excel®. This data may also be displayed in AutoCAD® and/or ArcGIS®.
- **Groundwater Gauging and Sampling**: Groundwater gauging data will be recorded in the field and processed in Microsoft Excel®. A graduated cylinder (or other appropriate methods) will be used to determine purge rate, which will be recorded in the field notebook or calculated in the office. Groundwater quality parameters will be recorded from the water-quality meter in the field and documented on a groundwater sampling form. Groundwater analytical data will be processed in Microsoft Access® and Microsoft Excel®. Gauging and analytical data may also be displayed in AutoCAD® and/or ArcGIS®.

ArcGIS® and/or AutoCAD® figures displaying Investigation Area data will utilize recent aerial photographs available from publicly available sources unless otherwise appropriate. Should unanticipated and/or changing field conditions be encountered at any point in the project, the project team, including the Professional Geologist ("PG") of record, will modify the work plan as necessary. Any meaningful modifications to the proposed work plan will be discussed with PADEP and identified in a deviations section of the RIR.

6. Field Documentation Procedures

Field documentation will be conducted in general accordance with the Act 2 TGM or other updated methods. Recorded information may include, but may not be limited to the following:

- Name and location of investigation activities, collected on a GPS and/or described in reference to surrounding landmarks;
- Date and time of arrival and departure;
- Affiliation of persons contacted;
- Name of person keeping log;
- Names of persons in the work area;
- Purpose of field event;
- Description of sampling plan;
- Field instrument calibration information (including equipment make, model, serial number, and lot number of any standards as applicable);
- Location of sampling points (including justification);
- Geographically referenced location of sample point and how determined;
- Number of samples taken and volume of samples taken;
- Preservation of samples;
- Method of sample collection and any factors that may affect its quality;
- Date and time of sample collection and any factors that may affect its quality;
- Name of collector;
- All sample identification numbers;
- Description of samples; and
- Weather conditions on the day of sampling and any field observations related to prior weather events that may affect sample integrity.

7. Field Instrumentation

Field instrumentation to be used as part of Site activities may include the following:

- PID for the field screening of soils;
- Depth to water meter and/or product interface probe to measure depth to water; and
- Water-quality meter for the field screening of groundwater for various parameters, including DO, ORP, pH, conductivity, temperature, and turbidity.

All field data will be recorded in the field electronically or on an appropriate field form.

7.1 Calibration and Maintenance of Field Instrumentation

Field equipment will be used and maintained in accordance with applicable SOP and as generally summarized below.

- **PID**: Calibration will be completed at the start of every field day using a two-point process consisting of “fresh air" and a standard reference gas (also known as span gas). The “fresh air" calibration will be used to set the zero point for the PID sensor. A standard reference gas that contains a known concentration of a given gas will be used to set the second point of reference. A record of the calibration will be kept with the project files.

  Field maintenance of the PID includes periodic cleaning of the PID sensor module and lamp housing. The lamp housing will be replaced as needed. More thorough cleaning and maintenance will be completed out of the field by the equipment vendor, as appropriate. Water traps will be attached to the tip of the PID probe to prevent fouling.

- **Depth to water meter and product interface probes**: These meters and probes are calibrated by the manufacturer by way of installation of the marked measuring tape portion of the meter. The measuring tape will be checked as used for signs of wear-and-tear (e.g., major bends or breaks or obscured depth markings) which may affect the ability to measure or record accurate measurements. The probes will be cleaned as needed so that the electronic indication of depth to water (e.g., lights and beeps) is clear and precise.

- **Water-quality meter**: The water quality meter components (probes, digital display, probes, etc.) will be inspected and cleaned, as appropriate. Replacement and repairs will be performed in the field or by the equipment vendor, as needed. When not in use, the probes of the water quality meter will be stored as recommended by the manufacturer.

  The probes of the water quality meter will be calibrated using the appropriate calibration fluids and procedures per the manufacturer’s instructions, as appropriate. A record of the calibration will be kept with the project files.

Documentation of equipment maintenance shall be maintained in the field notebook.

7.2 Decontamination Procedures

Proper equipment cleaning and field decontamination procedures are necessary to prevent cross contamination of samples. Sampling equipment will be decontaminated prior to the start of activities and

between sampling locations. Decontamination of equipment shall include the use of a laboratory grade, phosphate-free detergent such as Alconox® or Liquinox®. Equipment will be rinsed with laboratory-provided, PFAS-free water or a municipal water source, alternative.

Dedicated disposable equipment will be used where practical. When sampling equipment is reused, it will be cleaned in the following general manner:

- Wash with laboratory-grade glassware detergent and scrub to remove visual contamination;
- Rinse with tap water; and
- Rinse with distilled/deionized, PFAS-free water.

Field personnel performing sample collection activities and handling of equipment will don a new pair of nitrile gloves prior to use of the equipment, between sampling, and between decontamination procedures.

8. Field Methods and Procedures

The following sections describe the data and sample collection methods to be utilized as part of the RI sampling. Due to elevated concern of cross-contamination when sampling for PFAS, all equipment should be confirmed to be PFAS-free prior to use. No PFAS-containing equipment should encounter samples to be analyzed for PFAS. This applies to all sample collection procedures described below. PFAS-specific SOPs provided in Appendix D of the RIWP provide additional information.

8.1 Soil Sampling

The following sections outline the procedures for the collection of surface and subsurface soil samples.

8.1.1 Surface Soil Sample Collection

Surface soil samples will be collected as grab samples from a depth of zero to 24 inches bgs using a stainless-steel hand trowel or similar sampling equipment. Grab samples will be collected first from discrete 6-inch intervals and transferred directly into laboratory-provided HDPE containers. Composite samples, if collected, will be placed in a sample-dedicated bowl and homogenized with a trowel. Material in the bowl will be transferred with a trowel from the bowl to the appropriate HDPE sample containers. Sample containers will be filled no more than ¾ full, immediately closed, chilled to 4°C if appropriate, and processed for shipment to the laboratory as described in **Section 9**. Samples should be protected from light exposure from the time of collection until receipt at the laboratory.

8.1.2 Subsurface Soil Sample Collection

Subsurface soil samples will be collected at various depths below 24 inches bgs using a stainless-steel hand auger or a direct push drill rig. Prior to any subsurface work, all utilities must be located and marked. Additionally, each sampling location should be precleared to five feet bgs before drilling begins unless a utility pre-clearance waiver is approved by the Office Health and Safety Manager (“OHSM”). Each boring will be advanced to the designated sampling interval using disposable acetate-lined Macro-Core sampler. Once extracted, the core will be laid out horizontally on a clean work surface and photographed next to a measuring tape. Subsequently, the sol boring will be logged into the field book by on-Site personnel. Observations recorded will include color, soil texture, grain-size, lithology, moisture content, staining and odor. Soil lithology will be logged in accordance with the United Soil Classification System (“USCS”). Soil will be screened with a PID every six inches to identify potential impact.

After logging, grab samples will be collected first from discrete 6-inch intervals and transferred directly into laboratory-provided HDPE containers. Composite samples will be placed in a sample-dedicated bowl and homogenized with a trowel. Material in the bowl will be transferred with a trowel from the bowl to the appropriate HDPE sample containers. Sample containers will be filled no more than ¾ full, immediately closed, chilled to 4°C if appropriate, and processed for shipment to the laboratory. Excess soil from the core will be repacked into the hole.

8.2 Groundwater Sampling

The following sections outline the procedures for the collection of groundwater samples.

8.2.1 Monitoring Well Gauging

Prior to collecting groundwater samples at a given sampling event, a gauging round will be performed on the wells scheduled for sampling. Gauging will be conducted utilizing a water-level meter and the depth to

groundwater in each well will be measured to the nearest one-hundredth of a foot. The water level meter shall be decontaminated between wells.

8.2.2 Groundwater Sample Collection

After completing the gauging round, the monitoring wells identified for sampling in the RIWP will be sampled. Groundwater sampling will be performed in accordance with the procedures described below.

- HDPE tubing (½-inch diameter) will be connected to a decontaminated, non-dedicated, variable speed, 2-inch diameter stainless steel submersible pump.[3] The pump and tubing will be lowered gradually into each well to the center of the well screen zone or to the midpoint of the saturated portion of the screen if the well screen spans the water table. Tubing used during each sampling event will be dedicated to each well. All non-dedicated, reusable sampling equipment will be decontaminated before use at each well;
- If the drawdown in the well exceeds 0.3 feet while purging at a rate of 100 mL/min, the drawdown rate and field parameter readings described below will be considered for possibly terminating the purge and collecting the sample. The purge rate will be determined through the use of a graduated cylinder and stopwatch and will be monitored and recorded. Drawdown within the well will be measured and recorded during purging. The purge rate will be adjusted, if necessary, to prevent drawdown in the well. The flow-through cell will contain probes that will measure the following field parameters:
    - DO;
    - ORP;
    - pH;
    - Specific conductivity;
    - Turbidity; and
    - Temperature.
- Field parameters will be measured initially and at three- to five-minute intervals during purging. Parameters will be recorded on groundwater sampling logs. Field parameters will be monitored with calibrated meters that will be checked daily for accuracy according to the manufacturer's instructions (see QAPP). Purge volumes from each well will be based on the stabilization protocols described in the USEPA Region II Ground Water Sampling Procedure – Low Stress ("Low Flow") Purging and Sampling (March 16, 1998). In summary, the stabilization protocols are as follows:
    - Measurements should be taken every three to five minutes;
    - Stabilization is achieved after all parameters have stabilized for three (3) successive readings; and
    - Three (3) successive readings should be within the following:
        - +/- 0.1 standard pH units (SU) for pH;
        - +/- 3 percent for specific conductivity (microsiemens per centimeter);

[3] The method of purging the monitoring wells may be adjusted depending upon the depth to water that is encountered.

- +/- 10 percent for DO (milligrams per liter);
- +/- 10 millivolts ("mV") for ORP;
- +/- 10 percent for turbidity (when turbidity is greater than 5 nephelometric turbidity units ["NTU"]); and
- +/- 3 percent for temperature.

- If all field parameters do not stabilize after 30 minutes of purging, the rate of change of field parameters and the specific field parameters involved will be reviewed by the Project Manager and field personnel. If it appears that excessive purging time would be necessary to stabilize field parameters within the ranges described above or that the field parameter results are reasonably close to where they should be, the purging may be terminated at any time after the 30 minute of mandatory purging. Following the termination of purging, a sample will be collected and "sample collection without field parameter stabilization" will be noted in the field sampling forms (a groundwater sample will be collected from all wells scheduled for sampling regardless of the field parameter stabilization results described above). Purging may only be terminated upon review of the field data and with prior approval from Roux's Project Manager;
- Following stabilization of field parameters, groundwater samples will be collected directly from the pump discharge with no change in the purge rate;
- Purge water will be discharged to the ground next to each respective well in a manner to avoid ponding, soil erosion, or drainage to a catch basin; and
- Once sampling is complete, the submersible bladder pump and tubing will be slowly removed from the well. The well will be closed and locked, and reusable equipment will be decontaminated. Disposable equipment will be removed from the Department Investigation Area and disposed of off-Site.

8.2.3 Considerations for PFAS Groundwater Sample Collection

Due to an elevated concern for cross-contamination during PFAS sampling, the following considerations should be adhered to when sampling.

- Field staff will avoid the use of cosmetics and other personal care products that may contain PFAS during the 24 hours prior to the sampling event;
- Field staff will ensure that field supplies, clothing, and PPE are PFAS-free prior to the sampling event;
- Gloves will be changed immediately prior to collecting a PFAS sample and no other surfaces will be touched while handling the sample;
- Following sample collection, the PFAS sample will be placed in an individual HDPE plastic bag separate from all other samples;
- Laboratory-supplied, PFAS-free deionized water will be used for all decontamination activities; and
- QA/QC samples will be collected as described in the RIWP to evaluate the adequacy of the cross-contamination preventative measures and decontamination processes used.

8.3 Field Decontamination Procedures

Wherever possible, dedicated field sampling equipment will be utilized to collect soil, groundwater, and surface water samples so that decontamination needs will be minimized during RI events. Non-dedicated/non-disposable field equipment will be decontaminated prior to and between each sample collection location in accordance with the procedures listed herein. Decontamination procedures shall apply to all non-dedicated/non-disposable gauging and sampling equipment such as water-level meters, submersible sampling pumps, multiparameter water quality meters, hand augers, and PPE, as applicable. Decontamination will be completed in the field and will involve the following:

- Water-level meters and hand augers:
    - Pre-rinse: Equipment will be rinsed with Alconox® and potable water solution, and scrub brushes will be used as needed to remove any buildup material from the equipment; and
    - Thorough rinse: Equipment will be rinsed thoroughly with laboratory-supplied PFAS-free distilled/deionized water.
- Flow-through cells with integrated water quality meters:
    - Thorough rinse: Water quality field parameter sensors and flow-through cells will be rinsed with distilled/deionized water. Because of the sensitivity of the equipment, no other decontamination procedures are planned. After completion of the sampling event, the flow-through cell and sensors will be cleaned and maintained per the manufacturer's requirements.
- Low flow sampling pumps (external parts decontamination and non-disposable internal parts):
    - Pre-rinse: Low flow sampling pumps will be disassembled, and each disassembled part will be rinsed with Alconox® and potable water solution, and scrub brushes will be used as needed to remove any buildup material from the equipment;
    - Rinse: The low flow pump will be rinsed with PFAS-free distilled/deionized rinse water;
    - Final Rinse: After complete reassembly, the external surfaces of the low flow pump will be rinsed with PFAS-free distilled/deionized rinse water; and
    - The HDPE pump bladder will be replaced with a new bladder. O-rings and steel bearings (i.e., parts that come into contact with the water to be sampled) will be decontaminated using the procedure listed above. Once these parts are decontaminated the low flow pump will be reassembled for sampling the next well.

After decontamination is completed, care will be exercised to ensure that decontaminated equipment will not come into contact with collected samples or other materials that could jeopardize the integrity of the next sample.

9. Sample Handling and Chain-of-Custody Procedures

9.1 Sample Handling

Sampling materials (bottleware, coolers, etc.) from the laboratory will be coordinated to arrive the day of or the day before the planned sampling event. The bottleware and coolers will be visually inspected and will be assumed clean unless otherwise noted upon inspection.

9.1.1 Sample Collection

Upon collection and preservation, samples will be labeled in the field and placed on ice at 4°C in the laboratory-supplied cooler.[4] Samples will be given a unique identification code. Sample labels should be affixed to each sample container prior to sample collection, and will contain:

- Project information;
- Sample identification;
- Sample date;
- Sample time;
- Sampler's initials;
- Requested analysis; and
- Preservation information.

QC samples must travel with the sample containers from the laboratory and must arrive on-Site within one day of their preparation in the lab. Samples may be held on-Site for no longer than two calendar days and must arrive back in the lab within one day of shipment from the field. Samples will be submitted to the laboratory in accordance with appropriate analytical method hold times. A summary of the sample container, preservation, and holding times that may be used during Site activities is provided on Table 8 of the RIWP.

9.1.2 Transportation Procedures

The cooler will be kept in the possession of Roux field personnel until transferred (under property chain-of-custody procedures described below) to the appropriate laboratory personnel or mail carrier (such as UPS, USPS, FedEx). Samples must be stored and shipped in a cooler and maintained at 4°C until the sample reaches the analytical laboratory.

The samples shall be placed in a cooler with sufficient packaging material (e.g., foam or bubble wrap) to protect glassware from breakage during shipment. The chain-of-custody will be placed in a sealed PFAS-free plastic bag and taped to the underside of the cooler lid. A signed and dated custody seal will be placed on each sample cooler prior to shipment to the laboratory, if appropriate. Once the laboratory has received the samples, in-house custody procedures will take effect.

[4] Do not use chemical ice, blue ice, or dry ice.

9.2 Chain-of-Custody Procedures

Chain-of-custody forms will be completed during the day of sample collection. An individual chain-of-custody form will be completed for each batch of samples submitted for analysis. The chain-of-custody form will have the following information:

- Project name;
- Roux project number;
- Project location;
- Project manager and sampler(s) names;
- Sample designation;
- Date and time of collection;
- Sample matrix type;
- Number of sample containers;
- Analysis to be performed;
- Preservatives present; and
- A signature with date and time of each party responsible for custody of the samples.

A blank space shall be present next to each sample row for the laboratory to add their lab sample number. Any contingent analyses must be noted clearly on the chain-of-custody. The requested turnaround time, report deliverable type, and electronic deliverable must be clearly identified on the chain-of-custody form. Any special handling, analysis or deliverable information must be clearly placed in the notes or comments section of the chain-of-custody.

10. Procedures For Review

As part of the quality assurance program, Roux personnel will independently review all field and analytical data. The Project Manager will review field notes and the Laboratory Manager will review field instrument data and, as necessary, laboratory analytical data. Any inconsistencies found with the laboratory data packages will be addressed with the laboratory.

10.1 Field Data Review Procedures

The Field Technician or Field Manager will be responsible for generation and maintenance of the field forms, and chain-of-custody forms. The Field Technician or Field Manager is responsible for verifying these items daily. The Project Manager is responsible for verifying these items at the end of each field event.

Field Notes

Verification procedures include, but are not limited to:

- Verify that records are present and complete for each day of field activities;
- Verify that all planned samples, including QA/QC samples, were collected and that sample collection locations are documented;
- Verify that meteorological data were provided for each day of field activities;
- Verify that changes/exceptions are documented and were reported in accordance with requirements; and
- Verify that any required field monitoring was performed and results are documented.

Field Forms

Verification procedures include, but are not limited to:

- Review of field forms and planning documentation; and
- Review of completeness for sampling information.

Chain-of-Custody Forms

Verification procedures include, but are not limited to:

- Verify the completeness of chain-of-custody records;
- Examine entries for consistency with the field notebook;
- Check that appropriate methods and sample preservation have been recorded;
- Verify that the required volume of sample has been collected and that sufficient sample volume is available for QA/QC samples;
- Verify that all required signatures and dates are present;
- Check for transcription errors; and
- Scan a copy for record keeping.

10.2 Analytical Data Review Procedures

Data received from the laboratory will be summarized and tabulated to facilitate review of the results. All data received will be reported according to accepted practices of quality assurance, and tabulated data will be spot-checked by Roux personnel. Outliers, values outside the "expected" range of values, will be reported along with documentation of the cause of the problem if encountered. Review procedures will be consistent with the standard USEPA analytical method chosen. The actual review performed will be initially limited to an evaluation of holding times, method blank results, duplicate and replicate analysis, and surrogate recovery rates. DQIs will be evaluated as follows:

- Precision will be evaluated through one or more of the following:
    - Use of the same analytical methods to perform repeated analyses on the same sample (laboratory or matrix duplicates);
    - Use of two or more laboratories to analyze identical samples with the same method (inter-laboratory precision evaluation); and
    - Collection of a field duplicate (split or co-located sample) and submittal of both for evaluating the precision from sample collection, for sample handling, preservation, and storage.
- Accuracy will be evaluated through the following:
    - Instrument calibration information and documentation will be reviewed by the Quality Assurance Manager to ensure it is consistent with procedures defined in the analytical method.
- Representativeness will be evaluated through one or more of the following:
    - The matrix type and analytical parameters for each sampling event will be collected in accordance with applicable guidance documents.
    - The proposed soil and groundwater samples and analyses are summarized in the RIWP.
    - Targeting sample depth to the indications of highest impact to characterize soil conditions in the manner most protective of human health.
    - Co-locating samples with historic samples for comparison with historic data.
- Comparability will be evaluated through one or more of the following:
    - Location relative to other borings advanced in the Department Investigation Area.
    - Roux knowledge of conditions in the Department Investigation Area.
    - General consistency of sampling method and field personnel.
    - Evaluation of laboratory QA conformance/non-conformance summary for each laboratory data package.
    - Field methods and the investigation design process are further discussed in Section 5.
    - Sampling collection and handling method are discussed further in Section 8.
    - Analytical quality controls are discussed further in Section 10.
- Completeness will be evaluated through all or some of the following:

    - Sampling completeness, defined as the number of valid samples collected relative to the number of samples planned for collection;
    - Analytical completeness, defined as the number of valid sample measurements relative to the number of valid samples collected; and
    - Overall completeness, defined as the number of valid sample measurements relative to the number of samples planned for collection.
- Sensitivity will be evaluated through:
    - Ensuring that the reporting limits of analytical methods are at or below the relevant and applicable regulatory limits for each contaminant of concern as possible. Modifying analytical method and/or project objectives as necessary.

If initial findings suggest problems with the analytical data, a portion of the data may be subjected to independent, third-party data formal validation procedures.

11. Measurement Performance Criteria and Quality Control Samples

The selected laboratory contractor will be certified by PADEP through the National Environmental Laboratory Accreditation Program ("NELAP"). The laboratory will conduct analysis in accordance with analytical method criteria. This performance criteria and QC will be conducted in accordance with USEPA analytical methods and documentation of performance and QC will be presented in the nonconformance summary included in the analytical data package.

11.1 Field and Laboratory Quality Control Samples

The field and laboratory QC samples that will be analyzed, including their frequency of collection/analysis and associate acceptance criteria (where applicable), are summarized below:

- **Equipment Rinsate (Field) Blanks**: Rinsate blanks will be collected at a frequency of one per 20 samples collected per media.[5] Rinsate blanks will be collected by pouring laboratory-supplied water over or through pre-cleaned sampling tools and collecting the rinsate into a sample container with preservatives, as applicable. The rinsate blank will be analyzed for the same parameters for which that day's field samples are evaluated. The rinsate blank will allow the adequacy of equipment cleaning procedures to be evaluated. The rinsate blank will be handled in the same manner as a field sample.
- **Duplicate Samples**: Duplicate Samples will be collected at a frequency of one per 20 samples collected per media. The duplicate samples will be "blind" samples (i.e., no distinguishing designation for the laboratory) and will be collected in the same manner, from the same location, and temporally as close as possible to the (original) sample they are duplicating.
- **Field Reagent Blanks**: Field Reagent Blanks will be collected at a frequency of one per 20 samples per media. The field reagent blank water and sample bottleware will accompany the laboratory-provided sample jars and cooler to the field, during the sampling event and back to the laboratory. Laboratory supplied, PFAS-free water shall travel with the coolers and then will be poured into laboratory supplied bottleware.

11.2 Data Usability Assessment

An internal Data Usability Summary Memorandum will be prepared to document the data evaluation process. A summary of the data usability assessment process is described below.

- **Step 1: Review the project's objectives and sampling design**: Review the QAPP to determine if the DQOs are still applicable and that the sampling design met the project goals. Roux will evaluate all laboratory data in accordance with the procedures outlined below. The Project Manager and Project Principal will determine whether the data meet the requirements for use in the decision-making process.
- **Step 2: Review the data verification and data validation outputs**: Review available QA reports, including the data verification and data validation reports. Perform basic calculations and

[5] If single use dedicated sampling devices are employed, this sampling frequency is not required.

summarize the data (using graphs, maps, tables etc.). Look for patterns, trends, and anomalies (i.e. unexpected results). Review deviations from planned activities (e.g. number and locations of samples, holding time exceedances, damaged samples, non-compliant QC sample results, and SOP deviations).

- **Step 3: Verify the assumptions of the selected analytical method**: Statistical procedures are not documented in the QAPP and will not be performed when analyzing the data. Data will be assessed for precision, accuracy, sensitivity, completeness, representativeness, and comparability, as described below.
- **Step 4: Implement the analytical method**: The decision statements and estimation statement, as described in **Section 4**, will be reviewed and referred to during data evaluation. The data evaluator will perform its evaluation in accordance with the procedures outlined below.
- **Step 5: Document data usability and draw conclusions**: The documentation generated during data evaluation will include a Data Usability Summary Memorandum that describes the data review, the results of the review, and a recommendation on overall data usability and limitation of specific data points. The Data Usability Summary Memorandum provides information on the samples included in the review and the date they were collected; the condition of the samples when received at the laboratory and any discrepancies noted during the receiving process; verification of sample preparation and analysis within the method specified holding time; instrument calibration information; review of associated QC analyses including blanks, laboratory control samples ("LCSs"), matrix spikes ("MSs"), and field and/or laboratory duplicates; and verification of selected reported values from raw data (if applicable). As a result of this review, standard qualifiers may be entered into the database so that data users can readily identify any limitations associated with a specific data point. The Data Usability Summary Memorandum will be provided in the RIR.

11.3 Peformance or Acceptance Criteria

Performance or Acceptance Criteria is addressed by the QA/QC aspects of the project as well as by an assessment of potential decision error and uncertainty evaluation. QA/QC measures will be implemented throughout the course of the RI, as detailed. These measures will minimize variability, mitigate the potential for false positive and/or false negative error, and increase the accuracy and defensibility of collected data.

These measures include, but are not limited to, the following:

- Ensuring that that project personnel have the proper qualifications and training;
- Establishing a process for management of project documents, data and records;
- Requirements for testing, inspection, maintenance and calibration of field and laboratory instrumentation;
- Collection and analysis of field QC samples;
- Analysis of laboratory QC samples; and
- Assessment and oversight.

11.4 Corrective Action Discussed

Corrective action will be implemented by project-specific personnel in general accordance with rules and regulations set forth by PADEP.

11.5 Laboratory Quality Assurance and Quality Control

Copies of analytical laboratory QA/QC documentation are retained on file. The QA/QC documents are updated annually, if needed. The analytical laboratory will provide QA/QC documentation.

12. Data and Records Management and Archive

All data, documents, and information concerning project activities, including but not limited to, technical records and contractual documents, raw sampling and monitoring data will be managed, as below.

Sample Collection and Field Records			
Record	**Generation**	**Verification**	**Storage Location/Archival**
Field Notes, Forms, and Photos	Field Technician/Field Manager	Project Manager	Project File
Boring Logs	Field Technician/Field Manager	Project Manager	Project File
Chain-of-Custody Forms	Field Technician/Field Manager	Project Manager	Project File
Shipping Records	Field Technician/Field Manager	Project Manager	Project File
Field Modifications/Deviations from RIWP or QAPP	Field Technician/Field Manager	Project Manager	Project File
Corrective Action Reports	Project Manager	Project Principal	Project File
Correspondence	Project Manager	Project Principal	Project File
Safety Forms	Field Technician/Field Manager	Health and Safety Office and Project Manager	Project File

Project Assessments			
Record	**Generation**	**Verification**	**Storage Location/Archival**
Field Audit Checklists	QA Manager	Project Manager	Project File

Project Assessments			
Record	**Generation**	**Verification**	**Storage Location/Archival**
Data Validation Report/Data Usability Assessment Report	Data Validation Manager	Project Manager	Project File
Sample Receipt, Custody, and Checklist	Laboratory Sample Receiving	Laboratory Project Manager	Laboratory and Project File
Instrument Calibration Logs	Laboratory Analyst	Laboratory Project Manager	Laboratory and Project File
Instrument Maintenance Logs	Laboratory Analyst	Laboratory Project Manager	Laboratory and Project File
Laboratory Data Reports	Laboratory Analyst/Laboratory QA Manager	Laboratory Project Manager	Laboratory and Project File
Laboratory EDDs	Laboratory Analyst/Laboratory QA Manager	Laboratory Project Manager	Laboratory and Project File
Laboratory QC Samples, Standards, and Checks	Laboratory Analyst/Laboratory QA Manager	Laboratory Project Manager	Laboratory and Project File

APPENDIX F

Health and Safety Plan

Site-Specific Health and Safety Plan

Benner Township PFAS Investigation Area
2535 Fox Hill Road
State College, Pennsylvania

Prepared: November 2025

Prepared for:

The Pennsylvania State University
200 Office of Physical Plant
Physical Plant Bldg.
108 Stewardship Drive
University Park, PA 16802

Prepared by:

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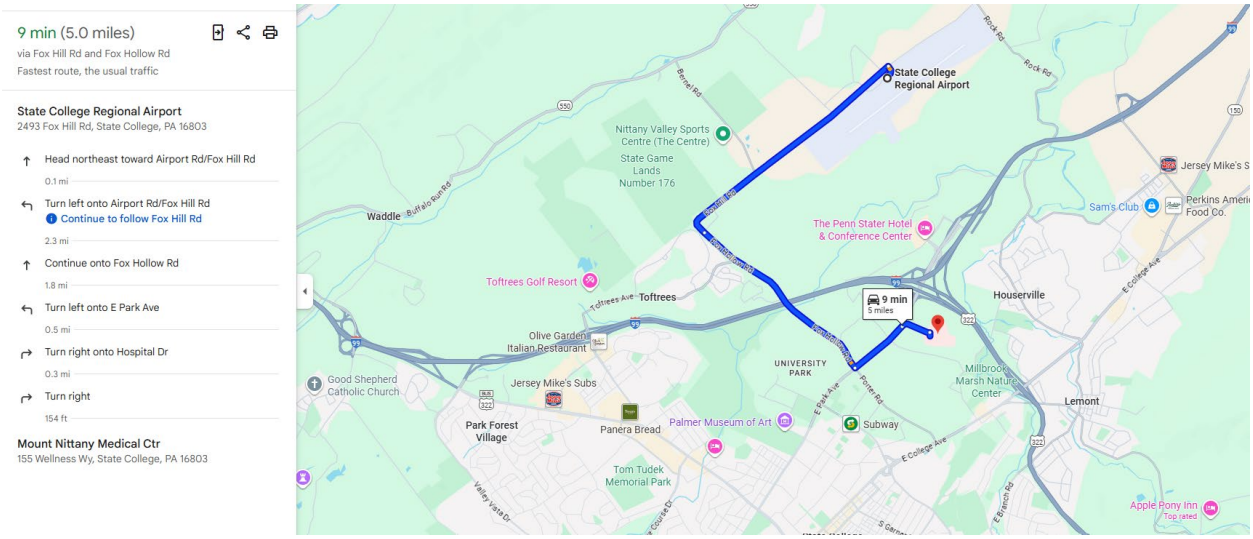
Site-Specific Emergency Information

Emergency Phone Numbers

Most emergency services can be obtained by calling 911. Where 911 service is not available, use the telephone numbers provided in the below table. The following is a master emergency phone list for use by the project management personnel. A more condensed version of the emergency numbers listed below will be posted throughout project work areas. Emergencies encountered on the site will be responded to by a combination of off-site emergency services and on-site personnel.

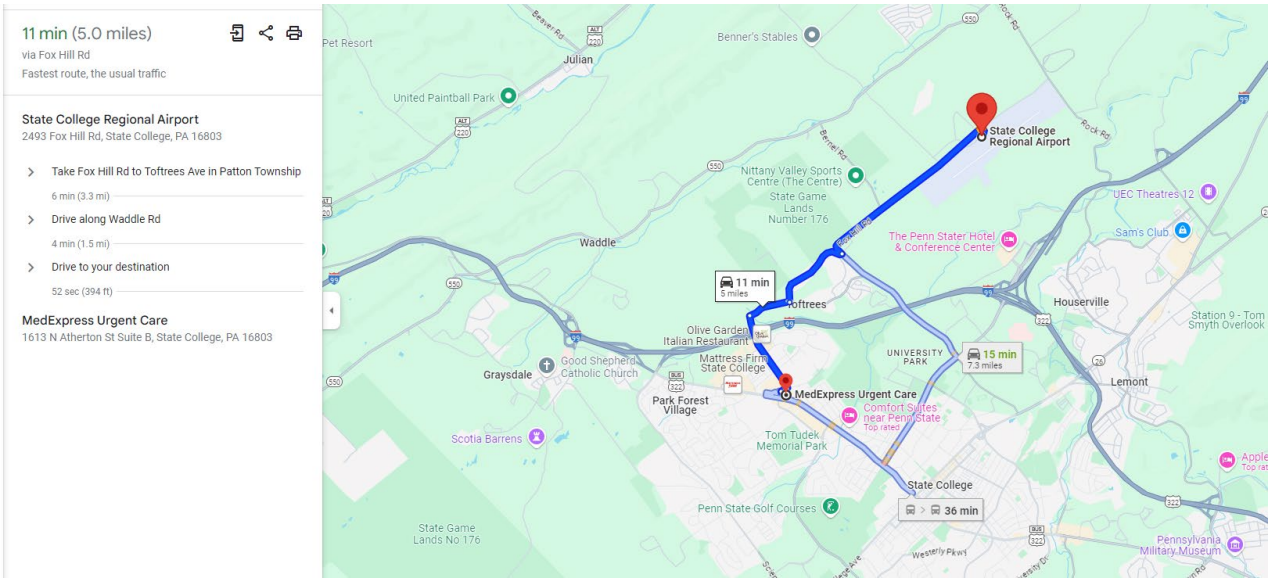
Emergency Contact Information			
Site Personnel			
Title	**Contact**		**Telephone**
Operations Manager (“OM”)	Matt DeMaio		Office: 856-823-3779 Cell: 856-745-1098
Project Principal (“PP”)	Peter Downham		Office: 856-832-3774 Cell: 856-649-2642
Project Manager (“PM”)	Shannon Boyle		Office: 732-584-6534 Cell: 732-710-1059
Site Supervisor (“SS”)	Juliana Alderfer		Office: 856-832-3797 Cell: 215-341-8409
Site Health and Site Safety Officer (“SHSO”)	Juliana Alderfer		Office: 856-832-3797 Cell: 215-341-8409
Office Health and Safety Manager (“OHSM”)	Rafhael Gandolff		Office: 732-584-6543 Cell: 732-619-3609
Corporate Health and Safety Director (“CHSD”)	Brian Hobbs, CIH, CSP		Cell: 631-807-0193
WorkCare, Inc.	Occupational Health Care Management Provider		888-449-7787
Client Emergency Contact	Bryan Rodgers, Airport Director		Office: 814-865-4042 Cell: 814-409-8627
Outside Assistance			
Agency	**Contact**	**Telephone**	**Address/Location**
Ambulance/emergency medical services (“EMS”)	Center LifeLink EMS 25	911 or 814-237-8163	125 Puddintown Rd, State College, PA 16801
Police	State College Police Department	911 or 814-234-7150	State College Municipal Building, 243 S Allen St #337, State College, PA 16801
Fire	Alpha Fire Company	911 or 814-237-4127	400 W Beaver Ave, State College, PA 16801
Site Address	2535 Fox Hill Road, State College, PA 16803		

Route to Mount Nittany Medical Center: 1800 E Park Ave, State College, PA 16803
Hours of Operation: 24 hours
Phone Number: 814-231-7000
Confirmed: August 29, 2025



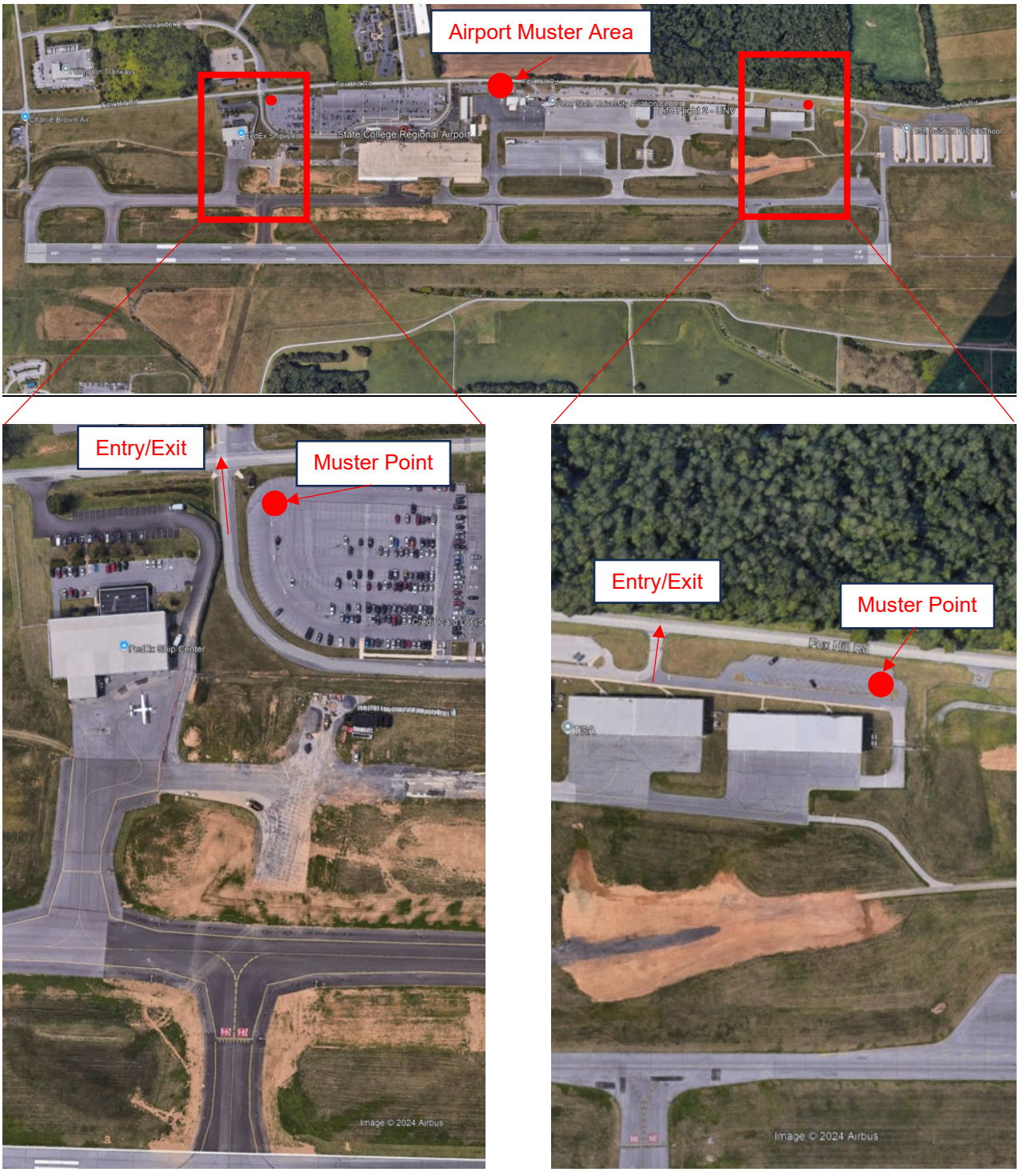
Route to MedExpress Urgent Care: 1613 N Atherton St Suite B, State College, PA 16803

Hours of Operation: 8am – 8pm (7 days/week)
Phone Number: 814-238-1066
Confirmed: August 29, 2025



Emergency Site Response Maps with Muster Points

Airport Map and Muster Point



Walnut Grove Map and Muster Point

High Tech Road Map and Muster Point

1. Introduction

This Site-specific Health and Safety Plan ("HASP") has been prepared by Roux Associates, Inc. ("Roux") for use during the site investigation and sampling activities being performed by Roux on behalf of the Pennsylvania State University ("University") during the Benner Township per and poly-fluoroalkyl substances ("PFAS") investigation activities located on and surrounding the State College Regional Airport ("the Airport"). The Airport is located at 2535 Fox Hill Road, State College, PA 16803. Investigation and remediation activities will take place at a variety of locations including on the Airport and in surrounding residential neighborhoods, commercial properties and agricultural areas. This investigation area as a whole will be referred to herein as the Site[1], as shown on **Figure 1**.

This HASP was prepared in general accordance with the requirements of the Occupational Safety and Health Administration ("OSHA") standards promulgated at 29 Code of Federal Regulations ("CFR") 1910.120 and 29 CFR 1926.65, both commonly referred to as the Hazardous Waste Operations and Emergency Response ("HAZWOPER") Standard. In accordance with the HAZWOPER Standard, this Site-specific HASP was prepared to address the safety and health hazards associated with the site investigation and sampling activities being performed at the Site by Roux and to provide requirements and procedures for the protection of Roux employees, subcontractor personnel, government oversight personnel, Site personnel, and the general public. It also addresses client- and Site-specific requirements for health and safety. Additionally, subcontractors may be required to submit their own HASP as it relates to their specific work activities and will be kept onsite during such work. Finally, this HASP is expected to be supplemented with additional Airport-specific requirements to be established during pre-mobilization work.

Implementation of this HASP is the joint responsibility of the Project Manager ("PM"), the Site Health and Safety Officer ("SHSO"), and all field staff, with assistance from the Project Principal ("PP"), Office Health and Safety Manager ("OHSM"), and Corporate Health and Safety Director ("CHSD

This HASP will be introduced to, reviewed, and signed off on by all Roux personnel through a formal training session prior to commencing work. A copy of the HASP will be kept at the Site at all times where work is being completed. The Roux SHSO or PM will be responsible for posting any changes, amendments, memos, etc. to the HASP. Any revisions to this HASP will be signed by appropriate personnel, which can include Roux's PP, OHSM, and CHSD. Any changes will be announced to all workers at the next safety meeting.

1.1 Roles and Responsibilities

Overall Roles and Responsibilities ("R&Rs") of Roux personnel are provided in Roux's Policies and Procedures Manual. Only those R&Rs specific to HASP requirements are listed below.

Project Manager

The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the SHSO, has the authority to oversee and monitor the performance of the SHSO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

[1] The term "Site" as used in this HASP refers to the "Department Investigation Area", as defined in Exhibit A of the November 13, 2024 Consent Order and Agreement, and is not used in accordance with Title 25 PA Code Chapter 250, Section 1.

- Preparing and coordinating the Site work plan;
- Providing Site supervisor(s) with work assignments and overseeing their performance; Coordinating safety and health efforts with the SSHO;
- Ensuring effective emergency response through coordination with the Emergency Response Coordinator ("ERC"); and
- Serving as primary Site liaison with public agencies and officials and Site contractors.

Site Health and Safety Officer

The SHSO has the full responsibility and authority to develop and implement this HASP and to verify compliance. The SHSO reports to the Project Manager. The SHSO is on Site or readily accessible to the Site during all work operations and has the authority to halt Site work if unsafe conditions are detected. The specific responsibilities of the SHSO include:

- Managing the safety and health functions on this Site;
- Serving as the Site's point of contact for safety and health matters;
- Ensuring Site monitoring, worker training, and effective selection and use of PPE;
- Assessing Site conditions for unsafe acts and conditions and providing corrective action;
- Assisting the preparation and review of this HASP;
- Maintaining effective safety and health records as described in this HASP; and
- Coordinating with the SS and others as necessary for safety and health efforts.

Site Supervisor

The SS is responsible for field operations and reports to the PM. The SS ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Site Supervisor include:

- Executing the work plan and schedule as detailed by the PM;
- Coordination with the SHSO on safety and health; and
- Ensuring Site work compliance with the requirements of this HASP.

Employees

All Roux employees are responsible for reading and following all provisions of the Corporate Health and Safety Manual, including this HASP. Employees report to the SS at the project Site. Each employee is also responsible for the following:

- Wearing all appropriate PPE as outlined within this HASP;
- Attending all safety meetings;
- Inspecting tools and equipment prior to use, and taking any defective tools or equipment out of service;
- Appropriately documenting field events as they occur within a logbook or equivalent;
- Properly operating machinery and/or equipment only if trained to do so;
- Stopping work operations if unsafe conditions exist;
- Identifying and mitigating hazards when observed;

- Reporting all incidents and near misses to the Roux SHSO and SS immediately; and
- Knowing where emergency equipment is located (e.g., first aid kit, fire extinguisher).

Subcontractors and Visitors

Subcontractors and visitors are responsible for complying with the same health and safety requirements. It is the responsibility of all to make sure subcontractors and visitors comply and uphold the HASP. Subcontractors and visitors have the following additional responsibilities:

- Designating a qualified safety representative for the project that can make the necessary changes in work practices, as necessary;
- Attending all safety meetings while participating in Roux Site work activities;
- Reporting all incidents and near misses to Roux SHSO and SS immediately;
- Conducting initial and periodic equipment inspections in accordance with manufacturer and regulatory guidelines; and
- Providing copies of all SDSs to Roux SHSO for materials brought to the Site.

2. Background

Relevant background information is provided below, including a general description of the Site; a brief review of the Site's history with respect to hazardous material use, handling, and/or storage; and a review of known and potential releases of hazardous substances at the Site.

2.1 Site Description

The Site is located in State College, adjacent to the University college campus, spanning multiple townships – Benner, Patton, and College Township. The Site generally consists of the Airport and associated facilities, residential areas, agricultural land, parks, military use areas, commercial and light-industrial properties. The Site is bounded by roads and creeks with several small waterways running through the Site.

The primary work areas at this time include the Airport, Walnut Grove Estates community residential area, and the High Tech Road commercial/industrial area. The Airport is an active airport facility central to the Site on which Roux will be conducting investigation and sampling activities. Special training, as described in **Section 8.1**, is required for personnel to enter certain areas of the Airport (runways, aprons, etc.) which will be coordinated directly through Airport management.

The Walnut Grove Estates residential area consists of approximately 40 residences south of the Airport, each sourcing their potable water from groundwater wells. These residential homes have been placed on Point-of-Entry Treatment ("POET") systems as a result of elevated PFAS levels detected within the wells. Roux will be responsible for the sampling and maintenance of these POET systems throughout the duration of this project. The health and safety of public residents will be an important consideration in addition to Roux's health and safety during work conducted in Walnut Grove Estates.

The High Tech Road industrial area is directly north of the Airport, consisting of a variety of business properties on which Roux will be performing investigation activities. It is important to note that as the remedial investigation progresses, the major working areas may change. This document will be updated regularly to ensure all areas of the Site, and their associated hazards are described herein.

Due to the size of the Site, health and safety considerations vary between areas, however, some hazards are applicable to the Site as a whole. A large portion of the Site is undeveloped agricultural land which may present biological hazards such as wildlife, ticks, poisonous flora, etc. Due to the local karst geology in central Pennsylvania, there is increased potential for sinkholes to occur. Precaution must be taken especially during subsurface work. Evidence of sinkholes include: bowl or funnel-shaped depressions, localized subsidence, circular cracks in pavement, disappearing streams, ponding water, and tilting or slumping of trees or structures.

Any subsurface work performed during this investigation will be performed by subcontractors that have been fully informed of the presence of karst conditions at the Site. Surface water sampling activities may be performed as a part of this investigation and will present safety hazards. As the Site is so large, the buddy system should be implemented whenever possible. Frequent and clear communication is crucial when working with others on Site – including between Roux personnel and non-Roux personnel.

2.2 Site History

During the early 1900s, the Site existed generally as undeveloped and agricultural land up until about 1959 when Airport construction began. Throughout the 1960s and 70s, the Airport grew – runways, terminals, hangers, roads, buildings and other facilities were constructed. During the 1980s, other businesses began to develop around the Airport such as the State of the Art ("SOTA") facility, present day Matreya and Cannon Instruments buildings, paved parking lots and additional roads. Expansions to the airport continued throughout the 90s. The Airport is currently in active use and continues to expand and upgrade. Residential areas (e.g., Walnut Grove Estates), small businesses (e.g., the High Tech Road industrial area), agricultural land, etc. surround the Airport.

The Airport is currently and has historically operated as an airport beginning in the 1950s and is a Federal Aviation Administration ("FAA") certified commercial airport under 14 CFR Part 139, known as the State College Regional Airport (formerly known as the University Park Airport). Prior to 2021, and pursuant to federal regulations (14 CFR Part 139), the FAA mandated that the Airport use aqueous film-forming foam ("AFFF") for aircraft rescue and fire suppression pursuant to FAA regulations to conform with military specification MIL-PRF-24385: "Fire Extinguishing Agent, Aqueous Film Forming Foam". As such, the AFFF required to be used by the FAA may have contained PFAS. In 2023, FAA released military specification MIL-PRF-32725 providing guidance on the use of Fluorine Free Foam (F3), available for use at airports in lieu of AFFF. Following this guidance, State College Regional Airport was the first airport in Pennsylvania to purchase the new PFAS-free foam[2].

2.3 Known and Potential Releases of Hazardous Substances at the Site

There has been historical and current use, storage, and training with AFFF at the Airport. PFAS has been detected in groundwater and soil at and/or surrounding the Airport, triggering remedial investigation activities to further define the extent of PFAS contamination. Site contaminants of concern ("COCs") includes the five PFAS compounds listed below, required for sampling as specified in the November 13, 2024, Consent Order and Agreement ("COA"):

- Perfluorooctanesulfonic acid ("PFOS");
- Perfluorooctanoic acid ("PFOA");
- Perfluorononanoic acid ("PFNA");
- Perfluorohexanesulfonic acid ("PFHxS"); and
- Perfluorobutanesulfonic acid ("PFBS").

[2] Paragraph L, page 5 of the COA.

3. Scope of Work

On behalf of the University, Roux's scope currently includes conducting a remedial investigation and POET system sampling and maintenance. The planned activities primarily include the implementation of the 2025 Remedial Investigation Work Plan (2025 RIWP) and 2025 Point-of-Entry Treatment ("POET") System Work Plan (2025 POET WP). Work areas generally include on-Airport areas located proximate to potential former AFFF storage/use areas, on-Airport stormwater control features, and off-Airport locations within the Department Investigation Area (e.g., High Tech Road, Walnut Grove Estates, etc.). The proposed sampling locations are included in the 2025 RIWP. The locations of private supply wells are included in the 2025 POET WP.

3.1 Distinct Scope Phases/Tasks

The scope of work includes the following routine tasks:

- Site walk and surveying activities;
- Ground Penetrating Radar ("GPR") activities to identify potential subsurface features;
- Installing soil borings using a hand auger, a track-mounted GeoProbe (direct-push methods) or using a track-mounted/truck-mounted drill rig. Soil boring locations will be pre-cleared to 5 feet below ground surface ("bgs") with an air knife or hand tools before advancing soil borings to greater depth with mechanical means;
- Installing temporary well points and collecting groundwater samples;
- Conducting borehole geophysics surveys (equipment consists of a drill rig, downhole camera, mechanical caliper, etc. – equipment provided and procedures completed by a subcontractor);
- Conducting a potentiometric head study (equipment consists of a water level meter);
- Installing permanent monitoring wells for groundwater sampling including overburden and bedrock wells using a drill rig and support truck;
- POET system maintenance and sampling.;
- Collecting groundwater samples using, conventional or low-flow methodology or passive-diffusion bags; and
- Potable well sampling on residential/commercial properties.

Non routine activities performed by Roux personnel include any tasks in the above scope performed on the Airport apron. The Airport is an active facility and Roux will assume Airport operations are ongoing at all times when traversing the Airport. Special training is required for any Roux or non-Roux personnel to have unescorted access to the Airport aprons at any time (described in **Section 8.1**). This HASP is expected to be supplemented with additional Airport-specific requirements to be established during pre-mobilization work.

Additional details regarding the scope of work to be completed as part of each phase of work are presented in the 2025 RIWP and 2025 POET WP. If there are any changes with the scope, a revision of the HASP will be required to address any new hazards.

3.2 Preliminary Work Schedule

The preliminary schedule for the implementation of remedial investigation activities is as follows:

- Q1 2026:
    - Field conditions verification;
- Q2 2026
    - Private supply well sampling;
    - GPR investigations;
    - Geophysical investigations;
    - Soil boring advancement and soil sampling;
    - Surface water inspection;
- Q3 2026
    - Monitoring well installation;
    - Gauging water levels and groundwater sampling;
    - Soil boring advancement and soil sampling;
    - Site Survey;
- Q4 2026:
    - Pressure transducer installation; and
    - Waste disposal.

The preliminary schedule for the implementation of POET system sampling and maintenance activities is as follows:

- November 2025: First POET System Sampling Event (completed); and
- May 2026: Second POET System Sampling Event.

3.3 Work Area Examples

The health and safety exclusion zone, contaminant reduction zone and/or support zones are not static either on or off the Airport. For this reason, Work Areas specific to the work being performed at/near a specific location will be established and no singular setup or geographic extent fits every circumstance. For instance, the definition of zones for hand-soil sampling, groundwater well sampling and/or treatment system/potable water sampling will vary substantially from drilling and/or treatment system installation

activities and may vary depending on being on or off-Airport within the Site. As an example, some on-Airport locations are close to operational areas, where there will be at a minimum daily and, at times more-frequent real-time communications and/or escort by Airport Operations Staff, versus off-Airport work where no Airport Operations coordination is needed. Some examples are given below:

- On-Airport direct push drilling:
    - On-Airport direct push drilling will be performed in the vicinity of the deicing pad. This will generally include coring through pavement, which will require specific focus in relation to Airplane arrival/departure, and silica/dust minimization considerations during pavement coring. To the largest extent possible, work will be conducted in areas outside of the Airport runway and taxiway and will be contained to a tight radius, as to cause the least amount of disturbance to Airport operations.
- Off-Airport POET system sampling:
    - Off-Airport POET system sampling will be performed in Walnut Grove Estates and other areas in individual residential properties. This work will generally include collecting potable water samples from residential kitchens, bathrooms, basements, outdoor water fixtures, and POET system ports. Special care will be taken related to sample procedures, sample handling and decontamination to minimize the potential of cross-contamination when sampling for PFAS. All equipment and bottleware will be carried out of residences after sampling, and the work area will be left as it was found. Sampling personnel will use the residential driveway as a staging and organization area for samples and bottleware. Sampling personnel will take special care to avoid disturbance to residents as much as possible.

4. Site Control

This Site control program is designed to reduce the spread of hazardous substances from contaminated areas to clean areas, to identify and isolate contaminated areas of the Site, to facilitate emergency evacuation and medical care, to prevent unauthorized entry to the Site, and to deter vandalism and theft.

4.1 Site Map

A map of this Site, showing Site boundaries, designated work zones, and points of entry and exit is provided in **Figure 2**.

4.2 Site Access

Access to the work areas at the Site is restricted to reduce the potential for exposure to its safety and health hazards. See below for individual access points/issues at locations across the Site. Please note that this HASP is expected to be supplemented with additional Airport-specific requirements to be established during pre-mobilization work.

4.2.1 Airport Access

Entry and exit at the Airport is controlled at all times. For unescorted access within the Air Operations Area ("AOA") (inside perimeter fence), personnel require an Airport issued Security Identification Display Area ("SIDA") badge[3] and AOA driver training. Once SIDA badge is obtained by an individual, they can escort up to three other personnel onto the property, however the other personnel must remain with the badge holder at all times. While on Airport premises, Roux personnel must travel in a company marked vehicle with a flashing amber beacon. The driver of the vehicle must also have an aviation radio in order to communicate with Air Traffic Control ("ATC") when traversing the Airport. Before entering the Airport, contact should be made with one of the following people, to let them know Roux will be on Site:

- Bryan Rodgers, Airport Director – 814-409-8627 (mobile)
- Jake Kapinus, Airport Operations Manager – 814-863-3392 (office)

4.2.2 Residential Areas Access

Entry and exit is not controlled in residential areas. Agreements from the occupant must be obtained prior to entry onto any private residential property. Contact with the resident should also be made prior to entry to ensure they are aware of our presence.

4.2.3 High Tech Road Properties Access

Entry and exit at the properties along High Tech Road vary from property to property. Agreement from the occupant must be obtained prior to entry onto private property. Contact with each individual business must be made prior to entry to ensure safety and to let them know Roux will be on Site. If additional procedures for proper access are necessary for a certain property, those will be coordinated and communicated to the project team prior to mobilization.

[3] A SIDA badge grants full airport access including unescorted access to the air carrier apron.

4.2.4 Any Non-University Property Access

Agreement from the owner must be obtained prior to entry onto any non-University property. Contact with each property owner be made prior to entry to ensure safety and to let them know Roux will be on Site.

4.3 Buddy System

This section is not applicable for all components of the SOW described in Section 3. Some Site inspections, groundwater and soil sampling may be completed by a single Roux employee. Also, when completing certain tasks, the single Roux employee may be accompanied either by Roux subcontractors, Airport personnel, or the Site caretaker/other representatives from the University. Any time Roux is on-site, the University shall be made aware and communications with the University and the Roux PM are maintained via cellular phone. As a caveat, any time work is being performed within or near active Airport operations or over/near water, no matter the specifics of the work, Roux personnel should operate in teams of two. Lone workers are not suitable for work within or near active Airport operations or over/near water.

While working in the Exclusion Zone, Site workers use the buddy system. The buddy system means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of an emergency. The responsibilities of workers using the buddy system include:

- Remaining in close visual contact with partner;
- Providing partner with assistance as needed or requested;
- Observing partner for signs of heat stress, chemical overexposure or other difficulties;
- Periodically checking the integrity of partner's PPE; and
- Notifying the SS or other Site personnel if emergency assistance is needed.

4.4 Site Communications

The following communication equipment is used to support on-site communication: cell phones, visual hand signals and an aviation radio.

As applicable, hand signals will be used according to the following:

Hand Signals

SIGNAL	MEANING
Hand gripping throat	Out of air; I cannot breathe
Grip partner's wrist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	I am all right; okay
Thumbs down	No; negative

A current list of emergency contact numbers is included in the Site-Specific Emergency Information at the beginning of this HASP.

4.5 Site Work Zones

This Site is divided into three (3) major zones, described below. These zones are characterized by the likely presence or absence of biological, chemical, or physical hazards and the activities performed within them. Zone boundaries are clearly marked at all times and the flow of personnel among the zones is controlled. The Site is monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean areas. Whenever boundaries are adjusted, zone markings are also changed and workers are immediately notified of the change.

Exclusion Zone

The area where contamination exists is the Exclusion Zone ("EZ"). All areas where excavation and handling of contaminated materials take place are considered part of the EZ. This zone will be clearly delineated by chain link fencing, caution tape, cones or other effective barriers, as necessary. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SHSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker);
- Required minimum level PPE;
- Medical authorization;
- Training certification; and
- Requirement to be in the zone.

Contamination Reduction Zone

A Contamination Reduction Zone ("CRZ") is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor ("CRC") and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- Requirement to be in the zone.

Support Zone

The Support Zone ("SZ") is an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

5. Job Hazard Evaluation

Roux's work at the Site is expected to entail a variety of physical, chemical, and biological hazards, all of which must be sufficiently managed to allow the work to be performed safely. Some of the hazards are Site-specific (i.e., they are associated with the nature, physical characteristics, and/or routine operation of the Site itself), while others are activity-specific (i.e., they are associated with [or arise from] the particular activity being performed). The various hazards can be grouped into the following categories:

- **Caught/Crushed** – the potential to become caught in, under, between, or by an object or parts of an object, such as equipment with parts that open and close or move up and down ("pinch points") or equipment that rotates, and the accompanying potential to have body parts cut, mangled, or crushed thereby.
- **Contact** – the potential to be struck by or against moving or stationary objects that can cause physical injury, such as heavy machinery, overhead piping, moving vehicles, falling objects, and equipment (including tools and hand-held equipment) or infrastructure with the ability to cut or impale.
- **Energy Sources** – the potential for bodily harm associated with energy sources, most notably electricity, but also including latent energy sources such as compressed air and equipment under tension (which when released could cause injurious contact or a fall).
- **Ergonomics** – the potential for musculoskeletal injury associated with lifting/carrying, pushing/pulling, bending, reaching, and other physical activity attributable to poor body position/mechanics, repetitive motion, and/or vibration.
- **Exposure** – the potential for injury/illness due to physical, chemical, or biological exposures in the work environment, including, but not limited to, temperature extremes, solar radiation, and noise ("physical"), chemical splashes and hazardous atmospheres ("chemical"), and animal/insect bites and poisonous plants ("biological").
- **Falls** – the potential to slip or trip and thus fall or drop a load, resulting in bodily injury to oneself or others.

The foregoing is intended to provide Roux employees with a general awareness of the hazards involved with Site work. A more detailed review of the potential hazards associated with each specific activity planned for the Site (or on-going activity, as the case may be) is provided in the activity-specific Job Safety Analysis ("JSA") forms in **Appendix A**.[4] As can be seen in the JSA forms, the hazards are identified by category per the above, and specific measures designed to mitigate/manage those hazards are also identified. In preparing the JSA forms, all categories of hazards were considered, and all anticipated potential hazards were identified to the extent possible based on the experience of the personnel preparing and reviewing the JSA forms. However, there is always the possibility for an unanticipated hazard to arise, potentially as condition change over the course of the workday. Roux personnel must maintain a continual awareness of potential hazards in the work zone, regardless of whether the hazard is identified in the JSA form. Particular attention should be paid to hazards associated with exposure to hazardous substances

[4] The Airport has specific safety and security protocols that must be integrated with and/or may supersede certain provisions herein. The Airport-specific protocols may be found in an airport-specific JSA to be prepared during pre-mobilization training. This JSA will be subject to review and comment by Airport personnel.

(see **Table 1** for a listing of the hazardous substances most likely to be encountered in environmental media at the Site) and to Site personnel being located "in the line of fire" with respect to moving equipment, pinch points, and latent energy (e.g., being located or having body parts located within the swing radius of an excavator, between two sections of pipe being connected, below a piece of suspended equipment, or adjacent to a compressed air line).

5.1 Hazard Communication and Overall Site Information Program

The information in the JSAs and SDSs is made available to all employees and subcontractors who could be affected by it prior to the time they begin their work activities.

Modifications to JSAs are communicated during routine pre-work briefings and periodically updated as needed in the HASP. SDSs will be maintained by the SHSO/SS for new chemicals brought on-site as needed. Copies of SDSs can be found in **Appendix B**.

5.2 Noise

Noise is associated with the operation of heavy equipment, power tools, pumps, and generators. Noise is also a potential hazard when working near operating equipment such as excavators, drill rigs or pole drivers. High noise (i.e., < 85 dBA) operations may be evaluated by the SHSO utilizing a type 2 handheld sound level meter ("SLM") operating on the "A"-weighted scale with slow response because this scale most closely resembles human response to noise and complies with OSHA 29 CFR 1910.95. Hearing protection is required in areas with noise exposure greater than 85 dBA. Double hearing protection (ear plugs and earmuffs) should be donned in areas where the noise exposure is more than 95 dBA. Noise exposure will be controlled by hearing protection as described above or by maintaining setbacks from high-noise equipment, as warranted. Personnel handling heavy equipment and using power tools that produce noise levels exceeding those described levels above are required by OSHA 29 CFR 1910.95 to wear the appropriate Noise Reduction Rating ("NRR") level of hearing protection. Appropriate hearing protection will be evaluated by the SHSO as necessary in consultation with the OHSM and CHSD.

5.3 Slip, Trip, and Fall Hazards

Slip, trip, and fall hazards may include, but are not limited to, general slip and trip hazards associated with uneven ground, possible debris, wet grass, and equipment. Prior to work, walking paths will be assessed for solid footings, any ground penetrations that may cause a tripping hazard will be appropriately marked, and other areas will be noted and discussed with the field team.

Personnel shall be aware of their surroundings and footings at all times, and all accommodations should be made for proper housekeeping and organized equipment placement at the Site, where possible, to help prevent any slip, trip, and fall-related incidents. All tools and materials should be appropriately stored when not in use and placed in appropriate storage containers.

5.4 Biological Hazards

Biological hazards that may potentially be present at a Site, include poisonous plants, insects (ticks, spiders, bees), animals (snakes, dogs), etc. Information on biological hazards can be found within Roux's Biological Hazard Awareness Management Program located within Roux's Corporate Health and Safety Manual. There is also potential for transmission and/or exposure to SARS-CoV-2, the virus that causes COVID-19.

Prior to beginning work, on-Site protocols shall be established by the project team, including subcontractors, in accordance with federal, state, county, city, and/or other guidance, as applicable.

5.5 Working Near Water Hazards

Drowning hazards may be present at the Site when working and sampling near water. Several factors are important to determining whether a drowning hazard exists such as the type of waterbody (i.e., basin, river, canal, etc.) near the work area, potential depth, presence or absence of tidal currents, work area height above the water surface, and the use of fall protection. Employees and contractors may be exposed to drowning hazards when performing remedial and sampling activities within six feet of a waterbody and/or at a height above the waterbody. More information on drowning hazards can be found within the Working Over or Near Water Management Program in Roux's Corporate Health and Safety Manual.

5.6 Silica Exposure

Crystalline silica is a common mineral found in the earth's crust. Materials like sand, stone, concrete, and mortar contain crystalline silica. Silica can become airborne from work activities such as demolition of brick, concrete, or masonry. Chipping, hammering, grinding, sawing, and drilling in concrete, brick, or rock. Abrasive blasting using sand or from the material being blasted such as concrete. Crushing loading, hauling, and dumping of concrete or rock. Dry sweeping concrete, sand, or rock dust. Trenching and excavating. Once silica dust is inhaled it can potentially result in silicosis.

Exposure to silica presents a significant health hazard during concrete and asphalt cutting, grinding, demolition, and soil disturbance activities. Inhalation of fine silica particles can lead to respiratory illnesses including silicosis, lung cancer and kidney disease. To mitigate these risks, personnel must adhere to OSHA's permissible exposure limits and implement safety control measures such as wet methods, ventilation, and use of appropriate respiratory protection. Air monitoring and proper preparation and training are required to ensure worker safety. Areas with identified silica exposure concerns should be clearly marked and restricted to authorized personnel equipped with proper PPE.

Roux has developed a site-specific Silica Exposure Control Plan as part of the Roux job planning process, which details the PPE requirements and management methods to reduce potential employee exposure to respirable silica dust. This Silica Exposure Control Plan has been developed in accordance with the requirements in 29 CFR 1926.1153 and can be found within the site-specific job planning form. For further information regarding crystalline silica exposure controls, please refer to Roux's Corporate Silica Exposure Control Program (**Appendix G**).

The following engineering and administrative controls will be implemented for work activities throughout the site per 29 CFR 1926.1153 Table 1 – *Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica*:

Engineering and Administrative Controls for Crystalline Silica	
Site Activities and Equipment	**Hazard Controls**
Rig or stand-mounted core saws or drills, Stationary masonry saws, handheld power saws, and walk-behind saws	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tools in accordance

	with manufacturer's instructions to minimize dust emissions
Handheld and stand-mounted drills (including impact and rotary hammer drills)	• Use drill equipped with commercially available shroud or cowling with dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions OR • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism Use a HEPA-filtered vacuum when cleaning holes
Jackhammers and handheld powered chipping tools	• Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. • When used outdoors no additional respiratory protection is needed. • Respiratory protection with Assigned Protection Factor (“APF”) of 10 must be worn, when used indoors or in an enclosed area. OR • Use tool equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions

5.7 Per- and Polyfluoroalkyl Substances

PFAS are a group of over 14,000 synthetic chemicals that have been used in industrial and consumer products for over 70 years. Industrial and consumer PFAS applications include AFFF, construction materials, stain-resistant textiles, and food handling materials. The National Institute for Occupational Safety and Health (“NIOSH”) reports community exposure to PFAS occurs through airborne releases, consumer products, public drinking water, food products, and soil contamination. As of November 2025, OSHA has not adopted federal workplace exposure limits the PFAS-related compounds presently being assessed at this Site; however, employers are required to protect potentially exposed employees per the General Duty Clause in Section 5(a)(1) of the Occupational Safety and Health Act.

The detection of PFAS in groundwater and soil in the Investigation Area has triggered remedial investigation activities to delineate the extent of contamination. Roux employees and applicable subcontractors may be potentially exposed to PFAS when sampling environmental media (i.e., soil, groundwater) and during intrusive activities such drilling and monitoring well installation where contaminated soil may become

airborne. The engineering controls, administrative controls, and PPE listed below will be implemented during sampling and remedial activities to prevent potential PFAS exposure.

Engineering Controls

- Prevention of airborne dust generation during sampling and intrusive activities shall include the use of irrigation and misting via manually operated pressure washer(s) or another suitable irrigation method. The subcontractor shall be responsible for securing a certified PFAS-free water supply and applicable equipment for dust suppression (i.e., nozzles, hoses, etc.).

Administrative Controls

- The generation of airborne dust will be avoided during all field activities.
- Workers must be positioned upwind of any intrusive activities, including drilling and well installation.
- Food, drinks, and tobacco use are always prohibited within 50 feet of sampling and intrusive activities.
- Disposable nitrile gloves will be removed and disposed of prior to contacting other surfaces including field notes, mobile phones, food, and drinks.

Personal Protective Equipment

- Disposable chemical resistant coveralls and splash-proof face shields will be donned, as applicable, to prevent dermal exposure during any activities with potential for sprays or splashes. Gore-Tex® or Tyvek® material must be avoided.
- Chemical-resistant nitrile gloves must be worn when contacting potentially contaminated soil and/or groundwater.

5.8 Karst Terrain

The Site is geographically situated in karst terrain. Karst terrain is prone to sinkholes and may present hazards that require heightened awareness and precaution. Karst landscapes are characterized by soluble rock formations such as limestone, which can lead to underground voids and unstable ground conditions. These voids may collapse suddenly, forming sinkholes that pose risks to worker safety, equipment stability, and structural integrity during mechanical intrusive work (i.e., drilling, excavation, etc.).

To mitigate these risks, a surface geophysical assessment will be conducted by a third-party contractor prior to site mobilization. Roux personnel, including subcontractors, will perform a thorough visual inspection of all proposed work areas prior to mechanical intrusive work. Visual inspection will assess and identify any of the following:

Aboveground Indicators

- Depressions or soft spots in pavement or ground
- Circular or oval-shaped low areas
- Cracks, especially radiating or widening ones (i.e., greater than 1/16”)
- Sudden changes in surface elevation or slope

Structural and Utility Issues

- Tilted or leaning light poles, signs, or fences
- Cracked or misaligned curbs and sidewalks
- Sunken or misaligned manhole covers or utility boxes
- Underground utility issues (e.g., water line breaks, sewer backups)

Surface Runoff and Drainage

- Erosion near storm drains, curbs, or edges.
- Unusual wet spots or soggy ground without recent rain.

Changes in Natural Vegetation

- Dead or dying vegetation in isolated patches
- Unusual growth in specific areas (may indicate subsurface water movement)

Prior to mechanical intrusive activities, geophysical investigation will be performed of the work area including, as applicable, GPR for identification of subsurface voids/anomalies.

Work zones should be clearly marked, and heavy equipment operations must be restricted in areas identified as high-risk. Continuous observation for ground movement, proper drainage management, and emergency response planning will be implemented to ensure safe operations in karst environments.

6. Emergency Response Plan

This emergency response plan details actions to be taken in the event of Site emergencies. The PM and SHSO are responsible for the implementation of emergency response procedures onsite. The SHSO/PM provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures and notification of appropriate authorities. In the event of an emergency, Site personnel are evacuated and do not participate in emergency response activities, response is facilitated through external emergency services.

6.1 Emergency Response

The SHSO, after investigating the incident and relevant information, shall determine the level of response required for containment, rescue and medical care. Limited on-site emergency response activities could occur therefore the SHSO is responsible for notifying external emergency response agencies. The SHSO provides relevant information to the responding organizations, including, but not limited to, the hazards associated with the emergency incident, potential containment problems, and missing Site personnel.

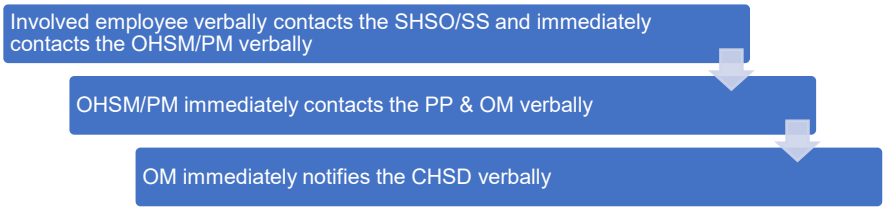
6.2 Emergency Alerting and Evacuation

If evacuation notice is given, Site workers leave the worksite, if possible, by way of the nearest exit. Appropriate primary and alternate evacuation routes and assembly areas have been identified and are shown on the Site Plan with Emergency Muster Area (**Figure 2**). After assembly of all Roux personnel and its subcontractors at the emergency muster areas on the Airport, these personnel will then proceed to the official Airport Muster Area. The routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by SHSO/PM.

Personnel exiting the Site gather at a designated assembly point. To determine that everyone has successfully exited the Site, personnel will be accounted for at the assembly point. If any worker cannot be accounted for, notification is given to the SHSO, PM, and any arriving response authorities so that appropriate action can be initiated. Subcontractors on this Site have coordinated their emergency response plans to ensure that these plans are compatible and potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

6.3 Emergency Medical Treatment and First Aid

In the event of a work-related injury or illness, employees are required to follow the procedures outlined below. All work-place injury and illness situations require Roux's Project and Corporate Management Team to be notified when an injury/illness incident occurs, and communication with the contracted Occupational Health Care Management Provider, WorkCare, Inc., is initiated, as necessary. The Injury/Illness Notification Flowchart is provided below and within Roux's Incident Investigation and Reporting program included within Roux's Corporate Health and Safety Manual.



If on-Site personnel require any medical treatment, the following steps will be taken:

a. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence and communicate with the contracted Occupational Health Care Management Provider, WorkCare, immediately following the notifications provided above.

b. Based on discussions with the Project Team, Corporate Management and the WorkCare evaluation, if medical attention beyond onsite first aid is warranted, transport the injured / ill person ("IP") to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an ambulance or transport the victim to the hospital, and continue communications with Corporate Management Team. If Fire Department or Ambulance Emergency services are requested the SHSO will additionally notify Airport Operations (814-865-4042) and University Police (814-863-1111) to ensure Airport safety and security procedures are followed. An Urgent Care/Hospital Route map with location to MedExpress Urgent Care/Mount Nittany Medical Center is included as **Figure 3**.

c. Decontaminate to the extent possible prior to administration of first aid or movement to medical or emergency facilities.

d. First aid medical support will be provided by onsite personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation ("CPR"), Automatic External Defibrillation ("AED"), and Blood-Borne Pathogens ("BBP") Awareness, until relieved by emergency medical services ("EMS").

e. The SHSO and PM will perform a Loss Investigation ("LI") and the Project Team will complete the final Loss Report. If a Roux employee is involved in a vehicular incident, the employee must also complete the Acord Automobile Loss Notice.

7. Environmental Conditions and Response

7.1 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or project principal will determine if work can continue without jeopardizing the health and safety of field workers. Some of the items related to adverse weather conditions to be considered prior to determining if work should continue include:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;
- Treacherous weather-related conditions. If wind speed is greater than 15 mph averaged over a 15-minute period or wind gusts over 25 mph, earthmoving operations will be ceased
- Limited visibility; and
- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions may include heavy rain, fog, high winds, and lightning. The SHSO and/or PM shall observe daily weather reports and evacuate, if necessary, in case of inclement weather conditions.

7.2 Electrical Storm Guidelines

In the event that lightning and/or thunder are observed while working onsite, all onsite activities shall stop and personnel shall seek proper shelter (e.g., substantial building, enclosed vehicle, etc.). Work shall not resume until the threat of lighting has subsided and no lightning or thunder has been observed for 30 minutes. If the possibility of lightning is forecast for the day, advise the onsite personnel on the risks and proper procedure at the pre-work safety briefing. Continuously monitor for changing weather conditions and allow enough time to properly stop work if lightning is forecast.

7.3 Environmental Stressors, Heat Stress, Heat Exhaustion, and Heat Stroke

It is the employer's responsibility to monitor weather forecasts and ambient air temperatures, both prior to the work shift and during the shift. The National Oceanic and Atmospheric Administration records average minimum/maximum temperatures of 19/91 degrees Fahrenheit during the year in State College, PA.

To prevent potential heat illness, the following strategies will be implemented:

- Adjusting personnel work/rest intervals;
- Monitoring for symptoms of heat illness;
- Providing shaded rest areas;
- Providing cool potable water so that each employee has access to at least one quart per hour for the entire shift, free of charge;
- Allowing for employees to acclimatize to the weather conditions and work demands;

- Observe workers during a heat wave (i.e., when the temperature is at least 80°F, and 10 degrees hotter than the average temperature of the five preceding days); and
- Implementing high heat procedures when the temperature reaches 95°F.

Roux's Heat Illness Prevention Plan is implemented when the ambient temperatures exceed 80°F. Roux's Heat Illness Prevention Program can be found within **Appendix C**. Additional information regarding heat illnesses is provided below. This can include, but is not limited to, access to shade that is sufficient in size to fit all workers who are on break; a car with air conditioning is acceptable, too. Preventative cool-down breaks shall be allowed at any time, and anyone taking such a break will be monitored for heat illness symptoms and not required to return to work until all symptoms (if present) of heat illness have disappeared. If necessary, first aid will be offered, but if symptoms are severe, emergency response procedures will be implemented per Section 6.3. Anyone who has shown symptoms of severe heat illness will not be sent home without being offered first aid or medical treatment.

High heat procedures must be implemented when temperatures reach 95°F. These procedures include:

- Ensuring that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor when necessary. An electronic device, such as a cell phone or text messaging device, may be used for this purpose only if the reception in the area is reliable.
- Observing employees for alertness and signs or symptoms of heat illness. The employer shall ensure effective employee observation/monitoring by implementing one or more of the following:
    - Supervisor or designee observation of 20 or fewer employees;
    - Mandatory buddy system; and
    - Regular communication with sole employee such as by radio or cellular phone, or other effective means of observation.
- Designating one or more employees on each worksite as authorized to call for emergency medical services and allowing other employees to call for emergency services when no designated employee is available.
- Encouraging employees throughout the work shift to drink plenty of water.
- A review of the high heat procedures during the daily tailgate meeting and remind employees of their right to take a cool-down rest when necessary.

7.3.1 Heat Stress

Heat stress is the body's response to excessive heat and can be a significant potential hazard. The risk of heat stress can be increased with heavy physical activity and/or the use of personal protective equipment in hot, humid weather environments. There are also personal risk factors that can contribute to the risk of suffering from heat stress, such as obesity, water intake, alcohol and caffeine consumption, pregnancy, age, medication, etc. Heat illness includes heat cramps, heat exhaustion, heat syncope, and heat stroke.

7.3.2 Heat Cramps

Heat cramps may be brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps, typically in the legs.

First aid treatment includes, but is not limited to, shade, rest, and fluid replacement. Typically, the individual should recover within one-half hour while being monitored constantly. If the individual has not improved substantially within 30 minutes and the body temperature has not decreased, the individual should be transported to a hospital for medical attention.

Per Roux's Heat Illness Prevention Plan, employees shall have access to potable drinking water that is fresh, pure, suitably cool, free of charge and in sufficient quantities. Access to shade shall be present when temperatures exceed 80 degrees Fahrenheit and shall be available when temperatures do not exceed 80 degrees Fahrenheit.

7.3.3 Heat Exhaustion

Heat exhaustion may occur in an individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual fails as blood collects near the skin to rid the body of excess heat through transference. The signs and symptoms of heat exhaustion are as follows:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin with heavy perspiration;
- Skin appears pale;
- Fatigue and weakness;
- Dizziness; and
- Elevated body temperature.

First aid treatment includes, but is not limited to, cooling the victim, elevating the feet, and replacing fluids.

If the individual is not substantially improved within 30 minutes and the body temperature has not decreased, the individual should be transported to the hospital for medical attention.

7.3.4 Heat Stroke

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a MEDICAL EMERGENCY requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- Dry, hot, red skin;
- Body temperature approaching or above 105^{o}F;
- Confusion, altered mental state, slurred speech;
- Seizures;
- Large (dilated) pupils; and
- Loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility. Heat stress is a significant hazard if any type of protective equipment (semi-permeable or impermeable) that prevents evaporative cooling when worn in hot weather environments.

7.4 Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 60°F. A work/rest regimen will be initiated when ambient temperatures and protective clothing cause a stressful situation. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. The signs and symptoms of cold stress include the following:

- Severe shivering;
- Abnormal behavior;
- Slowing;
- Weakness;
- Stumbling or repeated falling;
- Inability to walk;
- Collapse; and/or
- Unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks and encourage activity such as walking, wrapped in a blanket.

8. Safety Procedures

This section of the HASP presents the specific safety procedures to be implemented during Roux's activities at the Site in order to protect the health and safety of various on-site personnel. Minimum OSHA-mandated procedures are presented first, followed by client- and Site-specific procedures. Lastly, activity-specific procedures are discussed. These Site and activity-specific procedures supplement the general safety procedures included in Roux's Corporate Health and Safety Manual, which also must be followed in their entirely. This HASP is expected to be supplemented with additional Airport-specific requirements to be established during pre-mobilization work.

8.1 Training

At a minimum, Site personnel who will perform work in areas where there exists the potential for toxic exposure will be health and safety-trained prior to performing work onsite per OSHA 29 CFR 1910.120(e) and 29 CFR 1926.65(e). More specifically, all Roux, subcontractor, and other personnel engaged in sampling and remedial activities at the Site and who are exposed or potentially exposed to hazardous substances, health hazards, or safety hazards must have received at a minimum the 40 hour initial HAZWOPER training consistent with the requirements of 29CFR 1910.120(e)(3)(i) training and a minimum of 3 days' actual field experience under the direct supervision of a trained experienced supervisor, plus 8 hours of refresher training on an annual basis. Depending on tasks performed, less training may be permitted. Evidence of such training must be maintained at the Site at all times. Furthermore, all on-Site management and supervisory personnel directly responsible for or who supervise the employees engaged in Site remedial operations, must have received an additional 8 hours of specialized training at the time of job assignment on topics including, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques, plus 8 hours of refresher training on an annual basis. Additionally, all workers who will be required to don a respirator will be properly trained on their employer's Respiratory Protection Program, which also includes being medically cleared to wear a respirator and passed a fit test, at least initially prior to use, and then annually thereafter in accordance with 29 CFR 1910.134, Respiratory Protection.

Roux personnel training records are maintained in a corporate database with records available upon request from either the OHSM/SHSO/CHSD or Human Resources Department.

In addition to Roux's standard training outlined above, Airport-specific training is required for Roux personnel and Roux's subcontractors entering/working in the AOA at the Airport. In order to access the AOA, the following must be completed.

- SIDA Badge Application, Approval and Issuance of Badge
- AOA Online Driver Training
- FBI Fingerprinting and Background Check
- In Person Airport Driving and Security Training

Airport-specific training for Roux staff will be coordinated and managed by the SS, with support from the PM.

8.2 Site-Specific Safety Briefings for Visitors

A Site-specific briefing is provided to all Site visitors who enter this Site beyond the site entry point. For visitors, the Site-specific briefing provides information about Site hazards, the Site layout including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Please note, visitors requiring access to the Airport must travel with Roux personnel holding a SIDA airport badge. Access to the Airport without this badge is prohibited. See **Section 4.2.1** for further details.

8.3 HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a Site-specific tailgate briefing prior to the commencement of work to ensure employees are familiar with this HASP and the information and requirements it contains, as well as the relevant JSAs included in **Appendix A**. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during on-going Site characterization and analysis of changing conditions. Conditions for which we schedule additional briefings include, but are not limited to: changes in site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during Site work.

8.4 Medical Surveillance

The medical surveillance section of the Health and Safety Plan describes how worker health status is monitored at this Site. Medical surveillance is used when there is the potential for worker exposure to hazardous substance at levels above OSHA Permissible Exposure Limits ("PEL") or other published limits. The purpose of a medical surveillance program is to medically monitor worker health to ensure that personnel are not adversely affected by site hazards. The provisions for medical surveillance at this Site are based on the Site characterization and job hazard analysis found in Section 4 of this HASP and are consistent with OSHA requirements in 29 CFR 1910.120(f) as applicable.

8.4.1 Site Medical Surveillance Program

Medical surveillance requirements are based on a worker's potential for exposure as determined by the Site characterization and job hazard analysis documented in Section 4 and JSAs within **Appendix A** of this HASP and in compliance with the requirements of 29 CFR 1910.120(f)(2). Based on Site information and use of direct reading instruments, limited use of respirators (less than 30 days per year), and the absence of an employee-staffed HAZMAT team, a limited medical surveillance program is required and implemented at this Site. The medical surveillance program provides that:

1. Workers assigned to tasks requiring the use of respirators receive medical examinations in accordance with 29 CFR 1910.134(e) to ensure they are physically capable to perform the work and use the equipment, and
2. If a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substance or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.
3. These medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided to workers free of cost, without loss of pay, and at a reasonable

time and place. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after any apparent over-exposure.

8.4.2 Medical Recordkeeping Procedures

Medical recordkeeping procedures are consistent with the requirements of 29 CFR 1910.1020 and are described in the company's overall safety and health program. A copy of that program is available at our Islandia, New York office.

The following items are maintained in worker medical records:

- Respirator fit test and selection;
- Physician's medical opinion of fitness for duty (pre-placement, periodic, termination);
- Physician's medical opinion of fitness for respirator protection (pre-placement, periodic); and
- Exposure monitoring results.

8.4.3 Program Review

The medical program is reviewed to ensure its effectiveness. The Corporate Health and Safety Manager, in coordination with the Human Resources Director, is responsible for this review. At minimum, this review consists of:

- Review of accident and injury records and medical records to determine whether the causes of accidents and illness were promptly investigated and whether corrective measures were taken wherever possible;
- Evaluation of the appropriateness of required medical tests based on site exposures; and
- Review of emergency treatment procedures and emergency contacts list to ensure they were site specific, effective, and current.

8.5 Personnel Protection

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices and PPE are used to protect employees. Appropriate personal protective equipment ("PPE") shall be worn by Site personnel when there is a potential exposure to chemical, biological or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity, and noise), as determined by the SHSO. The level of personal protection, type and kind of equipment selected will depend on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors will be made before work can be safely executed.

Roux maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit and inspection. Roux's PPE program can be found within **Appendix D**. This PPE program shall be adjusted in accordance with the PFAS sampling SOP, where sampling is conducted for PFAS. PPE to be used at the Site will meet the appropriate American National Standards Institute ("ANSI") standards and the following OSHA (General/Construction Industry) standards for minimum PPE requirements.

The minimum level of PPE for entry onto the Site is Level D. The following equipment shall be worn:

- Work uniform (long pants, sleeved shirt);
- Hard hat;
- Steel or composite toe work boots (must comply with American Society for Testing and Materials [ASTM]) F 2412-05, Standard Test Methods for Foot Protection and ASTM F 2413-05, Standard Specification for Performance Requirements for Foot Protection);
- Safety Glasses (must comply with one of the following ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, ANSI Z87.1-2003);
- Boot Covers (as needed);
- Hearing protection (as needed);
- High visibility clothing (shirt/vest); and
- Hand protection (e.g., minimum cut resistance meeting ANSI 105-2000 Level 2).

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object (e.g., wrist watches, bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder-length hair should be tied back.

Site specific PPE ensembles and materials are identified within task specific JSAs located within **Appendix A**, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be approved by the PP and immediately communicated to all Roux personnel and subcontractors as applicable. PPE is used in accordance with manufacturer's recommendations.

8.5.1 Hearing Conservation

Hearing protection is made available when noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 dBA. Hearing protection is required when the 8-hour time weighted average sound level > 85 dBA, or when noise levels exceed 140 dBA at any point or exceeds 115 dBA for at least 15 minutes. Where noise exposure meets or exceeds this level, noise is listed as a physical hazard in the JSA for the tasks/operation, and hearing protection is included as one of the control measures ("PPE").

8.6 Monitoring

An air monitoring program is important to the safety of on- and off-Site personnel, and the surrounding area. A preliminary survey, to establish background conditions in the immediate sampling area, may be made prior to the initiation of Site work including, but not limited to, monitoring wind direction (e.g., wind socks) and approximate temperature during all invasive Site activities. This survey will be conducted with the appropriate pre-calibrated air monitoring instrument(s), as warranted by the field activity. Once this survey has been complete, any changes in the type of PPE will be determined and relayed to those working on Site.

VOCs are not an anticipated hazard at this Site. In the event additional investigation identifies VOC contamination, work zone air monitoring will be performed to verify that the proper level of PPE is used, and to determine if increased protection or work stoppage is required. The following equipment shall be used to monitor conditions:

- A Photoionization Detector ("PID") with a lamp energy of 10.6 eV will be used to provide direct readings of organic vapor concentrations during intrusive activities to determine that personnel

protection is adequate. Concentrations shall be recorded during intrusive activities with the potential to encounter contaminant vapors.

Personal exposure monitoring utilizing activated charcoal tubes may be considered based on whether or not the area sample results are at or above half of the PEL. The decision to perform the monitoring will be made by, and under the control of, the CHSD.

Below are monitoring action levels for Site-specific chemicals of concern. In the event PID readings above the thresholds identified below are sustained for 5 minutes in the breathing zone, worker protection will require upgrading following notification to the OHSM and applicable parties.

8.6.1 Action Levels for Air Monitoring

As stated above, VOCs are not an anticipated site hazard at this time. In the event additional investigation identifies VOC contamination, the following procedures will be followed.

The action levels to initiate testing with colorimetric tubes for airborne volatiles is 1 ppm (PID reading) and is based on the Permissible Exposure Limit ("PEL") for benzene (1 ppm). The colorimetric tubes are used to confirm the presence or absence of specific constituents, and they do not provide a measured concentration.

PPE can remain at Level D if breathing zone VOC concentrations are less than 5 ppm. Personnel are required to evacuate the Site when breathing zone VOC readings exceed 25 ppm.

8.6.2 Air Monitoring Equipment and Calibration

A PID calibrated to an appropriate calibration mixture will be used to detect organic vapors in and around the work areas. Monitoring will be conducted in and around all work areas and at the workers breathing zone before activities commence to establish a background level, then at 15-minute intervals throughout the day. All equipment will be calibrated according to the manufacturer's recommendation. A calibration log will be maintained and will include the name of the person who performed the calibration, the date and time calibrated, and the instrument reading at the time of calibration. A manual bellows pump or equivalent with colorimetric tubes for specific compounds will be utilized to determine the course of action related to upgrading or downgrading the level of respiratory protection, as applicable.

If air monitoring data indicate safe levels of potentially harmful constituents at consistent intervals (5-minute intervals), then monitoring can be conducted less frequently (every 30 minutes). This determination will be made by the onsite SHSO. Monitoring data, including background readings and calibration records, will be documented. Work to be performed on-Site will conform to Roux's Standard Operating Procedures ("SOPs"). Conformance with these guidelines as well as the guidelines described in this HASP will aid in mitigating the physical and chemical hazards mentioned throughout this HASP.

8.7 Tailgate Safety Meetings

A designated Site worker will provide daily safety briefings (e.g., tailgate meetings) including, but not limited to, the following scenarios:

- When new operations are to be conducted;
- Whenever changes in work practices must be implemented; and

- When new conditions are identified and/or information becomes available.

Daily safety briefings shall be recorded on the Roux Daily Tailgate Health and Safety Meeting Log/Daily Site Safety Checklist, and all completed forms will become a part of the project file.

8.8 Spill Containment

Spill containment equipment and procedures should, at a minimum, meet the requirements of the facility's Spill Prevention, Control and Countermeasure Plan, if applicable. Otherwise, spill containment equipment and procedures must be considered depending on the task, including, but not limited to, chemical/product transfer points and handling.

8.8.1 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify the SHSO. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries without compromising their own safety.

8.8.2 Spill Evaluation and Response

The SHSO is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated to the extent possible. If necessary to protect nearby community members, notification of the appropriate authorities is made by the PM as appropriate. On-Site response is limited to small spills (e.g., <10 gallons); large spills require external emergency responders who will be contacted by the SHSO.

8.9 Decontamination

The decontamination section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This section also describes how residual waste from decontamination processes is disposed. The site decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants to clean areas of the site and off-site. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and can permeate PPE surfaces. Decontamination is facilitated within the CRZ at this site, if applicable.

8.9.1 Decontamination Procedures for Personnel and PPE

The following are general decontamination procedures established and implemented at this site.

1. Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the SZ only after undergoing the decontamination procedures described below in the next section.
2. Protective clothing is decontaminated, cleaned, laundered, maintained and/or replaced as needed to ensure its effectiveness.
3. PPE used at this site that requires maintenance or parts replacement is decontaminated prior to repairs, or

4. PPE used at this site is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
5. This site uses an off-site laundry for decontamination of PPE. The site has informed that facility of the hazards associated with contaminated PPE from this site.
6. The site requires and trains workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.
7. Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

8.9.2 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the EZ or CRZ are decontaminated in the CRZ prior to removal to the SZ. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure and to avoid cross-contamination and chemical incompatibilities. Extra care should be taken during decontamination procedures due to the constituents of concern being PFAS. All equipment and decontamination materials should be confirmed to be PFAS-free before use.

General Equipment Decontamination Procedures:

1. Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the SZ only after undergoing the equipment decontamination procedures.
2. Vehicles that travel regularly between the contaminated and clean areas of the site are carefully decontaminated each time they exit the EZ and the effectiveness of that decontamination is monitored to reduce the likelihood that contamination will be spread to other parts of the site.
3. Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.
4. Procedures for disposal of decontamination waste shall meet applicable local, State, and Federal regulations.

The following items may be used to decontaminate equipment (subject to consideration of the PFAS sampling SOP):

- Laboratory-supplied, PFAS-free deionized water;
- Alconox®, Liquinox®, or Citranox®;
- Polyethylene or PVC brushes;
- Acetone rinse; and
- A steam cleaner or pressure washer (heavy equipment only).

All rinse water will be collected in basins or buckets and containerized for off-Site disposal.

8.9.3 Monitoring the Effectiveness of Decontamination Procedures

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures. Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing site conditions. Visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Personnel who work in contaminated areas of the site, either the Contamination Reduction Zone ("CRZ") or the Exclusion Zone, are trained in the principles and practices of decontamination described in this section of the HASP and in related SOPs. If site procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

8.10 Confined Space Entry

Confined Space Entry will not be performed by Roux personnel at any point during this scope of work.

The following is a list of the safety requirements for confined space entry at the Site:

- **ROUX PERSONNEL ARE NOT AUTHORIZED TO ENTER AN OSHA PERMIT REQUIRED CONFINED SPACE;**
- Currently the scope of work **DOES NOT** require personnel to enter permitted confined space for this project; and
- Any changes to the field activities that may necessitate confined space entry will be reported to the Project Principal and OHSM.

Confined space is defined as any space, depression, or enclosure that:

- Has limited opening for entry and egress;
- Is large enough for and employee to enter and perform assigned work; and
- Is not intended for continuous occupancy.

A permit required confined space is one that meets the definition of a confined space and has one or more of the following characteristics:

- May contain or produce life-threatening atmospheres due to oxygen deficiency the presence of toxic, flammable, or corrosive contaminants;
- Contains a material that has the potential for engulfment;
- Has an internal configuration that may cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and
- Contains any other serious safety or health hazards.

Although Roux personnel will not perform confined space entry, it is expected that subcontractors performing cleaning and mitigation and/or remedial measures activities may be required to enter structures that are considered to be a permit required confined space. Permitting of the confined space as well as hazard mitigation for entry will be completed by the subcontractor in accordance with 29 CFR 1910.146 or 1926.1201-1213 and/or applicable local/client requirements.

8.11 Client and Site-Specific

In addition to the OSHA-specific procedures discussed above, there may be client and site-specific safety procedures that must be adhered to during the performance of remedial activities at the Site.

- Airport-specific training is required before accessing the Airport (See **Section 8.1**).
- A SIDA Badge is required for unescorted access to the AOA (See **Section 4.2.1**).
- Not all properties on Site are owned by the University. Access agreements must be obtained before entering any non-University property.

Furthermore, this HASP is expected to be supplemented with additional Airport-specific requirements to be established during pre-mobilization work.

8.12 Unusual or Significant Risks

Field activities that appear to have unusual or significant risks that cannot be adequately managed with existing risk tools such as LPS, HASPs, traffic safety plans, work permits, design and O&M practices, equipment HAZOPS or other safety tools must be referred to the CHSD to help with the assessment and management of the associated potential safety risks. Examples include the use of explosives for demolition, use of firearms to control wildlife, rappelling, demolition over water, diving, etc.

8.13 Activity-Specific Hazards

In addition to the general hazards discussed above, there are activity-specific hazards associated with each work activity planned for the Site. An activity-specific JSA has been completed for each of the activities planned for the Site. JSAs are provided in **Appendix A**. In the event that new work activities or tasks are planned, JSAs will be developed and implemented prior to performing the new activities. In the absence of a JSA, the personnel performing work must prepare a field JSA and receive clearance from a designated competent safety official prior to performing any task with significant risk. In emergency situations where time is critical, Last Minute Risk Assessments ("LMRAs") will be utilized to identify the task, associated hazards and mitigative actions to take. For lower risk activities (as deemed by the discretion of a Competent Person) where a JSA is determined to not be needed, the individual(s) conducting the activities must perform LMRAs prior to and during the work.

8.13.1 Electrical and Other Utility Assessment and Accommodations

Roux shall perform a site walk to identify any potential overhead electrical or utility lines. All applicable guidelines will be followed in the vicinity of overhead power and utility lines (see Section 8.13.3 below).

Roux has also reviewed all available Site maps showing buried utility lines to identify potential hazards; the review revealed no underground hazards are known to exist in the vicinity of the areas of the Site pertinent to this HASP. Roux will also perform a GPR survey prior to mechanical subsurface work to minimize the potential for disturbance of utility lines, USTs, or other underground anomalies during investigation work.

8.13.2 Subsurface Work

Subsurface work activities will require adherence to Roux's Corporate Subsurface Utility Clearance Management program found within **Appendix E**.

8.13.3 Heavy Equipment

Use of heavy equipment at the Site will require adherence to Roux's Corporate Heavy Equipment Exclusion Zone Management Program found within **Appendix F**. Additionally, operation of the drill rig/other heavy equipment will maintain clearances from overhead power lines in accordance with 29 CFR 1926.1408 Table A Minimum Clearance Distances provided below.

Minimum Required Clearances for Energized Overhead Power Lines

Nominal System Voltage of Power Line (K V)	Minimum Required Clearance (feet)
0-50	10
51-100	12
101-200	15
201-300	20
301-500	25
501-750	35
751-1000	45

1 kilovolt (KV) = 1,000 volts

8.13.4 Working Over or Near Water

Any activities occurring in water, over water or near water will require adherence to Roux's Corporate Working Over/Near Water Management Program found within **Appendix G**.

8.14 Traffic Control

If Site operations encroach upon public streets or highways and a hazard exists to Site personnel because of traffic conditions, a traffic control plan will be implemented in accordance with the United States Department of Transportation's ("DOT's") "Manual on Uniform Traffic Control Devices."

8.15 Sanitation

Sanitation facilities will be provided in accordance with the sanitation standards (29 CFR 1910.141, 29 CFR 1926.51 and 29 CFR 1928.110). Sanitation facilities will be maintained and kept in good conditions at all times.

9. Field Team Review

Each person performing work at or visiting this site shall sign this section after site-specific training is completed and before being permitted to access the CRZ or Exclusion Zone.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provision contained therein.

Site/Project: The Pennsylvania State University

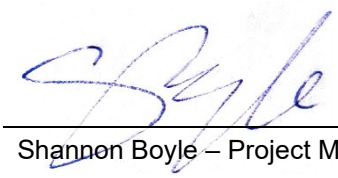
Name & Company	Signature	Date

10. Approvals

By their signature, the undersigned certify that this HASP is approved and will be utilized at the Pennsylvania State University Site.

Juliana Alderfer – Site Health and Safety Officer — 11/04/2025 Date

Rafhael Gandolff – Office Health and Safety Manager — 11/04/2025 Date



Shannon Boyle – Project Manager — 11/04/2025 Date

Peter Downham – Project Principal — 11/04/2025 Date

TABLES

1. Toxicology Properties of Hazardous Substances Present at the Site

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site.

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Per- and Polyfluoroalkyl Substances									
Perfluorooctanoic acid (PFOA)	335-67-1	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	White powder/waxy solid. BP: 377.6°F Fl.Pt. = NA LEL: NA UEL: NA
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	White powder (potassium salt). BP: 496.4-500°F Fl.Pt. = NA LEL: NA UEL: NA
Perfluorononanoic acid (PFNA)	375-95-1	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	White crystalline powder. BP: 424 °F Fl.Pt. = NA LEL: NA UEL: NA
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	Beige crystals. BP: 460.4-462.2°F Fl.Pt. = NA LEL: NA UEL: NA
Perfluoroheptanoic acid (PFHpA)	375-85-9	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	Beige crystals. BP: 347 °F Fl.Pt. = >230 °F LEL: NA UEL: NA
Perfluorobutanesulfonic acid (PFBS)	375-73-5	No Data	No Data	No Data	No Data	Inhalation, ingestion, skin and/or eye contact	Decreased fertility, high blood pressure in pregnant women, developmental effects or delays in children, increased rick of some cancers, reduced immunse system function, interference with the body's natural hormones, increased cholesterol levels.	Kidney, liver, lungs	Clear colorless liquid. BP: 410-413.6 °F Fl.Pt. = NA LEL: NA UEL: NA

References

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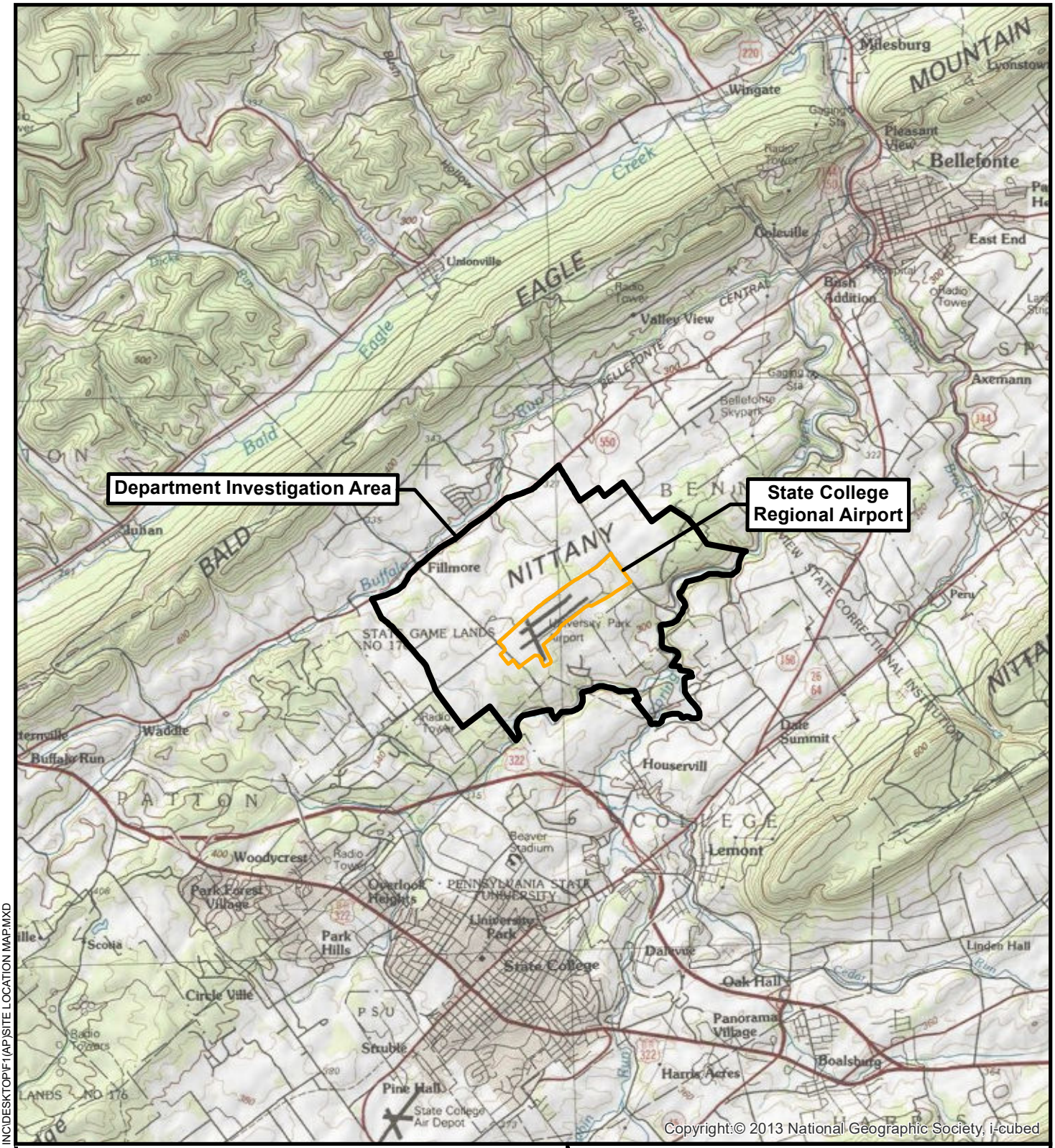
Abbreviations:

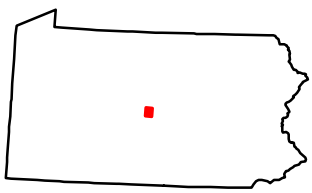
ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca – Carcinogenic.
CAS# - Chemical Abstracts Service registry number which is unique for each chemical.
DSEN - Dermal Sensitization
Ft Pt. – Flash point
IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH - National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
OTO - Ototoxicant
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million
REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
RSEN - Respiratory Sensitization
SG - Specific Gravity
STEL – ACGIH Short-term exposure limit (ST)
TLV - ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
TWA – 8-hour, time-weighted average
UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)
VP - Vapor Pressure

FIGURES

1. Site Location Map
2. Investigation Area Plan with Emergency Muster Areas
    A. Investigation Area Plan
    B. Emergency Response – Airport Muster Point
    C. Emergency Response – Walnut Grove Muster Point
    D. Emergency Response – High Tech Road Muster Point
3. Routes to Urgent Care and Hospital



QUADRANGLE LOCATION
(STATE COLLEGE)



Pennsylvania

NOTES
EASTING (X): 1941671.68
NORTHING (Y): 250114.97

BASEMAP SOURCE:
USA TOPO MAPS (ESRI).

N

8,000 0 8,000'

Title:

SITE LOCATION MAP

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 02/03/25
Prepared by: D.S.M.	Scale: AS SHOWN
Project Mgr: H.E.K.	Project: 4470.0001J000
File: F1(AP)	

FIGURE 1

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F1(AP)SITE LOCATION MAP.MXD

Benner Twp

PattonTwp

CollegeTwp

Buffalo Run

Buffalo Run Tributary

Spring Creek

Spring Creek Tributary

Big Hollow Creek

Big Hollow Creek Tributary

Rock

Barns

High Tech

Filmore

Bernel

Fox Hill

Minuteman

Fox Hollow

Big Hollow

I99

LEGEND

- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

2,400 0 2,400'

Title:

INVESTIGATION AREA PLAN

STATE COLLEGE, PA

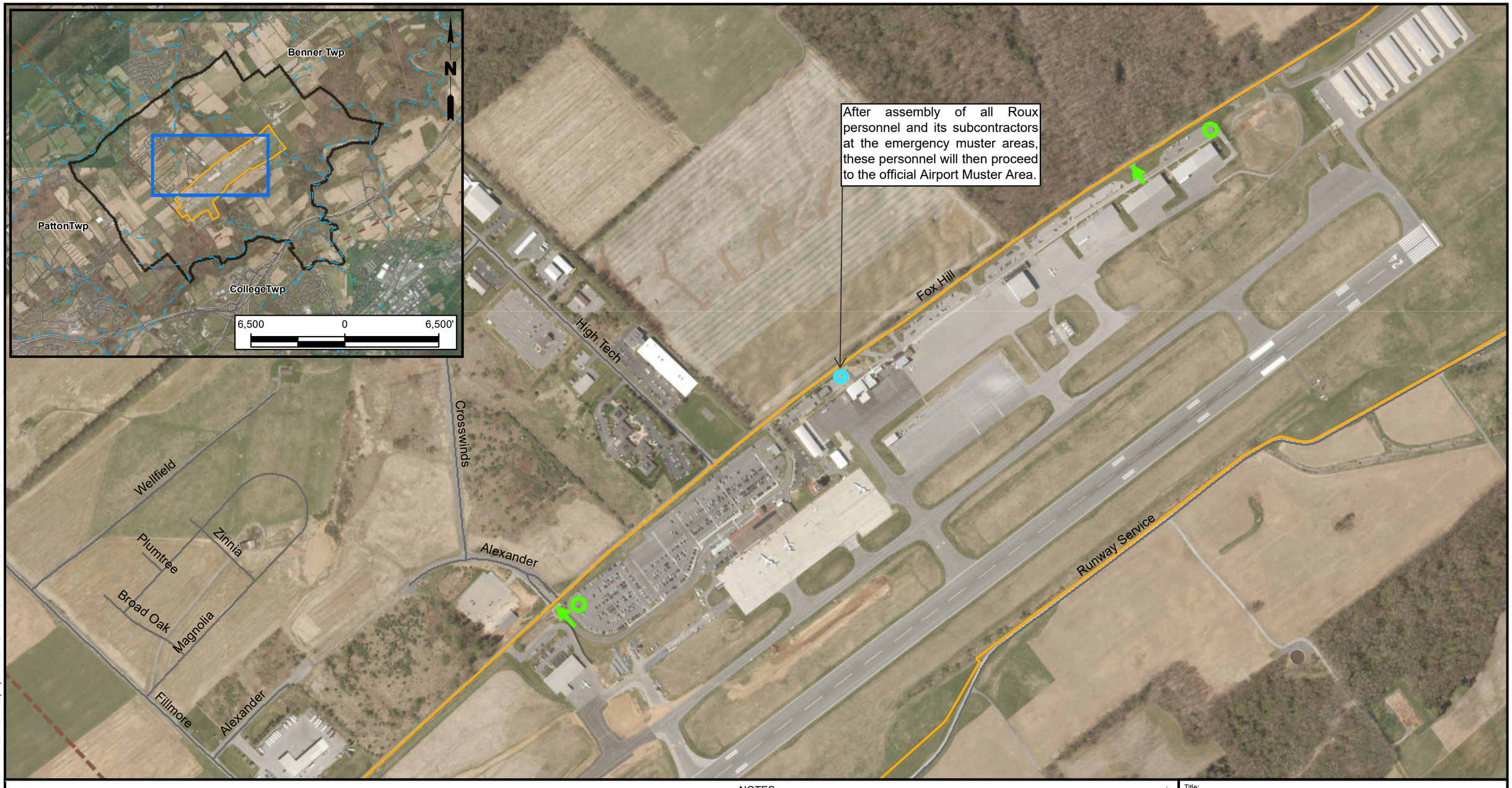
Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	2A
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F2(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F2A(BL)INVESTIGATIONAREA PLAN.MXD



C:\USERS\DMART\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F2B(BL)\EMERGENCY RESPONSE – AIRPORT PROPERTY MUSTER POINT - NEW.MXD

LEGEND

- Emergency Muster Point
- Entry/Exit Point
- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)
- Airport Muster Area

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

500 0 500'

Title:

EMERGENCY RESPONSE – AIRPORT PROPERTY MUSTER POINT

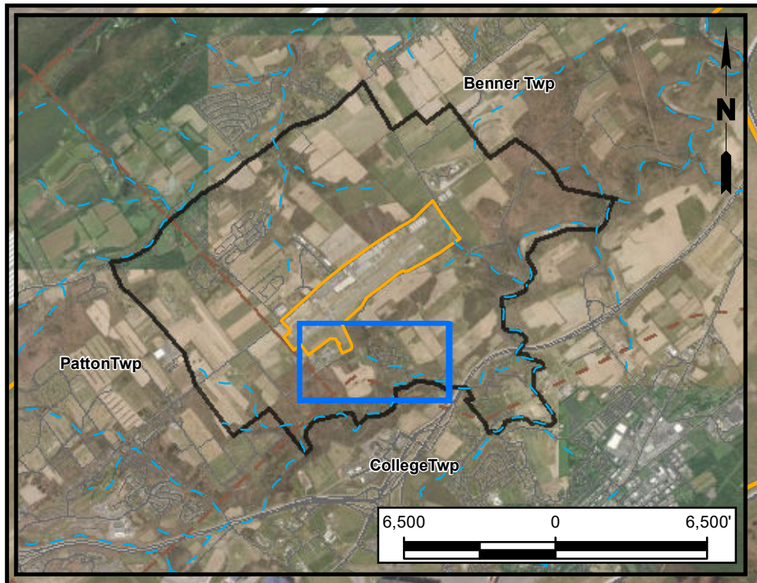
STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	2B
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F2B(BL)		



Runway Service

Majestic View

Millson

Walnut Grove

Minuteman

Big Hollow

Quick Farm

LEGEND

- Emergency Muster Point
- Entry/Exit Point
- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

400 0 400'

Title:

EMERGENCY RESPONSE – WALNUT GROVE MUSTER POINT

STATE COLLEGE, PA

Prepared for:

THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	2C
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F2C(BL)		

C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F2C(BL)EMERGENCY RESPONSE – WALNUT GROVE MUSTER POINT_NEW.MXD

LEGEND

- Emergency Muster Point
- Entry/Exit Point
- Road Centerlines
- Stream Centerlines
- Municipal Boundary Lines
- State College Regional Airport
- Benner Twp PFAS Investigation Area (Exhibit A of November 13, 2024 COA)

NOTES

1. Layer sources: World Imagery (ESRI), Benner Twp PFAS Investigation Area (Exhibit A: Benner Twp PFAS Investigation Area), Municipal Boundaries and Road Centerlines (Centre County GIS), State College Regional Airport (ESRI), Stream Centerlines (PSU).
2. PFAS = Per- and Polyfluoroalkyl Substances.
3. COA = Consent Order and Agreement.

N

230 0 230'

Title:

EMERGENCY RESPONSE – HIGH TECH ROAD MUSTER POINT

STATE COLLEGE, PA

Prepared for:

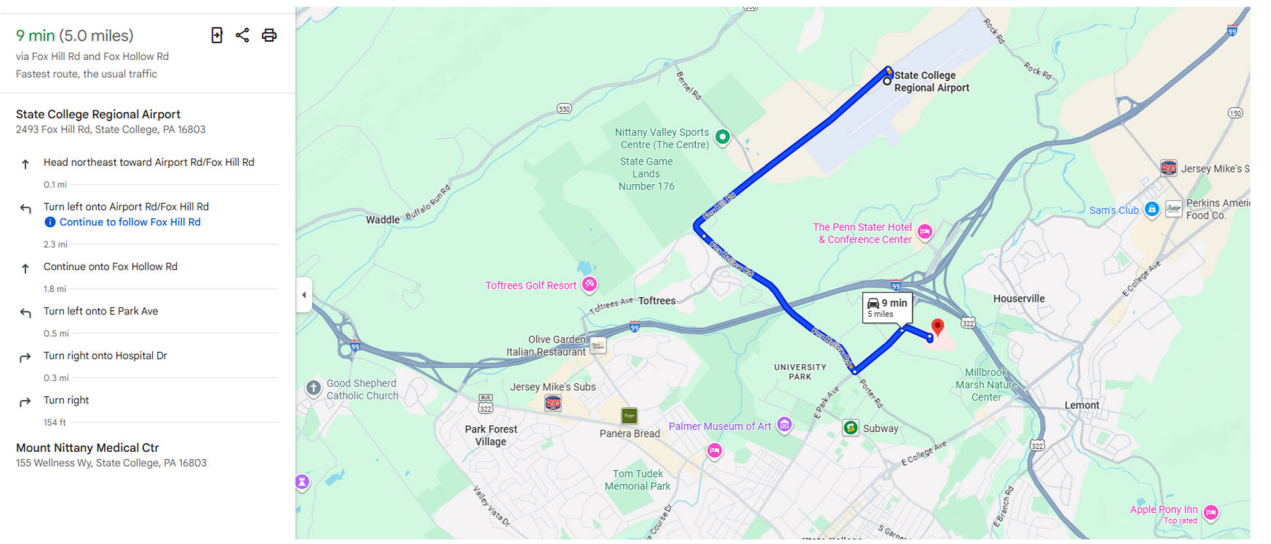
THE PENNSYLVANIA STATE UNIVERSITY

ROUX

Compiled by: J.A.	Date: 11/19/25	FIGURE
Prepared by: D.S.M.	Scale: AS SHOWN	2D
Project Mgr: H.E.K.	Project: 4470.0001J000	
File: F2D(BL)		

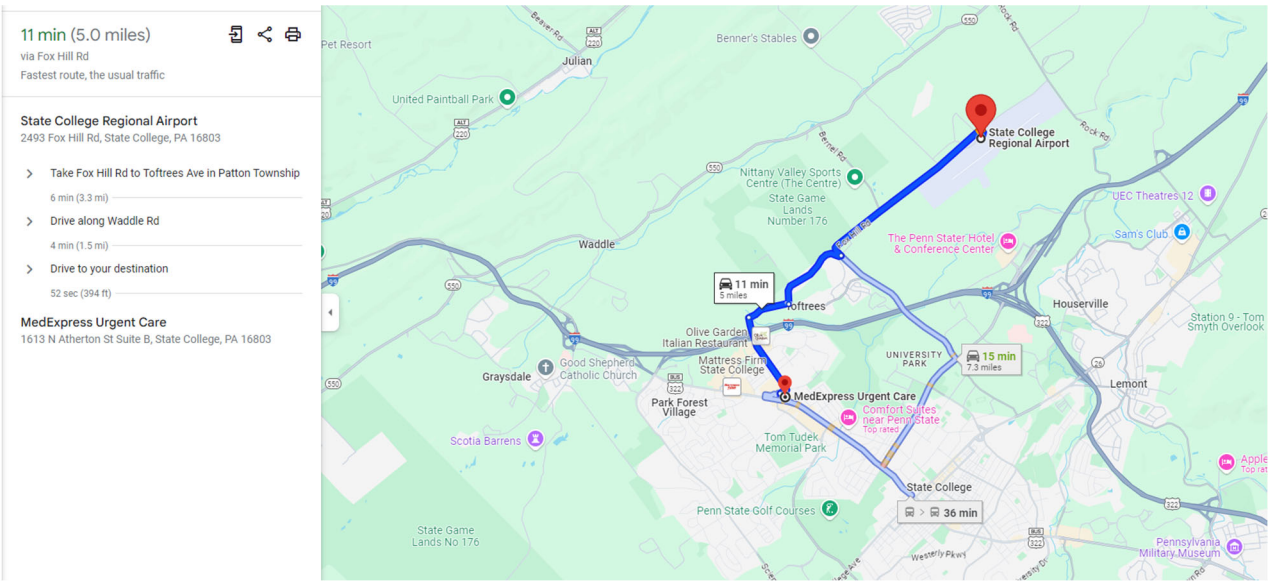
C:\USERS\DMARTIN\ONEDRIVE - ROUX ASSOCIATES INC\DESKTOP\F2D(BL)EMERGENCY RESPONSE – HIGH TECH ROAD MUSTER POINT_NEW.MXD

Route to Mount Nittany Medical Center: 1800 E Park Ave, State College, PA 16803
Hours of Operation: 24 hours
Phone Number: 814-231-7000
Confirmed: August 29, 2025



Route to MedExpress Urgent Care: 1613 N Atherton St Suite B, State College, PA 16803

Hours of Operation: 8am – 8pm (7 days/week)
Phone Number: 814-238-1066
Confirmed: August 29, 2025



APPENDICES

A. Job Safety Analysis (“JSA”) Forms
B. Safety Data Sheets (“SDSs”) for Chemicals Used
C. Heat Illness Prevention Program
D. Personal Protective Equipment (“PPE”) Management Program
E. Subsurface Utility Clearance Management Program
F. Heavy Equipment Exclusion Zone Policy
G. Working Over/Near Water Management Program

APPENDIX A

Job Safety Analysis ("JSA") Forms

JOB SAFETY ANALYSIS	Ctrl. No. GEN-006	DATE 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
Generic	**Drilling**	**Direct Push Soil Borings / Well Installation**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel-toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free Fluorescent reflective vest or high visibility clothing, long-sleeved shirt	☒ GLOVES: Nitrile and cut-resistant ☒ OTHER: PFAS-free Insect Repellant, PFAS-free sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Geoprobe or Truck-Mounted Direct Push Drill Rig, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Macrocore liners, Liner Opening Tool, 20 lb. Type ABC Fire Extinguisher, 42" Cones & traffic control paddles, "Work Area" Signs, PFAS-free Water.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

PSU AIRPORT-SPECIFIC COMMITMENT TO SAFETY AND SECURITY – The State College Regional Airport ("SCRA") has specific safety and security protocols that must be integrated with and/or may supersede certain provisions herein. The SCRA-specific protocols may be found in an airport-specific JSA to be prepared during pre-mobilization training. This JSA will be subject to review and comment by SCRA personnel.

EXCLUSION ZONE (EZ): Maintain a Minimum Heavy Equipment Exclusion Zone around equipment and loads while in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, the tip zone of the equipment, the fall zone of the equipment, and the contents.

"SHOW ME YOUR HANDS"
The driller and helper should show that their hands are clear of controls and moving parts.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization of drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed)	**1a. CONTACT:** Equipment/property damage.	1a. The drill rig's tower/derrick will be lowered and secured before mobilization. 1a. A spotter should be utilized while moving the drill rig. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. Use a spotter for all required backing operations. 1a. Set up the work area and position equipment to eliminate or reduce the need for backing support trucks and trailers. 1a. When backing up the truck rig with an attached trailer, use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility.
Secure Work Zone		1a. Inspect the driving path for uneven terrain. Level or avoid if needed. 1a. Ensure the work area is secure and inform others of work activity. Establish a HEEZ using traffic cones, barrels & snow fencing or telescoping poles. Use flag persons to maintain clear traffic and minimize motorist confusion during set-up. HEEZ is to include the tip/swing radius of the equipment.
	1b. FALL: Slip/trip/fall hazards.	1b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions before mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
	1c. CONTACT: Crushing from a rollover.	1c Geoprobe should cross all hills/obstructions head-on with the mast down to reduce the risk of rollover.
2. Raising the tower/derrick of the drill rig	**2a. CONTACT:** Overhead hazards.	2a. Before raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures that could come in contact with the rig's tower and/or drilling rods or tools. 2a. Maintain a minimum safe distance of 10' from overhead lines, material, or structures.
	2b. CONTACT: Pinch Points/Amputation Points when raising the rig, and the instability of the rig	2b. Inspect the equipment before use and avoid pinch/amputation points. 2b. Lower outriggers to ensure stability before raising the rig tower/derrick. 2b. If the rig needs to be mounted, use three points of contact.
3. Advancement of drilling equipment and sound installation	**3a. CONTACT:** Flying debris	3a. Be aware of and avoid potential line-of-fire hazards and wear required PPE such as eye, ear, and hand protection.
	3b. EXPOSURE: PFAS, Noise, and dust.	3b. Wet borehole area with a sprayer using PFAS-free water to minimize dust. 3b. Stand upwind and keep your body away from the rig. 3b. If conditions warrant, a disposable dust mask (e.g., N95/P100) should be worn. 3b. Wear hearing protection when the drill rig is in operation.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Advancement of drilling equipment and well installation (Continued)	**3c. FALL:** Slip/trip/fall hazards.	3c. Contain drill cuttings and drilling water to prevent fall hazards from developing in the work area. 3c. See 1b.
	3d. CAUGHT: Limb/extremity pinching; abrasion/crushing.	3d. Ensure all Emergency Safety Stop buttons function properly. 3d. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 3d. Inspect the equipment prior to use for potential pinch/amputation points. Keep hands away from pinch/amputation points, and the use of tools is preferable compared to fingers and hands. 3d. Inspect the drill head for worn surface or missing teeth; replace it if damaged or blunt. 3d. Ensure all jewelry is removed, loose clothing is secured, and PPE is correctly fitted and secured close to the body. 3d. All non-essential personnel should stay away from the immediate work area; position the body out of the line-of-fire of equipment. 3d. Drillers and helpers will understand and use the “Show Me Your Hands” Policy. 3d. Spinning rods/casing have an **exclusion zone of 24 inches** while in operation.
	3e. CONTACT: Equipment imbalance during the advancement of drill equipment.	3e. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3e. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3e. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone**).
	3f. EXPOSURE: PFAS, Inhalation of contamination/vapors.	3f. Monitor ambient air for dangerous conditions using a calibrated photoionization detector (PID) to monitor the breathing zone of the work area. 3f. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings, and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site-specific health and safety plan. 3f. Use a multi-gas meter to monitor ambient air for dangerous conditions (i.e., unsafe levels of carbon monoxide when drilling indoors or the presence of explosive vapors). 3f. Eliminate all visible dust with the use of misting and sprayer using PFAS-free water.
	3g. EXERTION: Potential for muscle strain/injury while lifting and installing well casings, lifting sand bags, and/or lifting rods.	3g. Keep your back straight and bend at the knees. 3g. Utilize team lifting or mechanical means for objects over 40 lbs. 3g. Use a mechanical lifting device for odd-shaped objects.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

4. Remove the sample liner.	**4a. EXERTION:** Potential for muscle strain/injury while removing the liner from the probe rod.	4a Utilize team lifting or mechanical means for objects over 40 lbs. 4a. Use the hydraulic liner extruder if available.
	4b. CONTACT: Pinch points and cuts	4b. Place the liner on the sturdy surface when opening. 4b. Don cut-resistant gloves and use an appropriate liner cutter when opening liners. 4b. Always cut away from the body.
	4c. EXPOSURE: Inhalation and/or dermal contact with contaminants (i.e., PFAS).	4c. Wear chemical-resistant disposable gloves (i.e., powder-free nitriles) when handling liners. 4c. See 3f.
Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
5. Decontaminate equipment.	**5a. EXPOSURE/CONTACT**: To contamination (e.g., PFAS, Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors).	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Disposable chemical resistant coveralls and splash-proof face shields will be donned to prevent dermal exposure during any activities with potential for sprays or splashes to the arms, face, and or body. 5a. Contain decontamination water so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Spray equipment from a side angle, not straight on, to avoid backsplash. 5a. See 3b and 3f.
	5b. EXPOSURE: The chemicals in the cleaning solution.	5b. See 4a. Review the SDS to ensure appropriate precautions are taken and understood.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-007	DATE 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 2
JSA TYPE CATEGORY **GENERIC**	WORK TYPE **General Site Activity**	WORK ACTIVITY (Description) **Driving**		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather/ cut-resistant level 2
☒ HARD HAT: when outside vehicle	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER _____
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: high visibility vest, when outside vehicle	
☒ SAFETY GLASSES: when outside vehicle	☒ SAFETY TOE BOOTS: when outside vehicle		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Motor Vehicle (i.e. car, truck, SUV)

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

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EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Driving to/leaving Site	**1a. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc. *Common factors that may lead to CONTACT incident, but not limited to: • distracted driving (cell phone, GPS, radio, billboards, "rubber necking") • lack of situational awareness • unfamiliarity with traffic patterns/road layout • weather conditions (wet/icy roads, hydroplaning, black ice) • weariness • high speeds • obstructed vision (solar glare, debris on windshield, blind spots, large vehicle at the front) • changes in travel pathway (construction, snow banks, non-operational signals, potholes, detours, special events) • improper vehicle maintenance (non-operational signal light, worn tires, cracked windshield, ineffective wipers) • loose or unsecure objects	1a. PLAN AHEAD – review/make yourself familiar with maps and driving directions before beginning the drive to the Site. Do not attempt to drive and review maps/directions at the same time. Pull over and stop your vehicle before looking at maps/directions. 1a. Complete a basic vehicle inspection before driving. Verify Inspection and Registration are current, tires and wipers are in good condition, all lights are functional, all glass/mirrors are undamaged, the horn is functional, roof/hood/trunk are free from accumulated snow and visibility is not impaired due to snow/ice/frost/fog on windows. 1a. Do not hang items in car that can obstruct your view or become projectiles in a collision. 1a. Do not get distracted using touch screen radios or GPS units built into newer models. Keep your eyes on the road and stay alert. 1a. Follow posted speed limits and obey traffic signals and roadway signs. 1a. Always wear your seat belt and shoulder harness when driving. 1a. When driving around large vehicles and trucks, maintain extra space as these vehicles may not be able to see a smaller car too close. 1a. Follow the "Rules of the Road" including: using your turn signals, coming to a complete stop, and allowing vehicles the right of way (yield) when they are when traffic laws require. 1a. Apply the Smith Five Keys® of safe driving • Aim High in Steering® - Expand eye lead time to a minimum of 15 seconds • Get the Big Picture® - Maintain proper a 4 second minimum following distance at all times - Scan mirrors every 5-8 seconds to achieve a circle of awareness - Position your vehicle so you can see relevant/non-relevant objects • Keep Your Eyes Moving® - Try to maintain about 180 degrees of visibility - Avoid blank and fixed stares. Avoid focusing on one object for more than 2 seconds • Leave Yourself an Out® - Avoid traveling in traffic clusters - Surround yourself with space - Anticipate the actions of others

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Driving to/leaving Site (cont'd)	**1a. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc.	• Make Sure They See You® - Maintain eye contact with on-coming vehicles/pedestrians - Use warning devices (e.g., hand signals, high-lights, horns etc.) - Proper timing is essential 1a. Do not perform reconnaissance or inspections while driving. Your vehicle should be parked in a safe location when viewing or surveying the Site and vicinity 1a. Avoid sudden turns and stops. Don't drive recklessly – be in control of vehicle at all times. 1a. In inclement weather, first determine if work can be POSTPONED. Otherwise, plan according to weather conditions including checking forecast along entirety of travel route (especially, for long distances). Reduce speed as road conditions warrant. Travelling with winter car equipment in the winter is strongly recommended (i.e., shovel, scraper, brush, blanket, extra clothing, flashlight, bag of sand). If your vehicle has 4-wheel drive, review the operators manual and understand operating procedure prior to engaging 4-wheel drive. If at any point on your drive weather becomes too severe to proceed safely pull over if safe to do so or seek nearest cover (e.g., overpass) 1a. If feeling drowsy or sleepy, do not drive. Pull over in a safe place to rest if you experience any signs of drowsiness. Make sure to get adequate sleep the night before an early drive. 1a. Never operate a vehicle under the influence of alcohol or illegal substances or medications affecting your performance. 1a. Keep your eyes on the road. Do not call or talk on cellular phones. Pull over to a safe location if you must answer or make a call. 1a. When parking, pull-through when possible. If backing is required visually inspect area to ensure it is free from obstructions prior to backing in and relying solely on mirrors; use spotters when available.
2. Entering/Exiting Vehicle.	**2a. CAUGHT:** Personal injury (broken fingers/hand) while entering or exiting vehicles **2b. FALL:** Personal injury (twisted ankle, deep contusion, concussion, broken wrist/arm, etc.) from slip/fall on uneven or unstable or slippery surface while exiting/entering vehicle **2c. CONTACT:** Severe injury/disability, property damage, monetary loss (insurance premiums, deductibles, loss of license/job) caused by collision with or struck by other vehicles, obstructions, pedestrians, animals, etc.	2a. Open and close doors slowly. Never put hands or feet in between door and vehicle to avoid pinch points. 2b. When exiting the vehicle make sure your feet are on firm footing and weight is evenly distributed before exiting/standing. In inclement weather use hands to support yourself, by holding the car door and/or steering wheel, when exiting the vehicle. 2c. Check both directions for traffic before opening door. Do not exit vehicle if traffic does not permit you to exit safely 2c. Check anticipated path of door prior to opening, do not open door into any obstructions (e.g., bollards, high curbing)

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-009	DATE: 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 1
JSA TYPE CATEGORY **Generic**	WORK TYPE **O&M**	WORK ACTIVITY (Description) **Movement of 55-Gallon Drums/Drum Handling with Mobile Carrier**		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut-resistant gloves level II
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER:
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent long-sleeve shirt or shirt and reflective safety vest.	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel or composite toe		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Mobile Drum Carrier, over-pack drum container, safety cones, and caution tape

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

PSU AIRPORT-SPECIFIC COMMITMENT TO SAFETY AND SECURITY – The State College Regional Airport ("SCRA") has specific safety and security protocols that must be integrated with and/or may supersede certain provisions herein. The SCRA-specific protocols may be found in an airport-specific JSA to be prepared during pre-mobilization training. This JSA will be subject to review and comment by SCRA personnel.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Preparing for an Inspection of the Drum	**1a. FALL:** Tripping/falling due to uneven surface. Loose debris/garbage in the work area.	1a. Clear the area of loose garbage and debris. Inspect 55-gal drums for proper condition, labeling, check drum ring and bolts for tightness, and inspect mobile drum carrier. 1a. Do a Test Lift to get a general sense of the weight of the drum. 1a. Inspect and use established pathways to avoid uneven terrain, weather-related hazards (i.e., debris, puddles, ice, etc.), and other obstructions. 1a. Secure a work area and coordinate and communicate the planned work activities with other personnel working in the area. 1a. Delineate work area with safety cones and caution tape
	1b. CONTACT/EXPOSURE: Drums could potentially be damaged or contain hazardous material. A mobile drum carrier could potentially be in poor working condition, causing malfunctioning during operation.	1b. Prior to inspecting drums, don cut-resistant gloves. If the drum is not properly labeled, do not open it and cease all drum transport activities. Immediately contact the project manager and inform him/her of the drum situation. 1b. Do not continue drum transport activities until the project manager determines further actions. 1b. If the drum is properly labeled, but leaking, improperly sealed, or in poor condition, place the drum in an overpack drum. 1b. Inspect the mobile drum carrier to ensure its overall integrity. Look for rust marks or potential weak points where the drum carrier could malfunction. Inspect the wheels to ensure that they easily turn and nothing is impeding their movement.
	1c. EXERTION/CAUGHT: Potential pinching/exertion hazards while securing the ring/ tightening bolts	1c. Keep back straight and knees slightly bent while securing the drum ring/tightening bolt. Wear cut-resistant gloves.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

2. Position the drum clamp tightly in between the drum ribs, securing the drum clamp to the drum with the chain	**2a. CAUGHT:** Pinching fingers between the drum clamp and the handle/chain.	2a. Attach drum clamp with chain and tighten until snug. Do not place hands between the drum clamp and the drum as the chain is tightened; wear cut-resistant gloves. Keep face away from the drum when handling in case of escaping vapors.
Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
3. Disengage safety latches on handle, pull handle down until drum is lifted off the ground, and safety latches are reengaged; slightly suspend drum off the ground	**3a. EXERTION/ CONTACT:** Potential muscle strain associated with lifting/engaging the drum/handle. The drum could shift/slip downward and crush toes.	3a. Ascertain whether the drum is overweight; if it is, then two people are needed to lower the handle while the drum is secured with the clamp so that safety latches can be engaged. Keep body out of the line-of-fire of the handle (do not position the head above the handle) as it is being pushed down. Do not allow feet/toes to be positioned under the drum as it is being lifted; wear steel/composite-toed boots.
	3b. CAUGHT: Fingers could be pinched while engaging/disengaging the safety latches on the handle	3b. Wear cut-resistant gloves while disengaging/reengaging safety latches. 3b. Avoid placing hands in pinch points.
4. Transport drums to the designated location and disengage the drum clamp (repeat Step 3 in reverse order)	**4a. FALL:** Tripping/ falling due to obstructions and uneven terrain. Potential for the drum to fall during transport.	4a. Ensure the transport path is free of potential obstructions that may cause the drum/carrier to become unstable. Position the drum clamp between the ribs on the drum to prevent possible slipping.

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JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Surveying**	**Elevation Surveying**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut-resistant or leather
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER:
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel-toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Surveying equipment (i.e., leveling rod/measuring ruler, tripod and auto level).

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site manager/ property owner.	**1a. CONTACT/EXPOSURE/FALL:** Lack of communication could result in H&S incident.	1a. Inform Site personnel of work scope, timeline and location(s). 1a. Inquire about other activities taking place at the Site. 1a. If applicable, obtain General Work permit for the day.
2. Locate surveying position for instrument and rod and set-up work area	**2a. FALL:** Slip/trip hazards	2a. Inspect area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.) and obstructions prior to setting up at the survey location. Keep eyes engaged with walking surface while in movement. Remember "Walking is Working." 2a. Conduct housekeeping and maintain clear paths to walk in and remove debris as required.
	2b. CONTACT: Traffic (surveying locations could potentially be in parking areas and sidewalks)	2b. Be aware of oncoming traffic. Utilize a flagman / spotter for locations in streets or high-traffic areas. 2b. Place Traffic cones around the work area and delineate work zone with caution tape, snow fencing or safety bars, if necessary. 2b. Wear appropriate PPE including high visibility clothing and reflective safety vest when exposed to traffic and vehicles. 2b. Face traffic, maintain eye contact with oncoming vehicles and establish a safe exit route.
	2c. OVEREXERTION: Hazard due to carrying, lifting, and bending while transporting equipment	2c. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2c. Avoid carrying too much equipment at one time and team-lift equipment that is heavier than 50 lb.
	2d. CAUGHT/CONTACT: Pinch Points / sharp edges associated with setting up the tripod	2d. Wear cut resistant gloves when handling the tripod and keep fingers away from pinch points located near moving parts of the tripod. Do not carry tripod by the pointed ends.
	2e. OVEREXERTION: Hazard due to bending awkwardly to look through the autolevel	2e. When practical, set the height of the auto level optic so as to minimize bending at the waist.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Open / close manhole cover to well that is being surveyed (if necessary).	**3a. OVEREXERTION:** Muscle strain	3a. See 2c. Bend knees when reaching to open well. Use manhole lifting hook or pry bar to avoid bending.
	3b. CAUGHT: Pinch points associated with removing / replacing manholes and working with hand tools	3b. Wear leather gloves or cut resistant gloves when working with well cover and hand tools. 3b. Use proper tools (ratchet and crowbar, pry bar or magnet for well cover) and inspect before use. 3b. Do not put fingers under well cover.
	3c. EXPOSURE: To potentially hazardous vapors To biological hazards	3c. No open flames/heat sources. 3c. To minimize exposure to vapors, allow well to vent after opening it and before survey activities begin. 3c. Work on the upwind side of manhole/well. 3.c Use caution while opening lids to inspect work area for bees and insects inside of covers. 3c. Use PFAS-free insect/tick repellent, as necessary.
	3d. CONTACT: With traffic	3d. See 2b.
4. Perform survey.	**4a. FALL:** Slip/trip hazards	4a. See 2a.
	4b. CONTACT: Traffic (surveying locations could be potentially located in parking areas and sidewalks)	4b. See 2b. 4b. Personnel using the scope will be devoting most of their attention to the surveying activity and shall be aware of vehicular and pedestrian traffic. Personnel holding the measuring stick should be extra vigilant of survey personnel and communicate any potential hazards to the instrument person via handheld radio or similar means. Ensure reflective safety vest is worn.
	4c. ENERGY SOURCES: Electrical shock from survey rod striking overhead electric lines or lights	4c. Prior to raising and extending the survey rod, personnel should thoroughly inspect the area above the measuring point. If overhead electrical lines are encountered within 10 feet of the measuring rod tip ; stop work and consult with the Office Health and Safety Officer.
5. Break down work area.	**5a. CONTACT:** Traffic (surveying locations can potentially be in parking areas and sidewalks)	5a. See 2b.
	5b. EXERTION: Hazard due to carrying, lifting, and bending while transporting equipment	5b. See 2c.
	5c. CONTACT: Personal injury or equipment damage by striking surroundings with an extended rod or unsecured tripod leg	5c. Ensure rod is entirely collapsed prior to mobilization / demobilization between survey points. 5c. Ensure tripod legs are fully collapsed and secured with strap prior to mobilization / demobilization between set-ups.

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JSA TYPE CATEGORY	WORK TYPE:	WORK ACTIVITY (Description):
Generic	**Gauging and Sampling**	**Gauging and Sampling**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☒ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Composite-toed or steel-toed boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free Fluorescent reflective vest or high visibility clothing	☒ GLOVES: , Nitrile and cut-resistant level II ☒ OTHER: Knee pads, PFAS-free Insect Repellant, PFAS-free sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Traffic Safety Cones, Caution Tape, Interface Probe with Ground Clamp, and/or Water Level Meter, 20-lb. type ABC Fire Extinguisher, Buckets. Tools as needed: Socket Wrench, Screw Driver, Crow Bar, Mallet, and Wire Brush.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization to monitoring well(s).	**1a. FALL:** Personal injury from slip/trip/fall due to uneven terrain and/or obstructions.	1a. Inspect the pathway and plan for the most suitable designated pathway prior to mobilization. 1a. Use established pathways, walk and/or drive on stable, secure ground, and avoid steep hills or uneven terrain. 1a. If working near open water with an unguarded edge, wear a personal flotation device (PFD).
	1b. CONTACT: With traffic/third parties.	1b. Identify potential traffic sources and delineate the work area with traffic safety cones. Position the vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area if necessary. 1b. Wear appropriate PPE, including high visibility clothing and reflective vest, when exposed to traffic 1b. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
	1c. EXERTION: Muscle strain from lifting equipment	1c. Use proper lifting techniques when handling/moving equipment; bend knees and keep back straight. 1c. Use mechanical assistance or team lifting techniques when equipment is 40 lbs. or heavier. 1c. Make multiple trips to carry equipment.
	1d. EXPOSURE: To biological hazards.	1d. Inspect work area for bees and insects. 1d. Use PFAS-free insect/tick repellent, as necessary.
2. Open/close well.	**2a. EXERTION:** Muscle strain.	2a. Use proper lifting techniques; keep back straight, lift with legs, and bend knees when reaching to open/close the well.
	2b. CAUGHT: Pinch/crush points associated with removing/replacing manholes and working with hand tools.	2b. Wear cut-resistant level II gloves when working with well cover and hand tools. 2b. Use proper tools (ratchet and pry bar or magnet for well cover) and inspect before use. 2b. Do not put fingers under the well cover.
	2c. CAUGHT: Pinch points associated with placing the J-plug back onto the PVC pipe.	2c. See 2b. 2c. Keep fingers out of line-of-fire when securing cap.
	2d. EXPOSURE: To potential hazardous vapors	2d. No open flames/heat sources. 2d. To minimize exposure to vapors, allow the well to vent after opening it and before sampling activities begin. 2d. Stand upwind if possible, to avoid inhaling vapors. 2d. Monitor atmosphere with multi-gas meter/PID.
3. Gauge well.	**3a. CONTACT:** With contamination (e.g., PFAS-contaminated groundwater).	3a. Wear chemical-resistant disposable gloves (over cut-resistant gloves) and safety glasses when gauging well. Disposable nitrile gloves will be removed and disposed of prior to contacting other surfaces including field books, mobile phones, food, and drinks. 3a. Insert and remove the probe slowly to avoid splashing. 3a. Use an absorbent pad to clean probe.

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	3b. CONTACT: With traffic.	3b. See 1b.
	3c. Exposure: To static electricity, fire, or explosion.	3c. Ground interface probe to a designated grounding point/rod, well casing, or electrically conductive surface to dissipate static electricity.
Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
4. Purge and sample well	**4a. EXPOSURE/CONTACT:** To contamination (e.g., PFAS, SPH, contaminated groundwater, vapors) and/or sample preservatives.	4a. Open and fill sample jars slowly to avoid splashing and contact with preservatives. 4a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling. Disposable nitrile gloves will be removed and disposed of prior to contacting other surfaces including field books, mobile phones, food, and drinks. 4a. Fill sample containers over the purge container to avoid spilling water onto the ground. 4a. Use an absorbent pad to clean spills. 4a. When using a bailer to purge a well, pull the bailer slowly from the well to avoid splash hazards. 4a. When sampling or purging the water using a bailer, pour water slowly to reduce the potential for splash hazards with groundwater. 4a. When using a tubing valve, always remove the valve slowly after sample collection to release any pressure and avoid pressurized splash hazards. 4a. When collecting a groundwater sample, always point the sampling apparatus (tubing, bailer, etc.) away from the face and body.
	4b. CONTACT: Personal injury from cuts, abrasions, or punctures by glassware or sharp objects.	4b. To avoid spills or breakage, place sampleware on an even surface. 4b. Do not over-tighten caps on glass sampleware. 4b. Wear chemical-resistant nitrile disposable gloves over cut-resistant (i.e., Kevlar) gloves when sampling and handling glassware or when using approved cutting tools.
	4c. EXERTION: Muscle strain while carrying equipment.	4c. Use proper lifting techniques when handling/moving equipment, bend knees, and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 40 lbs. or heavier. 4c. Make multiple trips to carry equipment.
	4d. CONTACT: With traffic.	4d. See 1b.
	4e. CONTACT: Pinch points with groundwater pump components (i.e., wheel, line, clamps).	4e. Wear cut-resistant gloves when working with groundwater pumps. 4e. Never place hands on or near pinch points such as the wheel, clamps, or other moving parts during pump operations. 4e. Use the correct mechanisms, such as a pump reel, to lower the pump into the well. 4e. Never attempt to manually stop any moving part of equipment, including hose reels and/or tubing.
	4f. EXERTION: Muscle strain from repetitive motion of bailing and sampling a well.	4f. See 4c. 4f. Include a stretch break when repetitive motions are part of the task.
5. Management of purge water.	**5a. EXPOSURE/CONTACT:** To contamination (e.g., PFAS, SPH, contaminated groundwater, vapors). **5b. EXERTION:** Muscle strain from lifting/carrying, and moving containers.	5a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling. Disposable nitrile gloves will be removed and disposed of prior to contacting other surfaces including field books, mobile phones, food, and drinks. 5a. Do not overfill the container, and pour liquids slowly so that they do not splash. 5a. Properly dispose of used materials/PPE in an appropriate container in the designated storage area. 5b. Use proper lifting techniques when lifting/carrying or moving container(s) (see 4c.). 5b. Do not overfill container(s).
6. Decontaminate equipment.	**6a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). **6b. CAUGHT:** Pinch points associated with handling hand tools	6a. Work on the upwind side, where possible, of the decon area. 6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Use an absorbent pad to clean spills. 6b. See 2b. 6b. Inspect hand tools for sharp edges before decontaminating.

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JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
Generic	**Drilling**	**Hollow Stem Auger Soil Borings / Well Installation**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☒ GOGGLES: Spoggles required if winds exceed 15 mph. ☐ FACE SHIELD HEARING PROTECTION: (as needed). ☐ SAFETY SHOES: Steel or Composite Toe.	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free Fluorescent long-sleeve shirt or long-sleeve shirt and reflective safety vest.	☒ GLOVES: Cut-Resistant, and Nitrile. ☒ OTHER: PFAS-free Insect Repellant, PFAS-free Sunscreen (as needed).

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Drilling Rig or Track Rig, Saw, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Interface Probe, 20 lb. Type ABC Fire Extinguisher, Traffic Cones/barrels, Caution Tape & Flags, "Work Area" Signs.

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EXCLUSION ZONE (EZ): Maintain a Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, the tip zone of the equipment, the fall zone of the equipment, and the contents.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization/demobilization and establish a work area.	**1a. See Mobilization/ Demobilization JSA GEN-015.**	1a. See Mobilization / Demobilization JSA GEN-015.
2. Raising the tower/derrick of the drilling rig.	**2a. CONTACT:** Overhead hazards.	2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for overhead hazards (wires, tree limbs, piping, or other structures) that may be contacted by the rig's tower or drilling rods. 2a. The tower/derrick must not be raised beneath overhead power lines unless approved by the Roux PM. 2a. Maintain a minimum of 10' from all overhead structures. 2a. Do not move the rig while the tower/derrick is raised.
	2b. CONTACT: Amputation/crush points when raising the rig and the instability of the rig.	2b. Inspect the equipment prior to use and avoid any potential amputation points. 2b. Lower outriggers to ensure stability prior to raising the rig tower derrick. Keep feet and body out of the line of fire when lowering outriggers. 2b. Inspect the set-up location for uneven terrain. Level or avoid the area if needed. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of augers for soil boring installation.	**3a. CONTACT:** Equipment imbalance during advancement of drill equipment.	3a. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3a. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. **3a. Drillers will maintain the "Purple Zone" policy surrounding augers to ensure no personnel come into contact with augers while in use. Workers can spray paint a 3' semi-circle surrounding the augers to visually show that no personnel should enter the "Purple Zone" while drilling activities are being conducted.** 3a. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (minimum exclusion zone of 20 feet).
	3b. CONTACT: Flying/spraying debris.	3b. Wear all required PPE (especially hand, eye, and ear protection). 3b. Maintain minimum EZ distance (i.e., swing/tip radius of rig) when rig is in operation to avoid potential line of fire hazards from flying materials or debris.
	3c. CAUGHT: Limb/extremity amputation, abrasion, and	3c. Inspect the equipment prior to use for potential pinch points. 3c. Test all emergency shutdown devices prior to drilling.

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	crushing.	3c. Inspect the drill head for worn surface or missing teeth; replace it if damaged or blunt. 3c. Inspect augers; do not use if the auger flight is damaged or bent.
Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
3. Advancement of augers for soil boring installation (Continued).	**3c. CAUGHT:** Limb/extremity amputation, abrasion, and crushing.	3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3c. All non-essential personnel should stay away from the immediate work area; position the body out of the line-of-fire of equipment, particularly when installing auger flights and steel override casings. 3c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3c. Spinning augers should have an exclusion zone of 20 feet when in operation.
	3d. FALL: Slip/trip/fall hazards.	3d. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 3d. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 3d. Use established pathways and walk on stable, secure ground. 3d. Use three points of contact when mounting or dismounting the rig. 3d. Remove soil cuttings to avoid a tripping hazard from developing near augers.
	3e. EXPOSURE: Inhalation of contamination/vapors.	3e. Air monitoring using a calibrated photoionization detector (PID) and multi-gas meter to monitor the breathing zone of the work area. 3e. The Action Level for breathing zone air is five (5) parts per million (sustained) as detected by the PID. 3e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings, and inform the Roux PM of the condition. The Roux PM will then recommend additional appropriate precautions in accordance with the site-specific health and safety plan.
	3f. EXPOSURE: Noise and dust, contaminated soil (e.g., PFAS).	3f. Wet borehole area with sprayer using PFAS-free water to minimize dust. Stand upwind and keep your body positioned away from the rig. The generation of airborne dust will be avoided. 3f. Wear hearing protection while the drill rig is operating or the noise levels exceed 85 dBA.
	3g. EXERTION: Installing well casings and lifting augers.	3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects heavier than 40 lbs. 3g. Use a mechanical lifting device for odd-shaped objects.
4. Installation of well materials.	**4a. CONTACT:** Installing well materials while also pulling up augers.	4a. Potential contact with augers during the installation of well materials. 4a. Keep distance from augers and do not place any materials while augers are in motion.
	4b. CAUGHT: Possible pinch or crush hazard assembling PVC and sending down the borehole.	4b. Keep all body parts out of potential pinch points while placing PVC together and sending down borehole.
	4c. FALL: Slip/trip/fall hazards with hand tools and materials.	4c. See 3d.
	4d. EXPOSURE: Potential contamination, harmful vapors, dust, and/or noise.	4d. See 3e and 3f. 4d. Stand upwind to avoid exposure to dust generated from packing materials.
	4e. EXERTION: Lifting heavy bags of materials to backfill the borehole.	4e. See 3g.
5. Cleaning the auger flights	**5a. CONTACT:** Cuts/scrapes or puncture wounds from contacting the auger.	5a. Follow the "Show Me Your Hands" Procedure and make sure the auger is out of gear before contacting the auger with the tool or hand. 5a. Pull the cleaning tool across your body with the handle away from your body; do not push toward the auger. 5a. Do not clean more than ¾ turn around the auger at a time. 5a. Wear cut-resistant and nitrile gloves. 5a. Always use two hands to operate the cleaning tool. 5a. Inspect the tool before use and remove from service if the handle or metal is cracked/fatigued. 5a. Stand out of the line of fire.

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Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
6. Decontaminate equipment.	**6a. EXPOSURE / CONTACT:** To contamination (e.g., contaminated groundwater, vapors, PFAS). **6b. EXPOSURE**: To chemicals in cleaning solution (including ammonia).	6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Disposable chemical resistant coveralls and splash-proof face shields will be donned to prevent dermal exposure during any activities with potential for sprays or splashes to the arms, face, or body. 6a. Contain decontamination water so that it does not spill. 6a. Use an absorbent pad to clean spills, if necessary. 6b. See 3e. Wear all appropriate PPE and stand upwind of any exposed cleaning solutions.

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JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Recon**	**Mobilization/Demobilization**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Steel Toe or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest of high-visibility clothing; long sleeve shirt; long pants	☒ GLOVES: Leather, nitrile, and cut resistant (as needed) ☐ OTHER

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Varies

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EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	**1a. FALL:** Slip/trips/falls from obstructions, uneven terrain, weather conditions, heavy loads, and/or poor housekeeping.	1a. Use 3 points-of-contact/ensure secure footing when entering and exiting vehicle. 1a. Inspect walking path for uneven terrain, steep hills, obstructions, and/or weather-related hazards (i.e., ice, snow, and puddles) prior to mobilizing equipment. Use established pathways. Walk on stable/secure ground. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping; organize and store equipment neatly in one area at its lowest potential energy. 1a. Wear boots with adequate treads. 1a. Delineate unsafe areas with 42" cones, caution tape and/or flagging.
	1b. CONTACT: Personal injury and/or property damage caused by being struck by Site traffic or equipment used in Site activities.	1b. Observe and maintain the posted speed limits. 1b. When first arriving onsite, park vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with Site Manager/Supervisor to ensure coordination with other Site activities and to discuss any special hazards. Ensure that short-service employees (SSE) are identified. 1b. Identify potential traffic sources. 1b. Wear PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing whenever possible. 1b. Maintain a minimum exclusion zone when vehicles are in motion (i.e. greater than swing/tip radius of equipment). When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver-to-spotter visibility. 1b. Delineate work area with 42" cones, flags, caution tape, and/or other barriers. 1b. Position "Work Area" signs at Site entrances, if possible, or at either side of work area.
Assess [1]JOB STEPS	**Analyze [2]POTENTIAL HAZARDS**	**Act [3]CRITICAL ACTIONS**

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		1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route. 1b. Observe potential overhead and ground surface features that may interfere with moving equipment. Clear the path of physical hazards prior to initiating mobilization.
	1c. CAUGHT: Personal injury from pinch points and being in line-of-fire of vehicle and/or equipment.	1c. Make sure driver has engaged parking brake and placed wheel chocks in a position to prevent movement. Be sure that vehicle is parked in front/down gradient (positioned to best block oncoming traffic) of work area. 1c. Wear leather gloves when handling any tools or equipment. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects/cutting tools/glass. 1c. Keep body parts away from line-of-fire of equipment. 1c. Always carry tools by the handles and/or designated carrier. Ensure sharp-edged tools are sheathed/secure. 1c. Remove any loose jewelry. Avoid wearing loose clothing and/or ensure loose clothing is secure. 1c. Secure all items on the equipment, tighten up any items or features that have potential to shift or break during mobilization.
	1d. OVEREXERTION: Muscle strains while lifting/carrying equipment.	1d. Use body positioning and lifting techniques that avoid muscle strain; keep back straight, lift with legs, turn with whole body, keep load close to body, and never reach with a load. 1d. Ensure that loads are balanced. Use assistance (mechanical or additional person) to carry equipment that is either unwieldy or over 50 lbs.
	1e. EXPOSURE: Personal injury from exposure to biological and environmental hazards.	1e. Inspect area to avoid contact with biological hazards (i.e. poisonous plants, stinging insects, ticks, etc.). 1e. Wear long sleeved clothes treated, apply PFAS-free insect repellant, and inspect clothes and skin for ticks during and after work. 1e. Apply PFAS-free sunscreen (SPF 15+) if exposure to sun for 30 minutes or more is expected.
	1f. EXPOSURE: Weather related injuries.	1f. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, nausea, rapid and shallow breathing). Take breaks in cool places and hydrate as needed. 1f. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks in warm areas as needed. 1f. Wear clothing appropriate for weather and temperature conditions (e.g., rain jackets, snow pants, multiple layers). 1f. If lightning is observed, wait 30 minutes in a sheltered location (car is acceptable) before resuming work.
	1g. EXPOSURE: Personal injury from noise hazards.	1g. Wear hearing protection if sound levels exceed 85 dBA (if you must raise your voice for normal conversation).

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-019	DATE: 11/2025	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Reconnaissance**	**Site Walk and Inspection**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: ear plugs as necessary ☒ SAFETY SHOES: Steel or composite toed	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: High-visibility vest or high-vis outerwear	☒ GLOVES: Leather/cut-resistant/chemical resistant ☒ OTHER: PFAS-free boot covers as necessary, dust mask as necessary

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Site map, emergency contact list, documentation of urgent care/hospital routes and / or guide familiar with Site, operating cell phone or walkie-talkie if Site allows, and bug spray.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing LMRAs throughout the day.

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EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

SITE SECURITY: Prior to site inspection verify appropriate method to address Site Security concerns as it relates to potential criminal activity, homeless population, and/or isolation concerns. Work with the Project Principal and/or Project Manager to address appropriately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site contact.	**1a. CONTACT/EXPOSURE/FALL:** Personal injury caused by lack of awareness of site-specific hazards.	1a. Inquire about hazards and other activities taking place at the Site. 1a. Inform Site contact of work scope, timeline and location(s). 1a. Discuss emergency evacuation procedures and muster points with Site contact.
2. Traversing the Site	**2a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles or unauthorized personnel at remote Sites.	2a. All equipment must be stowed and secured prior to moving. 2a. Maintain speed limit as posted on-site. 2a. When possible, drive on established roadways. 2a. Yield to all pedestrians. 2a. Use pull-through spots or back into parking spots. 2a. Don high visibility clothing/safety vest. If working at remote Site, add orange accessories during hunting season.
	2b. FALL: Uneven terrain and weather conditions. Overgrown shrubs and vines. Equipment in the work zone.	2b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 2b. When possible, use established pathways and walk on stable, secure ground. 2b. Communicate traversing hazards with others.
	2c. OVEREXERTION: Muscle strain while carrying equipment.	2c. When carrying equipment to/from work area, use proper lifting techniques; keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Use the buddy system or mechanical means to maneuver items heavier than 50-lb. If necessary, make multiple trips to carry equipment.
	2d. EXPOSURE: Biological hazards – ticks; bees/wasps; poison ivy; insects; (Ticks are most active any time the temperature is above freezing, typically from March to November.)	2d. Inspect area to avoid contact with biological hazards. 2d. Ticks: • Treat outer clothing including pants, shirts, socks, boots and hats the evening before with Permethrin (allowing at least two hours before use). • Apply DEET to exposed skin before travelling to the Site and reapply after two hours. • Check for ticks during and after work. 2d. Bees: • Use bee spray as appropriate to deter/eliminate bees. • Protect exposed skin with insect repellent. 2d. Poison Ivy:

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	2e. EXPOSURE: Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	• Identify areas of poison ivy and spray with weed killer. Don PFAS-free boot covers while traversing poison ivy areas. • If skin contacts poison ivy, wash skin thoroughly with soap and water. 2e. Wear PFAS-free sunscreen with SPF 15 or greater on exposed skin whenever 30 minutes or more of sun exposure is expected. 2e. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 2e. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 2e. Wear appropriate rain gear as needed. 2e. Take frequent breaks if tired, wet, or cold/hot. Drink water. 2e. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
3. Walking near heavy equipment and machinery.	**3a. CONTACT:** Personal injury from Site and roadway traffic. Personal injury from flying debris **3b. OVEREXERTION:** Personal injury from lifting/moving/rotating equipment. **3c. EXPOSURE:** Hearing damage from noise generating equipment/processes. Inhalation/exposure to hazardous vapors and or dust. **3d. EXPOSURE:** Working in a remote area.	3a. See 2a. 3a. Maintain an exclusion zone of at least 10'-25' feet from all engaged equipment. 3a. Keep body parts out of the line-of-fire of pinch points. 3a. Wear appropriate PPE always. 3b. See 2c. 3c. Wear hearing protection if >85 dBA. (i.e. noise levels which require you to raise your voice to communicate) 3c. Always wear leather gloves when handling any tools or equipment. 3c. Always wear appropriate PPE based off chemicals present. 3d. Use the "buddy system" whenever possible. If working alone, contact PM upon arrival/departure, as well as during work activities prior to commencing work if applicable. 3d. Always carry a communication device (i.e., cell phone, walkie-talkie) or directional (i.e., map, compass, etc.) when traversing remote areas. 3d. If available, follow Lone Worker Protocol/Procedure.
4. Working in adverse weather conditions.	**4a. EXPOSURE:** Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	4a. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 4a. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 4a. Wear appropriate rain gear as needed. 4a. Take frequent breaks if tired, wet, or cold/hot. Drink water. 4a. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
5. Departing Site.	**5a. EXPOSURE:** Exposure to unnecessary hazards should personnel believe Roux is on-Site during an emergency and conduct a search.	5a. Sign out or notify Site contact and Roux Project Manager of your departure.

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JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
GENERIC	**Gauging & Sampling**	**Soil Sampling**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES ☒ FLAME RESISTANT CLOTHING (as needed)	☐ GOGGLES ☐ FACE SHIELD: ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: PFAS-free Insect repellant, PFAS-free sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Recommended Equipment: 42" traffic cones, caution tape, trowel

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure location	**1a. CONTACT:** Personnel and vehicular traffic may enter the work area.	1a. If in an area with foot or vehicle traffic, delineate the work area with 42" traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 1a. Wear reflective vest and/or high visibility clothing. 1a. Face the direction of any vehicular traffic. Position vehicle to protect worker from traffic. 1a. Communicate work activity with adjacent work areas.
	1b. FALL: Tripping/falling due to uneven terrain or entry/exit from excavations.	1b. Inspect pathways and work area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions. 1b. Use established pathways and walk on stable, secure ground. 1b. Stage equipment and tools in a convenient, stable, and orderly manner. Store equipment at lowest potential energy. 1b. Roux employees should stay 5 feet from in-progress excavations and trenches. Should entry to an excavation be required (when stabilization is complete), ladders must be employed for steep embankments, excavations, pits, and trenches.
	1c. EXPOSURE: Exposure to sun and excessive heat, possibly causing sunburn, heat exhaustion or heat stroke. Exposure to cold temperatures possibly causing cold stress. Skin burn as a result of fire, if applicable. Exposure to explosive vapors due to tank farm operations. Exposure to airborne dust due to high wind speeds. Biological hazards - ticks, bees/wasps, poison ivy, thorns, insects, etc.	1c. Wear a PFAS-free sunscreen with an SPF 15 or greater whenever 30 minutes or more of exposure is expected. 1c. Use a tent to shade the work area from direct sunlight particularly when warm temperatures are expected. 1c. Be aware of the location of all Site personnel. 1c. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). 1c. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). 1c. Take breaks for rest and water as necessary. Move to an area that is well shaded or a climate controlled area (i.e., car, site trailer, etc.). 1c. No open flames/heat sources. 1c. Conduct air monitoring and ensure that harmul vapor concentrations are within the levels detailed in the Site Specific HASP. Follow procedures detailed in HASP for exceedances. 1c. PFAS-free flame retardant clothing must be worn when specified by Site policy. 1c. Cell phones should be disabled when specified by Site policy. 1c. Wear long sleeved shirts and tuck in (or tape) pant legs into socks or boots to prevent ticks from reaching skin. 1c. Spray PFAS-free insect repellant on exposed skin when working in overgrown areas of the Site. 1c. Inspect area to avoid contact with biological hazards. 1c. Wear cut-resistant gloves when handling branches, shrubs, etc. that may lie within the walking path. 1c. Wear spoggles if the average wind speeds are above 15 mph. 1c. Personnel shall examine themselves and co-worker's outer clothing for ticks periodically when onsite. 1c. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water. If rash persists after washing, immediately notify your supervisor, the OM and OHSM for possible consultation with a physician at an approved Occupational Health Clinic.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Collect Soil Sample	**2a. CONTACT:** Personal injury from pinch points, cuts, and abrasions from sampling equipment tools, and material within soil sample. Personal injury from contact with moving equipment while sampling. Personal injury from contact with glass sample jars.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant (nitrile) disposable gloves when handling soil samples and sampling jars. 2a. Where possible, use trowel or equivalent tool to avoid contact with soil. 2a. If sampling from bucket of heavy equipment, ensure all equipment is off and operator utilizes the “show me your hands” policy. 2a. See 1a.
	2b. EXPOSURE: Exposure to contamination (e.e., PFAS-impacted soil) and/or lab preservatives.	2b. Wear chemical-resistant (nitrile) disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 2b. Disposable nitrile gloves will be removed and disposed of prior to contacting other surfaces including field books, mobile phones, food, and drinks. 2b. Wear safety glasses to protect eyes from dust or air-borne contaminants that may results from disturbing the soil. 2b. Where possible, remain upwind from sample location if collecting soil sample from stockpile, drill rig, etc. to avoid breathing airborne dust or contaminant vapors, if they are present. 2b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil on to the ground. 2b. Open sample jars slowly and fill carefully to avoid contact with preservatives.
	2c. EXERTION: Exertion due to repetitive motion and ergonomics.	2c. Utilize a table or raised surface for soil sampling if multiple soil samples are going to be taken to minimize repetitive bending motion.
3. Decontaminate equipment	**3a. EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil).	3a. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3a. Use an absorbent pad to clean spills. 3a. Properly dispose of used materials/PPE in provided drums in designated drum storage area. 3a. Remain upwind of sample and avoid breathing contaminant vapors, if they are present.
	3b. EXPOSURE: Chemicals in cleaning solution including ammonia.	3b. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3b. Work on the upwind side of decontamination area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area. Ensure that all drums are properly labeled and secured.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-022	DATE 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
General	**Drilling**	**Rotosonic Soil Borings / Well Installation**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES steel or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free fluorescent long-sleeve shirt and reflective safety vest.	☒ GLOVES: Nitrile and cut resistant level II ☒ OTHER: PFAS-free Insect Repellant, PFAS-free sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Sonic Drilling Rig or Mini Sonic Rig, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Interface Probe, 20 lb. Type ABC Fire Extinguisher, Traffic/Safety Cones & Flags, "Work Area" Signs, PFAS-free Water

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EXCLUSION ZONE (EZ): Maintain a Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents.

"SHOW ME YOUR HANDS"
Driller and helper should show that their hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization of the drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed). **See also Mobilization/Demobilization JSA.**	**1a. CONTACT/CRUSH:** Equipment/property damage during movement. Crush point between the moving rig and other objects.	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. A spotter should be utilized while moving the drill rig or backing operations. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. 1a. Set up the work area and position equipment in a manner that eliminates or reduces the need for backing of support trucks and trailers. 1a. When backing up the truck rig with an attached trailer, use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver/spotter visibility. 1a. Inspect the driving path for uneven terrain. Level or avoid if needed. 1a. Drill rig should have a **minimum exclusion zone (i.e., greater than the swing/tip radius of the rig)** for non-essential personnel (i.e., geologist) when the rig is moving/in operation.
	1b. FALL: Slip/trip/fall hazards.	1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
2. Raising the tower/derrick of the drill rig.	**2a. CONTACT**: Overhead hazards.	2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for overhead utilities, tree limbs, piping, or other structures that could come in contact with the rig's tower and/or drilling rods or tools. 2a. Site requirements for raising a tower/derrick around overhead utilities must be reviewed prior to drilling. Maintain **a minimum distance of 10 feet** from overhead structures. 2a. The tower/derrick must not be raised beneath overhead power lines unless approved by both the Roux and Project PMs.
	2b. CONTACT: Amputation points occur when raising the rig and the instability of the rig.	2b. Inspect the equipment prior to use and avoid amputation points when engaging the tower/derrick. 2b. Lower outriggers to ensure stability prior to raising the rig tower/derrick. 2b. If the rig needs to be mounted, be sure to use three points of contact.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Advancement of soil boring and well installation.		**If possible, operate the drill rig using a remote control to avoid potential hazards.**
	3a. CONTACT: Flying debris.	3a. Be aware of and avoid potential line-of-fire hazards and wear required PPE such as eye, ear, and hand protection.
See also Soil Sampling JSA.	**3b. EXPOSURE**: Noise and dust, contaminated soil (e.g., PFAS).	3b. Wet borehole area with sprayer using PFAS-free water to minimize dust. Avoid the generation of visible dust. 3b. Stand upwind and keep your body away from the rig. 3b. A disposable dust mask/respiratory protection (depending on site COCs) should be worn if there is visible dust in the breathing zone. 3b. Wear hearing protection when the drill rig is in operation.
	3c. CAUGHT: Limb/extremity amputation points; abrasion/crushing.	3c. Always wear cut-resistant gloves (Level II) when making connections, using hand tools, or when handling cutting tools. 3c. Inspect the equipment prior to use for potential amputation points. Keep hands away from being between connections, and the use of tools is preferable compared to fingers and hands. 3c. Inspect the drill head for worn surface or missing teeth; replace it if damaged or blunt. 3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3c. All non-essential personnel should remain outside the heavy equipment exclusion zone, which is at least as far as the boom is high (**minimum exclusion zone based on swing/tip radius**). 3c. Drillers and helpers will understand and use the “Show Me Your Hands” Policy. Operators and helpers will remain a **minimum of 3 feet** from augers/drill rods while in operation.
	3d. CONTACT/CRUSH: Crushed between equipment due to an imbalance during the advancement of the drill equipment.	3d. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3d. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3d. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone based on swing/tip radius**).
	3e. EXPOSURE: Inhalation of contamination/vapors (e.g., PFAS).	3e. Air monitoring using a calibrated photoionization detector (PID) will be used to monitor the breathing zone of the work area. 3e. If readings above the site-specific action levels, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings, and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site-specific health and safety plan.
	3f. FALL: Slip/trip/fall hazards.	3f. Contain drill cuttings and drilling water to prevent slip/trip/fall hazards from developing in the work area. 3f. See 1b.
	3g. EXERTION: Potential for muscle strain/injury while installing well casings and/or lifting sonic rods/casings.	3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 40 lbs. 3g. Use a mechanical lifting device for odd-shaped objects.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Decontaminate equipment.	**4a. EXPOSURE:** Contamination (e.g., PFAS, Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors, chemicals in cleaning supplies).	4a. Wear chemical-resistant gloves and safety glasses. 4a. Disposable, PFAS-free chemical resistant coveralls and splash-proof face shields will be donned to prevent dermal exposure during any activities with potential for sprays or splashes to the arms, face, and or body. 4a. Contain decontamination water so that it does not spill. 4a. Use an absorbent pad to clean spills, if necessary. 4a. See 3b.

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JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Construction**	**Spotting Heavy Machinery**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ Particulate Respirator	☒ GLOVES: Cut resistant / leather
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER:
☒ LONG SLEEVED SHIRT	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-/Composite-toe boots/shoes		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Heavy Machinery (i.e. excavator, payloader, truck, forklift, etc.), two-way radios.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

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EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Prepare for machine activity.	**1a. CONTACT:** Obstructions in the work area may create contact hazards from machinery. **1b. Fall :** Slip/Trip/Fall	1a. Cordon off the work area with safety barrels/cones and a rigid barrier (snow fence, traffic bar, etc.). Communicate that only necessary personnel should be in the work area. Spotter and equipment operator shall enforce the **EZ**. Operator will not operate but shall remain in the hands-off mode while personnel are within the exclusion zone. 1b. Ensure that work area is flat, level and clear of any obstructions or debris before setting up work zone.
2. Spotting.	**2a. CONTACT:** Machine or load contact with personnel, property, or machinery.	2a. Discuss the specifics of the work with the operator and be clear about any hand signals that will be used. Clearly discuss the limits of the assigned work area and the machine's Exclusion Zone. Maintain Exclusion Zone. The Exclusion Zone shall be delineated by using 42-inch traffic cones/barrels and a fixed rigid barrier. 2a. The Minimum Heavy Equipment Exclusion zone is greater than the swing/tip radius of equipment. 2a. Both the spotter and equipment operators shall have 2-way radios/cellular devices on their persons to ensure audible communication in the event any changes or new hazards may arise. 2a. All workers should stay outside of the Exclusion Zone of all equipment unless operator is stopped and in "Hands Off" mode. **(This includes the spotter unless an exception has been established in the Site-specific JSA).** If the Exclusion Zone must be reduced due to work area restrictions, then the spotter and operator shall enforce the reduced Exclusion Zone. 2a. Spotters must make eye contact with the machine operator or all movement ceases until visual contact can be reestablished. 2a. Spotter shall keep an eye out for any issues with the machine the operator may not see and communicate with other work crews and spotters on behalf of the operator. 2a. If the spotter needs to take a break, he must find a replacement before leaving or have the machine stop operations. **No heavy equipment shall operate without a spotter under any circumstances.** 2a. Wear fluorescent clothing/safety vest. 2a. **Do not multitask. Only perform Spotting**

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
	2b. FALL: Slip/Trip/Fall	2b. Look where walking to identify and avoid slip/trip/fall hazards. Avoid icy and/or wet surfaces. Remove obstacles if possible. 2b. Use designated walkways during spotting whenever possible. 2b. **Do not walk backwards. Always face the direction you are walking towards.**
	2c. CAUGHT: Caught between machinery and nearby objects.	2c. **Maintain Exclusion Zone.** Do not stand between large, loose or fixed objects or structures and the machinery while it is in motion. Keep in sight of operator at all times while being aware of surrounding structures.
	2d. EXPOSURE: Inhalation of exhaust from machinery.	2d. The spotter will position him/herself upwind of the working machinery, when possible. Spotter will also inform others working within the vicinity of the EZ of proper positioning, if applicable.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-027	DATE: 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Drilling**	**Pre-Drilling Clearance, Vactron and Air Knife**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☒ FACE SHIELD (While Air Knifing) ☒ HEARING PROTECTION (As needed) ☒ SAFETY SHOES: Composite toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: PFAS-free Fluorescent reflective vest or high visibility clothing; long-sleeve shirt	☒ GLOVES: Leather, Nitrile, cut-resistant ☒ OTHER: Dusk mask, PFAS-free insect repellant, PFAS-free sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Vac-Truck or Vac Drum, Compressor, Jack Hammer, Air Knife. Circular Saw, Hand Tools, Dust Mask, Photoionization Detector, Multi Gas Meter, 42 inch safety cones and flags, Retractable Cone Bars, Caution Tape, 20 lb. Fire Extinguisher, "Work Area" Signs, Pressurized PFAS-free Water Sprayer

Commitment to Safety – All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

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EXCLUSION ZONE: All non-essential personnel will maintain a distance of 10 feet from drilling equipment while equipment is moving/engaged

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Verify pre-clearance protocol	**1a. CONTACT:** Underground utility damage; property damage; personal injury.	1a. Confirm that (if applicable) "Call Before You Dig" and local utility companies were contacted prior to starting work in order to confirm utility mark outs. Must have a case # before digging. 1a Walk the Site to evaluate utility markings and review maps (see Site Walk Inspection JSA - GEN-019). Utilities are not always properly marked out, ensure use of observational skills through the pre-clearing checklist. 1a. Review pre-clearing checklist form and sub-surface clearance form. Pre-clearing protocol indicates that clearance must be conducted to a minimum of 5 vertical feet below ground surface or 10 vertical feet below ground surface in the critical zone using hand tools.
	1b. ENERGY SOURCE/CONTACT: Property damage; Pressurized water mains may cause lacerations or broken bones. Pressurized gas mains may explode causing serious injury, or death. Underground electric may cause severe burns, shock, or death.	1b. Pre-clearing of each soil boring/monitoring well location must be conducted to a minimum of 5 vertical feet below the ground surface (10 feet minimum for Critical Zone) using hand tools (shovel and non-metallic dig bar and hand auger) prior to drilling. Supervisor should be contacted to discuss appropriate pre-clearing depth. 1b. MUST Complete subsurface clearance checklist prior to pre-clearance.
	1c. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones.	1c. Be aware of the conditions when walking or loading equipment and working. Walk within established pathway avoiding uneven surfaces. Remove potential slip/trip/fall hazards.
2. Mobilize/demobilize and establish work area	**2a. SEE MOBILIZATION / DEMOBILIZATION JSA – GEN-015**	2a. See Mobilization / Demobilization JSA.
3. Concrete saw cutting, jack hammer and hand clearance with hand tools, air knife and vacuum	**3a. CONTACT:** Flying debris striking face or body	3a Maintain 10' minimum exclusion zone. Use the required PPE (i.e., leather/cut proof gloves, safety glasses/face shield). 3a. Use anti-whip devices on compressor hoses. Ensure hose couplings are secure. 3a Wear a face shield to protect face from flying debris when using air knife. 3a. Utilize a traffic cone, cage or physical barriers over the hole during air knife activities to keep visible dust to a minimum and flying debris close to ground.
	3b. EXPOSURE: Inhalation/exposure to hazardous vapors and/or concrete dust, noise exposure	3b. Monitor breathing zone with a calibrated PID and/or multi-gas meter. If meters sustain readings greater than recommended in the HASP for the specific contaminant of concerns (COCs) the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings. Contact PM. 3b. Wet concrete or soil with PFAS-free water while using saw or air knife to minimize dust and wear N95 dust mask to prevent inhalation. 3b. Avoid the generation of airborne dust with proper use of the air knife in conjunction with a suitable vacuum. Inspect vacuum hose and ensure no dust is visible during operation.

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	3c. ENERGYSOURCE/CONTACT: Property damage; Pressurized water mains may cause lacerations or broken bones. Pressurized gas mains may explode causing serious injury, or death. Underground electric may cause severe burns, shock, or death. **3d. ERGONOMICS/EXERTION:** Muscle strain due to poor body positioning when handling equipment and materials **3e. FALL:**Tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at the Site **3f. CAUGHT:** Amputation points associated with the equipment and vacuum hose	3b. Stand upwind and keep body behind all particulate generating equipment. Observers and helpers should avoid line-of-fire for saw blade. Always cut away from body. 3b. No open flames/heat sources. 3b. Wear hearing protection when saw, jackhammer or air compressor are in operation. Otherwise, if sound levels exceed 85 dbA, put on hearing protection. 3c. For air knifing, ensure extension/lance tip reaches the full 5 feet bgs. Air knife should be advanced **AT A MINIMUM** in all four corners of the expected boring location to find any possible arrangement of utilities. 3c. Ensure diameter of soil preclearance hole is at a **MINIMUM 2x** the diameter of any drilling or hard dig equipment that will be entering the hole. 3c. See Complete subsurface clearance protocol for information provided above. 3d. Use body positioning and lifting techniques that minimizes muscle strain; keep back straight, lift with legs, keep load close to body, and never reach with a load. 3d. Ensure that loads are balanced to reduce the potential for muscle strain. 3d. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift. 3e. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. Mob/Demob JSA. 3e. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 3e. Use established pathways and walk on stable, secure ground. 3e. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e. tools should not be propped against walls or nearby equipment or vehicles). 3e. Equipment and tools that are not anticipated to be used will be returned to a storage area that is out of the immediate work area. 3e. Ensure power cords and compressed air lines are grouped when used within the work area. 3e. Pre-cleared location will be finished flush to grade as to prevent a slip/trip hazard or coned and taped off. 3f. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 3f. Inspect the equipment prior to use for potential pinch points. 3f. Test all emergency shutdown devices prior to using equipment. 3f. Inspect saw blade for worn surface or missing teeth; switch blade if damaged or blunt. 3f. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3f. All non-essential personnel shall maintain a 10 foot exclusion zone; position body out of the line-of-fire of equipment. 3f. Drillers and helpers will understand and use the “Show Me Your Hands Policy”.
4. Move drum to staging area using drum cart	**4a. EXPOSURE/CONTACT:** Contamination (e.g., PFAS, Separate Phase Hydrocarbons (SPH), contaminated groundwater, soil) **4b. EXERTION:** Muscle strain while maneuvering drums with drum cart/lift gate **4c. CAUGHT:** Pinch points associated with handling drum lid	4a. Wear Nitrile chemical-resistant gloves over leather or cut proof gloves. 4a. Do not overfill drums. Ensure that the drum lids are attached securely. 4a. All drums will be staged in the designated storage area. 4b. See 3d. Do not overfill drums. Use lift gate on back of truck to load and unload drums. Use drum dolly to move drum. 4c. Ensure that fingers are not placed under the lid of the drum. Wear leather gloves or cut proof gloves. Use appropriate ratchet while sealing drum lid.

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5. Decontaminate equipment.	**5a. EXPOSURE/CONTACT**: To contamination (e.g., PFAS, Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors). **5b. EXPOSURE:** To chemicals in cleaning solution.	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Disposable, PFAS-free chemical resistant coveralls and splash-proof face shields will be donned to prevent dermal exposure during any activities with potential for sprays or splashes to the arms, face, and or body. 5a. Contain PFAS-free decontamination water so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Spray equipment from side angle, not straight on, to avoid backsplash. 5a. See 3b. 5b. See 4a. Review SDS to ensure appropriate precautions are taken and understood.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-029	DATE: 11/2025	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Preclearing/Sampling**	**Hand Augering**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut Resistant level II / Nitrile / Chemical resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: PFAS-free Long-sleeved high-visibility clothing	
SAFETY GLASSES	☒ SAFETY SHOES: Steel or composite-toed boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Hand Auger Tools (buckets, rods), 5-gallon buckets, hand tools (hammer, etc.)

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Drive/walk to hand clearing/hand augering location	**1a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles	1a. Maintain speed limit on-site. 1a. All equipment must be stowed and secured prior to moving. 1a. Drive on established roadways. 1a. Do not back up the vehicle without a spotter where visibility is limited; use pull-through spots or back into parking spots; use an audible signal (horn/back-up alarm) when backing up vehicles.
	1b. FALL: Personal injury from tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at portions of the Site	1b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Use established pathways and walk on stable, secure ground. 1b. Use the established ramp when descending into/ascending from impoundment areas. 1b. Keep tools and equipment in a designated area. When not in use, tools and equipment must be returned to their proper storage location. Keep the work area clear of obstructions.
	1c. EXERTION: Muscle strain/exhaustion while carrying equipment (i.e., hand auger, post-hole digger, shovel, pry bar)	1c. When carrying equipment to/from the work area, use proper lifting techniques; keep back straight, lift with legs, keep the load close to the body, never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Use mechanical assistance or make multiple trips to carry equipment.
	1d. EXPOSURE: Exposure to the sun, possibly causing sunburn. Biological hazards - bees/wasps, poison oak, thorns, insects, etc.	1d. Wear PFAS-free sunscreen with an SPF of at least 15 whenever 30 minutes or more of exposure is expected. 1d. Inspect the area to avoid contact with biological hazards. 1d. Wear cut-resistant gloves when handling material, debris, branches, shrubs, etc. that may lie within the walking path. 1d. Avoid any areas on-site that have poison oak.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Secure location	**2a. CONTACT:** Personnel and vehicular traffic may enter the work area.	2a. Delineate the work area with traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 2a. Wear a reflective vest and/or fluorescent clothing. 2a. Face the direction of vehicular traffic. Position the vehicle to protect the worker from traffic. 2a. Communicate work activity with adjacent work areas.
	2b. FALL: Tripping/falling due to uneven terrain, and materials /equipment stored within the work area	2b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment to the impoundments. 2b. Equipment and tools will be staged in a convenient, stable, and orderly manner. 2b. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e., tools should not be propped against walls or nearby equipment or vehicles). 2b. Equipment and tools that are not anticipated to be used will be returned to an appropriate storage area that is out of the immediate work area.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Verify pre-clearance protocol; review completed Subsurface Utility Checklist and utility verification site walkthrough.	**3a. ENERGY SOURCE:** Underground utility damage; property damage; personal injury	3a. Confirm that "Call Before You Dig"/811 and local utility companies were contacted prior to hand augering. 3a. Walk the Site to evaluate utility markings and review maps.
4. Augering/advancing borehole	**4a. EXPOSURE:** Contaminated soil/water/vapor (i.e., PFAS)	4a. Monitor the breathing zone with a PID when VOCs are a concern. If vapors exceed site-specific action levels, upgrade PPE as per the HASP. 4a. Wear chemical-resistant disposable gloves and safety glasses when handling impacted materials. 4a. Place excavated soil on plastic sheeting and store soil waste in a designated area. 4a. Work on the upwind side of the boring.
	4b. EXERTION: Muscle strain from lifting, bending, repetitive motion.	4b. Body positioning and rotating with the auger to reduce strain. Do not twist back.
	4c. CAUGHT: Personal injury as a result of jewelry/loose clothing caught on equipment, well covers, machinery, hand auger, pry bar, etc.	4c. No form of jewelry should be worn while on-site. 4c. Clothing must be appropriately sized so that it is not loose-fitting.
	4d. CONTACT/CAUGHT: Pinch points, abrasions	4d. Keep head and upper body clear when lifting hand auger, pry bar/post-hole digger. Ensure not to be overly aggressive when using the pry bar. 4d. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body.
5. Lithologic observation and soil sampling	**5a. EXPOSURE:** Contact with contamination (e.g., PFAS impacted soil and/or lab preservatives)	5a. Wear chemical-resistant disposable gloves to protect hands when handling samples; wear safety glasses when on site and/ or goggles when handling any preservatives; use containment material or plastic sheeting to protect surrounding areas. 5a. When collecting a soil sample from a hand auger, put a large zip lock bag over the entire auger to prevent the spillage of soil onto the ground. 5a. Open sample jars slowly and fill them carefully to avoid contact with preservatives.

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6. Decontaminate equipment	**6a. EXPOSURE:** Contact with contamination (e.g., PFAS impacted soil, lab preservatives, decontamination solution) **6b. CONTACT/CAUGHT:** pinch points and cuts/abrasions	6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Disposable, PFAS-free chemical resistant coveralls and splash-proof face shields will be donned to prevent dermal exposure during any activities with potential for sprays or splashes to the arms, face, and or body. 6a. Use an absorbent pad to clean spills. 6a. Properly dispose of used materials/PPE trash bags. 6a. Refer to the SDS for the decontamination solution for proper handling. 6b. Keep fingers/hands out of pinch points when disassembling the hand auger during decontamination.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-032	DATE: 11/2025	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Construction**	**Spotting Third-Party Traffic**

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ Particulate Respirator	☒ GLOVES: Cut resistant / leather
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER:
☒ LONG SLEEVED SHIRT	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-/Composite-toe boots/shoes		
☒ SAFETY GLASSES			

REQUIRED EQUIPMENT

Handheld fluorescent warning flags (1 per spotter), two-way radios.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing LMRAs.

PSU AIRPORT-SPECIFIC COMMITMENT TO SAFETY AND SECURITY – The State College Regional Airport ("SCRA") has specific safety and security protocols that must be integrated with and/or may supersede certain provisions herein. The SCRA-specific protocols may be found in an airport-specific JSA to be prepared during pre-mobilization training. This JSA will be subject to review and comment by SCRA personnel.

EXCLUSION ZONE (EZ): Maintain Minimum Heavy Equipment Exclusion Zone around equipment, active operations (e.g., excavation, truck loading ,etc.) and loads while it is in motion. The HEEZ must be greater than the swing zone of any moving part of the equipment, tip zone of the equipment, fall zone of the equipment and contents, distance that debris may travel during demolition activities and/or foot print of a structure to be demolished. The HEEZ should not be compromised in any way by third party traffic.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Prepare for heavy equipment operations and/or job activity which require traffic stoppage.	**1a. CONTACT:** Third-party traffic in and/or adjacent to the work area may create contact hazards with machinery and site personnel. **1b. Fall :** Slip/Trip/Fall	1a. Cordon off the work area with safety barrels/cones and a rigid barrier (snow fence, traffic bar, etc.). Communicate that only necessary personnel should be in the work area. Spotter and equipment operator shall enforce the **EZ.** Operator will not operate but shall remain in the hands-off mode while personnel are within the exclusion zone. • Spotters must agree on communication via voice and hand signals before the activity begins. • Spotters must be visible and maintain contact with other spotters. • If contact is lost with either spotter, work operations should stop until communication has been re-established. • Spotters should never have additional duties while they are spotting. 1a. Spotters must analyze traffic patterns adjacent to the site to assess which traffic direction will need to be re-directed and what issues must be resolved prior to spotting traffic. 1a. The "Traffic Control Point" is a specific location where the spotter is positioned to direct traffic. 1a. **Spotters should select an appropriate Traffic Control Point where visibility, directions and personal safety will be maximized.** 1b. Ensure that the Traffic Control Point is flat, level and clear of any obstructions or debris before beginning spotting operations.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Spotting third-party traffic during site operations.	**2a. CONTACT:** Machine or load contact with third party traffic.	2a. Discuss the specifics of the work, limits of the assigned work area, and the machine's Exclusion Zone. Maintain the Exclusion Zone while spotting third-party traffic. 2a. **Spotters and equipment operators shall have 2-way radios/cellular devices on their persons** to ensure audible communication in the event any changes or new hazards may arise. 2a. Spotters must make eye contact with the machine operations and third-party traffic, or all movement ceases until visual contact can be reestablished. 2a. Spotter shall keep an eye out for any traffic issues the operator may not see and communicate with other work crews and spotters accordingly. 2a. If the spotter needs to take a break, he must find a replacement before leaving or stop operations. **Operations which may contact third-party traffic shall not be performed without a spotter under any circumstances.** 2a. Wear fluorescent clothing/safety vest. **Handheld fluorescent warning flags (1 per spotter) are required for spotting third party traffic.** 2a. Establish traffic control by performing all signals / movements with precision and ensuring drivers obey signals. • Break traffic at natural gaps whenever possible to direct opposite sides of traffic • Maintain consistency in the time you allow each direction of traffic to travel. Prioritize major routes over secondary routes. • If breaks do not occur, allow traffic to accumulate on opposite sides of the road before directing it to move. • Allow right turns whenever they do not interfere with traffic and pedestrians. • Make sure opposite lanes are stopped before allowing left turns to be made. 2a. **Do not multitask. Only perform Spotting.**
	2b. FALL: Slip/Trip/Fall	2b. Look where walking to identify and avoid slip/trip/fall hazards. Avoid icy and/or wet surfaces. Remove obstacles if possible. 2b. Use designated walkways during spotting whenever possible. 2b. **Do not walk backwards. Always face the direction you are walking towards.**
	2c. CAUGHT: Caught between machinery and nearby objects.	2c. **Maintain Exclusion Zone.** Do not stand between large, loose or fixed objects or structures and the machinery while it is in motion. Keep in sight of operator at all times while being aware of surrounding structures.
	2d. EXPOSURE: Inhalation of exhaust from machinery.	2d. The spotter will position him/herself upwind of the working machinery, when possible. Spotter will also inform others working within the vicinity of the EZ of proper positioning, if applicable.

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APPENDIX B

Safety Data Sheets ("SDSs") for Chemicals Used

SAFETY DATA SHEET

Version 6.12
Revision Date 08/07/2024
Print Date 08/08/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Trizma® base

Product Number : T1503
Brand : Sigma
CAS-No. : 77-86-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required.

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2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Substance is not persistent, bioaccumulative, and toxic (PBT).

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	2-Amino-2-(hydroxymethyl)-1,3-propanediol THAM Trometamol Tris base Tris(hydroxymethyl)aminomethane
Formula	:	$C_4H_{11}NO_3$
Molecular weight	:	121.14 g/mol
CAS-No.	:	77-86-1
EC-No.	:	201-064-4

No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1 Description of first-aid measures

No data available

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

No data available

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Nitrogen oxides (NOx)
Combustible.

5.3 Advice for firefighters

No data available

5.4 Further information

No data available

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
For personal protection see section 8.

6.2 Environmental precautions
No data available

6.3 Methods and materials for containment and cleaning up
No data available

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
No data available

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Personal protective equipment

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please

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contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Control of environmental exposure
Prevent product from entering drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Color: white
b)	Odor	slight, characteristic
c)	Odor Threshold	No data available
d)	pH	10.2 - 10.6 at 6 g/l at 20 °C (68 °F)
e)	Melting point/freezing point	Melting point/ range: 169 °C (336 °F) at ca.1,013 hPa - OECD Test Guideline 102
f)	Initial boiling point and boiling range	288 °C 550 °F at 1,013 hPa - OECD Test Guideline 103 - Decomposition at boiling point.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	< 0.1 hPa at 20 °C (68 °F)
l)	Vapor density	No data available
m)	Density	1.32 g/cm3 at 20 °C (68 °F) - OECD Test Guideline 109
	Relative density	1.3220.4 °C - OECD Test Guideline 109
n)	Water solubility	678 g/l at 20 °C (68 °F) - completely soluble
o)	Partition coefficient: n-octanol/water	log Pow: -2.31 at 20 °C (68 °F) - Bioaccumulation is not expected.
p)	Autoignition temperature	The substance or mixture is not classified as self heating.
q)	Decomposition temperature	143 °C (289 °F) -
r)	Viscosity	Not applicable

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s) Explosive properties No data available

t) Oxidizing properties none

9.2 Other safety information

Solubility in other solvents	ethyl acetate at 20 °C (68 °F) - slightly soluble Alcohol at 20 °C (68 °F) - soluble Dimethylformamide at 20 °C (68 °F) - soluble Acetone at 20 °C (68 °F) - soluble Chloroform at 20 °C (68 °F) - practically insoluble
Dissociation constant	8.22 at 25 °C (77 °F)

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
No data available

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Oxidizing agents
Bases
Caution! In contact with nitrites, nitrates, nitrous acid possible liberation of nitrosamines!

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - female - > 5,000 mg/kg
(OECD Test Guideline 425)
Inhalation: No data available
LD50 Dermal - Rat - male and female - > 5,000 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h

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(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rabbit - male and female - 28 d - LOAEL (Lowest observed adverse effect level) - 500 mg/kg
Remarks: Subacute toxicity

Repeated dose toxicity - Rat - male and female - Oral - 90 d - NOAEL (No observed adverse effect level) - 250 mg/kg - LOAEL (Lowest observed adverse effect level) - 1,000 mg/kg
Remarks: Subchronic toxicity
The value is given in analogy to the following substances:

RTECS: TY2900000

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To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After swallowing of large amounts:

Diarrhea
Nausea
Vomiting
Convulsions

The following applies to aliphatic amines in general: irritations after contact with eyes and skin. Mucosal irritations, coughing, and dyspnoea after inhalation.
This substance should be handled with particular care.

Under given conditions, contact with nitrites or nitric acid can lead to the formation of nitrosamines, which have shown themselves to be carcinogenic in animal experiments.

However, when the product is handled appropriately, hazardous effects are unlikely to occur.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - > 980 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to bacteria	static test EC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 97.1 % - Readily biodegradable. (OECD Test Guideline 301F)

12.3 Bioaccumulative potential

No bioaccumulation is to be expected (log Pow <= 4).

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Substance is not persistent, bioaccumulative, and toxic (PBT).

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

No data available

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

Further information
Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Maine Chemicals of High Concern

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Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16: Other information

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.12 Revision Date: 08/07/2024 Print Date: 08/08/2024

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APPENDIX C

Heat Illness Prevention Program

HEAT ILLNESS
PREVENTION PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**10/2019**
REVISION DATE	:	**03/2024**
REVISION NUMBER	:	**3**

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1. PURPOSE

Roux Associates, Inc. and its affiliated **companies**, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has established this heat illness prevention program to assist in preventing workplace accidents, injuries, and illnesses associated with temperature extremes. Roux is committed to taking every precaution to protect employees who might be exposed to heat stress, including establishing safe work practices, heat illness prevention controls, and emergency preparedness, which will be detailed in this plan.

2. SCOPE AND APPLICABILITY

Roux's Heat Illness Prevention Program applies to all employees who may be exposed to heat stress in the field.

3. ROLES AND RESPONSIBILITIES

The Heat Illness Prevention Program Administrator for Roux is the Corporate Health and Safety Director (CHSD), Brian Hobbs, CIH, CSP. The daily administration of the program is delegated to the Operations Manager (OM) and Office Health and Safety Manager (OHSM). The CHSD has the authority, responsibility, and overall accountability for the comprehensive implementation of this program.

All managers and supervisors shall implement and maintain the heat illness prevention program in work areas where there is a potential for heat stress.

Management Responsibilities

Management (i.e., Project Managers, Project Principals, OM) must provide the following to promote compliance and foster a good safety culture:

- Comply with applicable standards.
- Inform employees of the provisions of the heat illness prevention program and ensure understanding.
- Provide sufficient water, shade, rest areas, and other heat illness controls for employees.
- Assist with establishing work practices to minimize heat stress risks, such as acclimatization, required rest periods, employee monitoring, and strategic scheduling.
- Encourage employees to report hazardous conditions or heat illness symptoms.
- Provide training to any employee who could possibly be exposed to the risk of heat illness.

Employee Responsibilities

Employees are expected to actively participate in the organization's heat illness prevention program, which includes the following responsibilities:

- Receive appropriate training with regard to heat stress.
- Understand core concepts of heat illness prevention and follow guidelines to mitigate risks.
- Recognize the signs and symptoms of heat illness and immediately report them.
- Cooperate with workplace inspections and incident investigations.

Effective Communication

All Roux employees shall be accountable for ensuring there is effective communication with both the field team and their subcontractors. Communication between Roux employees project leads (e.g., Project Principal, Project Managers) and subcontractors (if applicable) will be established and maintained so that employees can quickly

contact should there be a change in condition or someone at the Site exhibits signs/symptoms of heat stress. These types of incidents would follow Roux's Incident Investigation and Reporting Management Program 2.12 and Roux's Injury Illness Prevention Program 2.22.

4. HAZARD IDENTIFICATION AND ASSESSMENT

Prior to scheduled fieldwork, the project team shall ensure a hazard assessment is conducted as it relates to heat stress. This will include a determination of how much heat and exertion employees are likely to be exposed to based on the work activity.

Factors that can increase heat stress include the following:

- Temperatures at the work site;
- Humidity;
- A lack of air movement or exchange;
- The amount of time employees spend working in the heat;
- The time of day work takes place;
- Sources of radiant heat (e.g., sunlight, fire, or hot furnace);
- Work activities that produce heat (e.g., welding);
- Physical contact with warm or hot objects or liquids;
- The clothing and PPE employees are required to wear; and/or
- Physically strenuous work.

Results of the hazard analysis should be used to determine appropriate controls for mitigating heat stress, whenever possible, for planning acclimatization, and for developing work schedules that rotate workers to limit employee exposure. Typically, the Site Supervisor (SS) or Site Health and Safety Officer (SHSO) shall conduct worksite observations to ensure all employees follow heat illness prevention procedures and that hazards are sufficiently controlled. However, all employees should be continuously evaluating work site conditions and be able to recognize heat stressors in order to prevent heat illnesses.

5. TRAINING

All Roux employees shall be trained on the topics listed below prior to beginning work, which may potentially expose workers to heat stress.

Training Topics

- The environmental, behavioral, and personal risk factors for heat illness, such as radiant heat sources, exertion, clothing and PPE, and use of alcohol or drugs.
- Types of heat illnesses, common symptoms, and appropriate emergency response for each.
- The knowledge that mild symptoms may quickly become more severe or life-threatening.
- The importance of immediately reporting any signs or symptoms of heat illness to the supervisor.
- The employer's responsibility to provide shade, water, access to first aid, and cool-down rests during work and the employee's freedom to exercise their rights under this standard without fear of retaliation.

- The employer's heat stress plan and its procedures:
  - Procedures for employees who are newly assigned to work in high-heat areas.
  - The organization's acclimatization methods, as applicable.
  - Heatwave procedures.
  - Heat illness and emergency response, including contact information.
- The importance of frequent consumption of water and the taking of rest breaks.
- How heat illness prevention applies to employees' specific tasks.

Increasing Training Effectiveness:

- The SS/SHSO will hold daily tailgates with the field team to go over daily work tasks and basic safety information including Job Safety Analysis (JSA) review as well as incorporate elements such as current weather and effects on the work activities for the day.
- If a heat wave or high heat is anticipated, OHSMs and/or OMs will provide communications to Roux employees prior to their shifts and remind them of any special high heat procedures.

6. DRINKING WATER

Employees shall be given access to potable drinking water. Access to water will be provided as near as possible to where employees are working, and there shall be enough locations so employees will have sufficient water. Water should be fresh and pure, free of taste or smell that would discourage employees from drinking, comfortably cool, and obtained from an approved source.

The recommendation is that during warm or hot weather, employees drink four 8-ounce glasses of water, or a total of one quart per hour, throughout the entire work shift. Easy access to sufficient potable drinking water throughout the work shift encourages employees to drink.

During a heat wave, water shall be replenished more often to keep available and cool. Water containers (and all spouts and levers) must be kept clean. If able, provide single-use drinking cups with appropriate waste receptacles. Accessible sanitation facilities shall also be maintained at work Sites as appropriate.

SS/SHSO is responsible for the following:

- Drink sufficient water before, during, and after work shifts to maintain hydration.
- Encourage frequent drinking of small amounts of water throughout the shift. In high-heat environments, remind field staff and subcontractors that drinking extra water may be necessary.
- Discourage the choice of drinks with caffeine or sugar that may possibly dehydrate employees instead of water. Also, discourage the drinking of alcohol.
- Monitor the water supply.
- If employees become dehydrated and are unable to alleviate symptoms with the steps below, get them immediate medical attention.

Field Staff/Subcontractors are responsible for the following:

- Drink sufficient water before, during, and after work shifts to maintain hydration. Drink up to 4 cups of water per hour, especially during hot weather.
- Be aware that in high-heat situations, you may need to drink more water.

- Monitor yourself and others for signs of dehydration. If you feel dehydrated:
  - Follow Roux's Incident Notification Flowchart;
  - Rest in the shaded resting area; and
  - Drink water in small amounts, but frequently.

7. ACCESS TO SHADE

Access to shaded areas will be provided to Roux staff, as needed. Employees are encouraged to use these areas when they feel overheated. Roux's SS/SHSO shall oversee the proper implementation of shaded areas and will communicate these locations on a daily basis with the Field Team.

Depending on the Site, shaded areas can include the following:

- Pop-up Tents
- Canopies
- Umbrellas
- Structures mechanically ventilated or open to air movement
  - Garage
- Conex-mounted RV canopies
- Full and thick tree canopies that block direct sunlight
- Buildings
- Enclosed areas only if they provide cooling comparable to shade in open-air
  - Vehicles with air conditioning

Shaded Area Requirements

The shade shall be strong enough to cool employees down and other shadows should not be visible in the shade. The shade will be provided by Roux when the air temperature exceeds 80°F. If the temperature is less than 80°F, shade will be available and provided upon request. The SS/SHSO will monitor conditions to determine when the air will exceed (and is exceeding) 80°F. For most Sites, air will be monitored hourly and shade will be set up immediately if 80°F is exceeded.

Shade shall be located as close as practical to areas where employees are working and is easily accessible. These areas will be considered safe and free from other hazards. Shaded areas should be large enough to accommodate all employees who are on a break, resting, or recovering without crowding. Should natural vegetation be used for shade, the SS/SHSO will evaluate shade for effectiveness.

Field Staff Responsibilities

Field Staff should take ordinary rest breaks in the shaded areas and monitor themselves for signs of heat stress, and go to the shaded area when they need to cool down. Any issues or problems with shaded areas should be reported to the SS/SHSO for the Site.

If shaded areas are used for a preventative cool-down, the SS/SHSO will ensure the affected employees will remain in the shade until they begin to feel better. The SS/SHSO will continue to monitor the employees and ask them if

they are experiencing symptoms of a heat illness. Employees shall not be sent back to work before symptoms have ended and at a minimum at least 10 minutes of rest.

8. MONITORING AND SCHEDULING

Monitoring

The SS/SHSO and Field Team will continue to monitor themselves and others for signs of heat illness. The SS/SHSO will monitor when the air temperature exceeds 80°F. Throughout the summer, weather and temperature will be monitored at least two weeks ahead, and the work schedule will be planned to accommodate the expected weather.

Scheduling

Scheduling accommodations may include:

- Working during cooler hours of the day
- Working at night
- Stopping work early
- Rescheduling work activities
- Increasing frequency of breaks

In general, strenuous work activities shall be rescheduled to the coolest parts of the day.

Special precautions are required for temperatures above 80°F, 95°F, and heat waves. These precautions are provided in the sections below.

9. ACCLIMATIZATION AND NEW EMPLOYEE PROCEDURES

Roux requires employees to be acclimatized in order for them to better tolerate heat in the workplace. Acclimatization is the physical process of adapting to a different thermal environment, allowing a better toleration of heat. Acclimatization procedures require gradual exposure that gives the employee time to adjust to each level of exposure. Acclimatization is essential for new employees but is necessary for all employees when the temperature significantly changes. Heat stress is much more likely if these procedures are not followed.

The SS/SHSO is responsible for observing new employees during their first 14 days of employment in high-heat areas.

Re-acclimatization is necessary if employees are absent from high-heat environments for a week or more or the temperature increases significantly.

10. HEATWAVE AND EXTREME HEAT PROCEDURES

Heat Wave Procedures

A heat wave is defined as consistent temperatures over 80°F or if the temperature is 10° higher than the average daily temperatures in the preceding 5 days.

SS/SHSO and Project Management (e.g., PP, PM) shall closely observe and monitor employees during a heat wave. The Field Teams should institute a ratio of one SS to 20 or fewer employees, a mandatory buddy system, or

a consistent practice for supervisors to check on employees. Pre-shift meetings to review high-heat procedures with employees will be carried out to emphasize work-rest schedules, drinking water, shade, etc.

Extreme Heat Procedures

When work-site temperatures equal or exceed 95°F, the employer will enact extreme heat procedures:

- Employees will be closely observed by the SS/SHSO for signs of heat illness. New employees will be supervised for acclimatization.
- Effective communication and monitoring will be assured through the use of periodic check-ins with the SS/SHSO via phone. Communications between employees and Project Management (e.g., PP/PM) will be established and maintained. Mandatory 10-minute break periods are required for every two hours worked. SS/SHSO must enforce this rule.
- Pre-shift safety tailgate meetings will occur to review procedures and to remind employees to drink water and take cool-down rests if needed. SS/SHSO shall remind employees to rest and drink water. Employees should drink more water than usual.

11. EMERGENCY RESPONSE PROCEDURES

Roux is dedicated to providing prompt appropriate care for all employees who report or show symptoms of heat illness. If an employee shows signs of heat illness, they will be monitored and shall not be left alone or sent home without being offered first aid or emergency medical services. If on-Site personnel require any medical treatment, the following steps will be taken:

1. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence, and communicate with the contracted Occupational Health Care Management Provider, AllOne Health (AOH), immediately following the notifications provided above.
2. Based on discussions with the Project Team, Corporate Management, and the AOH evaluation, if medical attention beyond onsite First Aid is warranted, transport the injured / ill person (IP) to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an ambulance or transport the victim to the hospital, and continue communications with Corporate Management Team. An Urgent Care/Hospital Route map with locations and directions is provided within Site Specific Health and Safety Plans.
3. First aid medical support will be provided by onsite personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED), and Blood-Borne Pathogens (BBP) Awareness, until relieved by emergency medical services (EMS).
4. The SHSO and Project Manager will perform a Loss Investigation (LI) and the Project Team will complete the final Loss Report.

12. HEAT-RELATED ILLNESSES

Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot-weather environments. For these reasons, the company will provide potable drinking water and access to shade or other areas of relief (i.e., air-conditioned vehicles and work trailers). Supervisors, prior to supervising personnel in the field as well as all personnel involved with the fieldwork of a project, are trained in this HASP that includes preventing heat-related illnesses and the below procedures in response to heat-related symptoms and illness. Since much of our work is dependent upon environmental factors beyond our control, we must closely monitor air temperature and humidity and be aware of avoiding radiant heat sources and providing as much air circulation as possible wherever we work. Physical factors that need to be evaluated as part of our Job Safety Analysis (JSA) reviews include the level of physical activity and duration of work

and the type (i.e., color, weight breathability) of the clothing we select. In addition, personal factors such as age, weight, fitness, drug/alcohol use, and prior history of heat-related illness need to be considered.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, resulting in painful muscle cramps. The signs and symptoms of heat stress are as follows:

- Severe muscle cramps, usually in the legs and abdomen;
- Exhaustion, often to the point of collapse; and
- Dizziness or periods of faintness.

First aid treatment includes, but is not limited to, shade, rest, and fluid replacement. Typically, the individual should recover within one-half hour while being monitored constantly. If the individual has not improved substantially within 30 minutes and the body temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat Exhaustion

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual fails as blood collects near the skin to rid the body of excess heat through transference. The signs and symptoms of heat exhaustion are as follows:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin with heavy perspiration;
- Skin appears pale;
- Fatigue and weakness;
- Dizziness; and
- Elevated body temperature.

First aid treatment includes, but is not limited to, cooling the victim, elevating the feet, and replacing fluids. If the individual is not substantially improved within 30 minutes and the body temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat Stroke

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a MEDICAL EMERGENCY requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- Dry, hot red skin;
- Body temperature approaching or above 105 degrees F;
- Confusion, altered mental state, slurred speech;
- Seizures;
- Large (dilated) pupils; and
- Loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility. Heat stress is a significant hazard if any type of protective equipment (semi-permeable or impermeable) that prevents evaporative cooling is worn in hot-weather environments.

13. OTHER HEAT CONTROLS

Clothing and PPE

Employees should choose clothing that is reflective, light-colored, lightweight, loose-fitting, and breathable. Clothing should cover the exposed parts of the body. In direct sun, hard hats with a brim or bill may be helpful. Should specialized cooling garments be applicable, please consult with your OM/OHSM/CHSD.

Managing Employee Risk Factors

It is recommended that employees are aware of how their health can affect their risk of heat stress. The following increases ones risk for a heat related illness:

- A poor level of physical fitness
- Obesity
- Chronic or acute illnesses
- Conditions such as diabetes, heart disease, or high blood pressure
- Certain medications, such as diuretics
- Age (60+)

Employees should:

- Maintain their health outside of work
- Be aware of the effects of medications
- Drink adequate amounts of water
- Eat light, cool meals during work shifts and save heavy meals until after the shift is over
- Do not skip meals: food helps replace electrolytes when sweating
- Take breaks as needed
- Do not consume alcohol prior to working in a hot environment

APPENDIX D

Personal Protective Equipment ("PPE") Management Program

PERSONAL PROTECTIVE EQUIPMENT MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
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1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") has instituted the following program to establish guidelines for the selection of personal protective equipment (PPE) for use by Roux personnel performing field activities in hazardous environments. PPE is not meant to be a substitute for engineering, work practice, and/or administrative controls, but PPE should be used in conjunction with these controls to protect employees in the workplace. Clothing, body coverings, and other accessories designed to prevent worker exposure to workplace hazards are all types of PPE. To ensure adequate PPE employee-owned PPE is evaluated on a case-by-case basis to insure its adequacy, maintenance and sanitation.

2. SCOPE AND APPLICABILITY

These guidelines apply to all PPE selection decisions to be made in implementing the Roux program. The foundations for this program are the numerous Occupational Health and Safety Administration (OSHA) standards related to PPE cited in 29 CFR 1910 Subpart I, 29 CFR 1926 Subpart E, and the hazardous environment work employee protection requirements under the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and 1926.65. To ensure hazard assessments are documented, the levels of protection, types of protection, and tasks requiring protection are covered in site-specific Health and Safety Plans (HASPs) and Job Safety Analyses (JSAs).

3. PROCEDURES

Due to the varied nature of site activities and the different potential hazards associated with different sites, several aspects must be considered when selecting PPE. The following text describes PPE selection logic and provides guidelines and requirements for the appropriate selection and use of PPE.

3.1 Introduction

To harm the body, chemicals must first gain entrance. The intact skin and respiratory tract are usually the first body tissues that are exposed to chemical contaminants. These tissues provide barriers to some chemicals but, in many cases, are damaged themselves or are highly permeable by certain chemical compounds. PPE, therefore, is used to minimize or eliminate chemical compounds from coming into contact with these first barrier tissues.

Proper PPE selection is essential in preventing exposures. The Project Manager (PM) or health and safety personnel making the selection will have to consider several factors. The level of protection, type, and kind of equipment selected depends on the hazardous conditions. In some cases, additional selection factors include cost, availability, compatibility with other equipment, and performance. All these factors must be accurately assessed before work can be safely carried out.

3.1.1 Training

Training shall be provided to all field-based employees in properly using and caring for PPE. Training shall include, but not be limited to, the initial 40-hour HAZWOPER training, annual 8-hour HAZWOPER refresher training, and site-specific PPE training. The training program includes when PPE is necessary, what types of PPE are required; how to don, doff, adjust, and wear PPE; the limitations of PPE; the proper care, maintenance, useful life, signs of PPE failure and emergency procedures to follow in the event of PPE failure and disposal of PPE. In addition, retraining shall be conducted when workplace changes require a change in PPE when an employee demonstrates a lack of knowledge or improper use of PPE is identified.

3.2 Types of PPE

The type and selection of PPE must meet certain general criteria and requirements as required under OSHA 29 CFR 1910.132 (General Industry) and 1926.95 (Construction). In addition to these general requirements, specific requirements and specifications exist for some types of PPE that form the basis of the protective clothing scheme. All manufacturer's recommendations for PPE care and use shall be followed. All PPE shall be maintained in a sanitary and reliable condition. Additionally, proper fit and size shall be evaluated to ensure adequate employee protection. Should PPE become defective, it shall be immediately removed from service and discarded.

The following is a list of the common types of specific PPE and the specific requirements for the PPE type, where applicable:

1. Hard Hats - Regulated by 29 CFR 1910.135 and 1926.100; and specified in ANSI Z89.1.
2. Face Shields and Safety Glasses - Regulated by 29 CFR 1910.133 and 1926.102; and specified in ANSI Z87.1.
3. Respiratory Protection - Regulated by 29 CFR 1910.134 and 1926.103.
4. Hand Protection - Regulated by 29 CFR 1910.138
5. Foot Protection - Regulated by 29 CFR 1910.136 and 1926.96; and specified in ANSI Z41.1.
6. Protective Clothing (e.g., fully encapsulated suits, aprons) - Specified in NFPA 1991/1992/1994.

3.2.1 PPE Inspection, Cleaning Maintenance, and Storage

The Office Health and Safety Manager (OHSM) or their designee is responsible for procuring PPE, in accordance with this management program. Single-use/disposable PPE should be purchased and used whenever practicable.

3.2.1.1 PPE Inspection

Roux employees must inspect PPE regularly, before and after each use, to check for defects and damage. Garments and other PPE in central storage must be inspected at least annually or as recommended by the manufacturer by the OHSM, Equipment Manager and/or their designee. Defective or damaged equipment must be tagged as out-of-service, immediately removed from the work site and discarded.

3.2.1.2 PPE Cleaning and Maintenance

All Roux employees are responsible for routine cleaning of their assigned PPE. Decontamination of PPE is addressed within Roux's Site Control and Decontamination Program as well as specified within site-specific health and safety plans. As appropriate, Roux employees should be issued single-use PPE when practicable to minimize the requirement for decontamination. When performing routine cleaning of reusable PPE:

- Always follow the manufacturer's recommendations to avoid damaging the PPE. For example, some cleaning solutions compromise the integrity of protective helmets' shells.
- Clean and maintain PPE according to the manufacturer's recommendations. Before being re-issued, PPE should be thoroughly sanitized.
- Disassemble, wash, and sanitize reusable respirators after each use, refer to Roux's Respiratory Protection Management Program.

Employees are not authorized to repair PPE without prior approval from the Health and Safety Department. Reusable PPE may require maintenance by the manufacturer to maintain integrity and certification. Many

manufacturers specify which repairs, if performed by the end-user, will void product warranty, therefore Roux employees are not typically authorized to perform such maintenance or repairs.

3.2.1.3 PPE Storage

Certain equipment failures can be directly attributed to improper storage. The OHSM or Equipment Manager (or another designated person) is responsible for implementing procedures for appropriate PPE storage, for equipment that is centrally stored. Both central storage and dedicated PPE provided to employees should be stored using the following:

- Store goggles and safety glasses in protective cases.
- Store PPE (such as helmets, boots, etc.) in clean, dust-proof containers or bags out of direct sunlight.
- PPE should ideally be stored under climate-controlled conditions. PPE, stocked gear bags, and/or go-kits should not be stored in hot, cold, or other extreme environmental conditions, and they should not be stored in vehicles (government-owned or rentals) for even short periods of time. Do not store helmets on the rear window shelf of a vehicle.
- Store different kinds of clothing and gloves separately to prevent errors in selection.
- Hang or fold protective clothing in accordance with manufacturers' recommendations.
- Never store contaminated PPE near new protective clothing or street clothing. Potentially contaminated, reusable clothing must be stored (usually bagged) away from new PPE, in a well-ventilated area, with good air flow around each item, until the garment is decontaminated or disposed.
- See Roux's Respiratory Protection Management Program for detailed procedures on storing respirators.

3.3 Fitting, Donning and Doffing PPE

Roux shall provide appropriately sized PPE for Roux employees. Improper fitting such as tight-fitting garments, can tear, especially at the knees, crotch, shoulders, back, and elbows due to movement. Protective clothing that is too large can easily snag and/or limit a user's dexterity. The Roux PM shall ensure site/project-specific PPE is kept in a sufficient stock of appropriately sized PPE (e.g., Level C ensembles). The OHSM, Equipment Manager and/or their designee shall ensure a sufficient stock of appropriately sized PPE is maintained in central storage locations.

The Site Supervisor (SS)/Site Health and Safety Officer (SHSO) is responsible for ensuring that site-specific procedures for donning and doffing PPE are incorporated into site-specific HASPs. Donning and doffing procedures may differ depending on the type of PPE and clothing (e.g., Level D, Modified Level D, Level C) utilized. Figures 1-4, provide examples of procedures that can be used to don and doff Levels A through D and are provided as a reference. Site-specific conditions may warrant adjustments to such procedures. Consult the CHSD for additional information.

Site-specific donning and doffing procedures should include the use of an assistant where necessary. Donning and doffing certain types of PPE without assistance could risk PPE failure or damage. Care must be taken to prevent the spread of contaminants on the PPE. Decontamination procedures should limit the potential for cross contamination and may include gross decontamination of outer boots, gloves, and suits as necessary to prevent tracking of contaminants into the contamination reduction zone (CRZ) and clean zone(s).

3.4 Controlling Hazards Associated with PPE Use

PPE use can pose potential health and safety hazards, which range from minor discomfort to life-threatening height stroke. The magnitude of the potential hazard can vary and will depend on various factors, including an individual's fitness level, the type of PPE worn, the work demands, individual work practices, duration of work and environmental conditions. The use of PPE can also lead to reduced efficiency and work performance.

Among hazards associated with PPE use, heat stress emerges as a prevalent and significant hazard. Particularly, the use of substantial and/or impermeable attire, such as heavy coveralls, Tyvek suits, splash suits, or Level A or B suits, alongside strenuous work, amplifies the risk of heat stress. Regular monitoring for indications of heat stress is imperative for workers operating in such conditions. Roux's Heat Illness Prevention Program lays out requirements for signs and symptoms as well as preventative measures to mitigate the potential for heat illness. In addition, cold environments can pose adverse risk, such examples include use of non-insulated steel-toe safety shoes in frigid conditions which has the potential to increase the risk of frostbite, while safety gloves worn for chemical protection may inadequately insulate hands from the cold.

It is the responsibility of Project Teams to integrate site-specific protocols to manage PPE hazards into such site-specific HASPs. These protocols can encompass considerations like work/rest ratios, crew rotations, and other accommodations for exceptionally demanding conditions.

The following measures are recommended for controlling hazards posed by PPE use:

- Prioritize through the hierarchy of controls with a focus on elimination, substitution, engineering, work practice and administrative control implementation rather than sole reliance on PPE. PPE shall be considered the last line of worker protection.
- Workers should maintain physical fitness to be able to withstand the potential physical strain of PPE use. A physically fit individual will endure less physiological strain, manifesting in a lower heart rate, reduced body temperature (indicating diminished retained body heat), more effective sweating, slightly lower oxygen consumption, and carbon dioxide production. Furthermore, acclimatization to extreme environmental conditions, such as high temperatures, can influence work performance and physical capacity.
- Understand the symptoms of PPE failure. Workers encountering any of these symptoms while donning PPE should promptly notify their onsite SHSO and/or SS:
    - Perception of odors when wearing a respirator
    - Skin irritation
    - Acute discomfort
    - Difficulty breathing
    - Unusual fatigue
    - Dizziness
    - Inability to see, hear, or speak clearly
    - Uncomfortable restriction of movement
    - Rapid pulse, nausea, or chest pain
- Implement a buddy system. Especially in situations where there is a need for increased level of protection (e.g. Level A-C) workers should work in pairs or teams, and are instructed to monitor the integrity of their team/partners gear and remain alert for symptoms of PPE failure.

3.5 PPE Selection

For site-specific work, the Project Manager in consultation with the Health and Safety Department has overall responsibility for coordinating the selection and distribution of PPE to field staff and for ensuring that the selected PPE is appropriate for the site-specific hazards. Generally speaking Roux employees are not engaged in emergency response or perform work at uncontrolled hazardous waste sites, if the case the CHSD shall be made aware of the work and consult with the Project Team on appropriate PPE selection. Most work falls under environmental sampling of low concentration water/soil/perimeter air. Therefore work is carried out in Level D PPE. Upgrades would be based on more information as it becomes available. The United States Environmental Protection Agency (EPA) has created Guidelines for PPE Ensemble Selection to assist workers in selecting PPE ensembles for specific activities and tasks and determining which ensembles and air monitoring equipment should be used to address specific chemicals. Guidelines to Ensembles for Specific Activities/Tasks Where Chemical Exposure is Possible is provided as a reference as Appendix A.

3.6 Protective Clothing Selection Criteria

3.6.1 Chemicals Present

The most important factor in selecting PPE is the determination of what chemicals the employee may be exposed to. The number of chemicals on field investigations may range from a few to several hundred. The exact chemicals or group of chemicals present at the site (certain groups tend to require similar protection) can be determined by collecting and analyzing air, soil, water, or other site media samples. When data are lacking, research into the hazardous materials used or stored at the site can be used to infer potential chemical exposures on the site.

The most appropriate clothing shall be selected once the known or suspected chemicals have been identified and considered based on the type of work to be performed.

Protective garments are made of several different substances for protection against specific chemicals. There is no universal protective material. All will decompose, permeate, or otherwise fail to protect under given circumstances. Fortunately, most manufacturers make guides to using their products (i.e., Dupont's Tyvek™ Permeation Guide). These guides are usually for gloves and coveralls and typically provide information regarding chemical degradation rates (failure of the material to maintain structural integrity when in contact with the chemical) and may provide information on the permeation rate (whether or not the material allows the chemical to pass through). When permeation tables are available, they shall be used with degradation tables to determine the most appropriate protective material for the specific chemical hazard(s).

During most site work, chemicals are usually in mixed combinations, and the protective materials are not in continuous contact with pure chemicals for long periods; therefore, the selected material may be adequate for the particular chemical of most concern and type of work being performed, yet not the "best" protecting material for all site chemicals and activities. Selection shall depend upon the most hazardous chemicals based on their hazards and concentrations. Sometimes, layering (i.e., using several layers of protective materials) affords the best protection.

3.6.2 Concentration of the Chemical(s)

One of the major criteria for selecting protective material is the concentration of the chemical(s) in air, liquid, and solid state. Airborne and liquid chemical concentrations should be compared to the OSHA standards and American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines to determine the level of skin or other absorptive

surface (e.g., eyes) protection needed. While these standards are not designed specifically for skin exposed directly to the liquid, they may provide skin designations indicative of chemicals known to have significant skin or dermal absorption effects. For example, airborne levels of PCBs on-site may be low because they are not very volatile, so the inhalation hazard may be minimal; however, PCB-containing liquid coming in direct contact with the skin may cause overexposure. Thus, PCBs have been assigned a skin designation in the OSHA and ACGIH exposure limit tables.

3.6.3 Physical State

The characteristics of a chemical may range from nontoxic to highly toxic, depending on its physical state. Inorganic lead in soil would not be considered toxic to site personnel unless it became airborne since it is generally not absorbed through the intact skin. However, organic lead in a liquid could be readily absorbed through the skin. Soil is frequently contaminated with hazardous materials. Concentrations will vary from a few parts per million to nearly one hundred percent by volume. The degree of hazard depends on the type of soil and concentration of the chemical. Generally speaking, "dry" soils that have not become airborne do not pose a hazard to site personnel if they take minimal precautions, such as wearing lightweight gloves.

3.6.4 Length of Exposure

The length of time a material is exposed to a chemical increases the probability of a breakthrough. Determinations of actual breakthrough times for short-term exposures indicate that several materials that would be considered inadequate under long-term exposures can be used. Different materials that would be considered inadequate under long-term exposures can be used. It should be kept in mind that during the manufacturer’s permeation testing, a pure (100% composition) liquid is usually placed in direct contact with the material, producing a worst-case situation.

3.6.5 Abrasion

When selecting protective clothing, the job the employee is engaged in must be taken into consideration. Persons moving drums or performing other manual tasks may require added protection for their hands, lower chest, and thighs. Using leather gloves and a heavy apron over other normal protective clothing will help prevent damage to the normal PPE and thus reduce worker exposures.

3.6.6 Dexterity

Although protection from skin and inhalation hazards is the primary concern when selecting PPE, the ability to perform the assigned task must be maintained. For example, personnel cannot be expected to perform work that requires fine dexterity if they must wear thick gloves. Therefore, the PPE selection process must consider the task being performed and provide PPE alternatives or techniques that maintain dexterity while still protecting the worker (e.g., wearing tight latex gloves over more bulky hand protection to increase dexterity).

3.6.7 Ability to Decontaminate

If disposable clothing cannot be used, the ability to decontaminate the materials selected must be taken into consideration. Once a chemical makes contact with the material, the PPE must be cleaned before reusing it. If the chemical has completely permeated the material, the clothing cannot be adequately decontaminated, and the material should be discarded.

3.6.8 Climactic Conditions

The human body works best with few restraints from clothing. Protective clothing adds a body burden by increasing weight, restricting movement, and preventing the body's natural cooling process. In severe situations, a modified work program must be used.

Some materials act differently when they are very hot and very cold. For example, PVC becomes almost brittle in frigid temperatures. If there are any questions about the stability of the protective materials under different conditions, the manufacturer should be contacted before using PPE in the field.

3.6.9 Work Load

Like climactic conditions, the type of work activity may affect work duration and personnel's ability to perform certain tasks. Similarly, the amount of protective materials a person wears will affect their ability to perform certain tasks. For example, a person in a total encapsulating suit, even at 72˚F, cannot work for more than a short period of time without requiring a break.

The work schedule should be adjusted to maintain the health of the employees. Modified work practices may include allowing more time for individual job tasks and implementing work/rest cycles per NIOSH and ACGIH thermal stress recommendations. Special consideration should be given to the selection of clothing that protects the worker and adds the least burden when personnel are required to perform strenuous tasks. Excessive bodily stress frequently represents the most significant hazard encountered during fieldwork.

3.6.10 Types of Protective Materials

1. Cellulose or Paper: suitable for nuisance dust and coarse fibers.
2. Natural and Synthetic Fibers
    a. Tyvek™: suitable small-sized hazardous particles, including lead, asbestos, and mold.
    b. Tychem™: is suitable for a variety of hazards, from light liquid splashes to heavy exposures to industrial chemicals and agents.
    c. Nomex™: is suitable for flame-resistance, radiation resistance, acids, alkalis, fluorocarbon refrigerants (CFCs), and non-polar solvents.
3. Elastomers
    a. Polyethylene: suitable for polar substances and solvents.
    b. Saran™ : suitable for flame-resistance, acids, alkalis, oils, and organic solvents.
    c. Polyvinyl Chloride (PVC): suitable for alcohols, oils, inorganic acids, alkalis, and salts.
    d. Neoprene: suitable for polar/non-polar substances, petroleum mixtures, and ≤ 200 F heat resistance.
    e. Butyl Rubber: suitable for polar substances and solvents.
    f. Viton: suitable for non-polar substances, petroleum mixtures, and ≤ 200 F heat resistance.
    g. Nitrile: suitable for polar/non-polar substances and petroleum mixtures.

3.7 Protection Levels

3.7.1 Level A Protection

Level A protection (a fully encapsulated suit) is used when skin hazards exist or when no known data positively rule out skin and other absorption hazards. Per the Roux Respiratory Protection Management

Program, Roux employees are not authorized to enter an IDLH atmosphere; therefore, the program does not allow supplied air respirators (SARs) or self-contained breathing apparatus (SCBA). At no time will Level A work be performed without the consent of the CHSD and OM.

The following conditions warrant the use of Level A protection:

- Hazardous substances have been identified and require the highest level of protection for skin, eyes, and the respiratory system;
- The atmosphere contains less than 19.5% oxygen or an atmosphere immediately dangerous to life and health (IDLH) that have not been ruled out;
- Site operations involve a high potential for splash, skin immersion, or exposure to suspected skin hazards;
- Direct-reading instruments indicate high levels of unidentified but potentially hazardous vapors or gases in the air (e.g., Total atmospheric readings on the Photoionization Detector (PID), Flame Ionization Detector (FID), and similar instruments indicate 500 to 1,000 ppm of unidentified substances); and
- Direct-reading instruments are not available to test the air and suspected highly toxic substances may be present.

It may be necessary to base the decision to use Level A protection on indirect evidence. Other conditions that may indicate the need for Level A protection include:

- Confined spaces;
- Sites containing known skin hazards;
- Sites with no established history to rule out skin and other absorption hazards;
- Site exhibiting signs of acute mammalian toxicity (e.g., dead animals, illnesses associated with past entry into the site by humans);
- Sites at which sealed drums of unknown materials must be opened;
- Visible indicators such as leaking containers or smoking chemical fires; and
- Extremely hazardous substances (e.g., cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials, suspected carcinogens, and infectious substances) are known or suspected to be present, and skin contact is possible.

Table 1: Recommended Level A Ensemble Components			
Component	**Type**	**Manufacturer / Recommended Material**	**Notes**
Respirator	Positive-pressure full- facepiece SCBA or positive-pressure supplied-air respirator with escape SCBA[1]	NIOSH approved respirator	See Roux's Respiratory Protection Program. Roux employees are not approved to utilize Supplied Air (SAR) and/or Self-contained breathing apparatus (SCBA).
Suit	Totally encapsulated chemical- and vapor-protective suit	DuPont® Tychem™ or Responder CSM™	Other material types may be substituted based on known contaminants.
Inner Gloves	Light weight	Nitrile, Neoprene, PVC, or Viton®	Other material types may be substituted based on known contaminants.
Outer Gloves	Integral part of suit	See Appendix A for additional information	Confirm chemical performance rating for suspected contaminants. Glove material may have different performance ratings than suit material. All fully-encapsulating suit materials must be compatible with substances involved.
Inner Boot	Integral Part of Suit	-	-
Outer Boot	HazMat boot[2]	–	Confirm chemical performance rating of outer boot for suspected contaminants. Provides slip/abrasion resistance.
Hard Hat	Standard[3]	-	-

[1] Must be NIOSH approved.
[2] Must meet NFPA 1991/NFPA 1994 requirements depending on the site hazard assessment.
[3] Must comply with the applicable ANSI standard.

3.7.2 Level B Protection

Level B protection is utilized when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body is unlikely. At no time will Level B work be performed by Roux personnel without the consent of the CHSD and OM.

The following conditions suggest a need for Level B protection:

- The type and atmospheric concentration of toxic substances have been identified, and they require the highest level of respiratory protection;

- IDLH atmospheres where the substance or concentration in the air does not present a severe skin hazard;
- The type and concentrations of toxic substances do not meet the selection criteria permitting the use of air-purifying respirators and
- It is highly unlikely that the work being done will generate high concentrations of vapors, gases, particulates, or splashes of materials that will affect personnel's skin.

Table 2: Recommended Level B Ensemble Components

Component	Type	Manufacturer / Recommended Material	Notes
Respirator	Positive-pressure full- facepiece SCBA or positive-pressure supplied-air respirator with escape SCBA[1]	NIOSH approved respirator	See Roux's Respiratory Protection Program. Roux employees are not approved to utilize Supplied Air (SAR) and/or Self-contained breathing apparatus (SCBA).
Suit	Chemical-resistant clothing (liquid-splash protective suit with integral boot and hood)[2]	DuPont® Tychem® CPF 3	Other material types may be substituted based on known contaminants.
Inner Gloves	Light/medium weight	Nitrile, Neoprene, PVC, Viton®, or PE/EVAL	Other material types may be substituted based on known contaminants.
Outer Gloves	Medium/heavy weight	Butyl MIL-G12223, Nitrile, Neoprene, PVC, Viton®, PE/EVAL, or heavy weight Nitrile or Neoprene	Confirm chemical performance rating. Other material types may be substituted based on known contaminants.
Inner Boot	Safety work boot	–	Other boot types may be substituted based on known contaminants and physical hazards. Puncture resistant shanks may be required.
Outer Boot	Heavy weight Latex booties or outer boots[2]	Latex booties are used to protect suit for light duty applications. NFPA-rated outer boots may be required based on anticipated site conditions and tasks.	Other outer boot coverings may be substituted based on known contaminants/anticipated tasks.
Hard Hat	Standard[3]	-	-

[1] Must be NIOSH approved.
[2] Must meet NFPA 1991/NFPA 1994 requirements depending on the site hazard assessment.
[3] Must comply with the applicable ANSI standard.

3.7.3 Level C Protection

Level C protection is utilized when skin and respiratory hazards are well defined, and the criteria for using negative pressure respirators have been fulfilled (i.e., known contaminants and contaminant concentrations, acceptable oxygen levels, approved filter/cartridge available, known cartridge service

life, etc.). Level C protection may require an emergency escape respirator during specific initial entry and site reconnaissance situations or when applicable after that.

Table 3: Recommended Level C Ensemble Components

Component	Type	Manufacturer / Recommended Material	Notes
Respirator	Full-face air-purifying respirator with appropriate cartridge[1]	NIOSH approved respirator	See Roux's Respiratory Protection Program for information about the brand, model, acceptable configurations, and specific care instructions for the standard issue respirator. Half-faced respirators may be donned if hazard assessment warrants.
Suit	Puncture/tear resistant suit material with boot and hood[2]	DuPont® Tychem® CPF 2/CPF 3 or Saranex	Other material types may be substituted based on known contaminants, if considered more appropriate.
Inner Gloves	Light weight	Nitrile, Neoprene	Other material types like Neoprene, PVC, Viton®, or PE/EVAL may be substituted based on known contaminants, if considered more appropriate.
Outer Gloves	Medium/heavy weight	Butyl, Nitrile, or other work glove	Confirm chemical performance rating. Other material types may be substituted based on known contaminants, if considered more appropriate.
Inner Boot	Safety work boot	–	Other boot types may be substituted based on known contaminants and physical hazards. Puncture resistant shanks may be required.
Outer Boot	Heavy weight Latex booties or outer boots[2]	Latex booties are used to protect suit for light duty applications. NFPA rated outer boots may be required based on anticipated site conditions and tasks.	Other outer boot coverings may be substituted based on known contaminants.
Hard Hat	Standard[3]	-	-
Eye Protection	Safety glasses/goggles[3,4]	-	-

1 Must be NIOSH approved.
2 Must meet NFPA 1991/NFPA 1994 requirements depending on the site hazard assessment.
3 Must comply with the applicable ANSI standard.
4 In the case a ½ face respirator is worn eye protection is required.

3.7.4 Level D Protection

Level D is the basic work uniform. Level D is worn when the atmosphere contains no known hazard. Work functions preclude splashes, immersion, potential for inhalation, or direct contact with hazard chemicals. For most Roux field jobs Level D is the standard minimum level of protection worn.

Table 4: Recommended Level D Ensemble Components

Component	Type	Manufacturer / Recommended Material	Notes
Respirator	None	-	-
Suit	Coveralls, street clothes, or disposable Tyvek suit	–	Other types may be substituted as appropriate.
Inner Gloves	N/A		
Outer Gloves	As appropriate for physical hazards and for comfort	–	-
Boot	Safety work boot	–	Roux's standard safety boot is 6", steel/composite safety toe, and electrical hazard (EH) rated.
Outer Boot Covering	As appropriate	–	–
Hard Hat	Standard[3]	-	-
Eye Protection	Safety glasses/goggles[3]	-	-
High Visibility Clothing	High Visibility Vest /Jacket[3]	-	ANSI Class 2 Safety Vests/Jackets are the standard. Class 3 Safety vests/jackets shall be worn in worksites with 50+ MPH traffic.
Hearing Protection	Ear muffs/plugs	-	Workers exposed to excessive noise shall don hearing protection. Refer to Roux's Hearing Conservation Program for more information.

[1] Must be NIOSH approved.
[2] Must meet NFPA 1991/NFPA 1994 requirements depending on the site hazard assessment.
[3] Must comply with the applicable ANSI standard.

3.7.5 Level E Protection

Level E protection is used when radioactivity above 10 millirems per hour (mrems/hr) is detected at the site. Personal protective equipment for Level E includes:

- Coveralls;
- Air purifying respirator (i.e., P100 or equivalent);
- Time limits on exposure;
- Appropriate dermal protection for the type of radiation present, and

- Radiation dosimetry and ambient monitoring.

3.7.6 Additional Considerations

Fieldwork will contain a variety of situations due to chemicals in various concentrations and combinations. These situations may be partially ameliorated by following the work practices listed below:

1. Foot protection is needed on every site. If the ground to be worked on is contaminated with liquid, and it is necessary to walk in the chemicals, some sort of protective shoe coverings or "booties" can be worn over the boots. Shoe coverings should be designed with soles to help prevent slips. Using disposable shoe coverings when contacting liquid contamination can on and reduce overall decontamination requirements. If non-liquids are to be encountered, a Tyvek™ bootie could be used. The advantage of booties is questionable if the ground contains any sharp objects. Boots should be worn with either cotton or wool socks to help absorb perspiration.
2. If the site requires hard hats, chin straps should be used if a person will be stooping over where his/her hat may fall off. Respirator straps should not be placed over the hard hats, as this will affect the respirator's fit.

   Some types of protective materials conduct heat and cold readily. In cold conditions, natural material clothing should be worn under protective clothing. Protective clothing should be removed before allowing a person "to get warm." Applying heat, such as with a space heater, to the outside of the protective clothing may drive contaminant permeation. In hot weather, under clothing will absorb sweat. It is recommended that workers use all cotton undergarments.
3. Body protection should be worn and taped to prevent anything from running into the top of the boot. Gloves should be worn and taped to prevent substances from entering the top of the glove. Duct tape is preferred, but masking tape can be used. When aprons are used, they should be taped across the back for added protection. However, this should be done so that the person has mobility.
4. Atmospheric conditions such as precipitation, temperature, wind direction, humidity, wind velocity, and pressure determine the behavior of contaminants in air or the potential for volatile materials to become airborne. These parameters should be considered in determining the need for and the level of protection.
5. A program must be established for periodic air monitoring during site operations. Without an air monitoring program, any changes to air quality would go undetected and might jeopardize on-site personnel. Monitoring can be done with various types of air pumps and filtering devices, followed by laboratory analysis of the filtration media, personnel dosimeters, and periodic walk-throughs by personnel carrying real-time direct-reading survey instruments.
6. For operations in the exclusion zone, different levels of protection may be selected, and various types of chemical-resistant clothing may be worn. This selection should be based on the job function, reason for being in the area, and the potential for skin contact with, or inhalation of, the chemicals present.
7. Escape masks must be readily available when levels of respiratory protection do not include an SCBA and the possibility of an IDLH atmosphere exists. The use and placement of escape masks should be made on a case-by-case basis. Escape masks should be strategically located at the site in areas with higher potential for vapors, gases, or particulates.

3.8 Decontamination of PPE

Roux prefers the use of single use PPE to minimize the requirement for significant decontamination. The following procedures shall be considered should a field project require the need for decontamination of PPE. Roux has also developed a Site Control and Decontamination Management Program.

3.8.1 Site-Specific Decontamination Plans

The Project Manager (or another authorized individual) is responsible for formulating the site-specific PPE decontamination plan as an integral part of the Health and Safety Plan (HASP). The SHSO/SS' responsibilities include ensuring the plan's implementation and adapting it as site conditions evolve. Refer to Roux's Site Control and Decontamination Management program for additional requirements.

The decontamination plan, often created in conjunction with PPE selection, must be established prior to workers entering potentially contaminated areas. The plan should address the following key aspects:

- Decontamination Hazard Evaluation and Risk Assessment: Assessing risks associated with decontamination processes.
- PPE for Decontamination Line Assistants: Specifying appropriate PPE for personnel involved in decontamination.
- Roles and Responsibilities During Decontamination: Defining tasks and duties during the decontamination process.
- Layout and Quantity of Decontamination Stations: Determining the number and arrangement of decontamination stations, along with the designated PPE decontamination procedures at each station.
- Decontamination Equipment: Identifying the necessary equipment for effective decontamination.
- Decontamination Methods: Describing the methods and protocols for decontaminating personnel and equipment.
- Preventing Contamination of Clean Areas: Outlining procedures to prevent contamination of uncontaminated zones.
- Minimizing Contact with Contaminants During CPC Removal: Providing guidelines to reduce wearer exposure during the removal of Chemical Protective Clothing (CPC).
- Disposal Procedures for Inadequately Decontaminated Clothing and Equipment: Ensuring proper disposal practices for items that have not been adequately decontaminated.

The initial decontamination plan, which is developed in conjunction with the initial site hazard assessment, should be based on worst-case assumptions about the extent and type of contamination.

3.8.2 Emergency Decontamination of PPE

The designated SHSO/SS (or another authorized individual) assumes responsibility for addressing emergency decontamination within the site-specific Health and Safety Plan (HASP). Emergency decontamination may become necessary due to events such as fires, explosions, sudden violent storms, or medical emergencies. The emergency decontamination plan must clearly delineate emergency egress routes, as well as procedures for both decontamination and egress.

Some key points to consider regarding emergency decontamination.

- Immediate Notification: The SHSO/SS (or their designated counterpart) must be promptly informed of any circumstances requiring emergency decontamination. Additionally, they are accountable for tracking all personnel during the process.
- Urgent Medical Treatment: If urgent medical attention is necessary, decontamination of PPE may be delayed until the victim's condition stabilizes.
- Balancing Priorities: When feasible, decontamination should occur without hindering essential first aid. However, if a worker is exposed to an extremely toxic or corrosive substance, immediate decontamination is crucial to prevent severe injury or fatality.

- Heat-Related Illness: In cases of heat-related illness, protective clothing must be promptly removed (refer to Roux's Heat Illness Prevention Program).

Emergency Facilities:

- For workers potentially exposed to corrosive materials, quick drenching or flushing facilities must be provided in accordance with 29 CFR 1910.151(c) and 1926.50(g).
- Similarly, if workers face other hazards (such as splash or dust) that could harm the eyes or body, readily accessible wash stations are essential. These stations should be properly located and maintained, including regular water changes, as per the manufacturer's instructions.

3.8.3 Protection of Decontamination Line Assistants

Should work require a decontamination corridor the following shall be used as guidance. The SHSO/SS (or other designated person) must for ensuring that decontamination line assistants receive appropriate PPE and addressing their protection within the site-specific HASP. Key zones—namely, the Exclusion Zone (EZ), Contamination Reduction Zone (CRZ), and Clean Support Zone—must be clearly marked both in the field and within the site-specific HASP. The following should be considered when preparing for protection of decontamination line assistants.

1. Task Hazard Analysis: A thorough analysis must be conducted for line assistants to determine the optimal PPE level required. Factors influencing this decision include:
    - Expected or Visible Contamination on Responders
    - Type of Contaminant and associated respiratory and skin hazards
    - Total Vapor/Gas Concentrations in the CRZ
    - Presence of Particulates and specific inorganic or organic vapors in the CRZ
    - Results of Wipe Tests (refer to Section 5.4)
    - Slope and Configuration of the CRZ
2. PPE Levels: Depending on the situation:
    - Line assistants may need to wear the same PPE level as workers in the EZ.
    - Alternatively, line assistants may be adequately protected by using PPE one level lower (e.g., wearing Level C protection while decontaminating workers who are wearing Level B)."

3.8.4 Procedures to Minimize PPE Contamination

Proper work practices and procedures should be implemented at sites to minimize the potential for contact with chemicals of concern while onsite. The following guidance should be considered when developing site specific procedures:

- Opt for single-use Personal Protective Equipment (PPE) when feasible to minimize decontamination needs.
- Ensure complete sealing of PPE closures and interfaces, including pockets, zippers, and other potential openings.
- Position gloves and boots underneath the sleeves and pant legs of outerwear to reduce exposure.
- Place hoods outside the collar if they are not already attached.
- Utilize disposable outerwear and equipment when suitable to facilitate easy disposal and reduce decontamination efforts.
- Secure all junctions with tape to block contaminants from entering gloves, boots, jackets, and suits.

- Adopt work practices that limit contact with hazardous substances, such as avoiding unnecessary exposure.
- Employ remote techniques for sampling, handling, and opening containers, like using drum grapples and pneumatic impact wrenches.
- Store monitoring and sampling devices in bags designed with openings for sample ports and sensors.
- Cover contaminant sources with plastic sheeting or overpacks to shield PPE from contamination.

3.8.5 PPE Disposal

The PM in coordination with the field team shall ensure the safe disposal of all wastes generated from PPE use. PPE must be placed in appropriate containers, labeled, and prepared for disposal separately from other forms of waste. Refer to Roux's General Waste Corporate Management Program for further guidance.

APPENDIX A
EPA's
GUIDELINES TO ENSEMBLES FOR SPECIFIC ACTIVITIES/TASKS
WHERE CHEMICAL EXPOSURE IS POSSIBLE

GUIDELINES TO ENSEMBLES FOR SPECIFIC ACTIVITIES/TASKS
WHERE CHEMICAL EXPOSURE IS POSSIBLE

IMPORTANT: READ FOOTNOTES AND ASSUMPTIONS/JUSTIFICATIONS PRIOR TO USING TABLE

Notes:

1. This table is for use by trained environmental professionals only. To use this table:
   a. Scan the activity description to find activities (bolded) that most closely matches those you plan to engage in.
   b. Review Hazard/Conditions section to make sure the hazards of the planned activity match those listed. Note the Required Work Practices and be ready to follow them.
   c. For those activities most likely to be conducted as part the response, select Targeted Minimum PPE (Personal Protective Equipment).
   d. Necessary equipment needs to be available and used unless other information becomes available which necessitates an upgrade or allows a downgrade in the protection level. The work area must be continuously re-evaluated to ensure workers have the proper safety equipment.
   e. When working in hazardous environments, workers must always be aware of their surroundings. In addition to this Table, workers entering these environments need to use “common sense” prior to proceeding.
2. These ensembles focus on chemical protection and may not be adequate for all hazards. This Table can be used as a starting point but does not circumvent proper evaluation by an industrial hygienist in appropriate situations. See Table 2 for more specific chemical agents.
3. Suits, gloves, boots listed in the Minimum PPE column will not be appropriate for all activities, hazards and conditions. The listings should be used as a guide only. Confirm PPE compatibility with specific chemical contaminants.
4. A comprehensive Task Hazard Analysis must be performed prior to final selection of ensembles/PPE material types.
5. Hardhat (Class A or C), safety glasses/other eye protection are typically required but may not be specified here. In noisy environments (above 85dB) hearing protection is required. In areas where there is traffic, heavy machinery, or other hazards involving worker visibility problems a Class 2 High Visibility Vest must be worn. Activities requiring vests include natural disaster responses, demolitions, and excavations.
6. PPE makes and models referenced in these tables are only suggestions. Other comparable, adequate makes and models may be used.

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Emergency Response and/or Initial Entry/Assessment – Low Hazard Expected (Sites/Facilities): • Air and Radiation Monitoring Sweep • Visual Assessment • Note Taking • Photo-documentation	• Suspected low hazard based on site history/visual evidence. • No CBRN suspected. • No visible/suspected vapors. • No potential for IDLH atmosphere. • Unknown physical hazards. • Some site background information. • No intrusive work expected. • Low potential for chemical splash/contact (based on expected tasks/ known conditions). • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Level B** (Downgrade/upgrade based on knowledge of contaminants and monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs) **Respirator: Scott or MSA Full Face** **Suit Type:** [I]Tychem CPF-3 (with boot, hood)/ChemTape **Inner Glove:** [II]Nitrile (6 mil min recommended) **Outer Glove:** [II]Neoprene, Nitrile, (28 mil min recommended) **Outer Steel Toe Boot:** [IV]Tingley HazProof Model 82330 **or** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty and rely on suit boot material for permeation protection. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON**: Dry or soap & water

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Emergency Response and/or Initial Entry/Assessment of Unknown – Potential Moderate Hazard (Sites/Facilities): • Air and Radiation Monitoring Sweep • Visual Assessment • Note Taking • Photo-documentation	• Possible high hazard chemicals based on site history/visual evidence (spills, corrosion, industrial practices, etc.). • No CBRN suspected. • No visible/suspected vapors. • **No** reasonable potential for **IDLH** atmosphere. • Unknown physical hazards. • Little/ no site background information. • No intrusive work expected. • Low potential for chemical splash/contact. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Level B** (Downgrade/upgrade based on knowledge of contaminants and monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs) **Respirator: Scott or MSA Full Face** **Suit Type:** [I]Tychem Responder (with boot, hood)/ChemTape **Inner Glove:** [II]Nitrile (6 mil min recommended) **Outer Glove:** [II]Neoprene, Nitrile, (28 mil min recommended) **Outer Steel Toe Boot:** [IV]Tingley HazProof Model 82330 **or** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty and rely on suit boot material for permeation protection. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON**: Dry or soap & water

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Emergency Response and/or Initial Entry/Assessment of Unknown - Suspected High Hazard (Sites/Facilities): • Air and Radiation Monitoring Sweep • Visual Assessment • Note Taking • Photo-documentation	• Potential for high hazard chemicals/ IDLH based on site history/visual evidence (visible/expected reactions, spills, vapors, fumes, smoke, known releases, etc.). • No CBRN suspected. • Potential for chemical reactions. • Unknown physical hazards. • Little/ no site background information or information suggesting high hazard. • Intrusive work possible. • Potential for chemical splash/contact. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Level A** (Downgrade/upgrade (Trelleborg, etc.) based on knowledge of contaminants and monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs) **Respirator: Scott or MSA Full Face** **Suit Type:** Encapsulating [I]Tychem Responder/Responder CSM (with boot, hood, gloves)/ChemTape **Inner Glove:** [II]Nitrile (6 mil min recommended) **Outer Glove:** [II]Neoprene, Nitrile, (28 mil min recommended) **Outer Steel Toe/Steel Shank Boot:** [IV]Tingley HazProof Model 82330 and rely on suit boot material for permeation protection. (ASTM F-2413/ANSI Z41) **DECON**: Dry or soap & water: water source for emergency DECON; other DECON agents on hand.

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Drum/Tank Sampling • Container opening • Continuous air monitoring • Product sampling	• Unknown chemicals. • No CBRN. • Potential splash hazard. • Physical hazard controls in place. • Assumes no initial hazardous atmosphere. • Ensure availability of water source for emergency DECON/shower/eyewash. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Level B** (Upgrade/Downgrade based on knowledge of contaminants and monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs) **Respirator: Scott or MSA Full Face** **Suit Type:** [I]Tychem Responder (with boot, hood)/ChemTape **Inner Glove:** [II]Nitrile, Neoprene, Viton, PVC **Outer Glove:** [II]Heavy Duty Butyl, Nitrile, **Other:** ANSI Approved Splash Shield **Outer Steel Toe Boot:** [IV]Tingley HazProof Model 82330 **or** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty and rely on suit boot material for permeation protection. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON or soap and water; water source for emergency DECON and eyewash suggested.

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Hazardous Categorization Testing (**HAZCAT**) • Opening sample containers in controlled environment • Working with small sample quantities in well ventilated area • Conducting HAZCAT testing with appropriate lab equipment	• Assumes known chemical classes and site situation/background. • No CBRN suspected. • Assumes immediate suit removal if contaminated and frequent glove changes. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Level B** (Upgrade/Downgrade based on knowledge of contaminants and monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs) **Respirator: Scott or MSA Full Face** **Suit Type:** [I]Tychem CPF4 (with hood, boot) **Inner Glove:** [II]Nitrile **Outer Glove:** [II]Viton or 4-H (use surgie over the 4-H for dexterity) **Outer Steel Toe Boot:** [IV]Tingley HazProof Model 82330 **or** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty and rely on suit boot material for permeation protection. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry or soap and water; water source for emergency DECON and eyewash suggested

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Oil Spill Response/Recovery Operations – Fresh Product: • Recovery operations (vac truck, skimmers, boom deployment where direct contact expected) • Product sampling • Continuous air monitoring at/near source of spill	• Crude oil/diesel/kerosene/gasoline spill. • Assumes fresh/ongoing spill, close proximity to source. • Assumes early phase while evaporation of light organics, benzene/other aromatics is still occurring (24-48 hours or if spill is on-going). • Assumes down-wind location. • Continuous air monitoring required for %LEL, Organics, $\%O_2$ (and H_2S as necessary for sour crude). • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Modified Level C:** 1/2 face respirator w/safety glasses/goggles as needed for splash protection. Downgrade as appropriate based on air monitoring. **Respirator: Scott or MSA ½ Face** **Respirator Cartridge:** [III] Multi-Phase Cartridge (Scott 642 Multi-purpose; MSA with/GME P-100 or equivalent). **Suit Type:** [I]Tychem CPF4 w/boot [jet fuel use Tychem BR] **Inner Glove:** [II]Neoprene (for protection at DECON line only, not for prolonged contact) **Outer Glove:** [II]Viton-Butyl Rubber (assumes potential for direct contact with fresh material – based on benzene/aromatic constituents) SEE NEXT ROW FOR WEATHERED PRODUCT. **Outer Steel Toe Boot:** [IV]Tingley HazProof Model 82330 **or** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty and rely on suit boot material for permeation protection. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/ Soap and water as feasible

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Oil Spill Response Assessment/Recovery – Weathered Product • Shoreline clean-up assessment (SCAT) • Environmental sampling/weathered product sampling • Recovery Operations for weathered material • Assessment via boat/on or near water – use appropriate flotation device with ensemble.	• Crude oil/diesel/kerosene/gasoline spill. • Assumes weathered oil (over 24-48 hours, depending on spilled material and ambient temperatures). • Assumes operations are remote from source of spill. • Assumes no other potential for airborne aromatics/benzene/flammable vapors.	**Modified Level D** (Upgrade/Downgrade based on potential for contact and air monitoring with FID/PID, LEL/O_2 Meter. **If contact with material suspected, use following:** **Suit Type:** [I]Tychem F w/boot [jet fuel-Tychem BR] (Tychem SL may be an option for weathered crude/diesel – see manufacturer's information) **Inner Glove:** [II]Nitrile **Outer Glove:** [II]Nitrile (Best Nitri-solv 727) **Outer Boot Cover:** [V]Latex HazMaster Booty **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/Soap and water as feasible

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Demolition/Excavation Operations: • Heavy equipment operation • Excavation/Trenching • Continuous air monitoring when soil is disturbed or demolition activities conducted. • Fuel Oil underground tank removal. • Drum Excavation activities EXCLUDED.	• Demolition activities generating potentially hazardous particulates (asbestos, lead, silica, etc.). • Excavation activities that could expose soil contaminated with low levels of known hazardous chemicals to the surrounding area /in the trench/ excavation. • No potential for IDLH atmosphere. • Site background information available. • Known physical hazards. • Workers will have minimal/ no contact with contaminants (i.e., operators in a cab, inspectors/ observers at a safe distance). • Continuous air monitoring required in trench for %LEL, Toxics, and $\%O_2$ when workers are in trench and for particulate when activities generating particulate are conducted. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Modified Level C:** 1/2 face respirator w/safety glasses. Downgrade or upgrade as appropriate based on air monitoring. **Respirator: Scott or MSA ½ Face** **Respirator Cartridge:** [III] Multi-Phase Cartridge (Scott 642 Multi-purpose P-100; MSA with/GME P-100 or equivalent). **Suit Type:** [I]Proshield Next Gen **Inner Glove:** NA **Outer Glove:** Leather **Outer Steel Toe Boot: NA** **Steel Toe Boot Cover**: [V]Latex HazMaster Booty (if chemical in soil is possible) **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/ Soap and water as feasible

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Natural Disaster Response (Hurricane, Tornado, Flood, Earthquake) - Orphan Container Recovery: • Routine hand collection/pick-up of small containers from debris piles/lines • Land based operations - conducted on foot **Note:** Physical Hazards may necessitate PPE modifications.	• Unknown materials – confident identification based on visual observations. • **Required Work practice:** re-evaluate prior to moving suspicious containers. Air monitoring and PPE upgrade may be required. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Modified Level D:** Upgrade/downgrade based on suspicious containers (not easily identified visually) and air monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs **Suit Type:** [I]Tychem CPF-3 w/boot **Inner Glove:** [II]Nitrile **Outer Glove:** [II]Nitrile (Best Nitri-solv 727) or Leather **Outer Boot Cover:** [V]Latex HazMaster Booty **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/Soap and water as feasible
Natural Disaster Response (Hurricane, Tornado, Flood, Earthquake) - Orphan Container Recovery: • Routine Drum recovery from debris lines/piles/ other – conducted on land **Note:** Physical Hazards may necessitate PPE modifications.	• Unknown materials – confident identification based on visual observations. • **Required Work practice:** re-evaluate prior to moving suspicious containers. Air monitoring and PPE upgrade may be required. • **Required Work Practice:** Immediate PPE Change-out (i.e., gloves, etc.) upon contact with chemicals. • **Required Work Practice:** Must follow standard air monitoring protocol.	**Modified Level D:** Upgrade/downgrade based on suspicious containers (not easily identified visually) and air monitoring with PID/FID, radiation detector, LEL/O_2 per HASP/ SOSGs **Suit Type:** [I]Tychem CPF-3 w/boot **Inner Glove:** [II]Nitrile **Outer Glove:** [II]Nitrile (Best Nitri-solv 727) or Leather **Outer Boot Cover** [V]Latex HazMaster Booty **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/Soap and water as feasible

Activity Description	Hazards/Conditions	Targeted Minimum PPE
Natural Disaster Response (Hurricane, Tornado, Flood, Earthquake) – Flood water sampling: • Water Sampling of flood waters where potential for contact with hands/feet is high **Note:** Physical Hazards may necessitate PPE modifications.	• Unknown contaminants • Potential for pathogens suspected • Low potential for acute exposure to hazardous chemicals • Assumes open air/well ventilated areas **Required Work Practice:** Monitor all poorly ventilated areas in appropriate PPE/Respiratory Protection for organic vapors (PID & FID), %LEL/flammable atmospheres, H_2S prior to entry	**Modified Level D:** Upgrade based on more information as it becomes available. **Suit Type:** [I]Proshield Next Gen **Inner Glove:** [II]Nitrile **Outer Glove:** [II]Nitrile (Best Nitri-solv 727) **Outer Boot**: Waders (butyl, neoprene) as needed. **Steel Toe/Steel Shank Boots:** ASTM F-2413/ANSI Z41 **DECON:** Dry DECON/Soap and water as feasible
Environmental Sampling (Low Concentration Water/Soil/Perimeter Air): • Multi-media Sampling • Documentation (written/photo) • Inspection of clean-up operations	• Known Chemical Contaminants. • Airborne concentrations well below PELs. • Minimal chance of skin exposure to chemicals. • Insects possible.	**Level D:** Upgrade based on more information as it becomes available. **Suit Type:** [I]Proshield 1 (if ticks, etc. maybe a problem) **Inner Glove:** [II]Nitrile **Outer Glove:** NA **Outer Boot:** NA **Steel Toe Boots:** ASTM F-2413/ANSI Z41 **DECON:** NA

i. Tychem and Proshield suits can be purchased from Safeware: 800-331-6707, http://www.safewareinc.com , (see also LSS, http://www.labsafety.com, Dupont: 1-800-931-3456, http://www2.dupont.com/Personal_Protection/en_US/index.html)

ii. Nitrile Inner/Outer Gloves; Viton; Butyl Rubber; 4-H (polymeric) can be purchased from Safeware: 800-331-6707, http://ww.safewareinc.com ; Airgas: 1-866-718-0685, http://www.airgas.com (see also North Safety, http://www.northsafety.com); Best Gloves, http://www.bestglove.com ; Lab Safety Supply (LSS), http://www.labsafety.com; Airbill, http://www.airbill.com)

iii. Multi-Phase Cartridge (Scott 642 Multi-purpose; MSA with/GME P-100 or equivalent) can be purchased from LSS: 1-800-356-0673, http://www.labsafety.com (see also Safeware, http://www.safewareinc.com; Scott Safety, http://www.scotthealthsafety.com/; MSA, http://www.msanet.com/)

iv. Tingley HazProof Overboots or similar can be purchased from LSS: 1-800-356-0673, http://www.labsafety.com; National Safety, Inc.: 1-800-213-7092, http://www.nationalsafetyinc.com

v. Latex Hazmaster Booties, Nuke Boot or similar can be purchased from Safeware: 800-331-6707, http://www.safewareinc.com; Airbill: 1-215-632-2000, http://www.airbill.com; (see also Airgas, http://www.airgas.com; LSS, http://www.labsafety.com

APPENDIX E

Subsurface Utility Clearance Management Program

SUBSURFACE UTILITY CLEARANCE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
REVIEW DATE	:	**03/2024**
REVISION NUMBER	:	**4**

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APPENDICES

Appendix A – Roux Subsurface Utility Clearance Checklist/ Utility Verification/Site Walkthrough Record

Appendix B – Private Utility Technology Applications and Considerations

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") has instituted the following program for completing proper utility mark-outs and for conducting subsurface clearance activities. This establishes a method to ensure, to the greatest extent possible, that utilities have been identified and contact and/or damage to underground utilities and other subsurface structures will be avoided. For the purpose of this program, a structure is defined as any underground feature that may present a potential source(s) of energy, such as, but not limited to, utility vaults, bunkers, piping, electrical boxes, wires, conduits, culverts, utility lines, underground tanks, and ducts.

2. SCOPE AND APPLICABILITY

The Subsurface Utility Clearance Management Program applies to all Roux employees, its contractors, and subcontractors. Employees are expected to follow this program for all intrusive work involving Roux or other personnel (e.g., contractors/subcontractors) working for Roux unless the client's requirements are more stringent. Intrusive work activities can include, but are not limited to, digging or scraping the ground surface, including, but not limited to, excavation; test pitting or trenching; soil vapor sampling or the installation of soil borings, soil vapor monitoring points and wells, or monitoring wells; and drilling within concrete slabs on grade.

Deviation from the program, regardless of the specific work activity or location, must be pre-approved based on the client's site knowledge, experience, site conditions, and additional documentation on the site. Any exceptions shall be documented through the Roux Subsurface Utility Clearance Variance Form located within the Roux Health & Safety Online Application or through OKTA. Approval is required by the Project Principal (PP) and the Operations Manager (OM) in consultation with the Office Health and Safety Manager (OHSM) or Corporate Health and Safety Director (CHSD) prior to mobilization. Depending on the work location, more stringent federal, state, local, or client requirements may apply. It is the responsibility of the Project Team to identify such requirements prior to mobilization.

3. PROCEDURES

3.1 Before Intrusive Activities/Job Planning Process

Prior to intrusive work at a site, the Project Manager (PM) shall ensure that the notification of the State One Call or equivalent service (Nationwide-811) is completed a minimum of 48-72 hours (One-Call State Law Directory) before intrusive work activities (this timeline excludes Saturdays, Sundays, Legal Holidays and 811 observed holidays). This notification is required by law for all states. State-specific/local laws related to utility location may vary. The project team is responsible for understanding requirements that may affect their work site.

Obtain, review, and field verify relevant historical site data that may include: as-builts/site plans; easement/right-of-way information; historical aerial photos/development plans; local/state permitting records; previous site investigation/boring logs; and/or interviews with site representative/client. Interviews with site or client personnel should ask the following:

- Employee(s) Name and Relationship with the site;
- Types of utilities, including structure and location of utilities on-site;
- Depth of known utilities; and

- Any other relevant information as it pertains to the site.

Prior to intrusive work activities, information pertaining to the site should be included in Roux's Subsurface Utility Clearance Checklist and Utility Verification/Site Walkthrough forms. This form is located within the Roux Health & Safety Online Application or through OKTA.

If there is the potential for unexploded ordinances or munitions, consultation with your OM and CHSD is required prior to site operations.

3.1.1 Project Kick-Off Meeting

During the project kick-off meeting for intrusive activities, the PM will review the Roux Subsurface Utility Clearance Checklist, Utility Verification / Site Walkthrough Record (Appendix A) and the below bullet points with the project field team:

- Confirm that the State One Call or equivalent is received and that the ticket number is confirmed, reviewed, and valid for the time of work. If intrusive work activities are not conducted during this valid time period, the One Call ticket must be renewed, and the site must be remarked;
- Review the work scope to be performed with the site owner/tenant to determine if it may impact any utilities;
- Determine the need for utility owner companies to be contacted or to have their representatives on site;
- Where mark-outs terminate at the property boundary, consider the use of private utility locating / (e.g., Radio Frequency Detection, Electromagnetic Induction), Ground Penetrating Radar (GPR) , and other applicable geophysical inspection services. The use of private utility locating firms, however, does not eliminate the legal requirement for the subcontractor (e.g., driller, excavation firm) to submit a request for Public Utility Mark-outs. Also, the information provided by the service may be inaccurate and unable to locate subsurface utilities and structures in urban areas, landfills, urban fill areas, below-reinforced slabs, etc. They should not be relied upon as the only means of performing utility clearance;
    - A mark-out is defined as the process of contracting with a competent and qualified company to confirm the presence or absence of underground utilities and structures. This process will clearly mark out and delineate identified utilities so that intrusive work activities can be performed without causing disturbance or damage to the subsurface utilities and structures. After utility mark-outs are completed, soft Digging must completed prior to intrusive work. Section 3.4 Preferred Methods of Clearing the Subsurface (Pre-Clearing) outlines requirements for pre-clearing techniques in order of preference.
- Documented description of the dig site, which is included in the project's Health and Safety Plan (HASP), and one call report will be maintained in the field and distributed amongst Roux personnel, its contractors, and subcontractors; and
- Documentation of the actual placement of mark outs in the field shall be collected using dated pictures, videos, and/or sketches with distance from markings to fixed objects. All documentation shall be maintained within the project file.

3.2 Utility Mark Out

- Ensure the Mark-out / Stake-out Request Information Sheet (or one-call report) is complete and accurate for the site, including address and cross streets, and review for missing utilities. Ensure ticket life is still valid for work.

  - Note: utility mark-out organizations do not have contracts with all utilities, and it is often necessary to contact certain utilities separately, such as the local water and sewer authorities, local transportation departments, and railroad operators. In the event the Project Teams anticipate subsurface work will impact public utilities, railroad operations, or public roadways, coordination with the utility owners/operators is required.

- Have written confirmation prior to mobilizing to the site that the Project Team or Roux personnel performing the intrusive activity has correctly completed the mark-out notification process, including requesting mark-outs, waiting for mark-outs to be applied to ground surfaces at the site, and receiving written confirmation of findings (via fax or email) from utility operators for all known or suspected utilities in the proposed area of intrusive activity, and provided utility owner written confirmation to Roux personnel for review and project files documentation.
- Do not begin any intrusive activity until all utility mark-outs have been completed (i.e., Did all utilities mark-out the site?) and any unresolved mark-out issues are finalized. Perform a site walk to review the existing utilities and determine if the utility locators have located said utilities.

  (Note: The Tolerance Zone is defined as three feet from the outside edge of any subsurface structure.)
- For non-subscribing utility owners or if public one-call service is not available, perform due diligence and request further information regarding utility type, construction details, location, and burial depth directly from public service providers/utility owners. Request utility mark-out by each public service provider/utility owner as applicable. Confirm contact and response by each public utility owner on the Subsurface Utility Clearance Checklist.
- If utilizing a Private Mark out, ensure the contractor has a plan regarding what types of technology will be used based on Table 1 in Appendix B: Private Utility Technology Applications and Considerations. If possible, it is recommended that multiple technologies be used to sweep each location/work area. Use a tracer wire to locate the utility (when tracer wires are present). Record the results of the private utility mark-out on the Utility Verification/Site Walkthrough Record form.

3.3 Site Visit/Utility Walkthrough

Before mobilization with the subcontractor or during the pre-work safety tailgate with the subcontractor, perform a site walkthrough after utility mark-outs have been completed to determine whether additional potential hazards are present and look for visible signs of utilities that may be present. Outlined below are considerations regarding a site walk before intrusive activities. Before initiating any intrusive work, verify that the utilities marked on-site align with the information provided in the One Call response notification/ticket and with site plans and documents. If any discrepancies arise, address them promptly to ensure accuracy and do not start intrusive work until they are rectified.

- Identify overhead utilities that may impede equipment mobilization or work zones to ensure adequate Occupational Safety and Health Administration (OSHA) clearance distance(s), as specified within the site-specific Health and Safety Plan (HASP) and 29 CFR 1926.1408 Table A.

The presence of any of the following may indicate potential subsurface structures:

- Locations of buildings, equipment, and features like area lights, signs, sprinkler systems, phones, drains, natural gas meters, manholes, etc.;
- Warning tape, which is often a sign of underground services;
- Material like pea gravel, sand, or other non-native materials can indicate the presence of tanks or lines or any deviations from the established native soil or backfill conditions;

- Red concrete, which is often used for electrical duct banks;
- Evidence of damaged utilities, such as piping materials, insulation, or odors present in the work area; and
- Other utilities, including fire hydrants, electrical transformers, pipeline markers, valve covers, steam lines, valve box covers, clean-outs, etc.

By observing the path between the main service line and the connection point (e.g., a utility meter at the exterior of the site building), it may be possible to determine the likely routing of on-site utilities. However, this method should not be relied upon solely, and proper risk mitigation strategies should be in place before proceeding with any ground disturbance activities. Look outside your work zone for other potential utilities that may cross through your work zone.

For sites with potential underground storage tanks present (UST), the following guidance applies:

- Identify if the product piping is either rigid or flexible.
- Conduct a visual examination of the tank field, observation wells, dispensers, vent stacks, and UST fill points to determine their location.
- Locate and become familiar with the emergency shutoff button/switch, if present.
- Determine the orientation, arrangement, and location of the tanks, as well as their size and capacity, through the examination of visible features at grade, such as fill ports and extractor covers, and by consulting any available as-built drawings.

Before commencing any subsurface intrusive work, field staff should thoroughly address any discrepancies in utility company mark-outs or the absence of mark-outs.

3.3.1 Project Management-Field Personnel

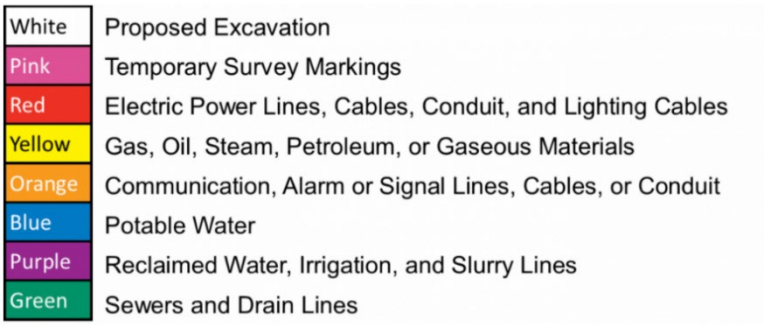
Whenever possible, it is advisable to assign the same project personnel to both utility location and clearance tasks as well as intrusive activities. This continuity ensures that site knowledge and utility information gathered during the clearance phase remain up-to-date. Having this historical perspective helps minimize the risk potential of utility strikes.

In cases where maintaining the same personnel throughout the project isn't feasible, a thorough knowledge transfer regarding site utilities, locations, clearance results, and proposed intrusive activities becomes essential. The PM must ensure that there is a successful handoff of information when there is a change in field personnel.

3.3.2 Utility Markings

The utility marking color code includes various uniform colors. The following APWA uniform color code (ANSI Z535.1) is provided below. While certain government agencies or large industrial facilities may use additional colors, Roux's policy is to consider any unlisted paint marking or pin flag color as a subsurface utility marking unless proven otherwise.

If utilities or subsurface anomalies are identified but their type or classification remains uncertain, it is advised to employ pink paint or pin flag (Temporary Survey Marking) for marking. Once the utility type is definitively established, the pink marks should be updated to accurately represent the correct type of utility.

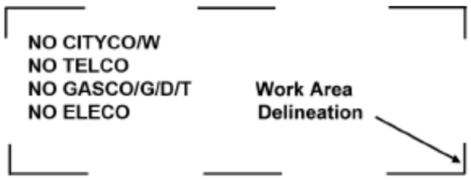


Understanding the markings left by locators during the 811 process is crucial for avoiding utility-related issues. Typically, these markings are done when Roux staff members are not physically present on-site. To enhance understanding/accuracy, it is advisable for staff to be present during the 811 process or engage in conversations with locators, both public and private, while on-site. Additionally, utility marks must adhere to the proper standards outlined in the Uniform Color Code.

Common Abbreviations

Source: Common Ground Alliance

Facility Identifier		**Underground Construction Descriptions**		**Infrastructure Materials**	
CH	Chemical	C	Conduit	ABS	Acrylonitrile - Butadiene - Styrene
E	Electric	CDR	Corridor	ACP	Asbestos Cement Pipe
FO	Fiber Optic	D	Distribution Facility	CL	Cast Iron
G	Gas	DB	Direct Buried	CMC	Cement Mortar Coated
LPG	Liquefied Petroleum	DE	Dead End	CML	Cement Mortar Lined
PP	Petroleum Products	JT	Joint Trench	CPP	Corrugated Plastic Pipe
RR	Railroad Signal	HP	High Pressure	CMP	Corrugated Metal Pipe
S	Sewer	HH	Hand Hole	CU	Copper
SD	Storm Drain	MH	Manhole	CWD	Creosote Wood Duct
SS	Storm Sewer	PB	Pull Box	HDPE	High Density Polyethylene
SL	Street Lighting	R	Radius	MTD	Multiple Tile Duct
STM	Steam	STR	Structure (vaults, junction inlets, lift station)	PLA	Plastic (conduit or pipe)
SP	Slurry System	T	Transmission Facility	RCB	Reinforced Concrete Box
TEL	Telephone			RCP	Reinforced Concrete Pipe
TS	Traffic Signal			RF	Reinforced Fiberglass
TV	Television			SCCP	Steel Cylinder Concrete Pipe
W	Water			STL	Steel
W	Reclaimed Water "Purple"			VCP	Vertrified Clay Pipe



3.4 Preferred Methods of Clearing the Subsurface (Pre-Clearing)

At least one of the methods listed below shall be carried out during pre-clearing activities. The Project Team is responsible for evaluating risks associated with the Scope of Work to determine which method is selected. If none of the following pre-clearing activities are performed, a Subsurface Utility Clearance Variance must be submitted to the OM. This Subsurface Utility Clearance Variance must provide clear lines of evidence that there are no utilities present within the intrusive work zone. Examples include demolition permits of the site, utility closure documents indicating no live utilities on-site, as-builts, site history, etc.

The following approaches shall be considered and implemented based on the Scope of Work.

- ***Soft Digging***
  - This is the preferred method of utility clearance when clearing higher-risk utilities. Soil should be cleared through the use of a vacuum truck/equivalent, an accompanying air knife (preferred), or a water lance to break up and loosen the soil for removal with the vacuum.
- ***Hand Digging***
  - Soil should be broken up and removed using a shovel or other appropriate hand tools without excessive force. Limit the use of dig bars or other tools that, if used incorrectly, can significantly damage utilities.
- ***Hand Augering***
  - The hand auger must be turned slowly using even hand pressure without excessive force. Rounded edge augers are preferred. Hand augers should not be used in pea stone/pea gravel where utilities may be present and could potentially be damaged by the hand auger. The abrupt absence of soil recovery in a hand auger could indicate utilities as pea gravel or sand may have spilled out of the auger (exception: native soil conditions that typically result in poor hand auger recoveries). If any resistance is encountered while operating the hand auger for pre-clearance, the equipment will be removed, and the exploratory test hole will be visually inspected by onsite personnel for any obstructions or indications of subsurface structures.

3.4.1 Guidance for Tools and Equipment

Personnel performing pre-clearance activities shall keep tools and equipment in safe working order and be properly inspected before use. If tools or equipment are broken, they will be tagged and removed from service. The following specify additional guidelines regarding tools and equipment:

- Hand-digging tools must have a non-conductive handle, such as fiberglass, wood, or composite, or fully insulated handles and potential contact surfaces.
- Blades on shovels and post-hole diggers should have rounded or blunt edges.
- Pick axes or pointed spades should not be used for physical clearance.
- Crowbars, pinch-bars, or pry bars should not be used to break hardened soil or backfill except when authorized by the Site Supervisor (SS). This should only be used to loosen materials like bricks or larger stones.

- Electric-powered equipment must have ground fault protection.
- Should there be refusal or difficulty with advancing hand tools, the contractor shall stop work and notify the Roux SS or Site Health and Safety Officer (SHSO) immediately.

3.5 During Intrusive Activities

3.5.1 Concrete/Paving Surface Removal

Remove any surface coverings (i.e., pavement, brush, debris, etc.) to ensure workers have clear visibility of the work area and subsurface conditions. Avoid mechanical jackhammering over known lines unless they are de-energized, locked-out/tagged-out, and potential repairs are planned or if the utility has been completely disconnected prior. When cutting or coring, go only as far as needed to penetrate the surface cover. When removing a large surface area, begin at the perimeter of the removal zone. This initial step helps identify any utilities passing through the work zone. For extensive areas, using a concrete saw might not be practical. Instead, heavy equipment is often employed. During this process, a designated spotter should guide the heavy equipment. Their role is to watch for warning signs of utilities. It's crucial that the heavy equipment does not have "teeth" that could potentially pass through the surface and damage utilities.

3.5.2 Pre-Clearance Procedures

Install pre-clearance exploratory test holes using one of the techniques, as outlined in Section 3.4, for the first 5-ft below land surface (BLS) at each location before conducting intrusive mechanized activities. Should utilities be located at a greater depth than 5-ft BLS consult with the OM, OHSM and CHSD regarding adjustments to the pre-clearance requirements to go greater than 5-ft BLS. Some Clients may require greater than 5-ft BLS for pre-clearance test holes; Project teams should be aware of such Client requirements prior to work.

Pre-clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for the PM and PP to evaluate alternative approaches for the project. Alternative approaches will need to be pre-approved by the OM through a Subsurface Utility Clearance Variance.

Both single-point and three-point clearance are acceptable as long as the following criteria are met below. For single-point clearance, the exploratory test hole is advanced at the exact location of the proposed borehole. If three-point clearance is performed, it must be done in a triangular pattern around the proposed borehole and in a configuration that would not allow utilities to enter the borehole.

- The size of the pre-clearance exploratory test hole should be, at a minimum, twice the diameter of any downhole tool or boring device.
- For direct push applications (CPT, Geoprobe®, etc.), the borehole clearance diameter shall be at least 125% of the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.), to the minimum required depth.
- For excavations, all utilities need to be marked and then exposed by soft-digging or by hand following the protocols in this program. Pre-clearing for excavations may be performed by the "moat" technique (i.e., soft Digging around the perimeter). In these cases, dig in small lifts (<12" for first 5 feet) using a dedicated spotter.)
- For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of pre-clearance test holes specified in Section 3.4 to expose the utility. Once structures have been verified, a minimum clearance of three feet must be maintained between the utility and any powered equipment. If considered a high-risk utility, additional requirements may be necessary and required by the Operator of the utility. Consultation with the OM and CHSD may be appropriate.

The PM, field team lead, or personnel performing oversight is to:

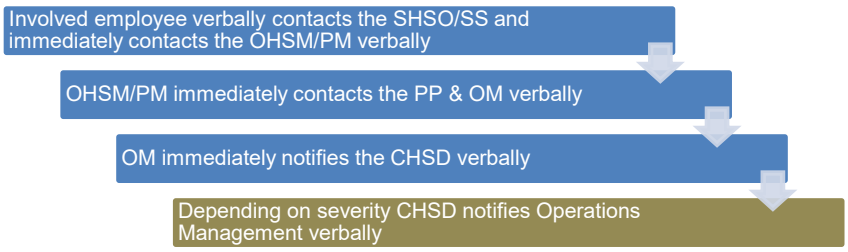
- Ensure the mark-out remains valid. (In certain states, there are limits regarding the duration of time after the mark-out was applied to the ground surface work can be started or interrupted.) Additionally, the mark-outs must be maintained, documented, and in many cases, refreshed periodically to be considered valid. This will be accomplished through calls to the one call center.
- Ensure intrusive activities are only performed within the safe boundaries of the mark-out as detailed in the One-Call Report.
- Halt all work if intrusive activities have resulted in the discovery of an unmarked utility. Roux personnel shall notify the facility owner/operator and the one call center. All incidents such as this will be reported as per Roux Incident Investigation and Reporting Management Program.
- Halt all work if intrusive activities must take place outside of the safe boundaries of a mark-out and only proceed after new mark-outs and subsurface utility clearance are performed.
- Halt the intrusive activities and immediately consult with the PP if an unmarked utility is encountered.
- Complete any loss reports associated with subsurface utility strikes as necessary.
- If a utility cannot be found as marked, Roux personnel shall notify the facility owner/operator directly or through the one-call center. If the facility operator is not responsive, then the one-call center must be notified. Following notification, the excavation/mechanical intrusive work may continue unless otherwise specified in state law.
- Contractors/subcontractors must contact the one-call center to refresh the ticket when the excavation continues past the life of the ticket. State law dictates ticket life. Project teams must be aware of their state-specific requirements.

3.6 Stop Work Authority

Each Roux employee has Stop Work Authority that he or she will execute upon determination of any imminent safety hazard, emergency situation, or other potentially dangerous situation, such as hazardous weather conditions. This Stop Work Authority includes subsurface clearance issues such as the adequacy of a mark-out or identification during intrusive operations of an unexpected underground utility. Authorization to proceed with work will be issued by the PM/PP in consultation with the OHSM after such action is reviewed and resolved. The PM will initiate and execute all management notifications and contact emergency facilities and personnel when this action is appropriate.

3.7 Reporting Utility Incidents

Roux field personnel engaged in any utility strike (e.g., subsurface/aboveground) must promptly stop work, shutdown any equipment and get to a safe location at the Site. Then notify the PM to discuss the incident. In case of injuries, field personnel must call 911 or the local emergency services number and then inform the PM. Additional notifications shall follow Roux's Incident Notification Process. Depending on the utility strike additional notifications shall be made to utility operators and/or clients/site contacts.



Appendix A
Roux Subsurface Utility Clearance Checklist

Appendix A

Roux Subsurface Utility Clearance Checklist/Utility Verification/Site Walkthrough Record

Roux Subsurface Utility Clearance Checklist ***Date of Revision: 3/2024***

Work site set-up and work execution

ACTIVITY	Yes	No	N/A	COMMENTS INCLUDING JUSTIFICATION IF RESPONSE IS NO OR NOT APPLICABLE
Daily site safety meeting conducted, SPSAs performed, JSAs reviewed, appropriate work permits obtained (if applicable).				
HASP is available and reviewed by site workers / visitors.				
Subsurface Utility Clearance Procedure has been reviewed with all site workers.				
Mechanical intrusive work activities may not be performed at any location without authorization from the Roux Site Supervisor (SS). Clearance activities may not be performed at any location unless the SS is physically present.				
Work area secured; traffic control established as needed. Emergency shut-off switch located. Fire extinguishers / other safety equipment available as needed.				
Utility mark-outs (public / private) clear and visible. Provide Excavator's Stake-Out Reference Number / Request Date / Time.				
Tolerance zone work identified. Intrusive work activities cannot be performed in areas that are in direct conflict with any markings made by public or private locators.				
Unless the PP & OM authorizes it, all boreholes and test pit locations must be physically cleared before using mechanized equipment. Required minimum physical clearance depths and diameters are as follows: • Physically clear to a depth of 5 feet bls. • The size of the pre-clearance exploratory test hole must be, at a minimum, twice the diameter of any downhole tool or boring device. • For direct push applications (CPT, Geoprobe®, etc.) the borehole clearance diameter shall be at least 125% to the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.).				
Work execution plan reviewed and adhered to (ground disturbance methods, clearance depths, any special utility protection requirements, or any other execution requirements; especially for Tolerance Zone work).				

Mechanical intrusive work is prohibited within 3-feet distance in all directions from subsurface structures that will be intentionally exposed during pre-clearance. Any removal of material within 3-feet of the subsurface structure may only proceed by hand using non-conductive tools/compressed air if authorized by state law and the owner/operator of the utility.				
All equipment onsite must maintain the appropriate horizontal distance from any point on the equipment to the nearest overhead electrical power line. Refer to site-specific HASP and local/utility company requirements.				
Verbal endorsement received from Roux PM and OM for any required field deviations to work execution plan.				

Key Reminders for Execution

The Subsurface Utility Clearance Protocol should be referenced to determine all requirements while executing subsurface work. The bullet points below are intended as general reminders only and should not be relied upon solely.

- The size of the pre-clearance exploratory test hole must be at a minimum twice the diameter of any downhole tool or boring device to minimum required depth of 5 feet bls.
- For direct push applications (CPT, Geoprobe®, etc.) the borehole clearance diameter shall be at least 125% of the diameter of the largest tool being pushed through the subsurface (e.g., tip, rod, sampler, etc.), to the minimum required depth of 5 feet bls.
- The tolerance zone is defined as three feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks, and other non-cylindrical utilities) of a utility and three feet from the outside of any subsurface structure.
- For excavations, all utilities need to be marked and then exposed by hand, following the protocols in this program. Pre-clearing for excavations may be performed by the “moat” technique (i.e., soft digging around the perimeter). In these cases, dig in small lifts (<12” for first five feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes to expose the utility. Once structures have been verified, a minimum clearance of three feet must be maintained between the utility and any powered equipment.

Utility Verification/Site Walkthrough Record

Employee Name:_____

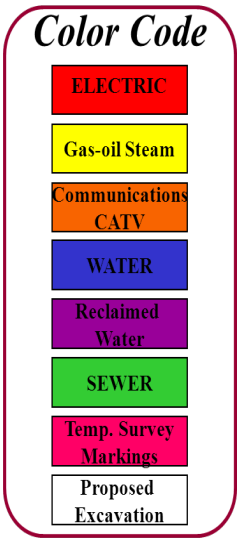
Date: _____

Instructions: For each utility suspected at the job site, indicate the location on the job site, approximate burial depth, and means of detecting the utility. Leave blank if that utility is not believed to be present.

Utility	Description of Utility Location Identified Onsite	Approx. Depth (bls)	Method / Instrumentation used to determine Utility Location	Utility Owner Response (Date/Time)	Mark Out Indicates (Clear / Conflict)
Electrical Lines					
Gas Lines					
Pipelines					
Steam Lines					
Water Lines					
Sanitary and Stormwater Sewer lines					
Pressured Air-Lines					
Tank Vent Lines					
Fiber Optic Lines					
Underground Storage Tanks					
Phone Lines/ Other					

* bls - below land surface

Site Sketch Showing Utilities:



Other Comments / Findings:

Completed by: _____

Signature: _____ Date: _____

Appendix B
Private Utility Technology Applications and Considerations

Appendix B – Private Utility Technology Applications and Considerations

Technology ⇒ Utility/Object ⇓	Radio Frequency Electro-Magnetic Detector (connection to utility, or induction without connection)	Radio Frequency Electro-Magnetic Detector (passive sweep)	Ground Penetrating Radar (GPR)⊙	Acoustic Plastic Pipe Locator	Beacon, Sonde or Conductive Rodder Insertion	EM-61 (time domain electromagnetics) Ξ	
Power/Instrument Line (Energized/Signaled) □	❋ G	G	G	R	R	G	
Power Line (Non-energized) □	❋ G	R	G	R	R	G	
Sewer/Water Line (Metallic) □	❋ G	Y	G	Y	G	G	
Sewer/Water Line (Non-metallic)	R	R	G	G	❋ G	R	
Instrument / Telecomm Lines (Non-energized)	❋ G	R	G	R	R	Y Only if metallic	
Hydrocarbon Transmission Line (Pipeline)◆ □	❋ G	R	G	R	R	G	
Metallic/Non-Metallic Line (with Tracer Wire)	❋ G	Y	G	Y	Y	G metallic	Y non-metallic
Metallic/Non-Metallic Line (without Tracer Wire)	G metallic	R non-metallic	R	❋ G	Y	Y	G metallic	R non-metallic
Metal or Fiberglass UST	R	R	❋ G	R	R	G metallic	R non-metallic

Additional Considerations

Technology ⇒ Variable ⇓	Radio Frequency Electro-Magnetic Detector	Ground Penetrating Radar (GPR)⊙	Acoustic Pipe Locator	Beacon, Sonde, or Conductive Rodder Insertion	EM-61 Ξ
Moist Soil	G	Y	G	G	G
Dry Soil	Y	G	Y	G	G
Clay	Y	R	G	G	G
Concrete w/Rebar	R	Y	G	G	R
Long Horizontal Profile	G	G	G	G	G
Short Horizontal but Deep Vertical Profile	Y	G	R	R	G
Access to Line✚	G	N/A	G	G	G
No Access to Line✚	G (induction or passive)	G	R	R	G
	R (direct connect)				G
Ferrous Metal	G	G	G	G	G
Non-ferrous Metal	Y	G	G	G	G
Adjacent or crossing conductive utility(ies)	Y	N/A	N/A	N/A	Y

Each site will be unique. Do not use this table as the sole criteria for technology selection. Use it as a starting point to assess available, applicable technology(s).

❋ Indicates best technology for given object. Site structures, rebar in concrete, shallow groundwater tables, perched storm water, etc. can significantly affect performance and reliability of any electro/magnetic method. Other utilities which cross or are adjacent to the target line can cause the EM signal to bleed or jump to the other utility line.

□ Metallic lines that have power running through them or can be connected to a tracer signal generator.

◆ Natural gas pipeline locating technicians must be trained/certified (in the U.S. requires DOT and Office of Pipeline Safety standards, other regions may have similar certification or requirements).

⊙ Most sensitive to interpretation. The skill, training and experience of operator are critical.

Ξ Emerging technology with limited availability.

✚ Access: induce unique electronic signature, apply acoustical impulse or insert conductive rodder/beacon/sonde.

Green Generally, an applicable technology **Yellow** May or may not be applicable **Red** Not generally applicable

APPENDIX F

Heavy Equipment Exclusion Management Program

HEAVY EQUIPMENT EXCLUSION ZONE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/2019**
REVIEWED DATE	:	**03/2024**
REVISION NUMBER	:	**3**

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4. TRAINING 2
5. STOP WORK AUTHORITY 2

1. PURPOSE

The Exclusion Zone Management Program aims to establish the minimum clearance distance that must be maintained between workers and heavy equipment while equipment is in operation (i.e., engaged or moving). The intent is to have no personnel or equipment entering the Exclusion Zone while the equipment is in operation or moving to ensure that Roux and Subcontractor employees are unnecessarily exposed to the hazards of the equipment.

2. SCOPE AND APPLICABILITY

This Management Program applies to all Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") employees and their subcontractors performing fieldwork and are potentially exposed to heavy equipment. Heavy equipment includes, but is not necessarily limited to, excavation equipment, drill rigs, vacuum trucks, forklifts, lull telehandlers, man lifts, bobcats, delivery trucks, etc.

3. PROCEDURES

As specified in the following sections of this program, Exclusion Zones must be established and maintained during activities involving the movement/operation of heavy equipment. The Exclusion Zone requirements apply to all personnel on the site but are primarily focused on personnel required to work near the equipment. The exclusion zone is in effect when heavy equipment is moving or engaged (e.g., movement of an arm or bucket of an excavator, rotation of an auger, lifting of a load with a forklift, raising/lowering of a man lift, etc.).

1. The Exclusion Zone must meet the following minimum requirements:
   - A minimum distance of 10 feet from all heavy equipment and loads being moved by the equipment;
   - Greater than the swing/reach radius of any moving part on the heavy equipment (i.e., for large equipment, this may mean an exclusion zone distance larger than 20 feet);
   - Greater than the fall zone of equipment and their contents; and
   - Greater than the tip-over distance of the heavy equipment.

   The size of the Exclusion Zone will need to be determined on a task-specific basis considering the size of the heavy equipment in use and the task being performed. Prior to all heavy equipment operations, the Exclusion Zone(s) distance must be specifically identified in the Job Planning Process and incorporated in the pre-job tailgate meeting with the subcontractor(s), including any updates to our Job Safety Analysis (JSA).

2. The spotter (or another authorized individual) is responsible for enforcing the Exclusion Zone and not conducting any other task. The spotter should be positioned immediately outside of the Exclusion Zone within a clear line of sight of the equipment operator. The spotter must signal the operator to stop work if anyone or anything has the potential to enter or compromise the Exclusion Zone. The operator should stop work if the spotter is not within their line of sight. If a spotter must be within the Exclusion Zone, they must be in a designated area outside the swing/tip radius, fall zone, line of fire of lifted loads, etc. If multiple pieces of equipment are being used, one spotter may be adequate so long as there is a clear line of sight and the spotter can control the zone(s). Radios would be required since hand signals would not be adequate if two pieces of equipment are in operation at the same time in the Exclusion Zone.

3. If an individual must enter the Exclusion Zone, the designated Spotter must signal the Equipment Operator to stop the equipment. Once the equipment is no longer moving (e.g., movement of an arm of an excavator is STOPPED, lifting of a load with a forklift STOPPED, raising/lowering of a man lift is STOPPED, etc.), the operator must bring the boom/arm to the ground ensuring a “Zero Energy State” and DISENGAGE THE CONTROLS and STOP and SIGNAL BY “SHOWING HIS HANDS.” This signal will indicate that it is safe for the person to enter the limits of the Exclusion Zone to perform the required activity. The equipment must remain completely stopped/disengaged until all personnel exited the Exclusion Zone's boundaries and the designated Spotter has signaled by “SHOWING HIS HANDS” to the Equipment Operator that it is safe to resume operations.
4. When entering the limits of the Exclusion Zone, personnel must, at a minimum:
    - Establish eye contact with the operator and approach the heavy equipment in a manner that is in direct line of sight to the Equipment Operator;
    - Never walk under any suspended loads or raised booms/arms of the heavy equipment; and
    - Identify a travel path free of Slip/Trip/Fall hazards.
5. The Exclusion Zone should be delineated using cones with orange snow fences or solid poles between the cones, barrels, tape, or other measures. For work in rights-of-way, rigid barriers, such as Jersey barriers or temporary chain link fences, should be used. For certain types of widespread or moving/mobile equipment operations, such delineation may not be practicable around equipment or individual work areas. In such instances, it is expected that the entire operation will be within a larger secure work area or that additional means will be utilized to ensure the security of the work zone.

All subcontractors who provide heavy equipment operations to field projects must implement a program that meets or exceeds the expectations described above as well as any additional requirements that may be required on a client or site-specific basis. Logistics involving heavy equipment should be understood and discussed prior to the field event during the job planning phase.

3.1 Exceptions

It is recognized that certain heavy equipment activities may require personnel to work within the limits of the Exclusion Zone as specified in this program. Such activities may include certain excavation clearance tasks, drill crew activities, or construction tasks. However, any such activity must be pre-planned, emphasizing limiting the amount and potential exposure of any activity required within the zone. The critical safety steps to mitigate the hazards associated with working within the Exclusion Zone must be defined in the JSA and potentially other project-specific plans (i.e., critical lift plans, etc.), and approved by the Roux Project Principal (PP), Office Health and Safety Manager (OHSM) and client representative, if required, prior to implementation.

4. TRAINING

Many Roux projects have different requirements that are client-specific or site-specific in nature. However, all Roux employees are provided initial training, as well as annually thereafter, on our Heavy Equipment Exclusion zone policy.

5. STOP WORK AUTHORITY

All Roux employees and their subcontractors have stop-work authority. Upon initial hire, all Roux employees are provided initial safety orientation, including stop work authority. All Roux employees and subcontractors are encouraged to stop work whenever any task or operation presents unreasonable risk or employees are

unsure how to carry out work safely. This includes upon observing any questionable safety-related behavior or condition, they are to stop work immediately and discuss the behavior or condition with the individual(s) involved. Upon stopping work, the following actions will be taken:

- Notify the affected parties to include the Project Manager (PM) and Site Health and Safety Officer (SHSO);
- Work to correct the situation or not proceed until the situation is corrected by the PM or SHSO;
- Resume work only when told to proceed by either the PM or SHSO;
- The SHSO will document the Stop-Work intervention in the field logbook;
- Stop-Work interventions will be reported to the PP for review to ensure the interventions are closed; and
- The PP will share learnings from the interventions, as appropriate, throughout the firm, to demonstrate the importance of the Stop-Work interventions.

Please note: Any form of retribution or intimidation directed at any individual or company for exercising their right to issue a stop work authority will not be tolerated.

APPENDIX G

Working Over/Near Water Management Program

WORKING OVER/NEAR WATER MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY DIRECTOR	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**03/2024**
REVIEW DATE	:	**06/2024**
REVISION NUMBER	:	**0**

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1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C., and Remedial Engineering (collectively, "Roux") has established this Working Over/Near Water Management Program to assure its employees and contractors are working safely near waterbodies where the danger of drowning exists. This document provides guidance for assessing potential drowning hazards when working over/near water, mitigating drowning hazards, and developing procedures that site personnel will follow when responding to a water rescue emergency.

2. SCOPE AND APPLICABILITY

This guidance document shall be used when conducting work on Roux projects with actual or potential drowning hazards including:

- Remedial and sampling activities within six (6) feet of a body of water;
- Site inspections within six (6) feet of a body of water; and
- Remedial and sampling activities performed over water (i.e., sediment sampling, surface water sampling).

According to OSHA Standard 29 CFR 1926 Subpart M, 1926.106 for working over or near water, a minimum depth of water where a danger of drowning would exist is not specified. Several factors are important to determining whether a drowning hazard exists. These include the type of waterbody (i.e., basin, river, canal, etc.), depth, presence or absence of tidal currents, work area height above the water surface, and the use of fall protection.

There may be some circumstances where a drowning hazard could exist where workers are near or over a waterbody that is less than two (2) feet in depth. For example, where workers are not using fall protection and are four (4) feet above a waterbody, a worker may fall and be knocked unconscious. Without the use of a life jacket or buoyant work vest and appropriate water rescue procedures, a worker in such a scenario could potentially drown.

3. REQUIREMENTS AND MINIMUM SAFETY EXPECTATIONS

Per 29 CFR 1926 Subpart M, 1926.106, Roux employees and applicable subcontractors working over or within six (6) feet of the water edge where the danger of drowning exists, shall be provided with the following:

- U.S. Coast Guard-approved personal floatation devices (PFDs) or buoyant work vests
- Ring buoys with at least- ninety (90) feet of line safely fastened to the ring buoy; distance between ring buoys shall not exceed 200 feet.
- At least one lifesaving skiff immediately available at locations where employees are working over or adjacent to water

The use of fall protection (including fall protection that eliminates the potential for drowning) does not relieve the requirement for providing ring buoys and an immediately available lifesaving skiff. The purpose of water rescue emergency response shall be to ensure prompt rescue of employees that fall into water, regardless of the fall prevention measures implemented.

3.1 Personal Floatation Device Planning

Regulations pertaining to the use of PFDs vary depending on the type of activity and the authority having jurisdiction. In general, on federally controlled waters all boats must be equipped with U.S. Coast Guard-approved PFDs (33 CFR 175, Subpart B). The quantity and type depend on the length of the boat and the number of people on board and/or being towed. Each PFD must be the proper size for the intended wearer (sizing for PFDs is based on body weight and chest size), in good and serviceable condition, and readily accessible. In addition to size, PFDs should be appropriate for the planned activities and the expected water conditions.

3.2 Personal Floatation Devices

All Roux employees and applicable subcontractors working over or within six (6) feet of the edge of a waterbody, where the potential for drowning exists, shall utilize U.S. Coast Guard-approved PFDs. Roux employees will be provided with PFDs at no cost to the employee whenever exposed to potential drowning hazards. Subcontractors will be responsible for providing their own PFDs and additional equipment as applicable. Approved PFDs shall be selected based on the swimming competency of workers, intensity of tidal currents (as applicable), and expected maximum response time in the event of an emergency.

Please refer to the table below for U.S. Coast Guard-approved PFDs and their uses:

PFD Type	Description	Use
I	Offshore Life Jackets	Provides the most buoyancy. Effective for all waters, especially open, rough, or remote waters where rescue may be delayed. Designed to turn an unconscious wearer to a face-up position in the water.
II	Near-Shore Buoyancy Vests	Intended for calm, inland waters or where there is a good chance of quick rescue. Will turn some unconscious wearers to a face-up position in water, but the turning is not as pronounced as a Type I device. Turns as well as a Type I foam jacket.
III	Flotation Aids	Good for calm, inland waters, or wherever there is a good chance of quick rescue. Turns as well as a Type II foam vest but may not turn an unconscious wearer face up. Wearers may have to tilt their head back to remain in the face-up position. Type III foam vest has the same minimum buoyancy as Type II device. Available in many styles, colors, and sizes. Generally, the most comfortable for continuous wear. Includes float coats, full-sleeved jackets, fishing vests, and vests with features suitable for other activities.
IV	Throwable Devices	Can be used anywhere. Designed to be thrown to a person in the water and grasped and held by the user until rescued. Not designed or intended to be worn. Includes ring buoys, buoyant cushions, and horseshoe buoys. There are no U.S. Coast Guard-approved inflatable Type IV devices.
V	Special Use Devices	Designed for specific activities and must be worn and used in accordance with the approval label. Provides the performance of a Type I, II, or III device (as marked on the approval label). Examples include deck suits, work vests, and sailing vests with a safety harness. Some Type V devices provide significant hypothermia protection. Note: Do not attach the safety harness of a Type V inflatable device to a boat unless it is being worn with a tether less than 6.5 feet in length with quick-release-under-load hardware. Do not use the harness for climbing activities. U.S. Coast Guard approval does not apply to use of the harness as fall protection.

Source: A Boater's Guide to the Federal Requirements for Recreational Boats (and Safety Tips) by the U.S. Coast Guard.

3.3 Lifesaving Skiffs

OSHA has established the following criteria for determining when a lifesaving skiff is considered "immediately available."

- The skiff must be in the water or capable of being quickly launched by one person.
- There must be at least one person present and specifically designated to respond to water emergencies and always operate the skiff when there are employees above water.
- When the operator is on break, another operator must be designated to provide the requisite coverage while employees are above water.
- The designated operator must always either man the skiff or remain in the immediate area such that the operator can quickly reach the skiff and get underway.
- The skiff operator may be assigned other tasks provided the tasks do not interfere with the operator's ability to quickly reach the skiff and get underway.
- The communication system, such as a walkie-talkie, must be used to inform the skiff operator of an emergency and to inform the operator where the skiff is needed.
- The skiff must be equipped with a motor and/or oars for manual operation.

When considering the appropriate number of skiffs and maximum water rescue response time, the following factors should be evaluated prior to mobilization:

- The number of work locations where there is a danger of falling into a waterbody;
- The distance to each location where a drowning hazard exists;
- Water temperature;
- Tidal currents; and
- Other hazards such as, but not limited to, rapids, dams, and water intakes.

In the event a PFD is not worn or malfunctions, permanent brain damage can occur in a drowning victim within three to four minutes of oxygen deprivation. Water rescue emergency procedures shall be developed by the project team and reviewed prior to and during work over/near water to minimize response time and ensure a worker who has fallen into a waterbody is rescued within the shortest timeframe feasible.

Skiffs and Life-Saving Boats are not necessary in the following instances:

- The water is too shallow to navigate a boat.
- Where the geography lacks a safe area to launch a skiff or life-saving boat or when the water way presents an immediate hazard to the employee (rescuer) operating the skiff or life-saving boat, e.g. gorge areas and other sheer launch sites, lock areas and waterfalls.
- When other effective means of rescue exist; e.g. in shallow areas, with slow-moving water that are close to shore such that an employee can immediately wade into the water or utilize a rescue pole to provide rescue.

4. WATER RESCUE EMERGENCY RESPONSE

4.1 Site Emergency Coordinator

At project sites where Roux employees and subcontractors are working within six (6) feet or over a waterbody where the potential for drowning exists, the Site Emergency Coordinator(s) for water rescue

emergency response shall be the Site Health and Safety Officer (SHSO) and/or Site Supervisor (SS). Coordinator(s) will be responsible for implementing water rescue emergency procedures whenever conditions warrant such action. Emergency response procedures include assuring the immediate rescue of any worker who has fallen into a waterbody, emergency treatment, emergency transport of personnel as necessary, and notification of emergency medical services and the appropriate management staff (i.e., Project Manager, Project Principal, Operations Manager, Corporate Health and Safety Director). Any incident involving Roux employees or applicable subcontractors falling into water where the danger of drowning exists will be reported immediately to the SHSO and/or SS by site personnel.

4.2 Controlled Access Zones

Applicable workers must be protected through limited access to high drowning hazard locations of the work area. Prior to the start of working over or near water, a controlled access zone (CAZ) shall be clearly delineated by the SHSO and/or SS as an area where a recognized drowning hazard exists. To prevent third-party access to the work area, it is recommended that the SHSO and/or SS demarcate the CAZ with the use of signage, visual barriers (i.e., cones, caution tape, fencing), and physical barriers (i.e., jersey barriers, fencing).

The SHSO and/or SS shall take the following steps to ensure that the CAZ is clearly marked or controlled:

a) All access to the CAZ must be restricted to authorized entrants such applicable employees and subcontractors.

b) All workers who are permitted in the CAZ shall be visibly identifiable by the SHSO and SS prior to implementation.

The SHSO and/or SS shall ensure that all protective elements of the CAZ are implemented prior to the beginning of work.

4.3 Water Rescue Procedures

The following water rescue procedures will be performed by employees who have completed relevant training in working over or near water, can safely perform water rescue procedures, and are able to recognize relevant drowning hazards. The appropriate emergency response procedures, training, and required equipment will be determined in consultation with the OHSM and CHSD based on the swimming competency of the affected worker(s), presence/absence of tidal currents, type of waterbody, weather conditions, and expected maximum response time. The PM and SS/SHO must ensure that site-specific water rescue procedures have been implemented and discussed with affected subcontractors prior to field mobilization.

4.3.1 Self-Assisted Rescue

In the event of a water rescue emergency, the following emergency response procedures will be followed by the SHSO and/or SS and applicable subcontractor personnel:

- The sound of five or more blasts on the air horn will be used to alert all personnel that a worker has fallen into the water.
- Water rescue personnel will throw a ring buoy into the water towards the fallen worker.
- Once the employee has a firm grip around the ring buoy, water rescue personnel will pull the fallen worker to a safe rescue point.

- An emergency escape ladder (if able) will be properly secured and deployed at the safe rescue point.
- In the event the employee is unable to rescue themselves and/or unconscious, water rescue personnel will deploy the onsite lifesaving skiff, or the on-site rescue boat will be notified via two-radio or mobile phone.
- Contact emergency medical services (EMS), and provide location information, nature of the incident, and direction the person is moving.
- When working on navigable waters, notifications will be provided to the U.S. Coast Guard (VHF-FM Channel 16 /156.8 MHz or dial 911).

4.3.2 Skiff or Boat-Assisted Rescue

In the event the employee is unable to rescue themselves and/or unconscious, water rescue personnel will deploy the onsite lifesaving skiff, or the on-site rescue boat (as applicable) will be notified via two-radio or mobile phone.

a) Conscious employee: The employee will be removed from the water with the assistance of rescue personnel and will be brought to a safe location on land or on the rescue boat.
   - The worker should be evaluated by a qualified first aid responder or an employee certified in First AID/CPR/AED. If additional medical attention is needed, EMS will be notified.

b) Unconscious employee: If the worker is unconscious, keep the worker's air passages open and obtain first aid. All designated rescue personnel shall be First AID/CPR/AED certified.
   - Once the employee has been removed from the water and is in the rescue vessel, a rescue basket stretcher should be lowered onto the boat to transport the affected worker to land.
   - The unconscious worker will be retrieved and brought to land, where EMS will be standing by for emergency medical treatment.

c) If additional rescue is required, the U.S. Coast Guard will be notified immediately.

4.3.3 Water Rescue Equipment

In order to properly affect water rescue emergency response, the following equipment will be immediately available for applicable work areas:

- OSHA-approved lifesaving skiff or rescue boat
- OSHA/ANSI-approved First aid kit
- Automated External Defibrillator (AED)
- Air horn
- U.S. Coast Guard-approved PFDs
- Ring buoys with at least 90 feet of line
- Two-way radios
- Rescue basket stretcher equipped with patient restraints and lifting bridle/sling