

# Per- & Polyfluoroalkyl Substances Investigation and Drinking Water Sampling and Reporting at Southern Vermont Regional Airport

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## Services / Expertise

DEC Program Oversight  
PFAS Monitoring  
Site Specific Health and Safety Plan (HASP)  
Work Plan and Cost Estimate  
Site Investigation Work Plan, including  
Conceptual Site Model

## Markets

State Government

## Project Location

North Clarendon, Vermont

## Date Completed

2019–Present

## Project Owner

Vermont Agency of Transportation

## Point of Contact / Reference

Andy Shively  
Hazardous Materials Unit Manager  
Pollution Prevention & Compliance  
Vermont Agency of Transportation  
2178 Airport Road, Barre, VT 05641  
[andy.shively@vermont.gov](mailto:andy.shively@vermont.gov)

## Project Manager

Katrina Mattice, PE  
[kmattice@stone-env.com](mailto:kmattice@stone-env.com)

## Project Team

Michael Smith  
Daniel Voisin  
Laura Rajnak  
Jodie Wright  
Sarah Rathay  
Barb Patterson  
Christina Nick

## Subcontractors/Subconsultants

Platform Environmental Drilling and  
Remediation Services  
Culligan Water  
Holt Gilmour Survey Associates, LLC  
Pace Analytical Services, LLC  
Eurofins Environment Testing



*Southern Vermont Regional Airport aqueous film-forming foam (AFFF) testing and training areas.*

**IN 2018**, the Vermont Department of Environmental Conservation (VT DEC) and the Vermont Agency of Transportation (VTTrans) evaluated the Southern Vermont Regional Airport (SVRA) in North Clarendon, Vermont, for potential impacts related to the use of aqueous film-forming foam (AFFF) in firefighting apparatus during firefighting training and fire response activities. A phased sampling of bedrock groundwater monitoring wells revealed that groundwater in bedrock is impacted by common constituents of AFFF known as per- and polyfluoroalkyl substances (PFAS). Subsequently, PFAS were detected in residential and public water system supply wells on and off the airport property. A limited site investigation was performed at one known firefighting training area, which included soil and shallow groundwater sampling.

In 2019, VTTrans contracted with Stone to perform periodic monitoring of approximately 45 residential water supply wells, including six with point-of-entry treatment systems (POETs), and a public water treatment and supply system serving a local business park. This work included maintenance of the residential POET systems. As part of this project, Stone reviewed the as-built drawings, developed a sampling procedure for the business park water system, and maintained compliance with the VT DEC Drinking Water Division.

Stone also completed groundwater, surface water, and sediment monitoring at and near the SVRA in 2019 to further evaluate the distribution, fate, and transport of PFAS from suspected source areas. Sampling and subsequent testing confirmed the migration of PFAS from the Bravo AFFF training area to the Mill River, located south of the airport, and to an unnamed first-order stream northeast of the training area.



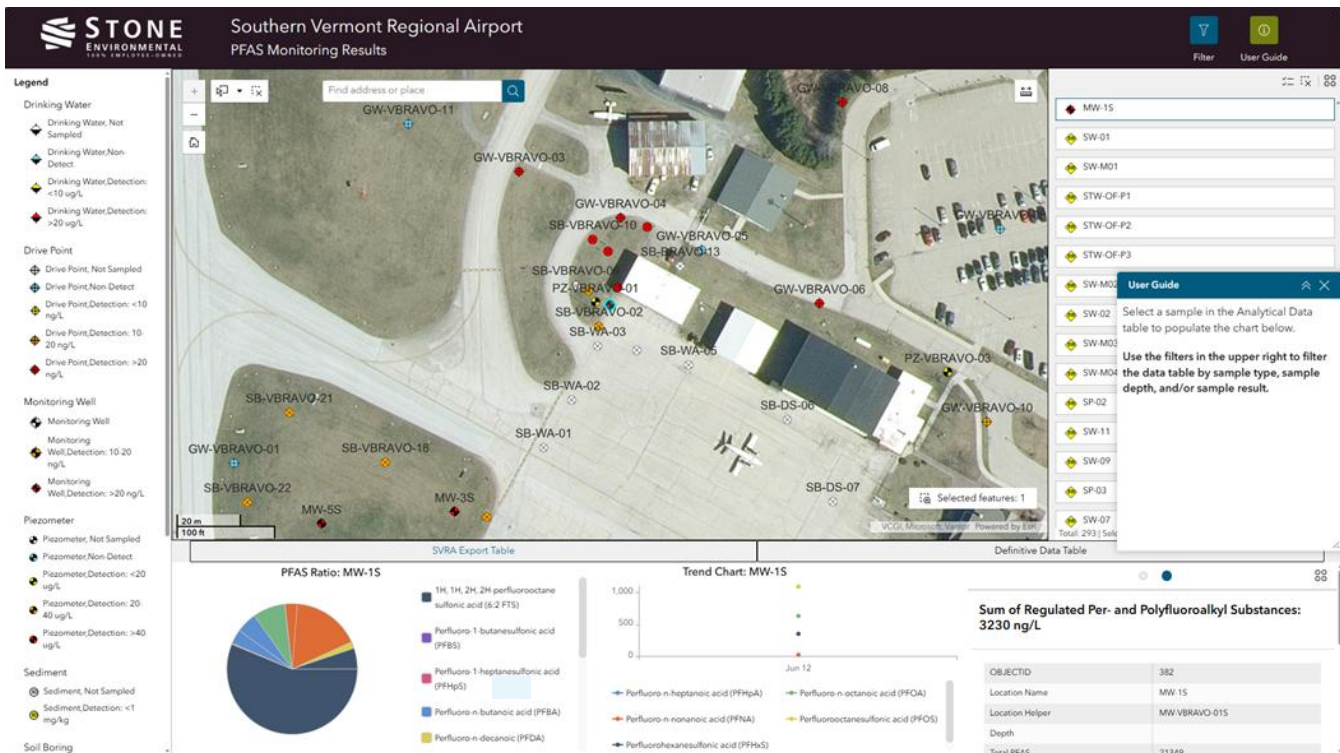
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Between 2020-2021, the Vermont Geological Survey—in conjunction with Middlebury College, the University of Vermont, and the State University of New York (SUNY) Plattsburgh—completed surficial bedrock mapping, spatial analysis of well reports, geophysical logging of bedrock wells, and chemical tracing to identify potential groundwater and PFAS transport pathways in bedrock. This work characterized bedrock structures and hydrogeology at and near SVRA, improving our understanding of subsurface conditions that affect the fate and transport of PFAS.

In 2022, Stone implemented a high-resolution site investigation to further investigate potential source areas and assess the impact on shallow, overburdened groundwater, soil, and surface water. Work plan development included reviewing historical information to develop a chronology of airport construction and AFFF use to inform and update the Conceptual Site Model (CSM). Work began in April 2022 by first evaluating the site-wide hydrogeology of the unconsolidated aquifer. In addition, Stone completed soil and groundwater assessments within each fire training and emergency response area and crash sites in October 2022. This work utilized both screening level and definitive analytical methods to guide a dynamic work strategy to delineate PFAS source areas. The site investigation included quarterly sampling of surface water and stormwater runoff and quarterly groundwater monitoring to evaluate temporal trends in PFAS concentrations and the role stormwater infrastructure plays in PFAS transport at the site.

In 2022, Stone developed an Experience Builder application in ArcGIS Online that showcases the locations of soil and groundwater investigations and their corresponding analytical data in an online dashboard. Concurrent with fieldwork, Stone integrated field and analysis results from the lab into the dashboard to help users efficiently manage and interpret the investigation's results. Using the menu, users can query data and view sampling results in a pie chart, or obtain information for individual sampling sites in a table. These visuals make it easier for users to understand the investigation's outcomes.



A screenshot showing the SVRA Dashboard Experience. Users can select a sample in the Analytical Data table to populate the chart. The filters in the upper right enable them to filter the data table by sample type, sample depth, and/or sample result.

