

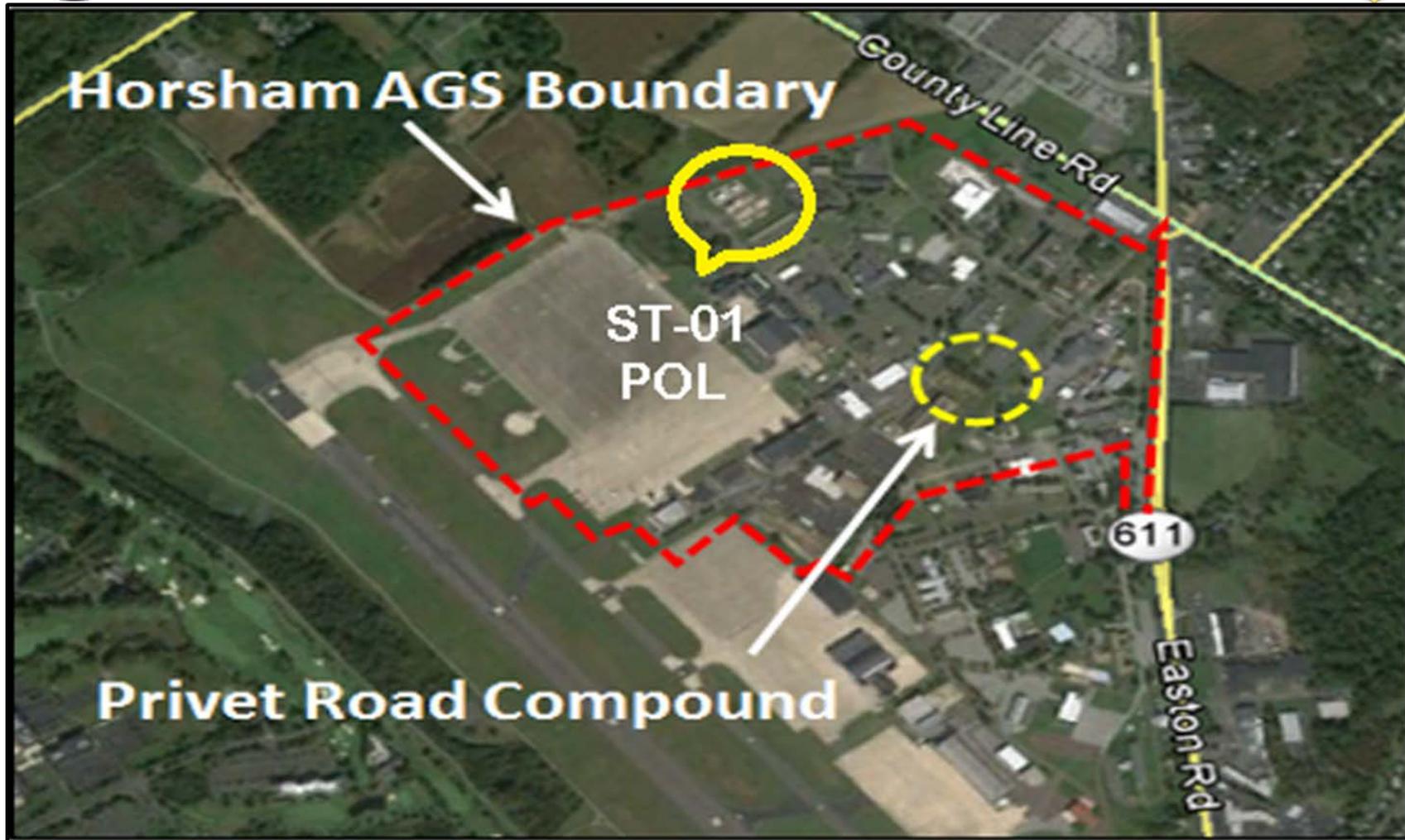


# Restoration Advisory Board Horsham Air Guard Station

Keith Freihofer  
NGB/A4OR

13 September 2018

# Environmental Restoration Program Sites





# Air Force Reserve ST-01 POL



- Former Air Force Reserve Petroleum Tank Area
  - Site originated from a jet fuel spill in the 1970's
  - Injections of persulfate and Epsom salt replaced the biosparge system in 2016
  - Petroleum tanks were dismantled in 2016 allowing for removal of any petroleum impacted soil that may be present under the tanks. 175 tons of presumed petroleum impacted soil removed from beneath tanks and disposed of at licensed facility.
  - Confirmatory sampling expected to begin Summer 2018 in accordance with 25 Pennsylvania Code, Section 245.310 of the Department of Environmental Protection (DEP)'s Rules and Regulations.
- POC: Ms. Margaret Patterson: [margaret.patterson@us.af.mil](mailto:margaret.patterson@us.af.mil)

# Privet Road Compound



- Former waste management area for Naval Air Station Joint Reserve Base Willow Grove
- Sampling completed in June 2016 indicates trichloroethene (TCE) and tetrachloroethene (PCE) exist in the groundwater but levels are below maximum contaminant levels (MCL) set by the U.S. Environmental Protection Agency for drinking water quality
- Leidos, Inc. is contracted for continued long-term monitoring. Biannual groundwater sampling and land use control inspections will continue to be conducted pending a final site remedy
- Second Five-Year Review underway for Privet Road groundwater contamination by BB&E Inc. on behalf of the ANG
- The purpose of the Five-Year Review is to evaluate the implementation and performance of the remedy to determine if it is and will continue to be protective of human health and the environment

# PFOS/PFOA on Horsham AGS



- In 2015, ANG completed a Preliminary Assessment of potential PFOS/PFOA release sites at the Horsham Air Guard Station (AGS). Ten potential source areas identified in the PA include:
  - Buildings that contained foam fire suppression systems
  - Areas that may have received runoff from foam releases
  - Stormwater sediment basin
  - Former waste water treatment plant
  - Former storage area for wastewater treatment sludge
  - These potential source areas are being further investigated by Leidos in a PFOS/PFOA Facility Investigation



# Potential PFOS/PFOA Source Areas



# Field Investigation Update



- GW sampling event conducted in March 2018
- Joint gauging event conducted 8-9 March 2018
- Baseflow SW sampling conducted 19 March 2018
- Rain event SW sampling conducted 28-29 June 2018

# Reporting Update



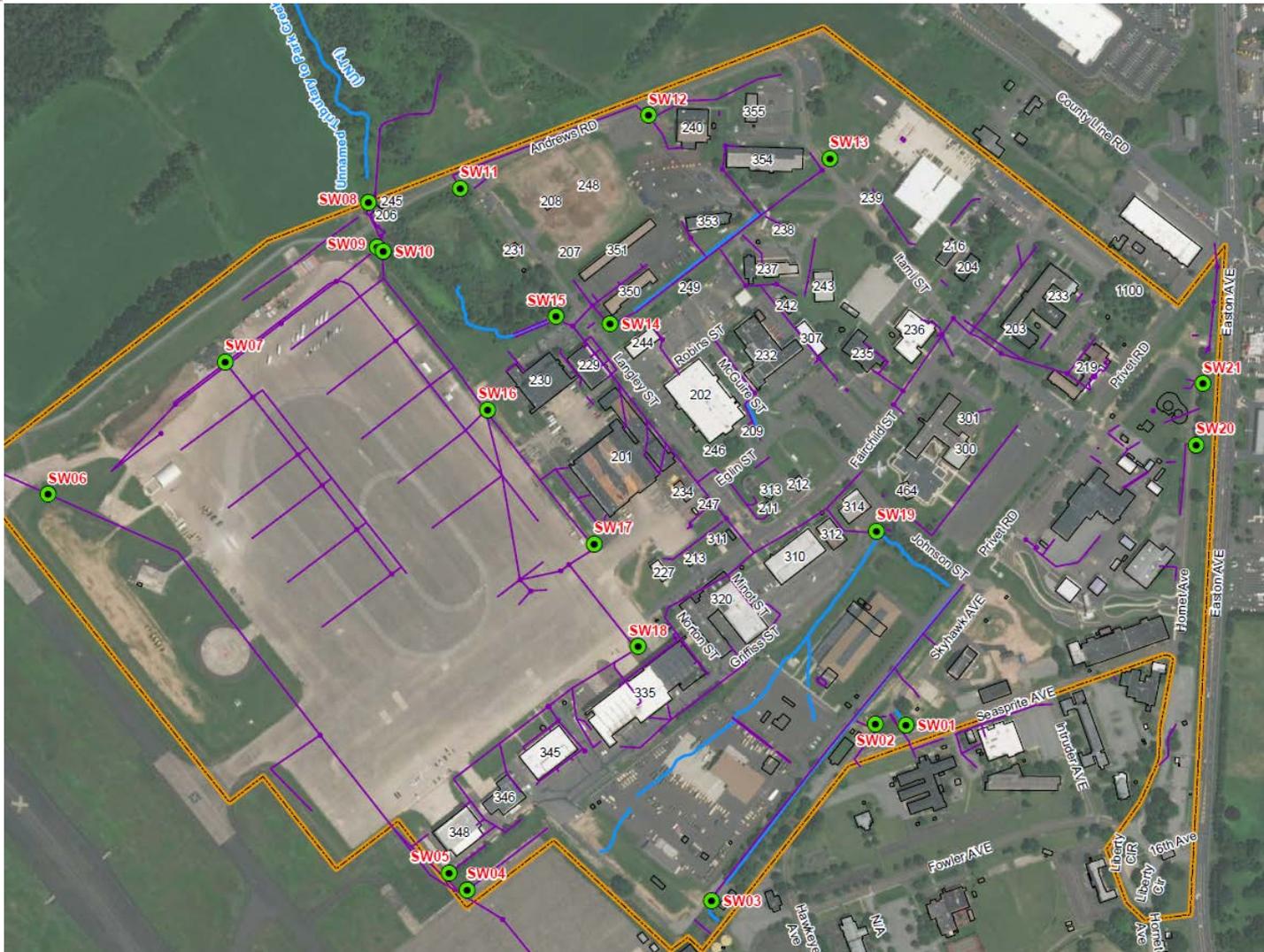
- Final Facility Investigation Report available on Administrative Record. <http://afcec.publicadmin-record.us.af.mil/Search.aspx>
- Final Groundwater Monitoring Report for December 2017 event submitted.
- Final Groundwater Monitoring Report for March 2018 event submitted.
- Draft Final Stormwater Study Tech Memo submitted September 2018. Under review.
- Conceptual Design Report submitted to ANG.
- NPDES application submitted to PADEP 28 August. Public notices submitted to township, county, and local newspaper.

# Surface Water Data Findings



- Study results indicate widespread detections of PFCs at Horsham AGS and in the regional watershed.
- The highest concentrations are observed within Horsham AGS and, in general, decrease with distance from Horsham AGS.
- Conclusions include:
  - Elevated PFC concentrations flow onto Horsham AGS from Willow Grove via locations SW01, SW02, SW03, and SW04. SW04 conveys elevated concentrations during wet and dry weather.
  - Discharge of contaminated groundwater occurs within Horsham AGS, as evidenced by base flow sampling results at SW05, SW15, SW16, SW17, and SW18.
  - Discharge of contaminated groundwater occurs offsite, as evidenced by base flow sampling results at SW23, SW28, and SW30.
  - Basin treatment system reduces (but does not eliminate) PFC concentrations discharges from the basin. Quickly reaches capacity during precipitation. Downstream concentrations are consistently lower than concentrations entering the Basin.

# Surface Water Sampling Locations

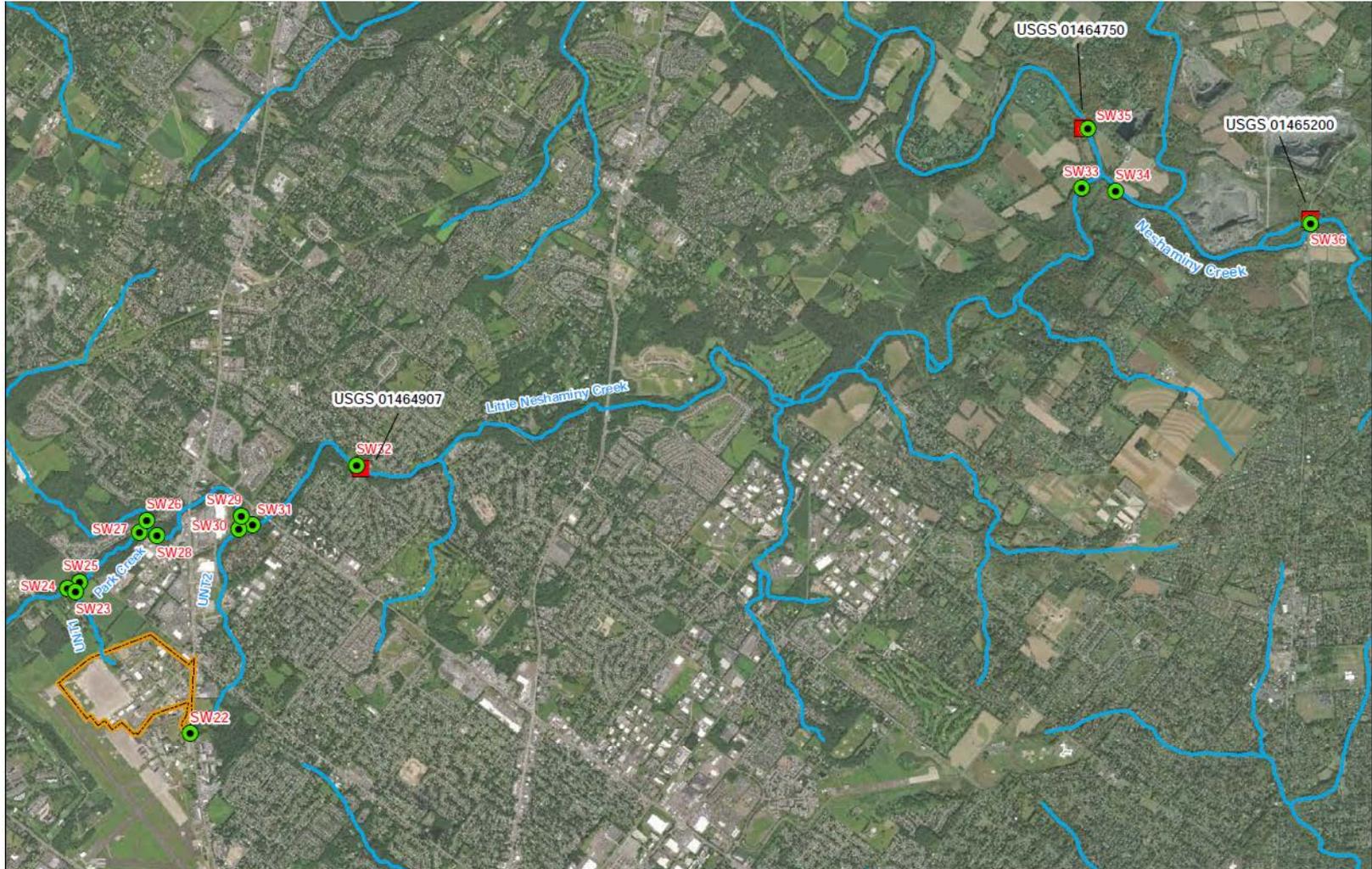


# Surface Water Data Findings



- Conclusions (continued):
  - Increased PFC concentrations downgradient of confluences with tributaries closer to Horsham AGS. However, PFCs are detected in upstream sample locations (e.g., SW24, SW26, and SW31) prior to confluence with impacted streams. Additional upstream sources may be present.
  - Wet-weather sampling within Horsham AGS indicates potential residual sources contributing to PFC concentrations at sampling locations. For example, locations SW07, SW12, SW13, and SW14 were dry during base flow conditions, but contained PFC detections ranging from 29 ng/L (SW12) to 165 ng/L (SW07) during storm events.
  - Locations SW20 and SW21 contained PFC concentrations ranging from 44 ng/L (SW21) to 198 ng/L (SW20) during precipitation events. Source of detections is unknown. These locations discharge to off-site surface water.
  - The storm sample from SW22 indicates that elevated PFC concentrations discharge from Willow Grove to the headwaters of UNT 2.

# Surface Water Sampling Locations





# Surface Water: Recommendations



- Additional investigation to further characterize the nature and extent of PFC contamination to surface water at Horsham AGS.
- Curtail influx of PFCs from Willow Grove at locations SW01, SW02, SW03, and SW04.
- Evaluate the source of PFCs at locations SW16, SW17, and SW18. Likely due to infiltration of contaminated groundwater, but need to evaluate the potential for residual sources at Horsham AGS.
- Additional investigation to determine the source of PFCs at locations SW12, SW13, SW14, SW20, and SW21.
- Enhanced treatment of surface water discharge from Basin.

# Groundwater Data Update



- Gauging conducted 8-9 March 2018
  - Semi-confined multilayer aquifer system, subdivided into four zones for contouring
  - Gradients trends northwest in each zone
- Sampling event conducted 5-15 March, 2018
  - Concentrations similar to previous events
  - 78 of 85 locations exceeded 70 ng/l (combined PFOA/PFOS)
  - Highest concentrations found in three general areas: along the southern boundary, near Building 335, and near Building 201.
  - Highest concentrations at PMW01, Zones A, B, and C: 329,500 ng/l, 147,400 ng/l, and 186,900 ng/l, respectively.
  - Next highest concentration at IMW-06 (49,000 ng/L) along the southern boundary).
  - Four wells near Buildings 201 and 335 contained concentrations above 10,000 ng/L.
- No additional sampling or gauging planned at this time.

# GW Results: March 2018



# PFOS/PFOA in Surface Water on Horsham AGS



- PFOS/PFOA has been detected in surface water leaving the Horsham Air Guard Station. This water flows from a storm water detention basin on the northwest boundary of the Base to Park Creek which flows to the Little Neshaminy Creek.
  - ANG is taking action to reduce this release of PFOS/PFOA to the Creek:
    - An updated carbon filtration system was installed on the outfall in August 2018 replacing the original system from September 2017.
    - The system is designed to reduce dry weather flow PFOS/PFOA concentrations to below 70 PPT.
    - Additional funding was received this month to enhance the surface water treatment.

# PFOS/PFOA in Drinking Water



- The Air National Guard has a \$13.5 million Cooperative Agreement with Warrington Township to:
  - Connect residents with PFOS/PFOA impacted drinking water wells above the Health Advisory to municipal water and abandon the impacted private wells
  - Install water mains as needed
  - Installation and maintenance of carbon filters on five Township wells
  - Install municipal water system interconnections with North Wales Water Authority to ensure Warrington Township has adequate access to water until carbon filtration is installed on municipal wells



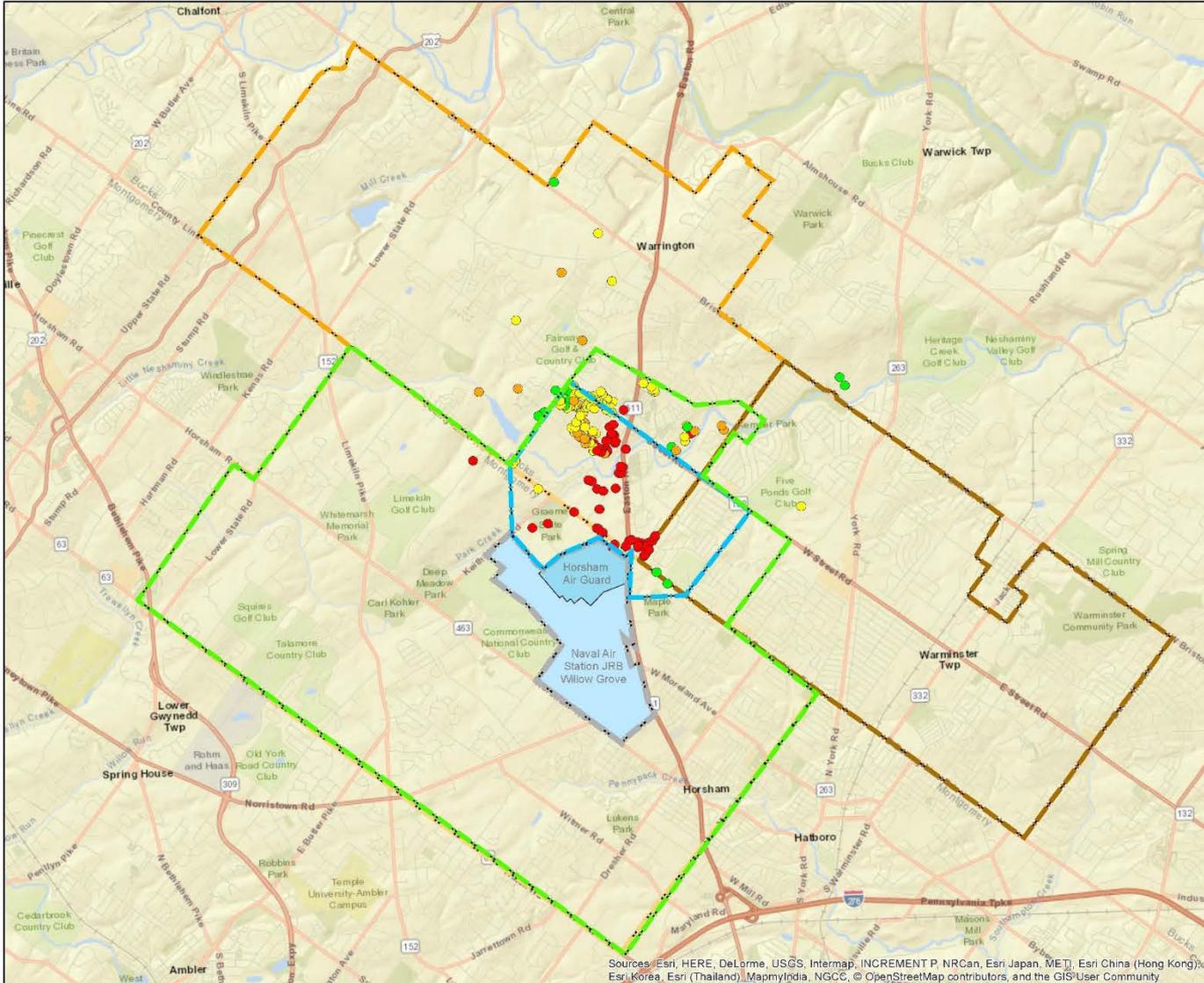
# Private Well Sampling



- ANG has contract in place with Wood (formerly Amec Foster Wheeler) to provide PFOS/PFOA testing of private drinking water wells and supply bottled water to properties with PFOS/PFOA at or above the lifetime health advisory level (HAL) for residents within our area of responsibility in Horsham, Warminster, and Warrington
  - The number of private wells sampled by ANG are:
    - Horsham: 5, all above HAL; 4 have been connected to municipal water (remaining one not in use)
    - Warrington: 136, 45 are above HAL; 33 have been connected
    - Warminster: 12\*, 11 are above HAL; 8 have been connected
- \*Some of these properties are on Valley Road with Warminster mailing addresses but are located in Warrington Township
- Sampling contact for ANG area of responsibility: David Side at [david.side@woodplc.com](mailto:david.side@woodplc.com) or (610) 877-6111



# Private Well Sampling Map



PFC Sample Location Map  
as of April 2018

Horsham Air Guard Station  
Horsham and Warrington Township

### Legend

**Health Advisory Level (HAL)**  
HAL is the sum of both PFOA+PFOS (PFOA 0.070 ug/L, PFOS 0.70 ug/L)

- Sum of PFOA+PFOS concentrations above 0.070 ug/L
- Sum of PFOA+PFOS concentrations detected between 0.040 ug/L and 0.070 ug/L
- Sum of PFOA+PFOS concentrations detected at or below 0.040 ug/L
- PFOA & PFOS not detected

- Horsham Air Guard
- Former NAS JRB Willow Grove
- Sampling Area
- Air Force Administrative Order Boundary
- Horsham Township
- Warrington Township
- Warminster Township

### Notes & Sources

Sources:  
Street Base Map hosted by ESRI.

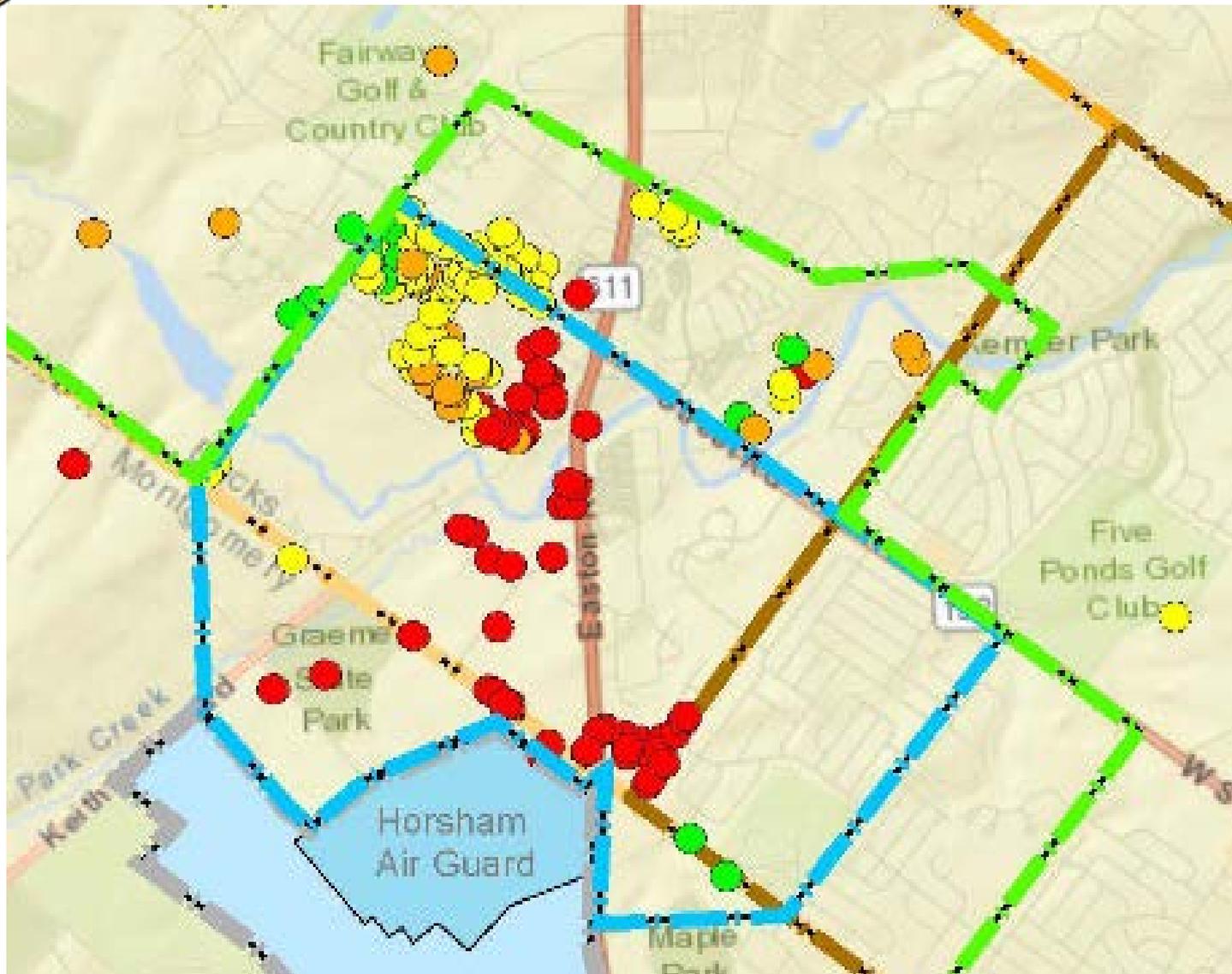
**wood.**  
Wood Environment & Infrastructure, Inc.  
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Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



# Private Well Sampling Map





# Questions?

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**Air National Guard Administrative Record:**  
**<http://afcec.publicadmin-record.us.af.mil/Search.aspx>**  
**select "Air National Guard", then "Horsham AGS", then click Search**