



January 30, 2018

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Tina M. O'Rourke, Business Manager
Horsham Water & Sewer Authority
617 Horsham Road
Horsham, PA 19044

Reference: Horsham Air Guard Station
GW Monitoring Report PFC FI – December 2017
Horsham Township, Montgomery County

Dear Ms. O'Rourke,

On behalf of Horsham Water & Sewer Authority, G&A has reviewed the following document:

Groundwater Monitoring Report for the Perfluorinated Compound Facility Investigation at the Horsham Air Guard Station (111th Attack Wing) Horsham, Pennsylvania, Draft Final Air National Guard, dated December 2017.

Air National Guard (ANG) has provided this report produced by Leidos summarizing the activities involved in the groundwater monitoring event which took place in July 2017. Also included in this report is a comprehensive background of the site, including a timeline of the property and ownership events, site soils, hydrogeologic conditions and geologic information. The following summarizes those topics.

Background

For review, the timeline of property and ownerships events is as follows:

- 1942 – Property was purchased by the US Navy
- 1957 – 148 Acres purchased by the US Air Force (USAF)
 - Maintenance Hangar (Building 201), Storage Warehouse (Building 202), and Wing Headquarters (Building 203) were built
 - Aircraft parking ramps, taxiways and utility infrastructures were built
- 1960-1961 – Navy transfers 25.3 acres to USAF; USAF acreage increases to 162 acres and is referred to as Willow Grove Air Reserve Station
- 1994 – Remaining Navy land is designated as “NAS JRB Willow Grove”
- 2007 – Air Force Reserve (AFRES) deactivated under Base Realignment & Closure Act of 2005
 - ANG becomes responsible for USAF land
- 2011 – USAF land officially known as Horsham Air Guard Station (AGS) and remaining Navy land, 27.2 acres are transferred to ANG responsibility.
- 2014 – ANG and surrounding municipal water supply entities notify public of per- and poly-fluoroalkyl substances (PFAS), also known as perfluorinated compounds (PFC's) present in groundwater at concentrations above EPA's health advisory level (HAL).

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- 2015 – EPA Region 3 issues an Administrative Order to National Guard Bureau (the federal administrative entity of the ANG) to perform a facility investigation (FI)
 - EPA Safe Water Drinking Act is published
 - Leidos is hired to complete the FI then publishes objectives and proposals.
- 2016 – Leidos publishes the Uniform Federal Policy Quality Assurance Project Plan for PFC Facility Investigation at Horsham AGS (UFP-QAPP)
- 2017 – Leidos publishes the Draft Final Facility Investigation Report detailing the first investigative activities under the UFP-QAPP.

The site soils are generally silt loams of the Doylestown, Lansdale, Lawrenceville and Readington groups. These groups vary in drainage and depth, ranging between 3 and 11 feet deep across the site. The site sits within the Middle Arose Member of the Triassic-aged Stockton Formation. The Stockton formation is comprised of siltstone, shale and arkosic sandstones.

Aquifer at the Horsham AGS is complex and heterogeneous including from shallow unconfined zones and ranging to deep confined zones. Groundwater is generally encountered between 5 and 20 feet below ground surface.

Monitoring Event

Groundwater level monitoring was performed on July 24, 2017. Other monitoring activities were performed over the months of July and August. Monitoring was performed at 84 independent locations including 26 single-screen Facility Investigation (FI) wells, 8 multi-port FI wells, and 26 existing wells (existed prior to the final Facility Investigation and relevant plans). Sampling was performed in accordance with standard practice of low-flow purging and sampling. Samples were analyzed for PFOS and PFOA.

Results of sampling and monitoring activities yielded 4 distinct aquifer zones referred to by Leidos as shallow, intermediate 1, intermediate 2, and deep. The maximum concentration of PFOS/PFOA combined was 309,700 ng/L and results were averaged at 14,248 ng/L.

Seven (7) wells, or 8% of the wells included, yielded results less than the 70 ng/L Health Advisory Limit (HAL). The remaining seventy-seven (77) wells, or 92% of the wells included, were above the 70 ng/L HAL. The wells with the lowest concentrations were, generally, deep aquifer wells along the northern boundary of Horsham AGS.

Leidos Conclusions

These results contributed to the following conclusions by Leidos:

- The highest PFOS and PFOA concentrations are located along the southern boundary of the site, near Building 335, and Building 201.
- Contamination has migrated throughout the intermediate and deep aquifer zones, from a potential source area at the surface near well PMW01. However, concentrations of PFOS and PFOA decline with depth in the aquifer.
- Groundwater flow direction is to the north to northwest.
- Data and research performed for this report confirm the previously presented conceptual site model (CSM) reported by Leidos. This conceptual site model was reported in the Facility Investigation report as follows:
 - The source of PFOS and PFOA was near well PMW01. PFOS and PFOA migrated through soils then through bedrock fractures.
 - Pumping activities of supply wells on site (NAS-1 and NAS-2), and supply wells off site pulled the contamination in the supply system on and off site.

- Leaking of the aging water and sewage infrastructure distributed contamination throughout the area.

A second monitoring event is planned for March 2018. Currently, Leidos is performing a study of the stormwater and surface waters to assess the possible contribution of PFOS/PFOA by groundwater discharges to surface water.

G&A Comments

We appreciate the continued information made available to the public. G&A has the following comments on the reviewed report:

1. The conceptual site model ignores possible releases of PFOS and PFOA into soils into other parts of the Horsham Air Guard facility. Previous soil sampling was performed and screening of the results did not account for the possible soil-to-groundwater pathway.
2. The monitoring report does not address offsite migration. We are aware that the current investigation scope was limited to onsite evaluation. Evaluation of pathways offsite is critical interest to HWSA.

G&A will continue to review documents as they become available.

Sincerely,



Toby J. Kessler, P.G.
Manager – Environmental Services
Gilmore & Associates, Inc.

TJK/dmk

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