



Restoration Advisory Board Biddle Air National Guard Base

Bill Myer

NGB/A4VR

14 September 2023



Updates Since 11 May 2023



- Environmental Restoration Program Sites:
 - Willow Grove Site 1 (Privet Road):
 - Final Five-Year Review (BB&E) to EPA/PADEP 25 April 2023
 - Final Work Plan Long Term Monitoring RTCs submitted to EPA/PADEP February 2023
- Coordinating with SAF IEE on signing amendment to Navy Federal Facility Agreement
 - ANG Staffing Final Amendment to Navy FFA to Secretary of the Air Force for Installations, Energy and Environment Ms. Nancy Balkus for Signature
- PFAS Remedial Investigation:
 - Started drilling borings/wells for Phase II
 - Coordinated packer testing zone selection, well screen selection for Phase II of RI
 - Conducted groundwater level monitoring at 30 wells for 1 month in support of groundwater flow model
 - Draft Surface Water Sampling Report (events 15 & 16)
 - EPA/PADEP/Navy/ANG conducted a technical meeting on 24 July 2023 to discuss surface water sampling and next steps
- Interim Groundwater Action:
 - Started drilling wells for pilot test
 - Coordinated with EPA/PADEP on packer testing intervals
 - Finalized Pilot Test Discharge Permit



3 Month Forecast of Activities



- Sign Navy Federal Facilities Agreement September 2023:
 - Complete Surface Water Response Action Memorandum
 - Complete Residential Drinking Water Action Memorandum
- Continued drinking water response actions (sampling, bottled water, and coordination with North Wales Water Authority (NWWA) and Warminster)
- Finalize Memos for Surface Water Sampling Events 15 & 16
- Continued storm water treatment operations (Warminster)
- Long Term Monitoring Groundwater Site 1 Privet Road
- Complete groundwater extraction well construction September 2023
- Start Pilot Test November 2023

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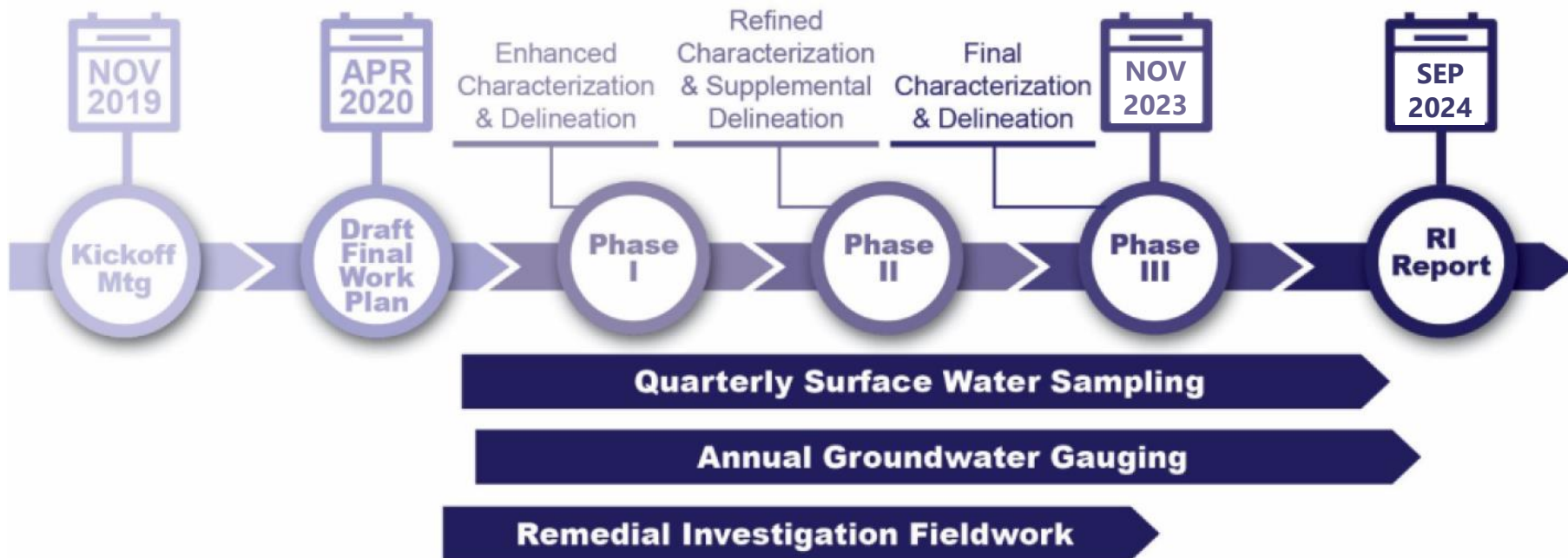


Remedial Investigation Project Objectives



- Delineate the nature and extent of PFAS contamination, the threat to human health and the environment and prepare a Remedial Investigation (RI) Report.
 - Collect soil, sediment, surface water, and groundwater PFAS data on and around Biddle ANGB.
 - Conduct Baseline Risk Assessment (BRA).
 - Investigate link between groundwater and unnamed tributary to Park Creek.
 - Obtain data required to inform future development of a Feasibility Study.
 - Conduct quarterly surface water sampling for PFAS in coordination with the Navy.
 - Conduct annual potentiometric gauging, as needed to support USGS model.

Remedial Investigation General Process and Schedule





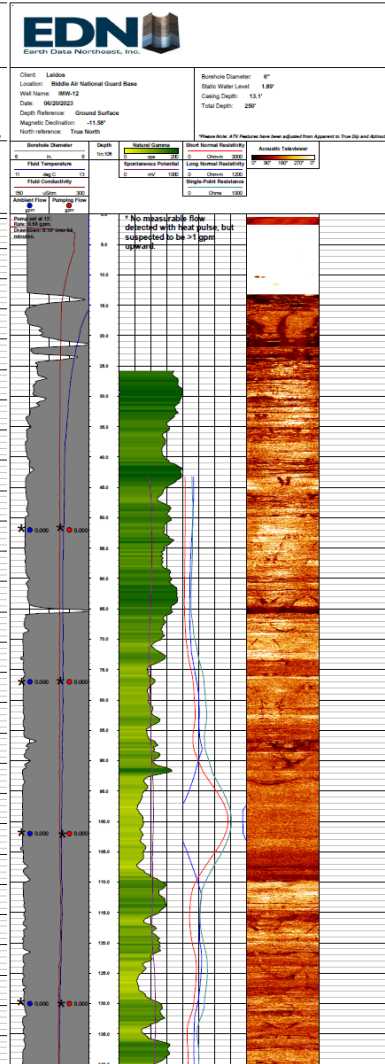
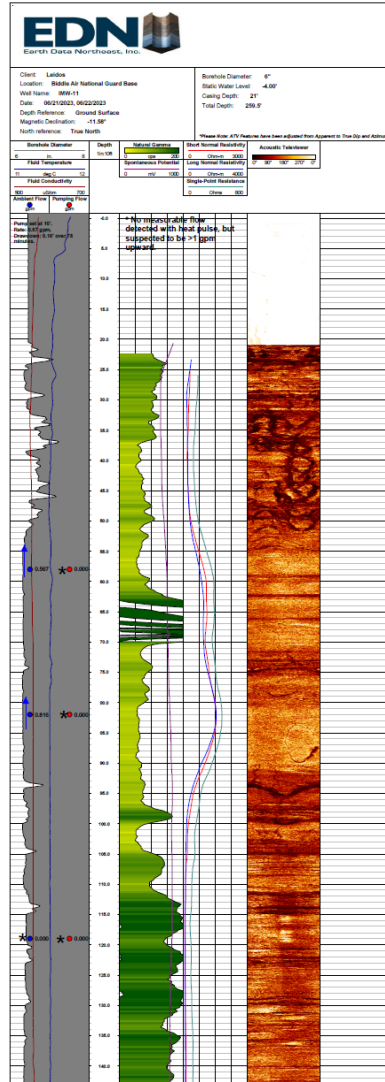
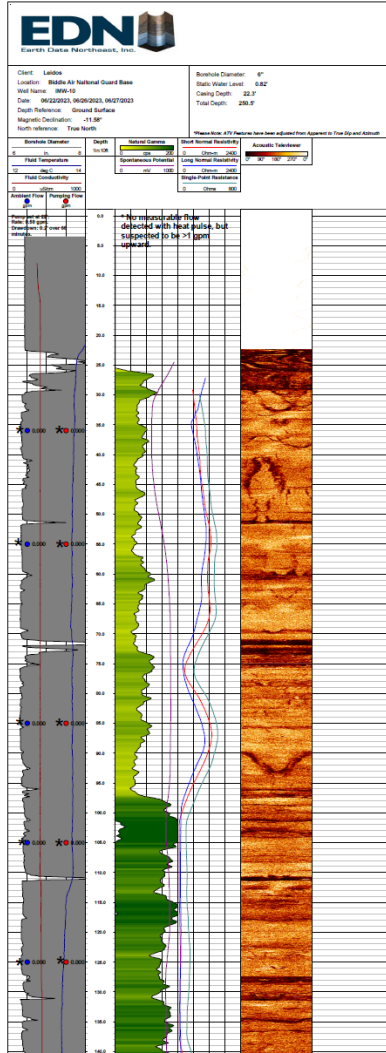
Remedial Investigation Progress



- Began Phase II drilling activities 5 June 2023
 - 5 boreholes with depths between 175 ft and 285 ft
 - Borehole geophysics and review with EPA/PADEP
 - Packer testing and review with EPA/PADEP
 - Borehole liner installation and transmissivity profiling
- Reviewed packer test data with EPA/PADEP 29 August 2023
 - Selected well screen intervals for 5 boreholes and target depths for 4 new intermediate depth wells and 6 shallow wells
 - Currently drilling intermediate boreholes, installing shallow wells, and completing wells in previous boreholes
 - Geophysics and packer testing to follow
- Automated groundwater level monitoring
 - 30 wells monitored with data-logging pressure transducers for 1 month
 - Data to be processed and used for groundwater model



Remedial Investigation Progress



Remedial Investigation Progress





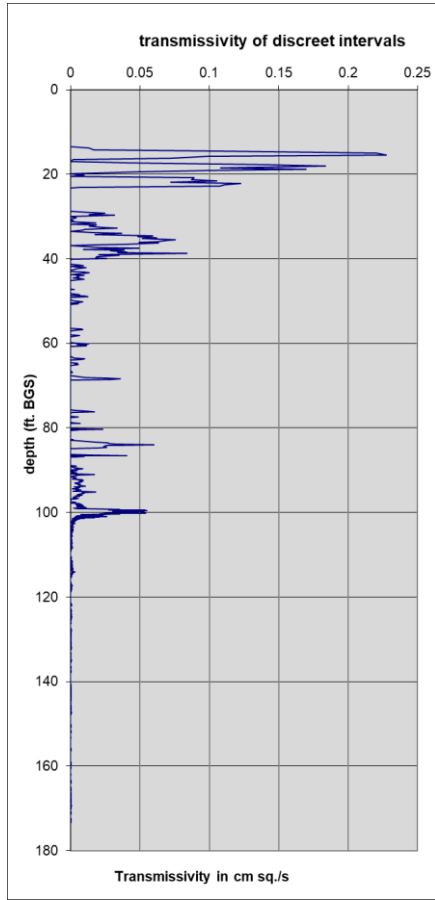
Remedial Investigation Progress



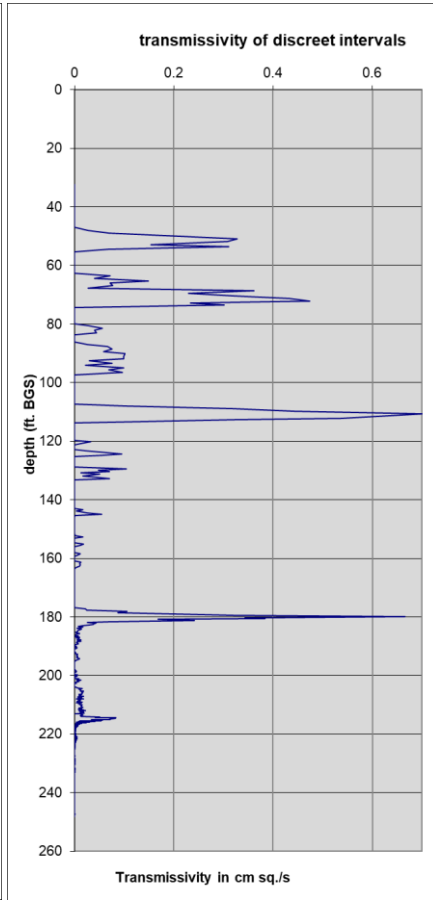
	IMW10A	65-80	IMW10B	107-122	IMW10C	175-190	IMW10D	204-219	IMW10E	218-233	IMW10F	229-250
Compound	Result	Relative %	Result	Relative %	Result	Relative %	Result	Relative %	Result	Relative %	Result	Relative %
PFOS	6,500	54.68%	5,200	50.74%	4,300	51.72%	17,000	61.65%	4,500	55.70%	1,800	59.67%
PFHxS	2,000	16.82%	1,400	13.66%	1,500	18.04%	4,200	15.23%	1,200	14.85%	450	14.92%
PFHxA	720	6.06%	590	5.76%	470	5.65%	1,300	4.71%	480	5.94%	130	4.31%
PFOA	550	4.63%	330	3.22%	530	6.37%	1,000	3.63%	320	3.96%	130	4.31%
6:2FTS	460	3.87%	1,200	11.71%	260	3.13%	800	2.90%	380	4.70%	120	3.98%
PFPeS	450	3.79%	290	2.83%	340	4.09%	920	3.34%	280	3.47%	95	3.15%
PFBS	340	2.86%	240	2.34%	300	3.61%	710	2.57%	220	2.72%	84	2.78%
PFPeA	330	2.78%	440	4.29%	230	2.77%	540	1.96%	280	3.47%	78	2.59%
PFHpS	220	1.85%	160	1.56%	160	1.92%	590	2.14%	170	2.10%	62	2.06%
PFHpA	140	1.18%	150	1.46%	110	1.32%	250	0.91%	120	1.49%	33	1.09%
PFBA	130	1.09%	160	1.56%	93	1.12%	210	0.76%	100	1.24%	28	0.93%
8:2FTS	24	0.20%	37	0.36%	7.3	0.09%	27	0.10%	13	0.16%	3.5	0.12%
PFNA	9.6	0.08%	13	0.13%	6.3	0.08%	16	0.06%	8.1	0.10%	2.1	0.07%
PFOSA	5.9	0.05%	11	0.11%	2	0.02%	13	0.05%	4.5	0.06%	1	0.03%
4:2FTS	5.3	0.04%	9.8	0.10%	4.1	0.05%	0	0.00%	2.5	0.03%	0	0.00%
PFNS	1.9	0.02%	0	0.00%	0.97	0.01%	0	0.00%	0	0.00%	0	0.00%
PFDA	1.5	0.01%	1.8	0.02%	0.8	0.01%	0	0.00%	1.1	0.01%	0	0.00%
5:3FTCA	0	0.00%	15	0.15%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
PFDS	0	0.00%	0.56	0.01%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Sum	11,888		10,248		8,314		27,576		8,079		3,017	
PFOS+PFOA	7,050		5,530		4,830		18,000		4,820		1,930	

Draft data, not yet validated

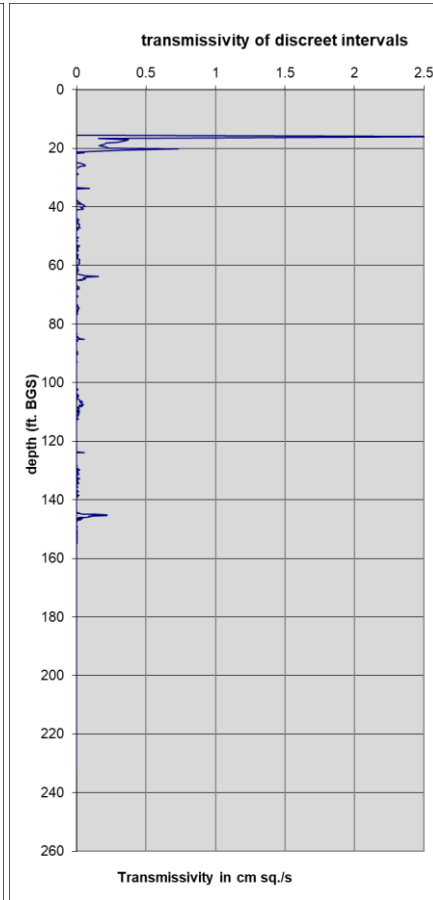
Remedial Investigation Progress



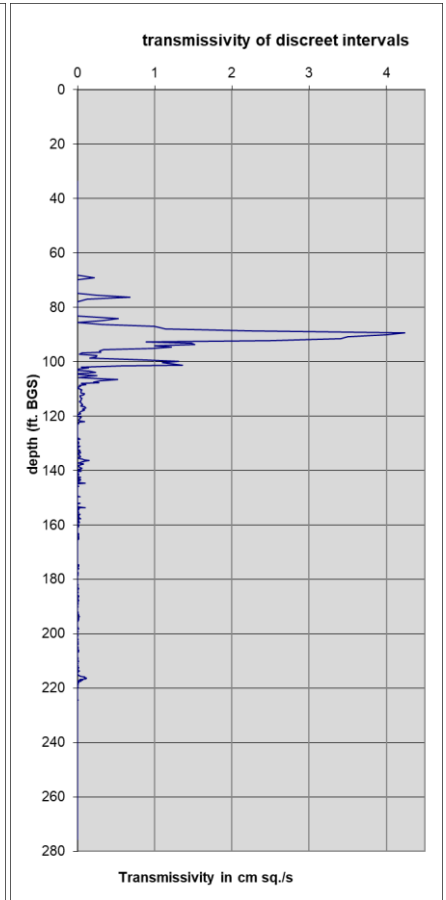
IMW09



IMW10



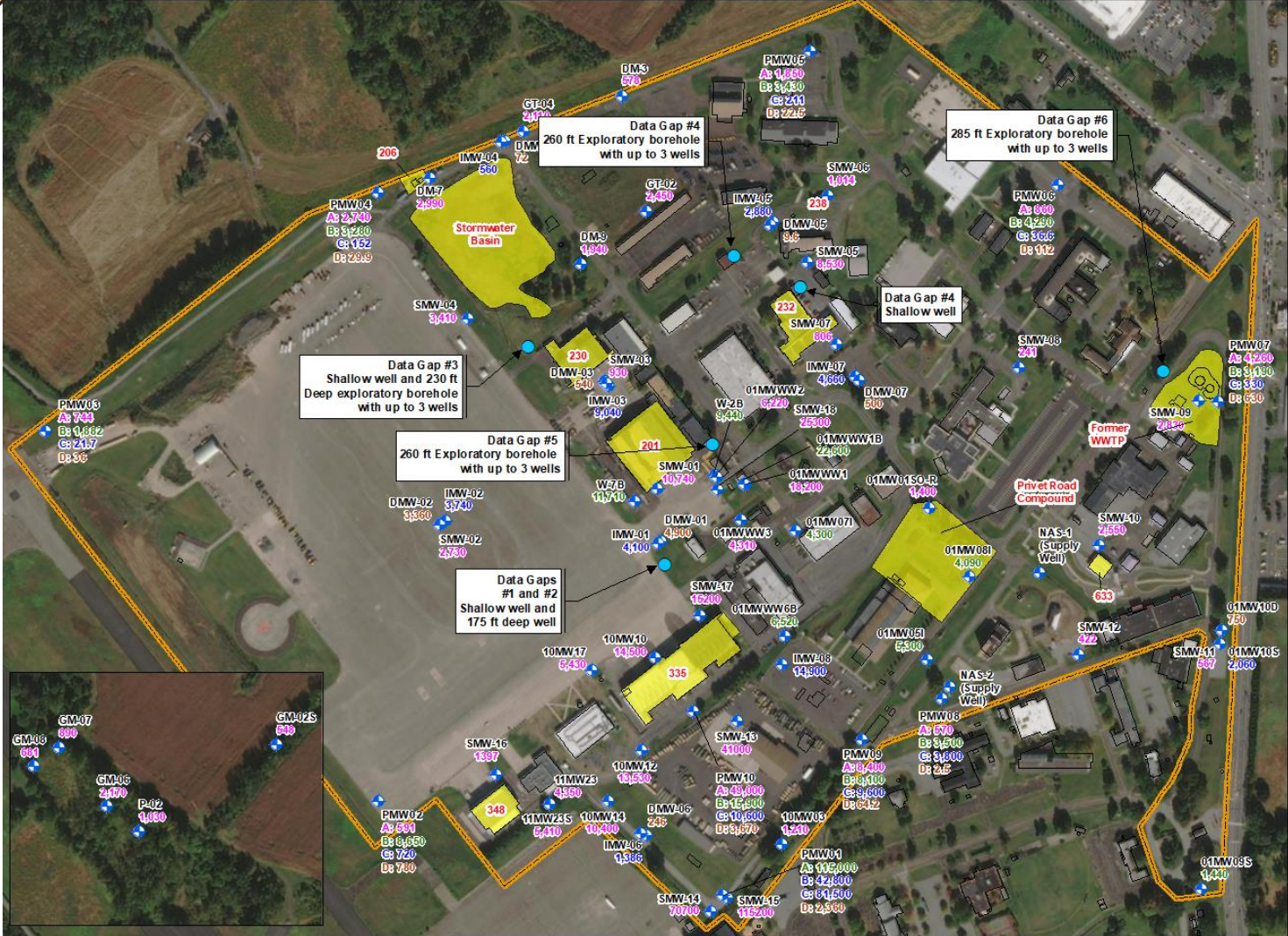
IMW12



IMW13



Remedial Investigation Progress





Remedial Investigation Progress



- Planned activities for the remainder of Phase 2 include:
 - Conduct geophysics and packer testing at 4 new intermediate depth boreholes. Review data and complete well installations
 - Conduct comprehensive groundwater sampling event including all new wells and subset of existing wells
 - Process transducer data and continue building groundwater flow model
 - Results, conclusions, and recommendations to be presented in Phase 2 Memorandum

Quarterly Surface Water Sampling



- Performed Round 16 Surface Water Sampling with Navy and USGS in June 2023 (last event under scope)
- Awaiting EPA/PADEP comments on Draft Final Sampling Memo for Round 14 on 19 April.
- Draft Sampling Memo for Round 15 and Round 16 under review by ANG
- Held joint discussions with Navy, ANG, EPA, PADEP, and USGS regarding additional surface water monitoring

Groundwater Pilot Study Overview



- ANG conducting Pilot Study to inform plans for subsequent interim groundwater action
- Pilot Study includes design, construction, operation of 30-day pilot test to evaluate feasibility of hydraulic containment of groundwater plume near Building 201
- Conducted 3 scoping sessions with EPA and PADEP to present, discuss, and refine plans
- UFP-QAPP (Work Plan) Addendum 2 approved by EPA and PADEP in early July 2023

Groundwater Pilot Study Overview



- Three extraction wells with an estimated combined 50-75 gpm extraction rate. Wells to target unique depths/zone of the aquifer
- Pilot Study to include series of variable rate step-tests, followed by series of constant rate pump tests with hydraulic and chemical monitoring throughout 30-day period
- Results, conclusions, and recommendations to be compiled in Technical Memorandum
- Pilot Study will inform plans for full-scale interim action(s)

Groundwater Pilot Study Status



- Drilled boreholes for intermediate (90 ft) and deep (140 ft) extraction wells and borehole for intermediate (145 ft) monitoring well
- Drilled and installed shallow extraction well (40 ft) and shallow monitoring well (35 ft)
- Conducted borehole geophysics and packer testing at intermediate extraction well, deep extraction well, and intermediate monitoring well
- Awaiting packer test results to confirm well construction specifications
- Designing and procuring temporary treatment system

Groundwater Pilot Study Next Steps



- Review packer test data, select well screen intervals, and finalize well construction
- Install data-logging pressure transducers 1 week prior to pilot test
- Conduct baseline groundwater sampling 1 week prior to pilot test

PFOS/PFOA Water Treatment

Biddle ANGB



- PFOS/PFOA has been detected in surface water leaving Biddle.
- 500 gallon per minute treatment plant began operations on 11 August 2021. Approximately 233M gallons treated through August 2023 (first 2 yrs operation).
- 25 composite samples collected from treatment plant effluent. All except 1 below NPDES permit limit (<70 ppt required). April 2023 exceeded due to algae interference.
- Both treatment trains - media replaced, vessels disinfected /cleaned, aerator added to basin, PFOS+PFOA < 5 ppt
- Used media staged on base disposed of – Carbon regenerated by Calgon. Sand, clay, resin – hazardous waste landfill.
- Construction and O&M through Warminster Cooperative Agreement. Funding added for additional year of O&M.

NWWA Activities



- North Wales Water Authority assumed responsibility for Warrington water service area. Cooperative agreement for water system actions.
- GAC treatment for Wells 1, 2, 3, 6 and 9 is complete. Working on resolving Total Dissolved Solids issues for 4 of the wells.
- Main extensions and service connections completed.
- Funding added for an additional year of O&M on GAC systems and service connections as needed.

Private Well Sampling



- ANG has identified 16 residential locations/properties with PFOS/PFOA at near or above the PADEP drinking water maximum contaminant levels (MCLs) for residents within our area of responsibility in Horsham, Warminster, and Warrington.
- 5 letters sent to residence at or above the state limit, only one response back for bottled water/sampling
- 21 letters being prepared for residence with unknown well status/never been sampled/resampling required
- 18 September 2023 Weston will be conducting sampling in the area and go to residences who have not responded to mailings.
- Philadelphia USACE contract being prepared to support drinking water response actions for next 4 years.
- Weston contract for drinking water response actions expires in November 2023

Private Well Sampling



- ANG has contract in place with Weston to provide PFOS/PFOA testing of private drinking water wells and supply bottled water to properties with PFOS/PFOA at or above the EPA Health Advisory level (HA) for residents within our area of responsibility in Horsham, Warminster, and Warrington.
 - Horsham:
 - 6 wells sampled
 - 5 were above HA
 - 4 have been connected to municipal water
 - 1 well abandoned by Wood
 - Warrington:
 - 150 well sampled
 - 53 are above HA
 - 68 have been connected



Private Well Sampling (cont.)



- Warminster: 12* wells sampled
 - 11 are above HA
 - 10 have been connected municipal water
 - 1 residence above HA not connected
 - * Some of these properties are on Valley Road with Warminster mailing addresses but are located in Warrington Township
 - * ANG is using the US EPA 2016 Health Advisory standards, 70 part per trillion (ppt) for PFOA and PFOS
- Sampling contact for ANG area of responsibility: Transitioning to Weston, Mr. Bob Wagner, 570-466-4026, r.wagner@westonsolutions.com

