PERFLUOROALKYL SUBSTANCES SOURCE TRACKING AT THE FORMER PEASE AIR FORCE BASE

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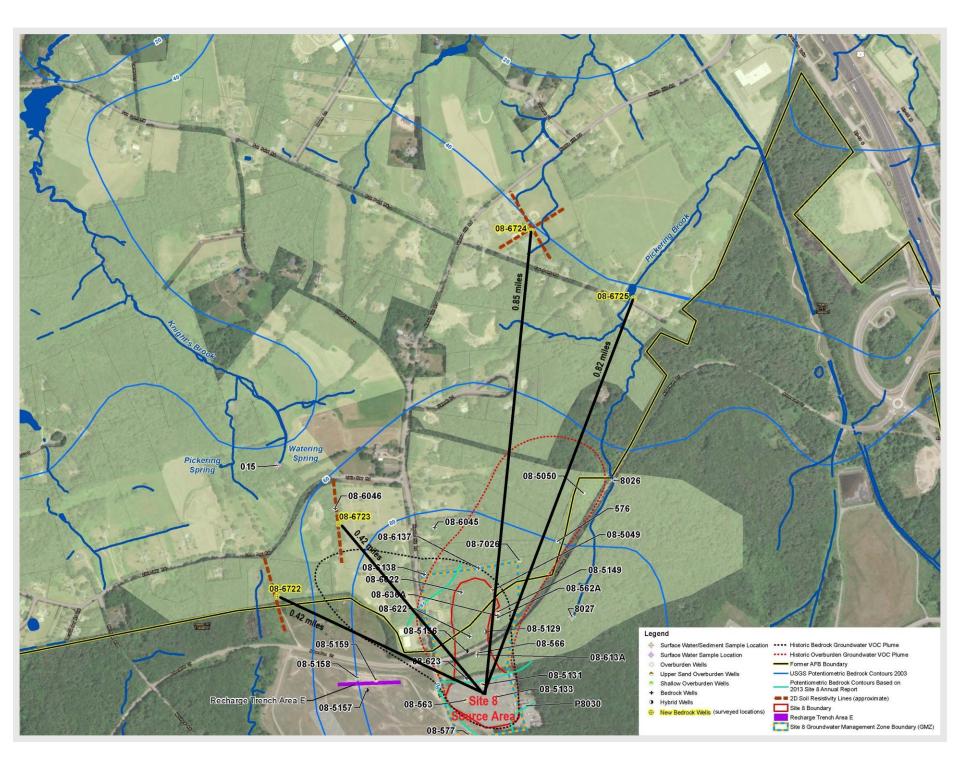
INTRODUCTION

▶ At the former Pease Air Force Base in Portsmouth, New Hampshire, perfluoroalkyl substances (PFAS) have been detected above EPA's Health Advisory Level (HA) in the overburden and bedrock groundwater units.



- Site 8, main source of PFAS contamination
- > 1961–1988 Used as a fire training area
- > 1970, aqueous film forming foam (AFFF) containing PFAS with perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) was used to extinguish petroleum fires and firefighting training activities
- ▶ 2013 Initial PFOA and PFOS sampling conducted at Site 8
- > Maximum PFAS concentration detected in overburden groundwater at concentrations of 120 µg/L for PFOA and 95 μg/L for PFOS
- > EPAs HA is 0.07 µg/L for PFOA and PFOS combined
- ▶ 2015, APTIM conducted PFAS investigation of fractured bedrock down gradient from the former fire training area to delineate likely pathway to impacted private residential wells

INVESTIGATION OF FRACTURED BEDROCK GROUNDWATER



INSTALLATION OF FOUR BEDROCK WELLS DOWNGRADIENT OF SITE 8

- ➤ 2-D resistivity testing used to locate areas with fractured bedrock
- ► Installed four bedrock wells (08-6722 through 08-6725)
- Downhole geophysical logging completed at all four boreholes
- New well groundwater samples for PFAS analysis collected > Packers used to sample different fracture zones at three of four wells



2-D resistivity line



2-D resistivity control unit



Drill rig at 08-6724 next to high school



Air hammer



Finished well

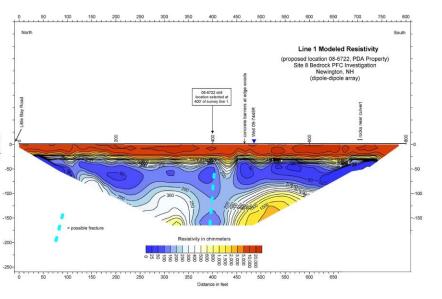
Down-hole geophysical evaluation uid temperature and fluid se/flow meter, and acoustic viewer (ATV) to locate fracture nd high conductivity zones

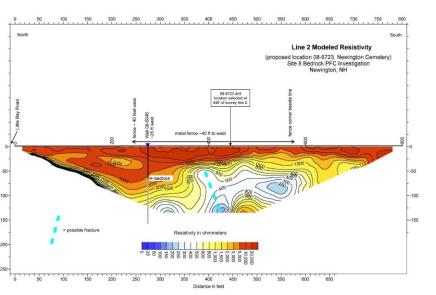


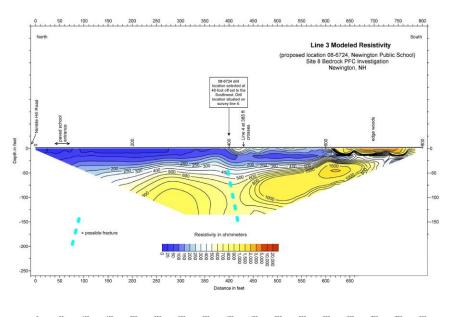
Packer Testing at 08-6724 location

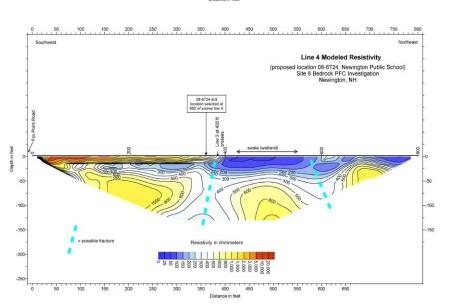
2-D RESISTIVITY TESTING

- Soil resistivity (dipole-dipole array) used to evaluate a 2-D portion of the subsurface
 - > Resulting images used to choose specific target locations of highest conductivity indicating a water-bearing zone within the





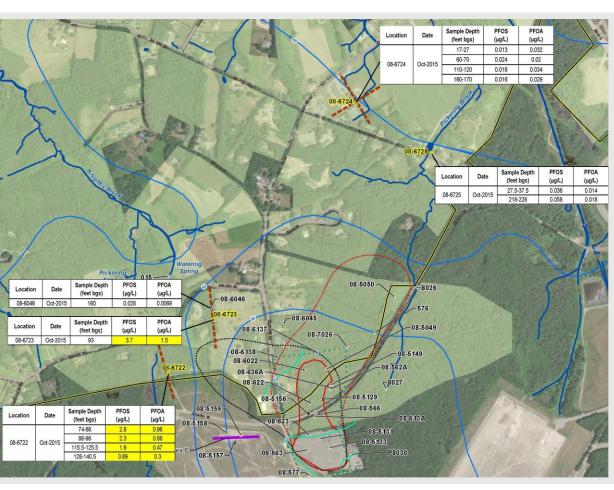




RESULTS

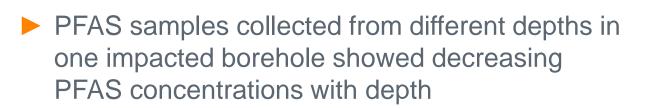
► 2-D resistivity testing successful in locating transmissive zones in bedrock

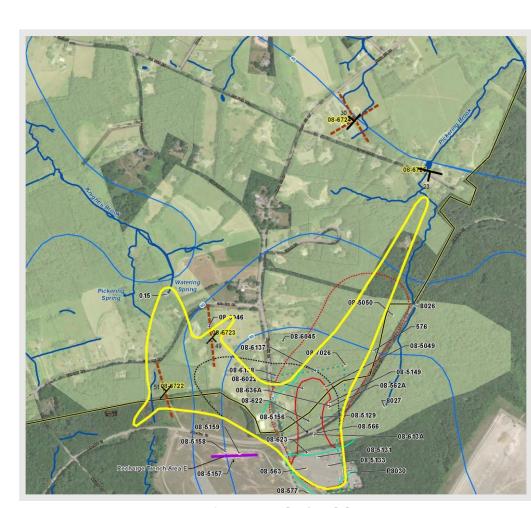
PRODUCTIVE FRACTURE ZONES			
Well 08-6722 (open bore hole 74-140.5 ft bgs)	Well 08-6723 (open bore hole 88 - 108.5 ft bgs)	Well 08-6724 (open bore hole 19.2 - 180.8 ft bgs)	Well 08-6725 (open bore hole 27.5 - 228 ft bgs)
120-123': 14 gpm	89.5-92': 20 gpm	19.2-20': 1 gpm	220-225.5: 46 gpm
130.5-132.5': 15 gpm	95-97.5': 30 gpm	34-38': 1 gpm	
135-139.5: 20 gpm		65-67': 4 gpm	
		72-73': 6 gpm	
		75-80': 3 gpm	
		112-115': 5 gpm	
		166-168': 10 gpm	
49 gpm total	50 gpm total	30 gpm total	46 gpm total



2015 PFOA/PFAS results







Possible extent of 2015 PFOA/PFOS contamination. Plume shape affected by bedrock fracture orientation

- ► Investigation confirmed PFAS is migrating in bedrock
 - > Primarily along the orientation of northeaststriking and northwest-striking fracture sets

