



PFAS Update

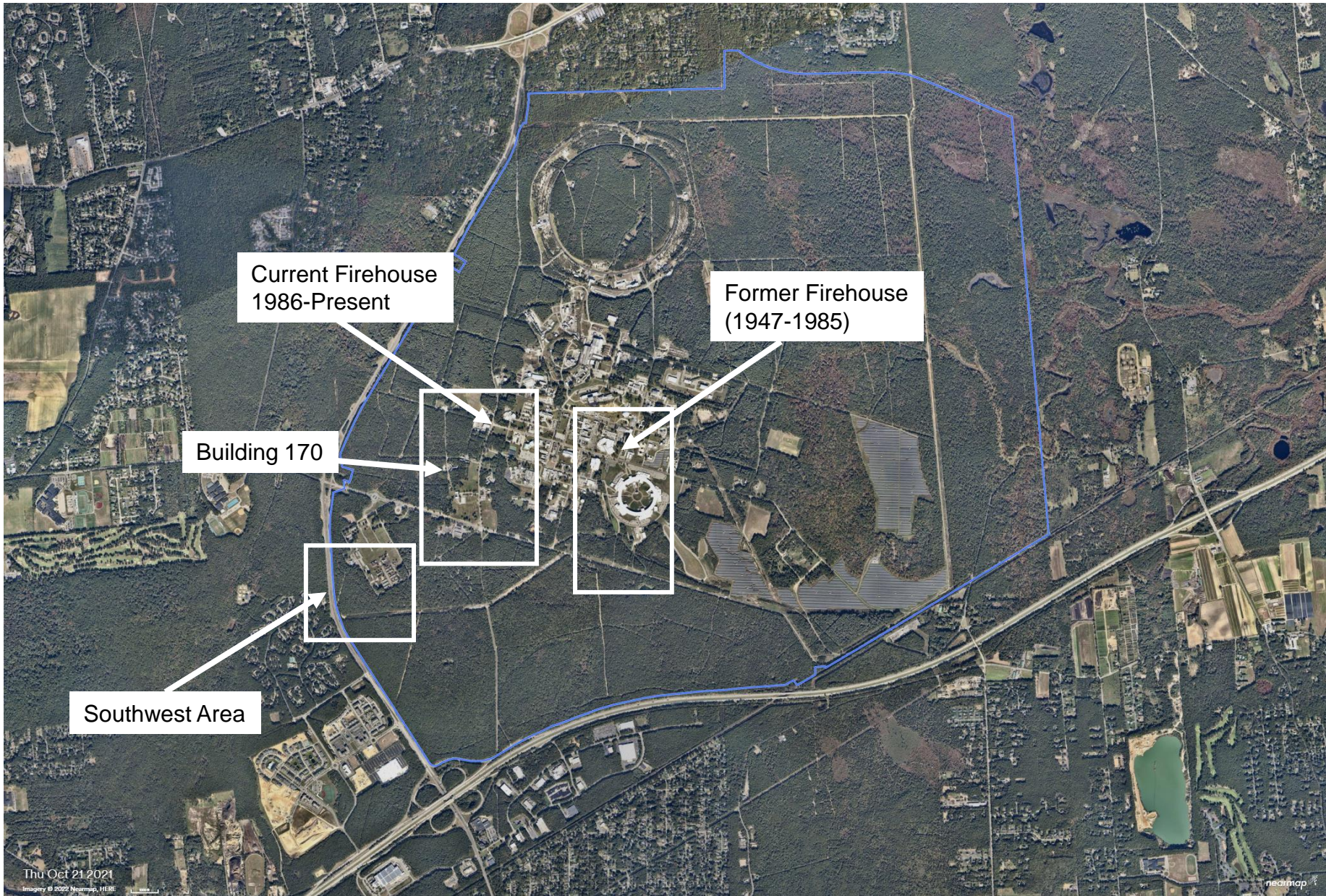
**BNL Community Advisory Council
March 10, 2022**

Douglas Paquette
BNL Groundwater Protection Group



Agenda

- Update on installation of groundwater treatment systems for the Current Firehouse and Former Firehouse PFAS plumes
- Continued testing for PFAS in groundwater
 - West of Building 170 (newly identified foam release area)
 - Southwestern area of BNL
- Discussions with SCWA on PFAS in groundwater
- BNL support to SCDHS for sampling groundwater characterization wells south of BNL
- Next steps

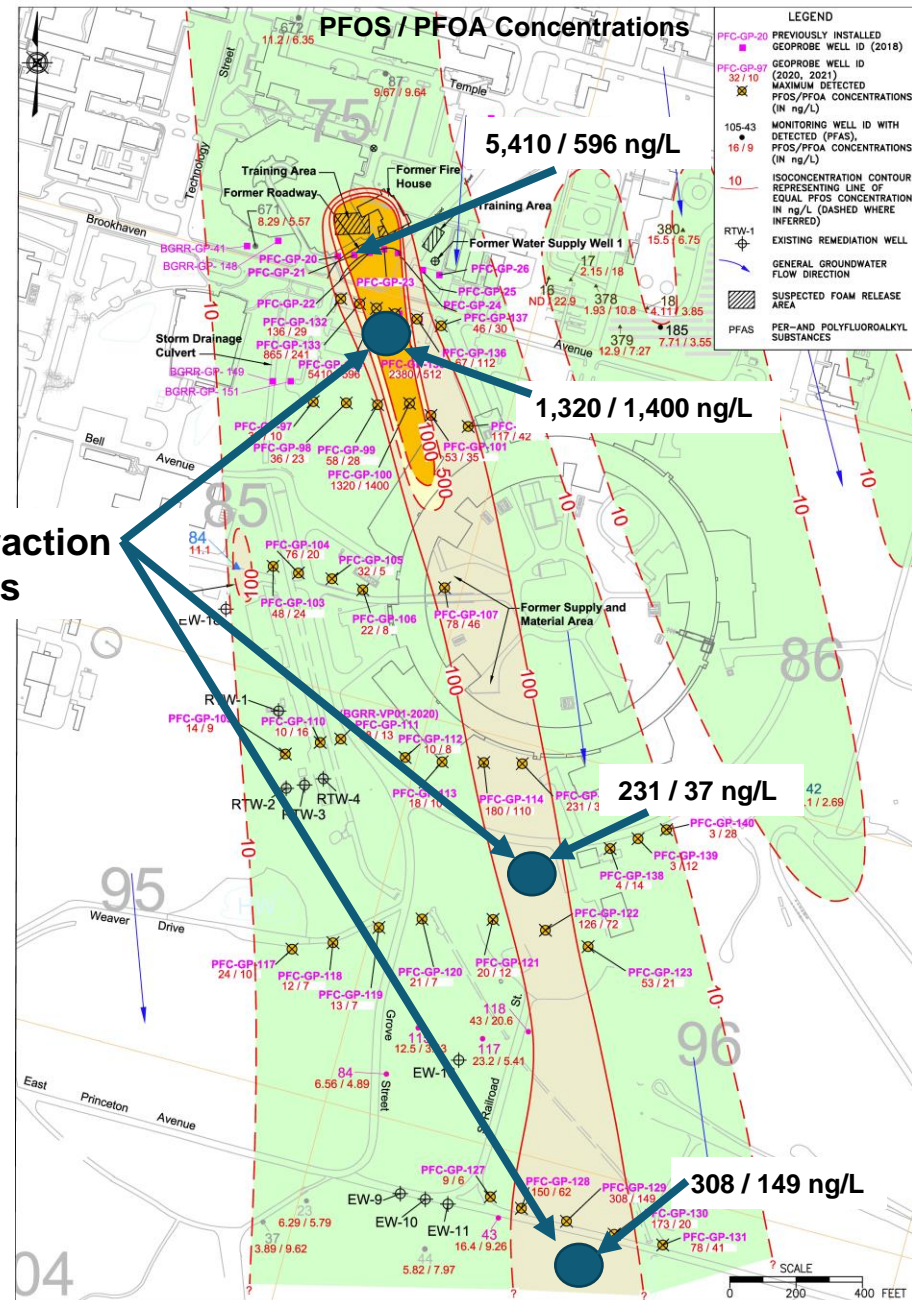


Thu Oct 21 2021
Imagery © 2022 NeoMap, HERE

neoMap

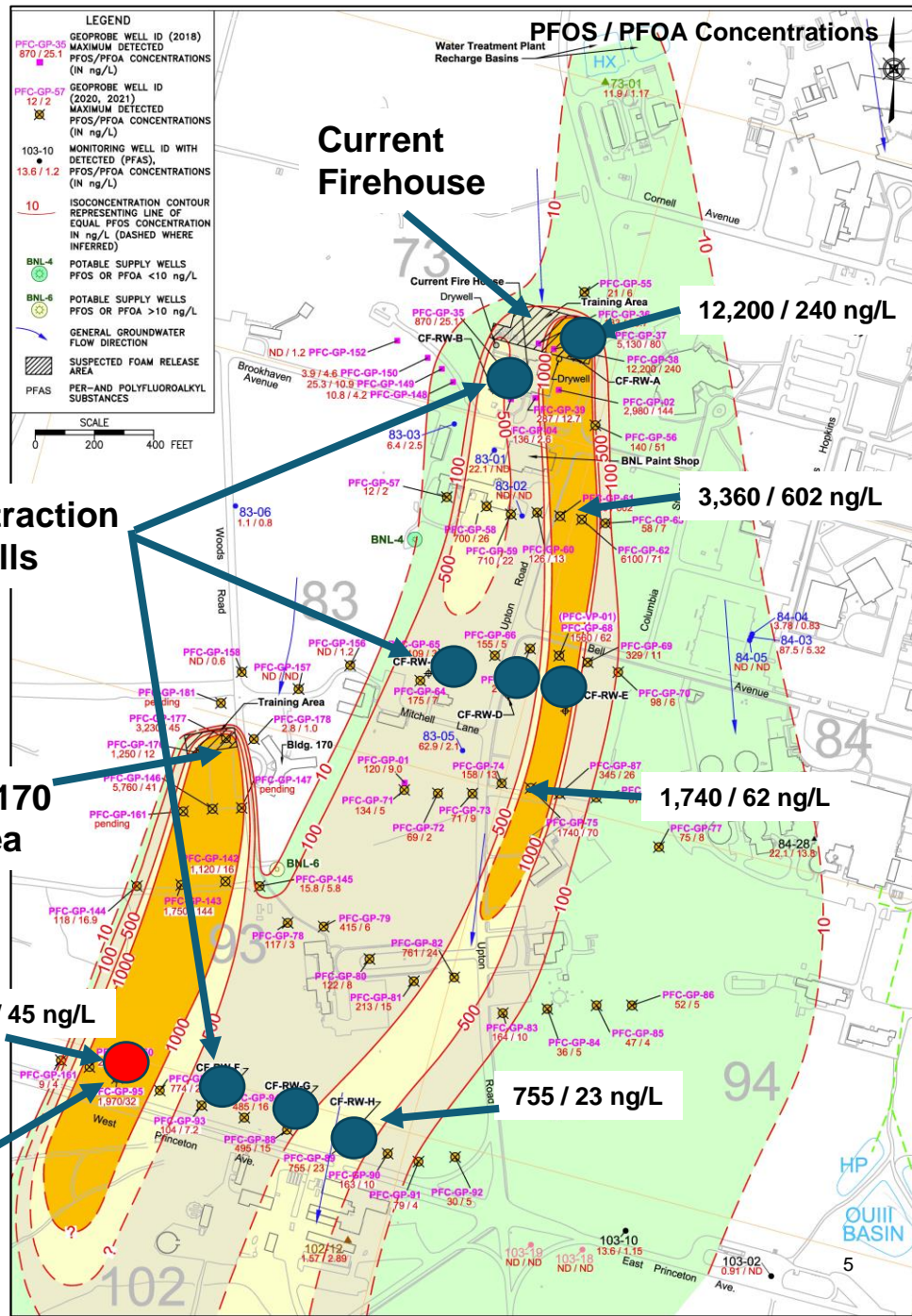
Former Firehouse Plume Remediation

- Treatment system design
 - Three extraction wells
 - Capture goal of 100 ng/L for PFOS or PFOA
 - Repurposed carbon filters to be upgraded
 - Construction of a new building for the filters
- Monitoring
 - Install 29 groundwater monitoring wells for long-term surveillance

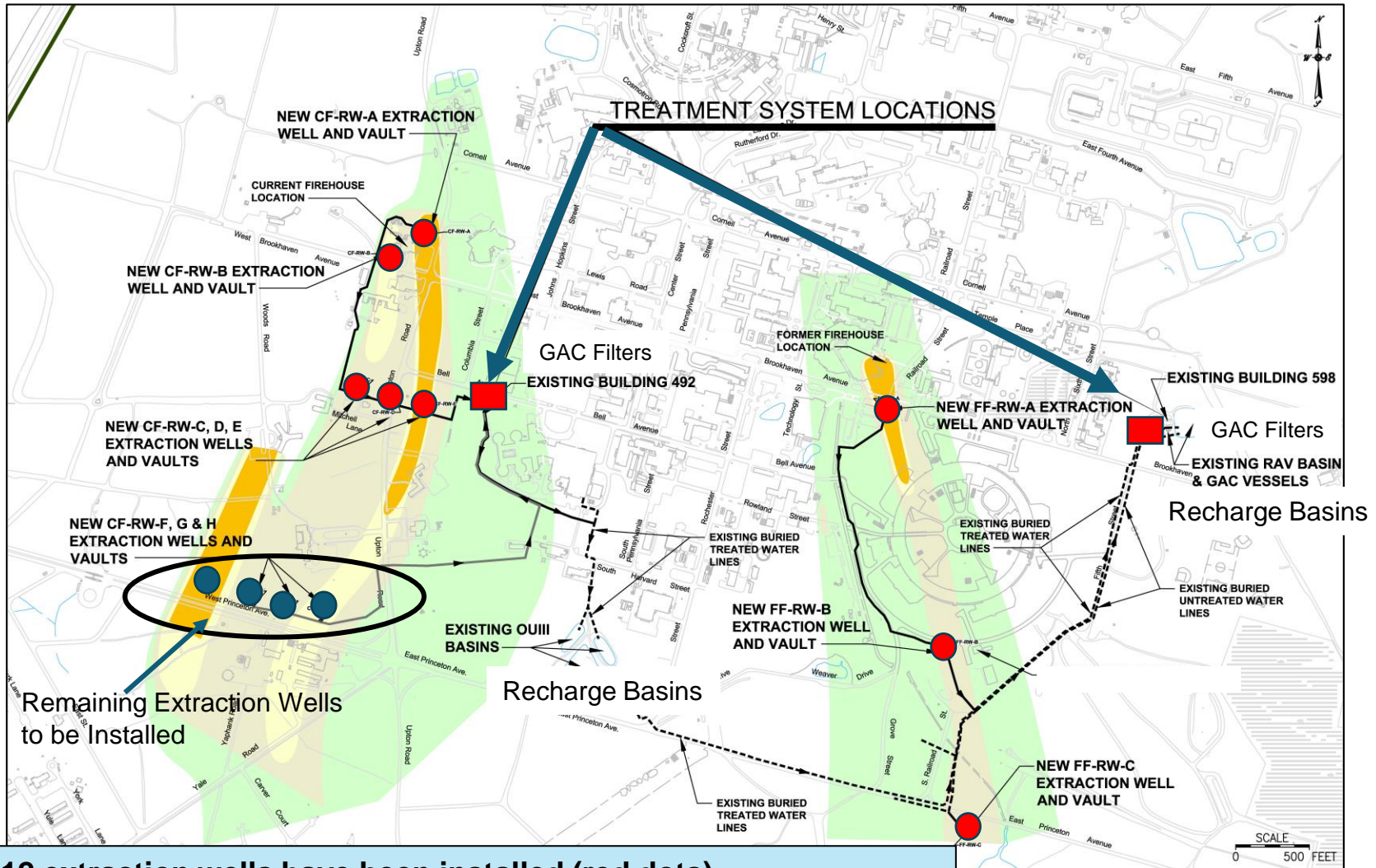


Current Firehouse Plume Remediation

- Treatment system design
 - Original plan was to install eight extraction wells
 - A ninth well will be required for the Building 170 PFAS plume
- Capture goal of 100 ng/L for PFOS or PFOA
- New carbon filters installed in repurposed treatment building
- Monitoring
 - Installing 54 monitoring wells for long-term surveillance
 - Several additional wells will be needed for the Building 170 plume



PFAS Treatment Systems – Current Status



- 8 of 12 extraction wells have been installed (red dots)
- 76 of 83 planned monitoring wells have been installed
- Started construction of Former Firehouse system GAC filter building

Construction Progress



Extraction Well Vault at Current Firehouse



Extraction Well Installation
South of Former Firehouse
Area



Underground Pipe Installation



Monitoring Well Installation

Construction Progress



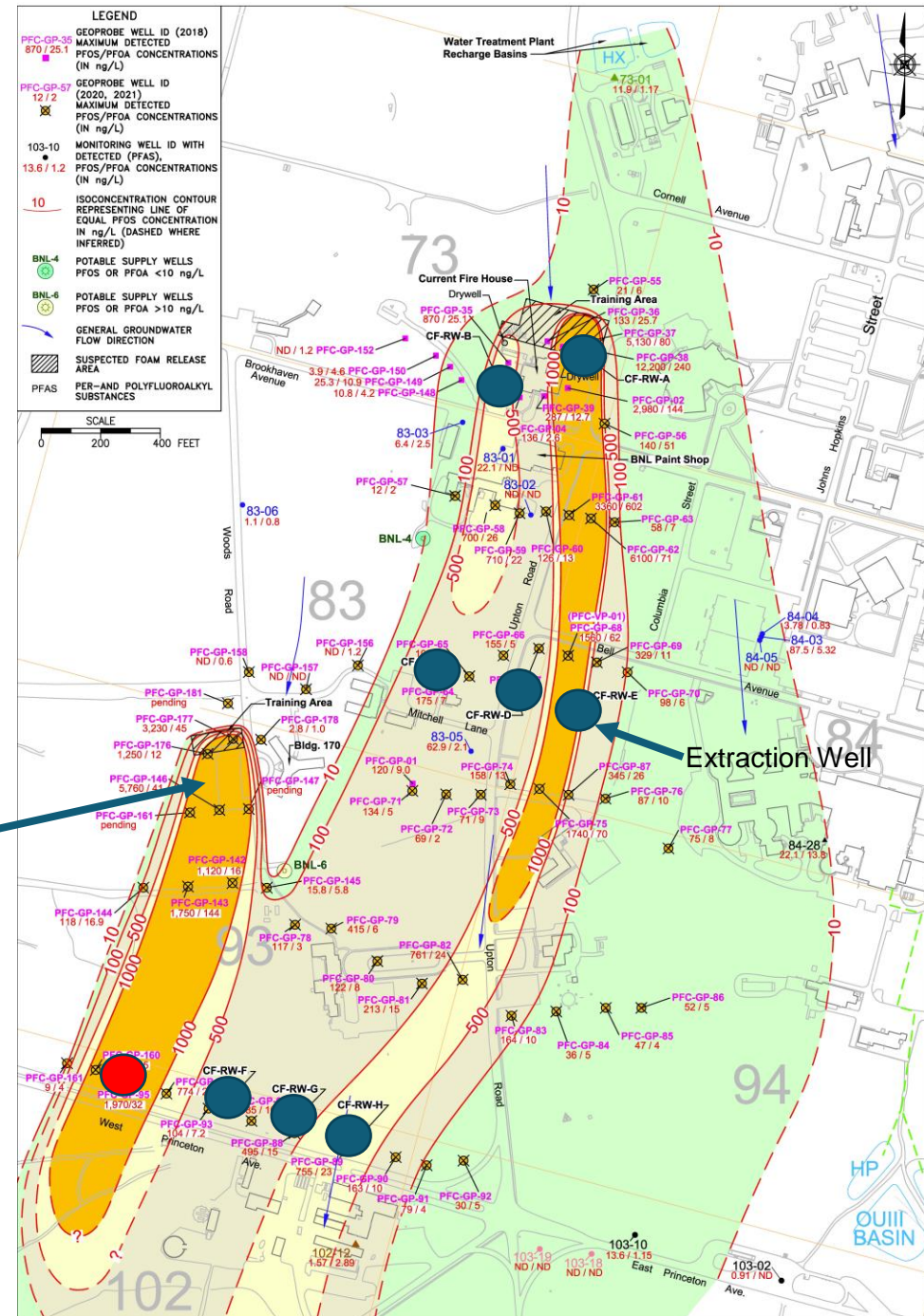
Installing GAC Filters at Current Firehouse Treatment System Building



Preparing for Construction of Former Firehouse GAC Filter System Building

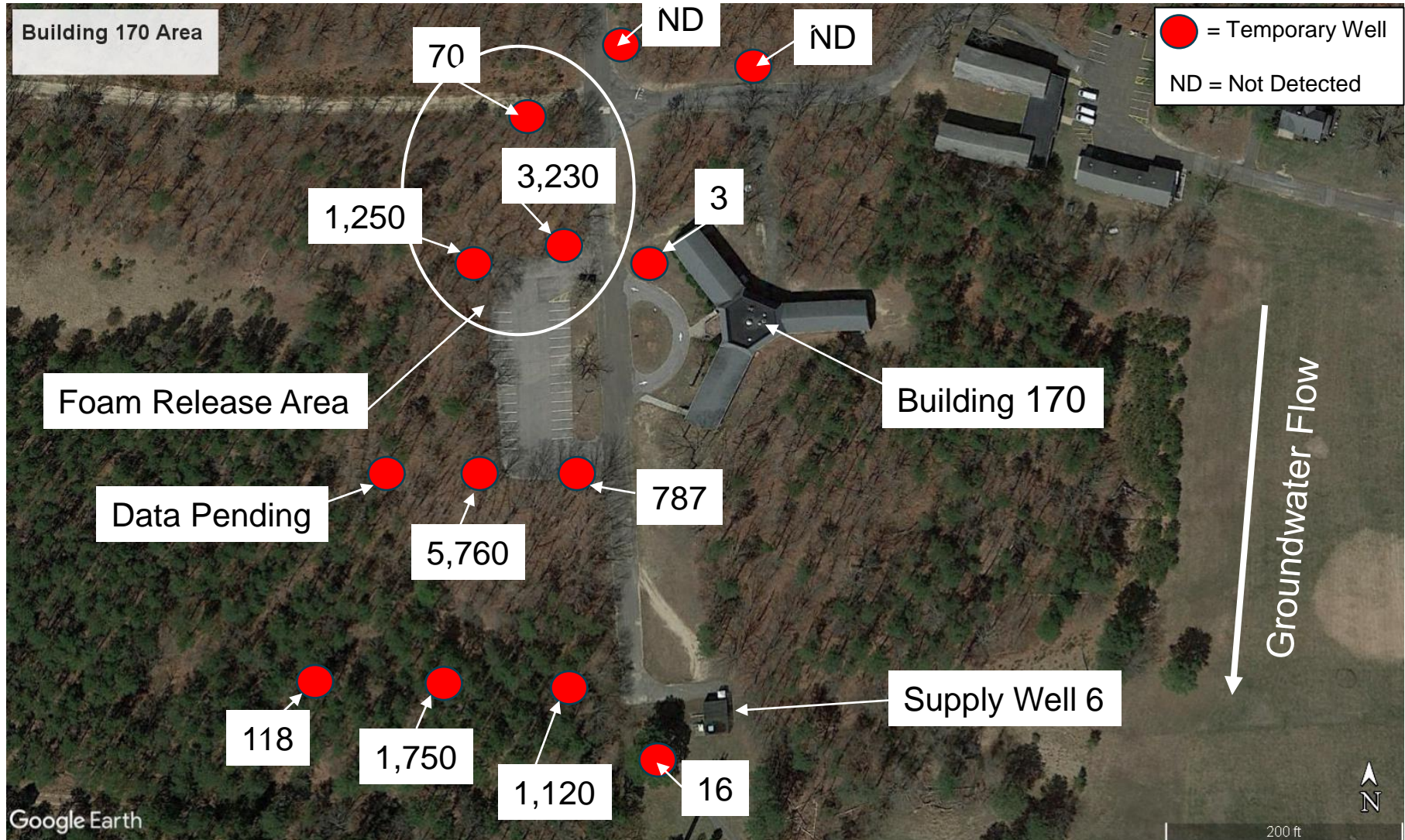
Building 170 PFAS Plume

- In 2021, BNL installed additional temporary wells to verify western margin of the Current Firehouse plume
- Unexpected high levels of PFAS were detected along West Princeton Ave, with PFOS up to 2,330 ng/L
- Additional upgradient wells were installed to determine if there was another source
 - PFOS up to 5,750 ng/L near Building 170
- Monitoring results indicate that foam was released in area west of Building 170
 - Recent discussion with long-term firefighter indicates that foam was released in this area during training, possibly from 1986 until early 1990s



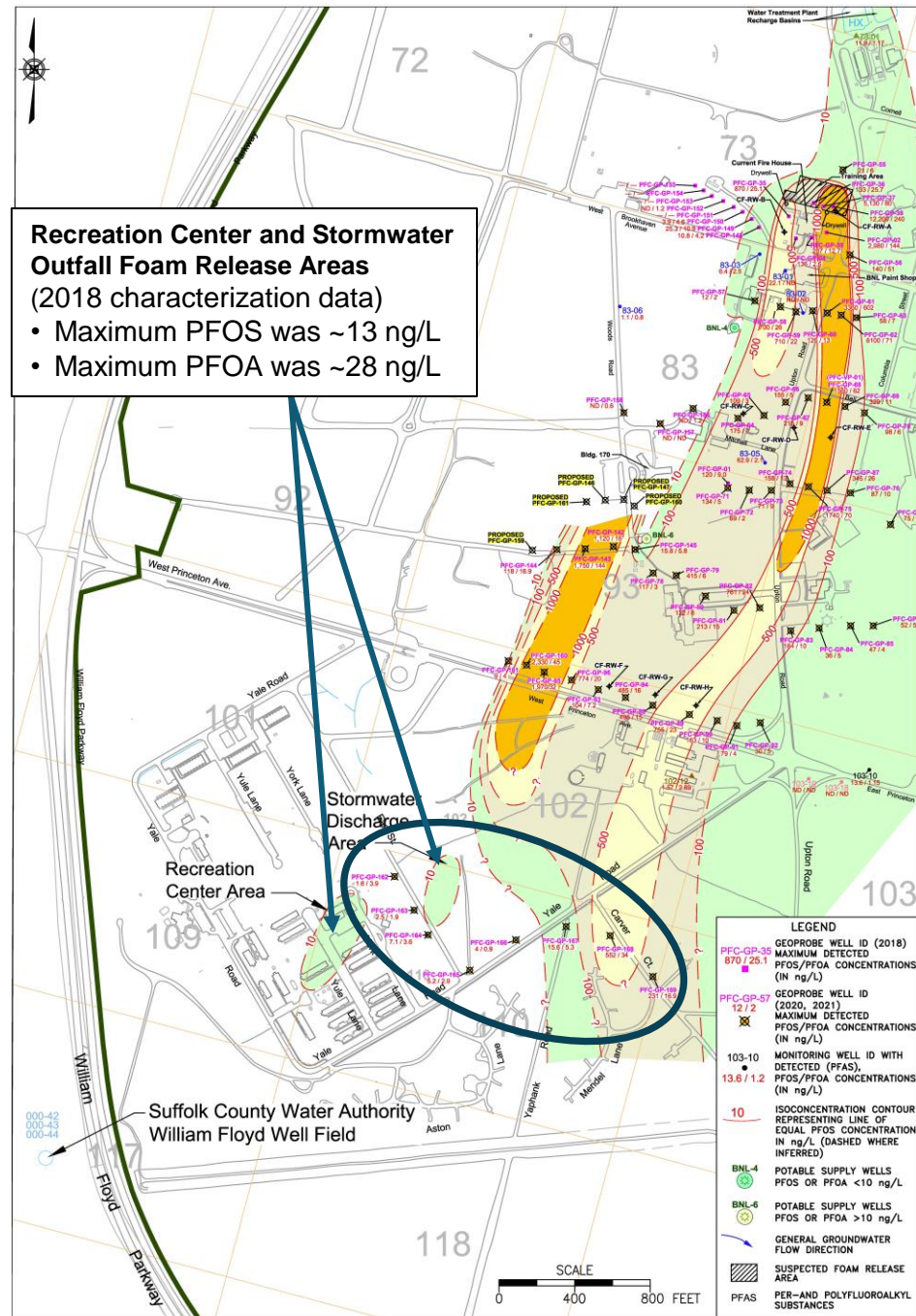
Building 170 Foam Release Area

Max PFOS Concentrations Shown (ng/L)



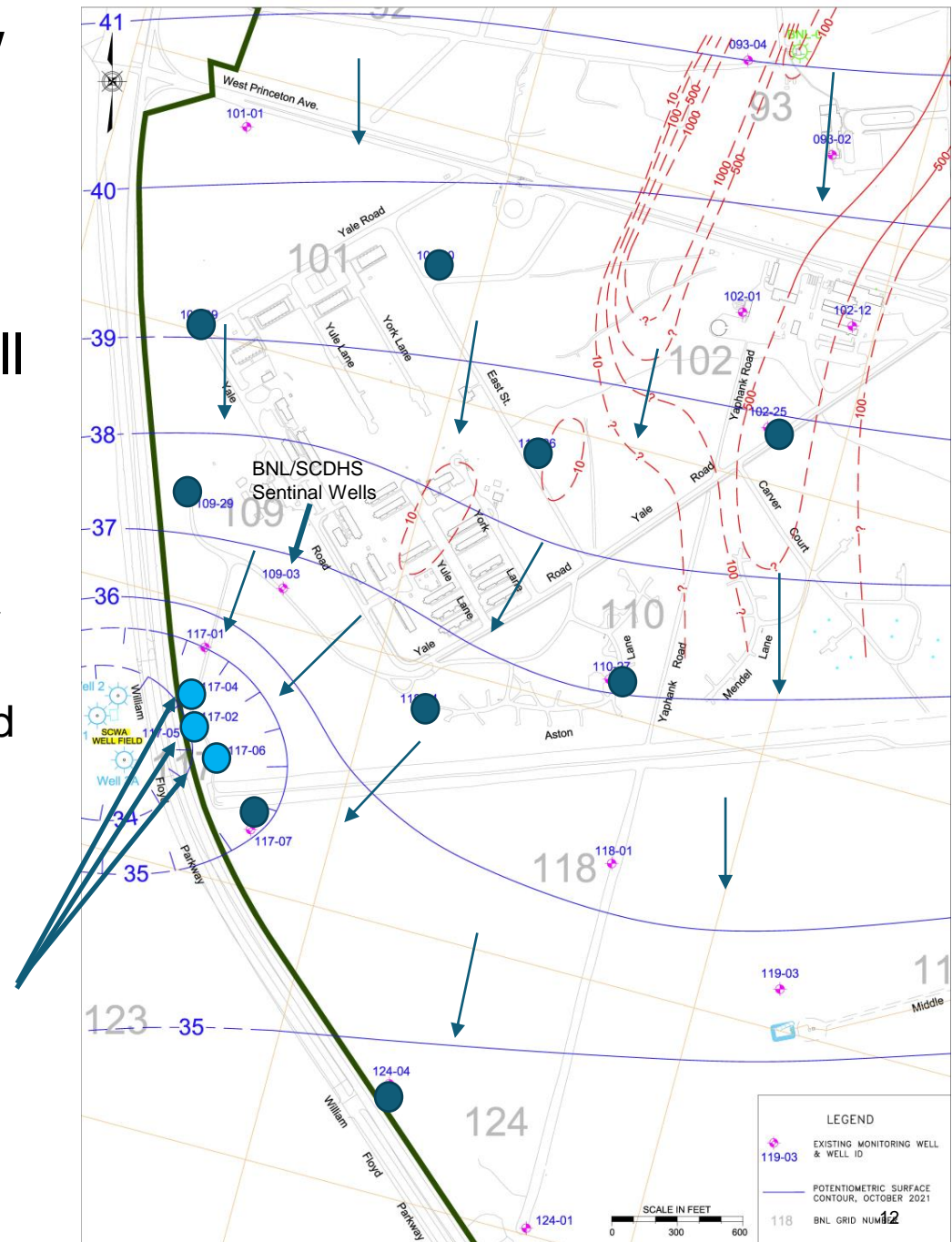
Tracking Southern Portion of Building 170 PFAS Plume

- Evaluate downgradient migration of the Building 170 PFAS plume and determine whether the migration pathway is being influenced by the Wm. Floyd well field
- SCWA data indicates low levels of PFOS (max. 7 ng/L; average <5 ng/L) have been detected in water samples from the well field
- Results from eight temporary wells show that the high concentration plume segment is not within the immediate capture zone of the well field



Groundwater Flow in SW Area

- 12 new wells installed to improve BNL's ability to evaluate influence the well field has on groundwater flow directions
- Water level measurements from the wells are used to prepare groundwater contour maps
 - Wells have been surveyed and water levels measured
 - Water table data indicate the well field is impacting groundwater flow on-site
- Plan was to also use 3 of the new wells for water quality surveillance
 - Similar depth as the water supply wells (130-140 ft)

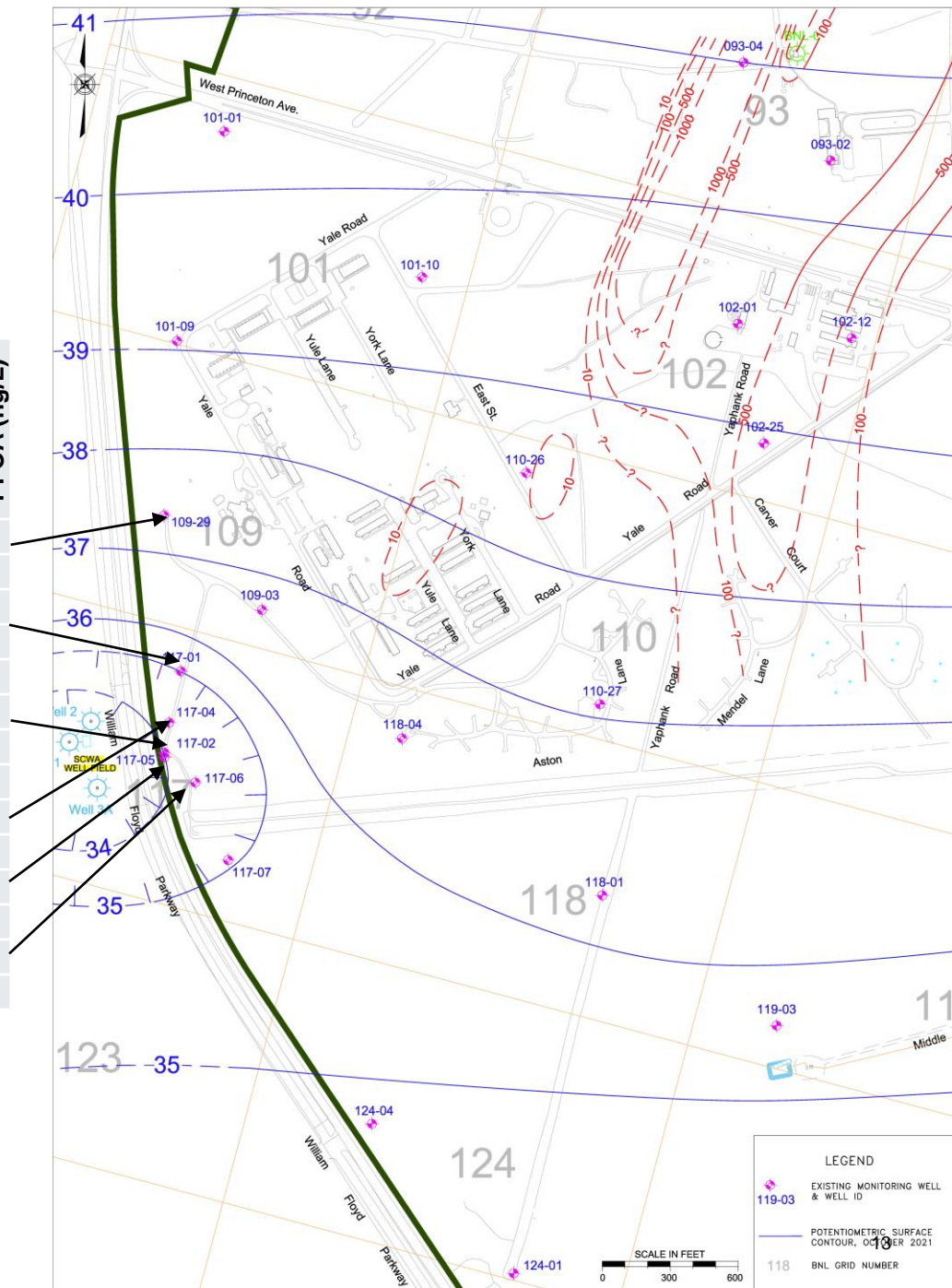


Monitoring Well Results (Oct. – Nov. 2021)

Well No./Screen Depth (BLS)	Collection Date	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)
109-29 (99'-109')	11/3/2021	NA	1.78U	0.94J
117-01 (75'-85')	10/21/2021	0.2U	7.47	6.48
	11/3/2021	NA	5.36	4.21
117-02 (74'-84')	10/21/2021	0.2U	4.86	1.35J
	11/3/2021	NA	0.79J	1.91U
117-04 (130'-140')	10/7/2021	0.2U	1.84U	1.84U
117-05 (130'-140')	10/8/2021	0.2U	1.93U	1.93U
117-06 (130'-140')	10/7/2021	0.2U	1.83U	1.83U

U: Not detected above method detection limit

J: Estimated concentration



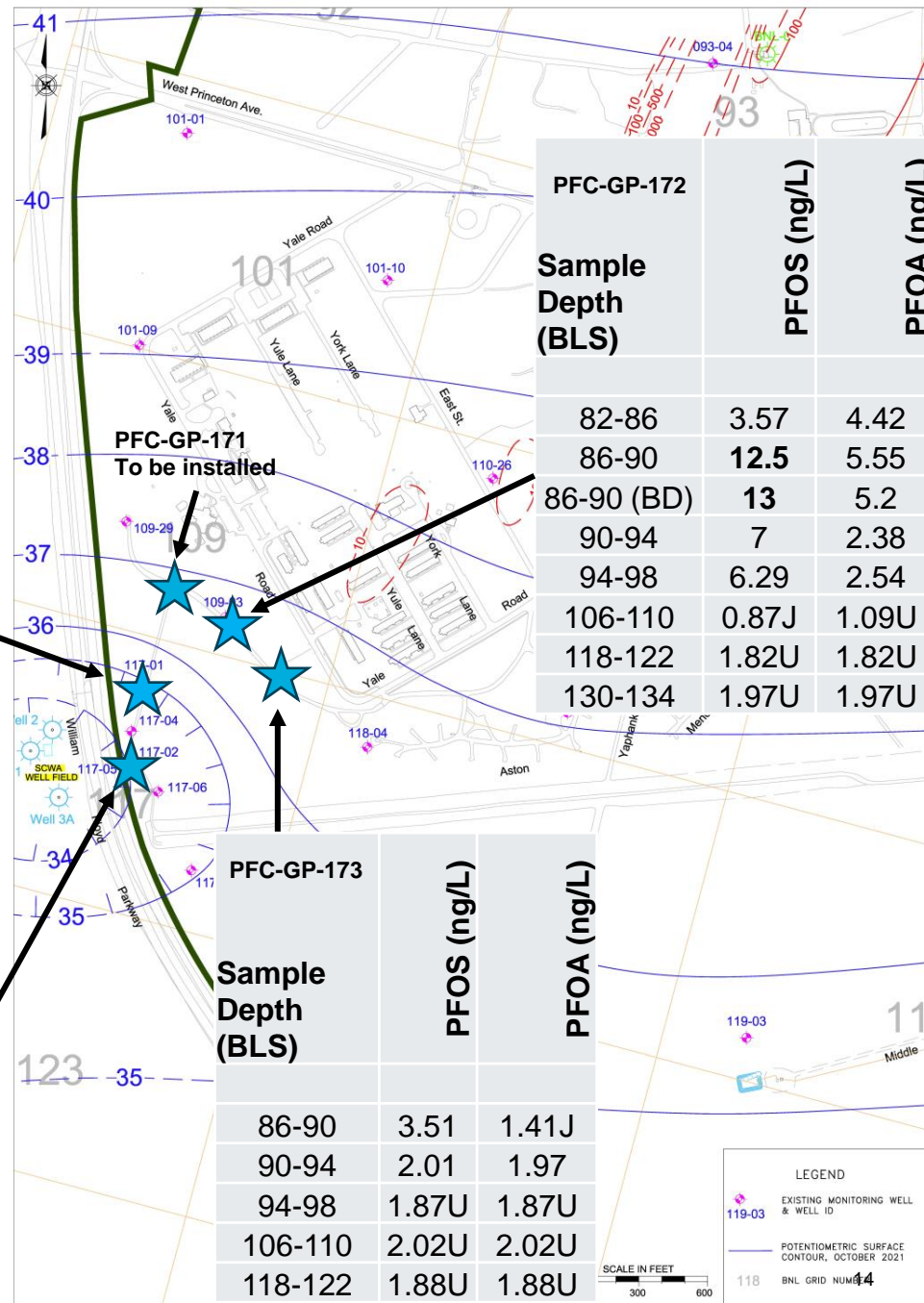
Temporary Wells (Dec. 2021 – Jan. 2022)

PFC-GP-170	PFOS (ng/L)	PFOA (ng/L)
Sample Depth (BLS)		
82'-86'	7.68	8.77
86'-90'	7.6	9.8
90'-94'	9.58	6.59
90'-94' (BD)	7.29	5.59
94'-98'	3.23	3.46
106'-110'	0.88J	0.72J
118'-122'	1.87U	1.87U
130'-134'	1.86U	1.86U

PFC-GP-174	PFOS (ng/L)	PFOA (ng/L)
Sample Depth (BLS)		
80-84	2.04J	0.88J
90-94	7.3	2.76
100-104	7.17	1.55J
110-114	2.01U	0.84J
120-124	1.23J	2.85
130-134	2.03U	2.03U
140-144	2.12U	2.12U

PFC-GP-173	PFOS (ng/L)	PFOA (ng/L)
Sample Depth (BLS)		
86-90	3.51	1.41J
90-94	2.01	1.97
94-98	1.87U	1.87U
106-110	2.02U	2.02U
118-122	1.88U	1.88U
130-134	1.80U	1.80U

PFC-GP-172	PFOS (ng/L)	PFOA (ng/L)
Sample Depth (BLS)		
82-86	3.57	4.42
86-90	12.5	5.55
86-90 (BD)	13	5.2
90-94	7	2.38
94-98	6.29	2.54
106-110	0.87J	1.09U
118-122	1.82U	1.82U
130-134	1.97U	1.97U



BD: Blind Duplicate Sample

U: Not detected above method detection limit

J: Estimated concentration



LEGEND

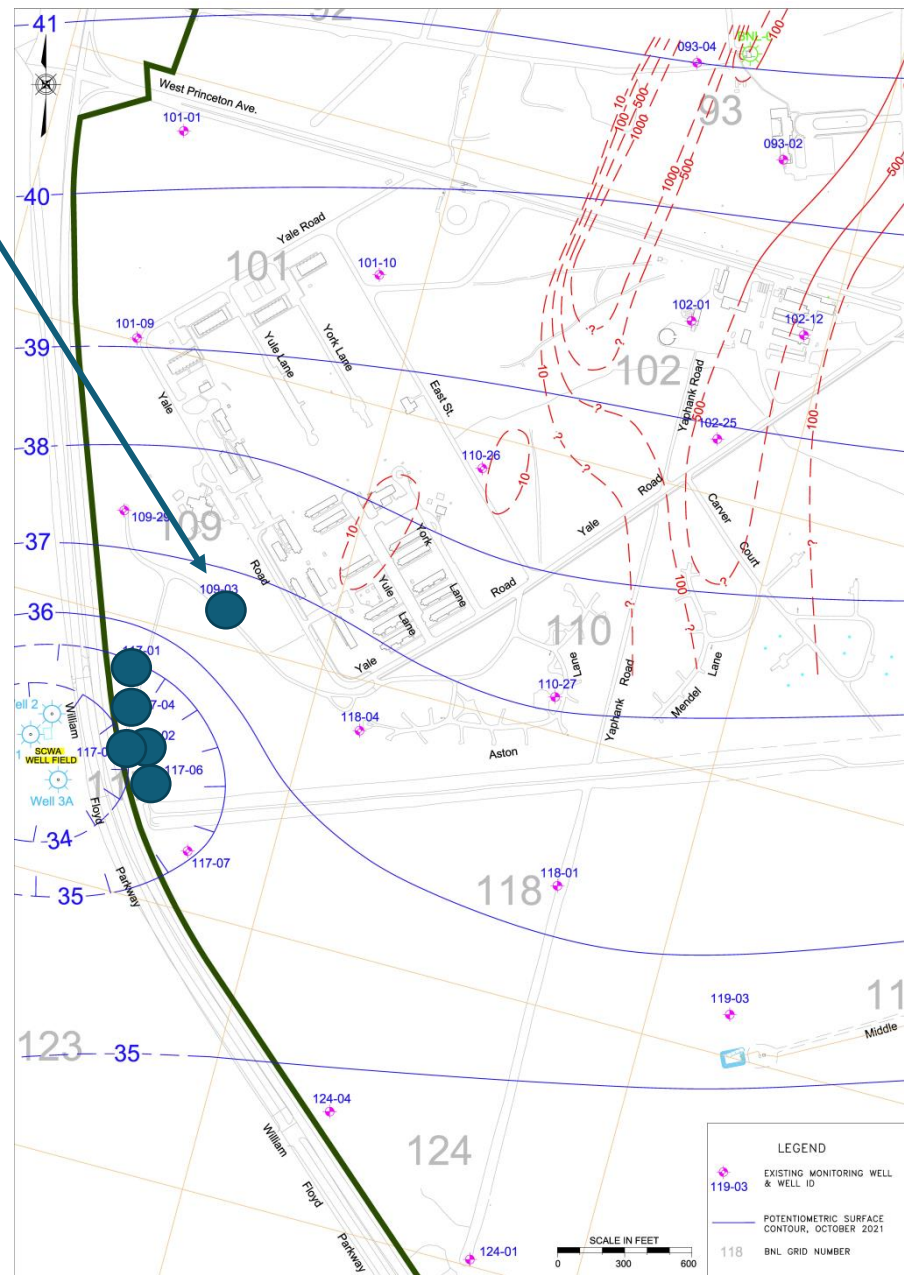
- EXISTING MONITORING WELL & WELL ID
- POTENTIOMETRIC SURFACE CONTOUR, OCTOBER 2021

SCALE IN FEET
300 600

118 BNL GRID NUMBER

Wm. Floyd Well Field Sentinel Well Monitoring Program

- Joint BNL-SCDHS program
 - Started in Sept. 1996 with two wells
 - Split samples collected
 - PFAS analyses added in 2018
 - PFAS were not detected
- For 2022, program was modified
 - Expanded to six wells
- Wells are sampled quarterly by BNL and SCDHS for:
 - VOCs
 - Sr-90
 - Tritium
 - Gamma spec
 - **1,4-dioxane**
 - **PFAS** (analysis by BNL contract laboratory)
- Results are published in BNL annual Groundwater Status Report
- Unexpected results would be reported immediately



BNL Reviewed Monitoring Results with SCWA and SCDHS

- Conference call held on January 26, 2022
- Very productive exchange of information
- BNL, SCWA and SCDHS have agreed to have routine communications to share:
 - BNL's data related to ongoing PFAS and 1,4-dioxane characterization
 - Results of the joint BNL-SCDHS "Sentinel Well" program for Wm. Floyd Well Field
 - SCWA's analytical data for William Floyd supply wells

BNL also shares new monitoring results during monthly conference calls with EPA, NYSDEC and SCDHS

BNL to Support SCDHS Testing for PFAS

- SCDHS installed 10 temporary groundwater characterization wells in areas south of BNL for independent testing
- Because Suffolk County's testing lab cannot currently analyze samples for PFAS:
 - Samples from three wells will be analyzed for PFAS by BNL's contractor lab
 - NYSDEC will provide support for PFAS testing of samples from the other seven wells
 - SC Analytical Lab will test for other parameters such as VOCs and 1,4-dioxane
- Wells will be sampled by SCDHS technicians
- All results will be shared as they become available
 - Data will be useful to BNL for planning Remedial Investigation/Feasibility Study (RI/FS) characterization efforts in the off-site areas

Next Steps

- Complete the installation of the PFAS remediation systems. Most construction activities expected to be completed by Fall 2022
 - Collect initial round of groundwater samples from the 83 new monitoring wells (Spring 2022)
 - Treatment system startup testing (Fall 2022)
 - BNL/DOE to secure funding needed for long-term operations and maintenance (O&M) of the systems
- Conduct a RI/FS to fill in the data gaps in our understanding of the extent of PFAS and 1,4-dioxane in source area soils and in groundwater on-site and off-site
 - BNL recently issued a contract for support to prepare the RI/FS Work Plan (expected to be completed by early 2023)
 - BNL/DOE to secure funding needed to conduct the RI/FS