PFAS Update

BNL Community Advisory Council
March 10, 2022

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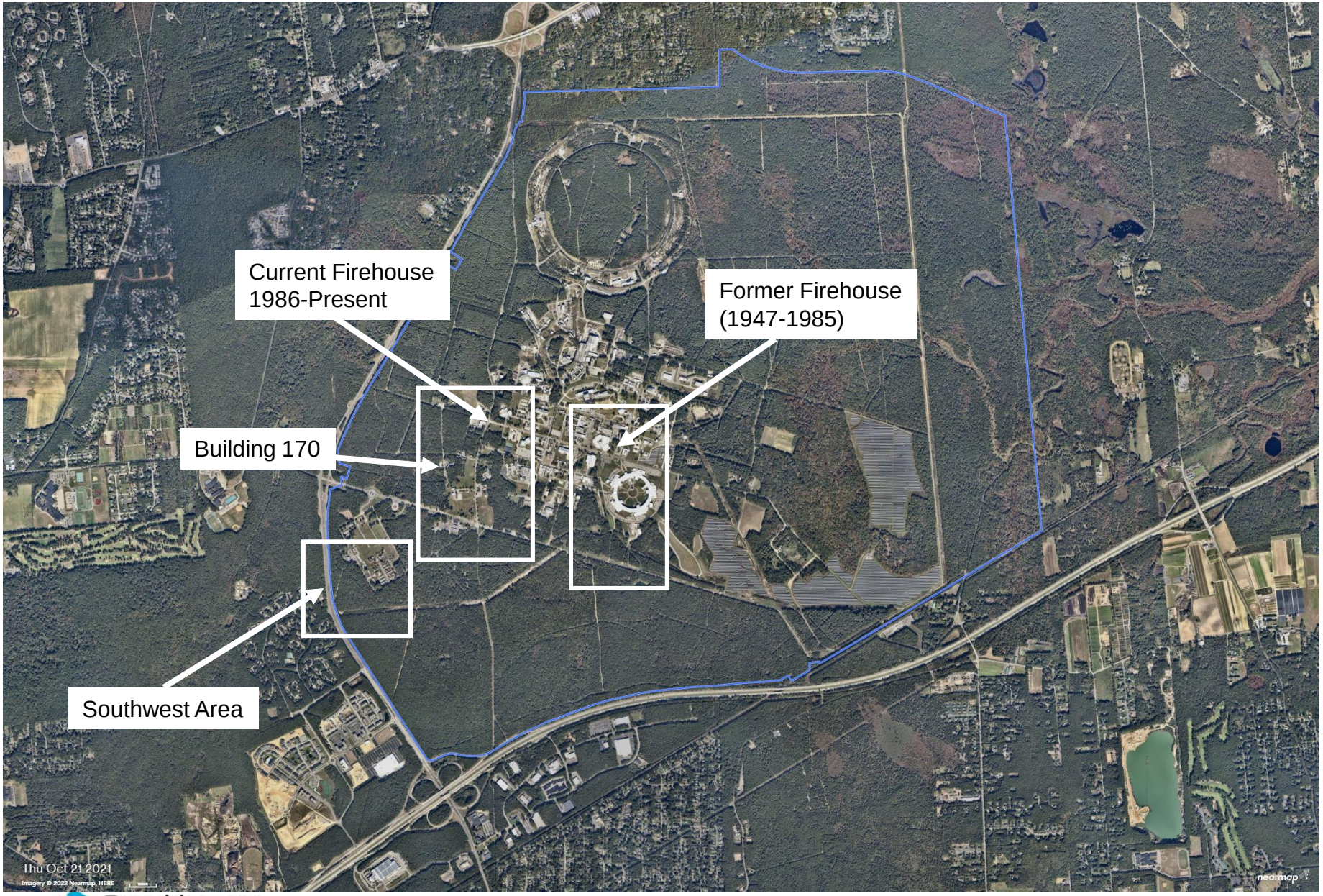
BNL Groundwater Protection Group

@BrookhavenLab

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



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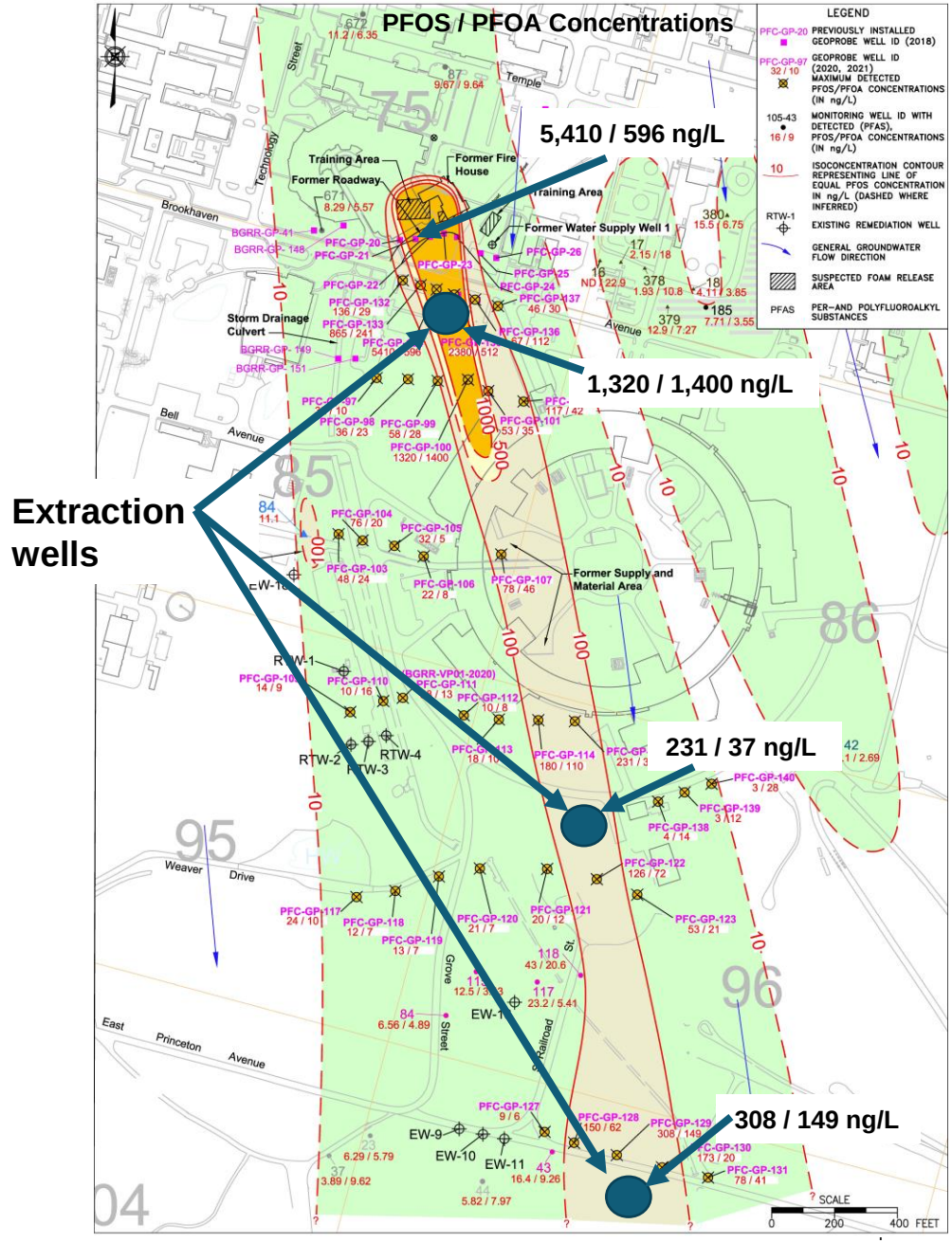
Former Firehouse Plume Remediation

- 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



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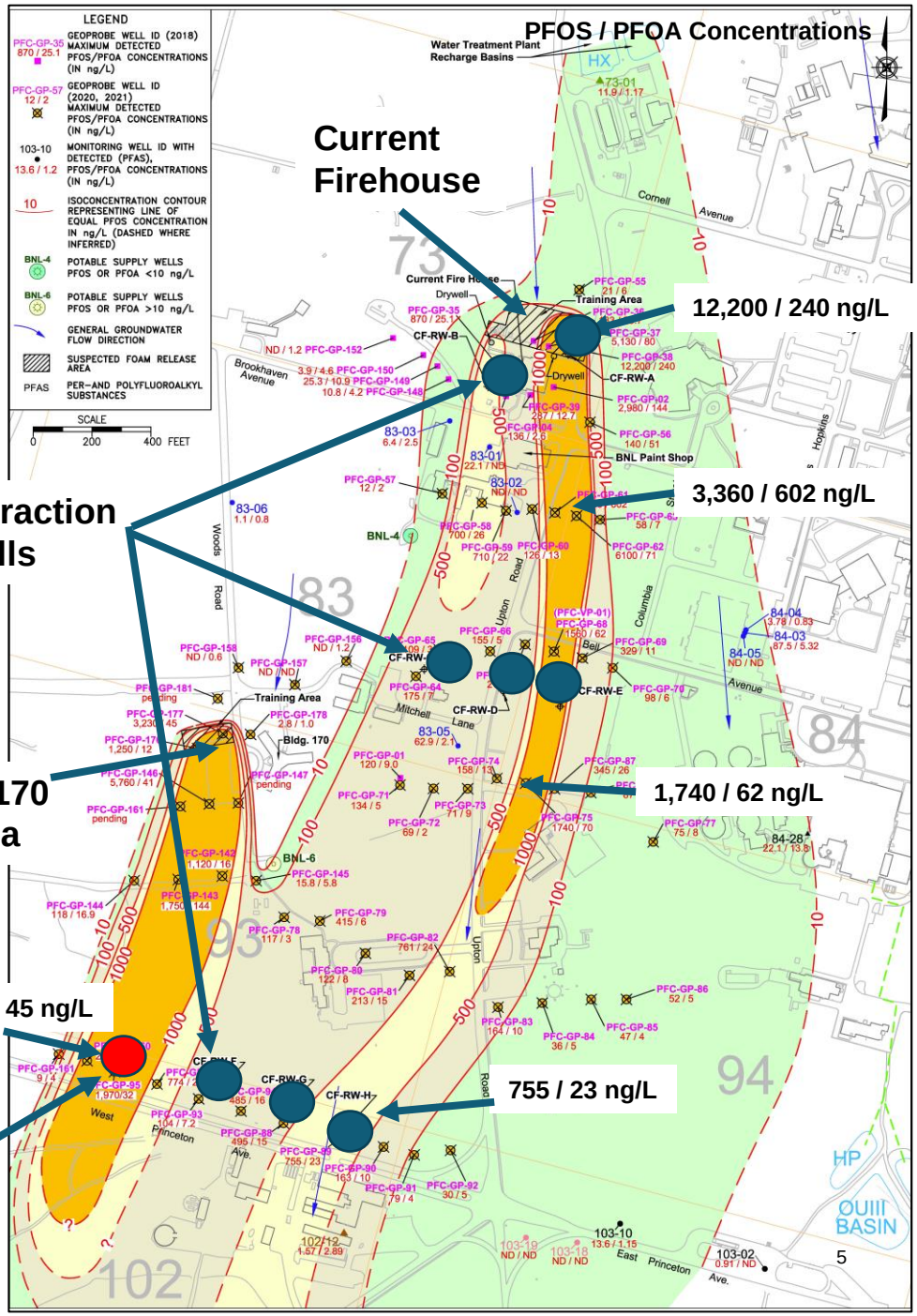
Current Firehouse Plume Remediation

- Treatment system design
  - Original plan was to install eight extraction wells
    - A nineth 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



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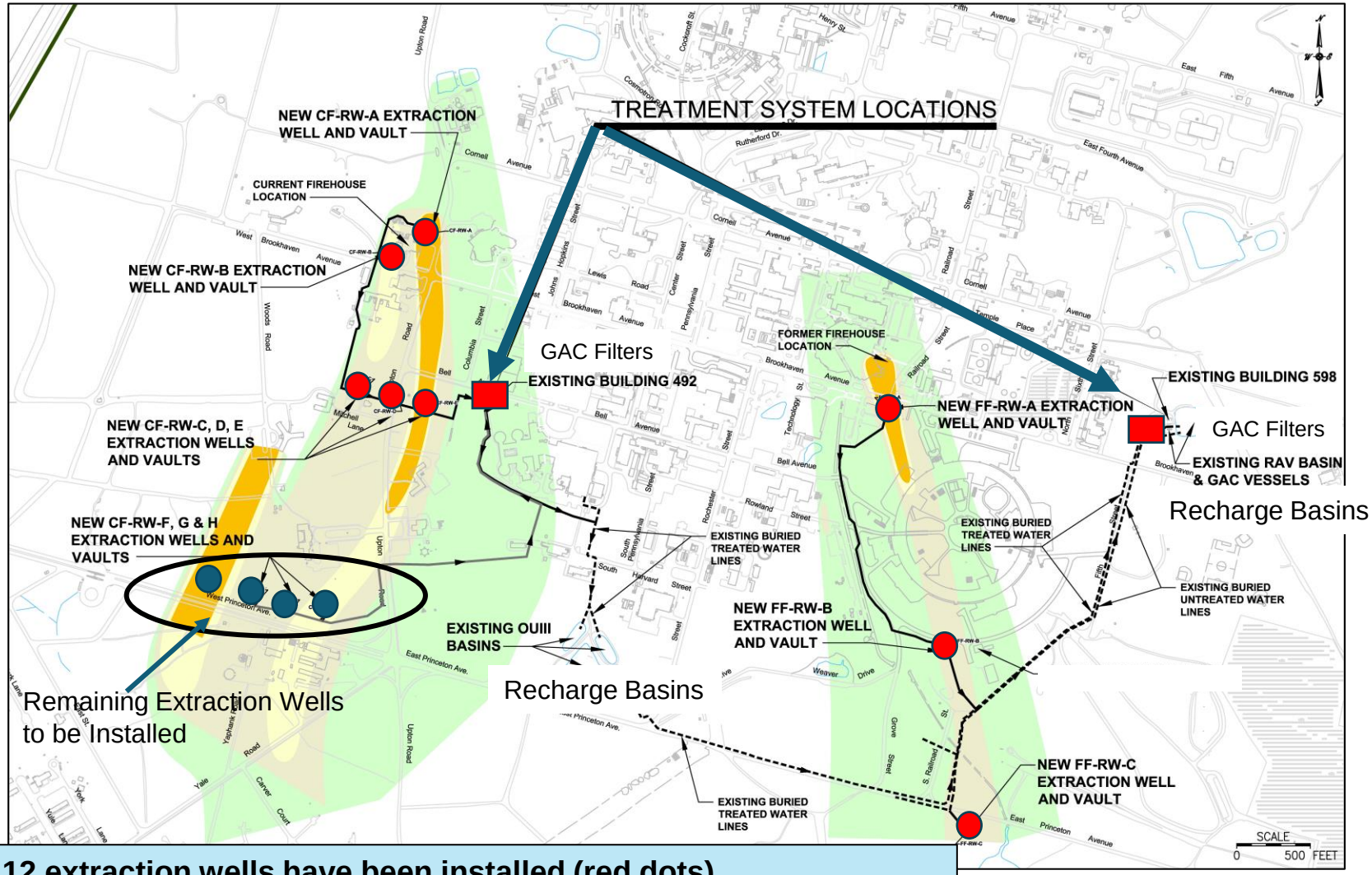
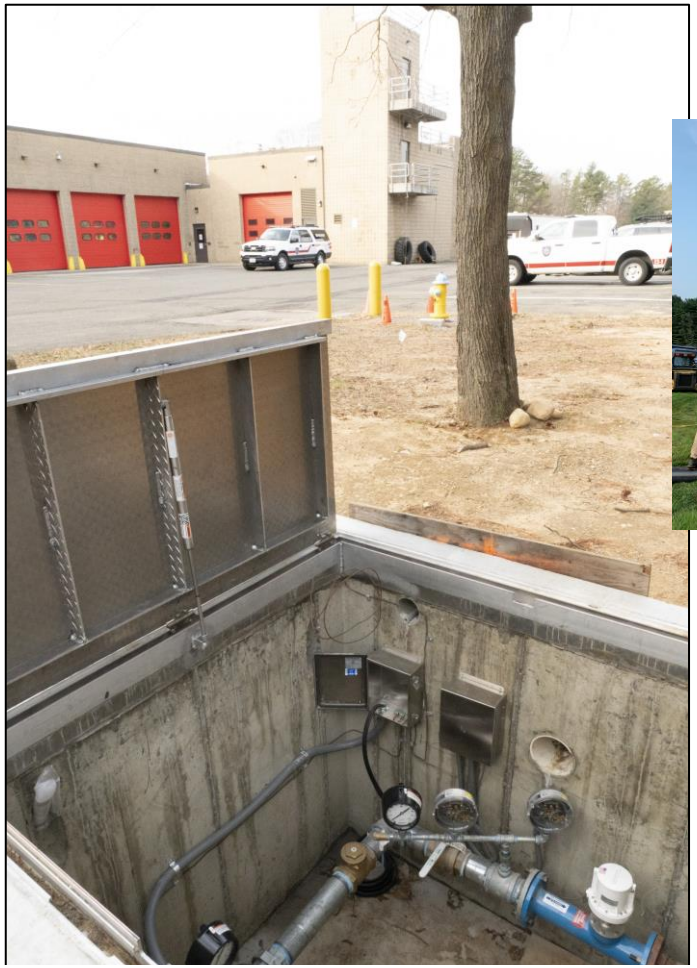
PFAS Treatment Systems – Current Status



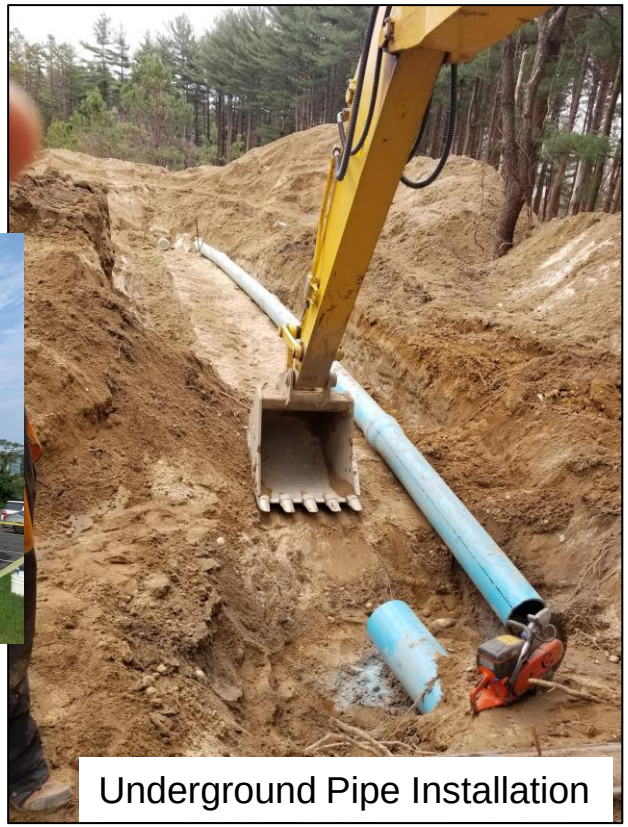
- **8 of 12 extraction wells have been installed (red dots)**
- **76 of 83 planned monitoring wells have been installed**
- **Started construction of Former Firehouse system GAC filter building**

Construction Progress



Extraction Well Vault at Current Firehouse

Extraction Well Installation South of Former Firehouse Area



Underground Pipe Installation

Monitoring Well Installation

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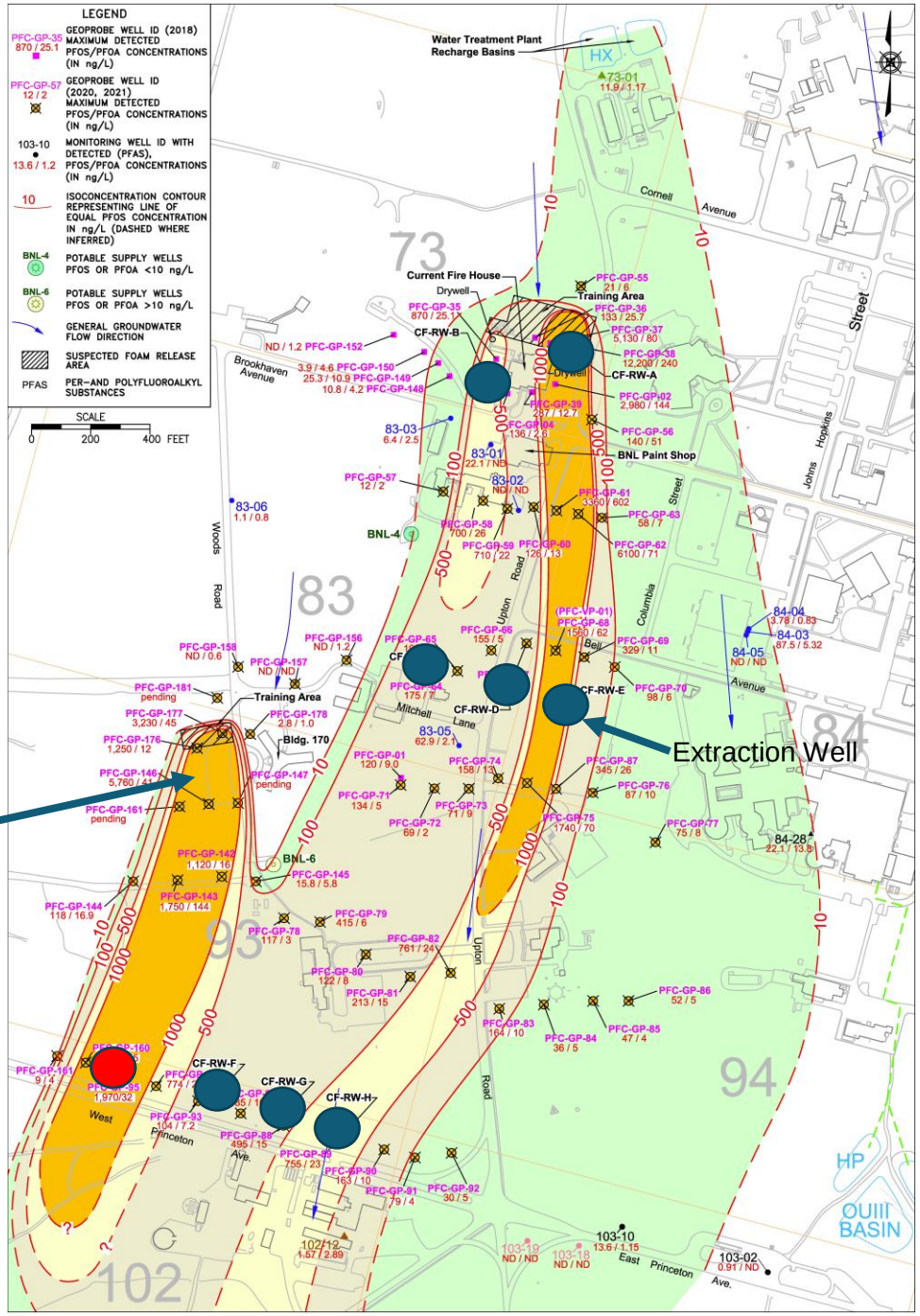
Construction Progress

Installing GAC Filters at Current Firehouse Treatment System Building

Preparing for Construction of Former Firehouse GAC Filter System Building

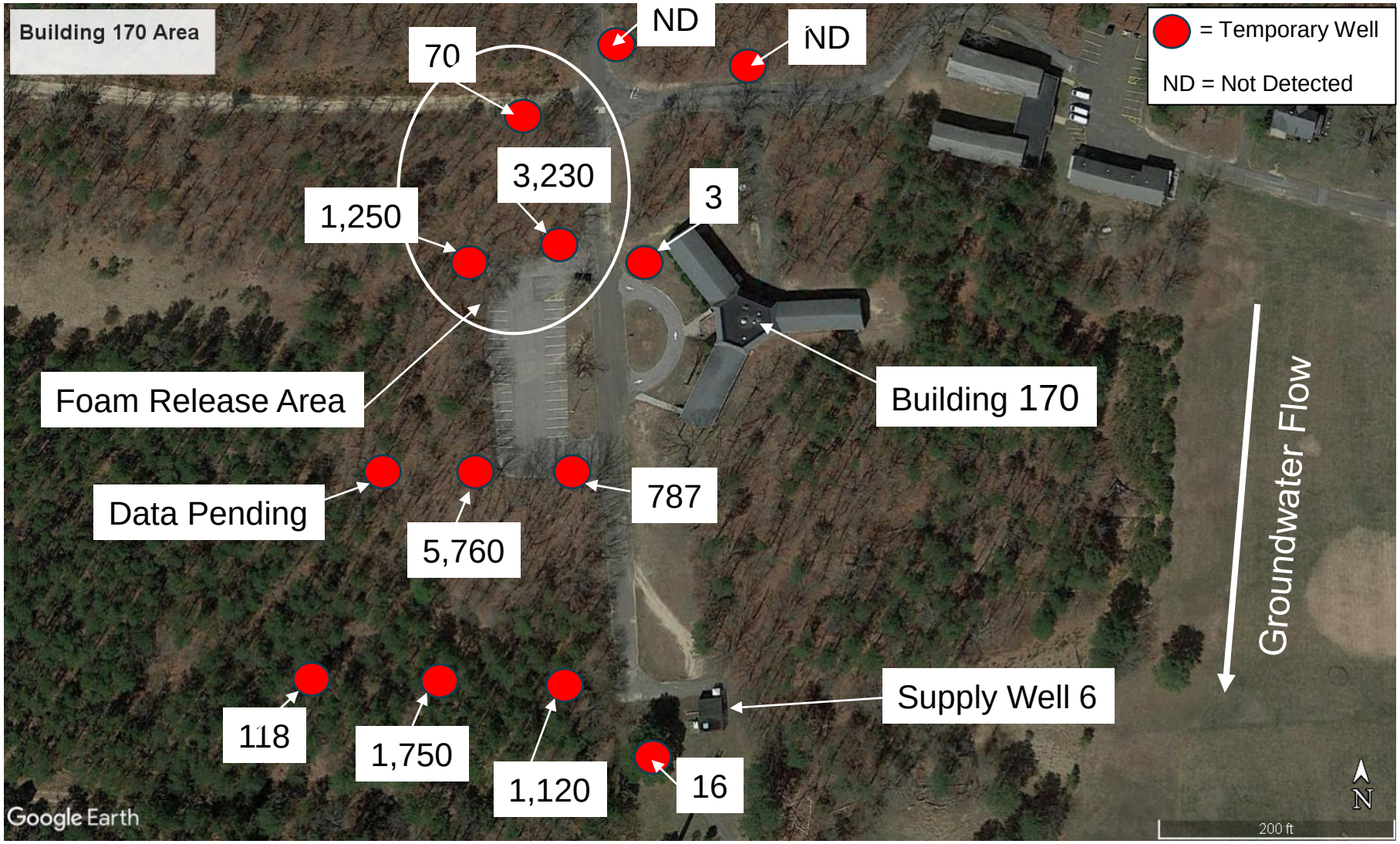
Building 170 PFAS Plume

- 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



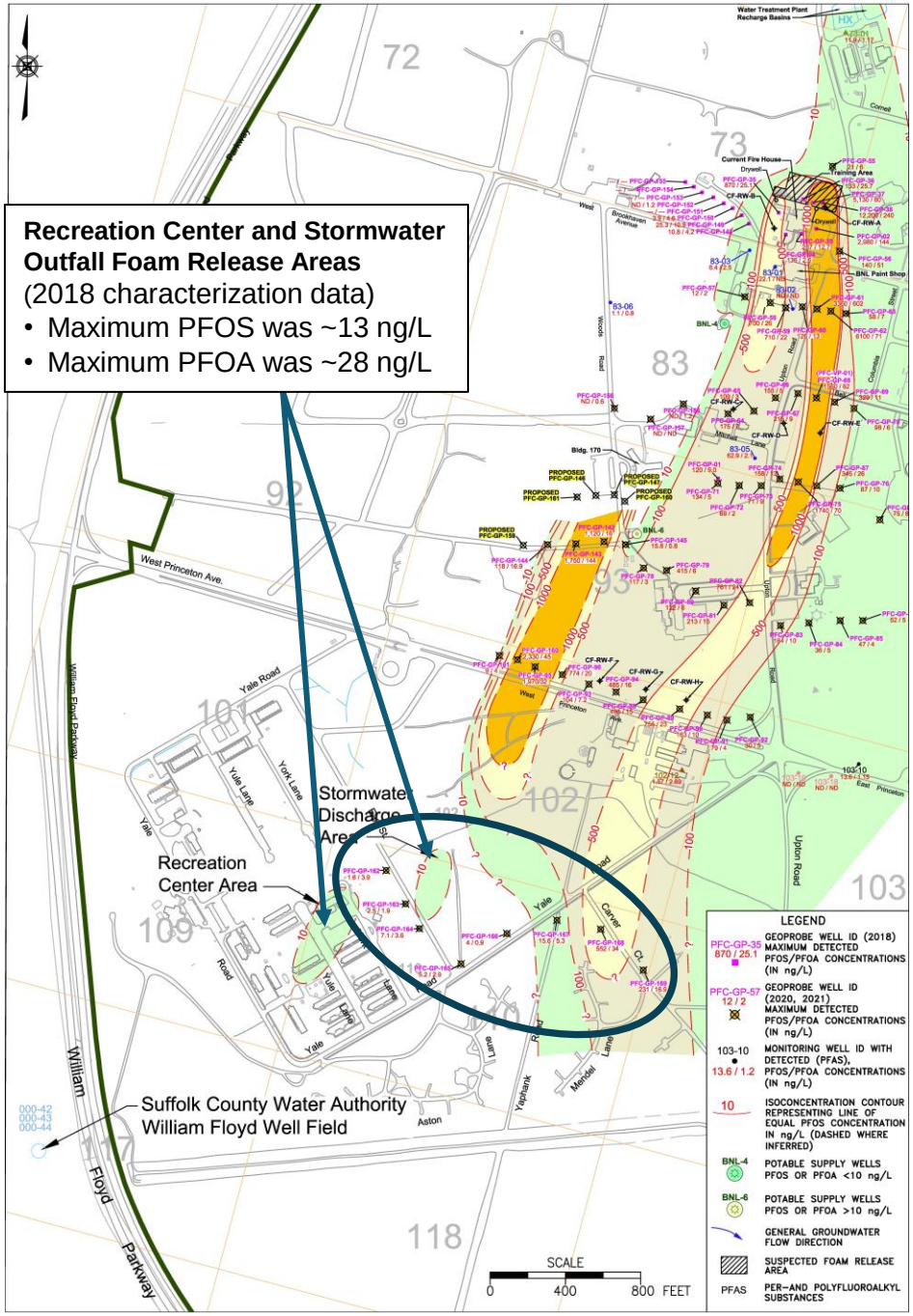
Building 170 Foam Release Area

Max PFOS Concentrations Shown (ng/L)



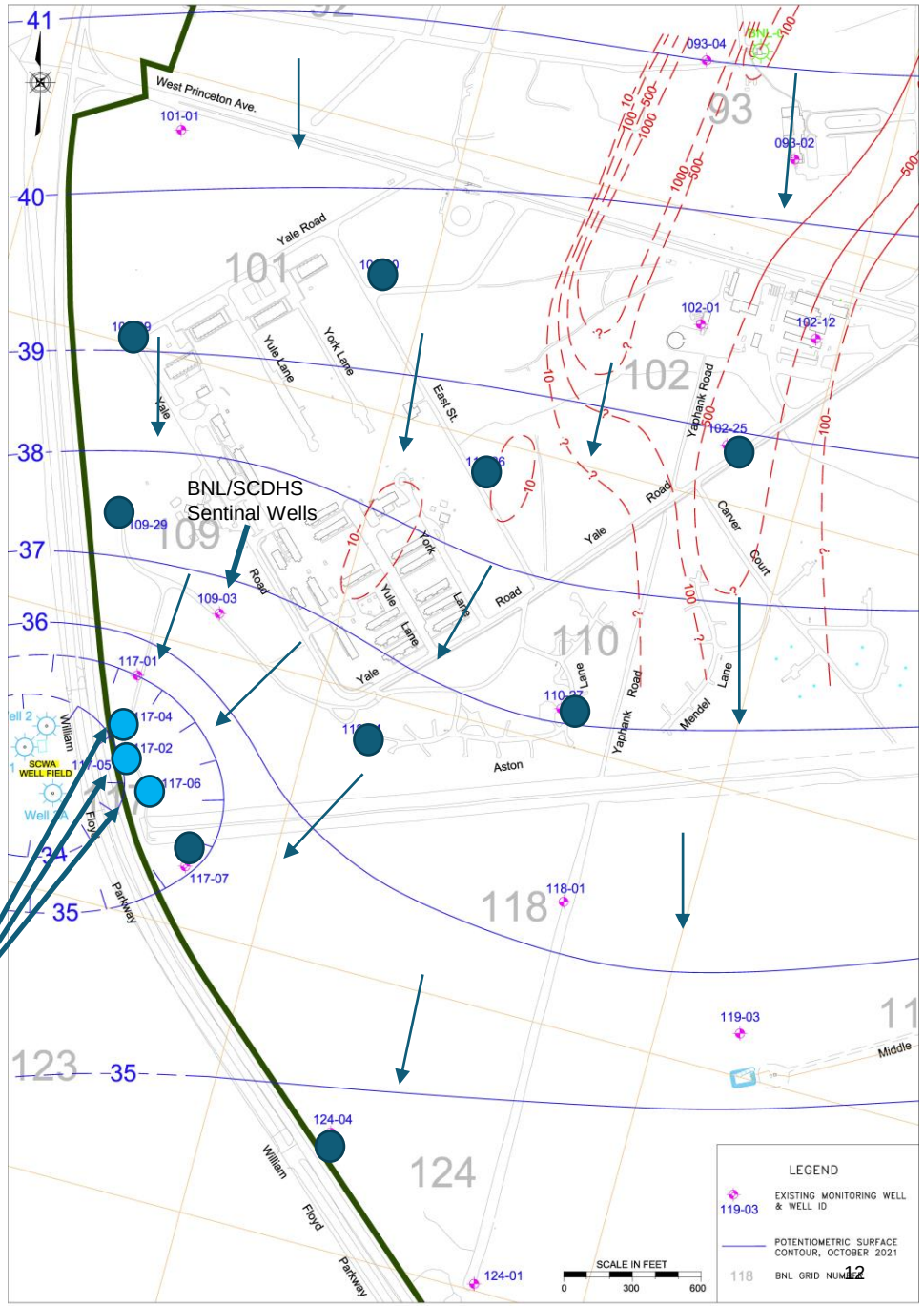
Tracking Southern Portion of Building 170 PFAS Plume

- 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)

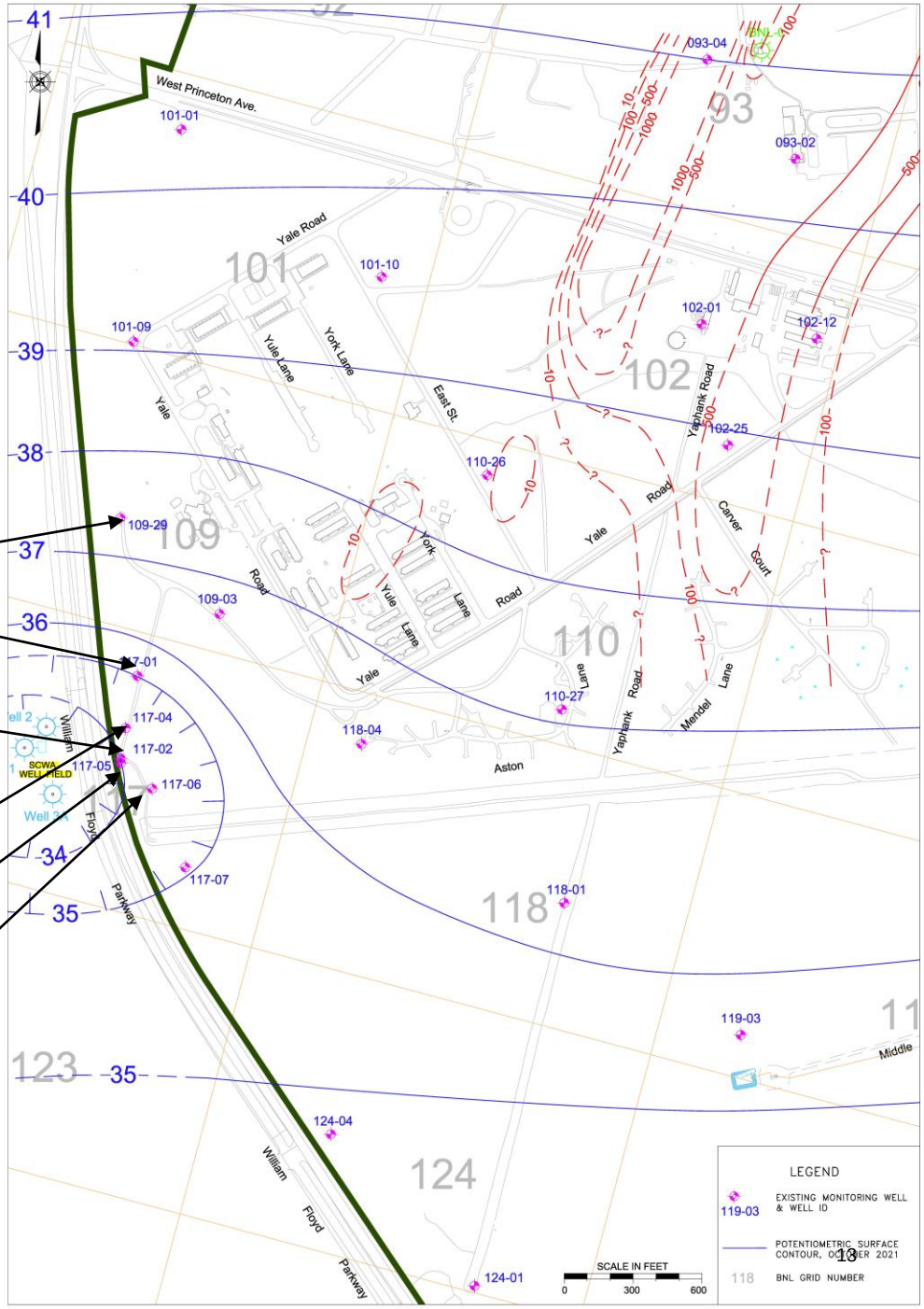


Monitoring Well Results
(Oct. – Nov. 2021)

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

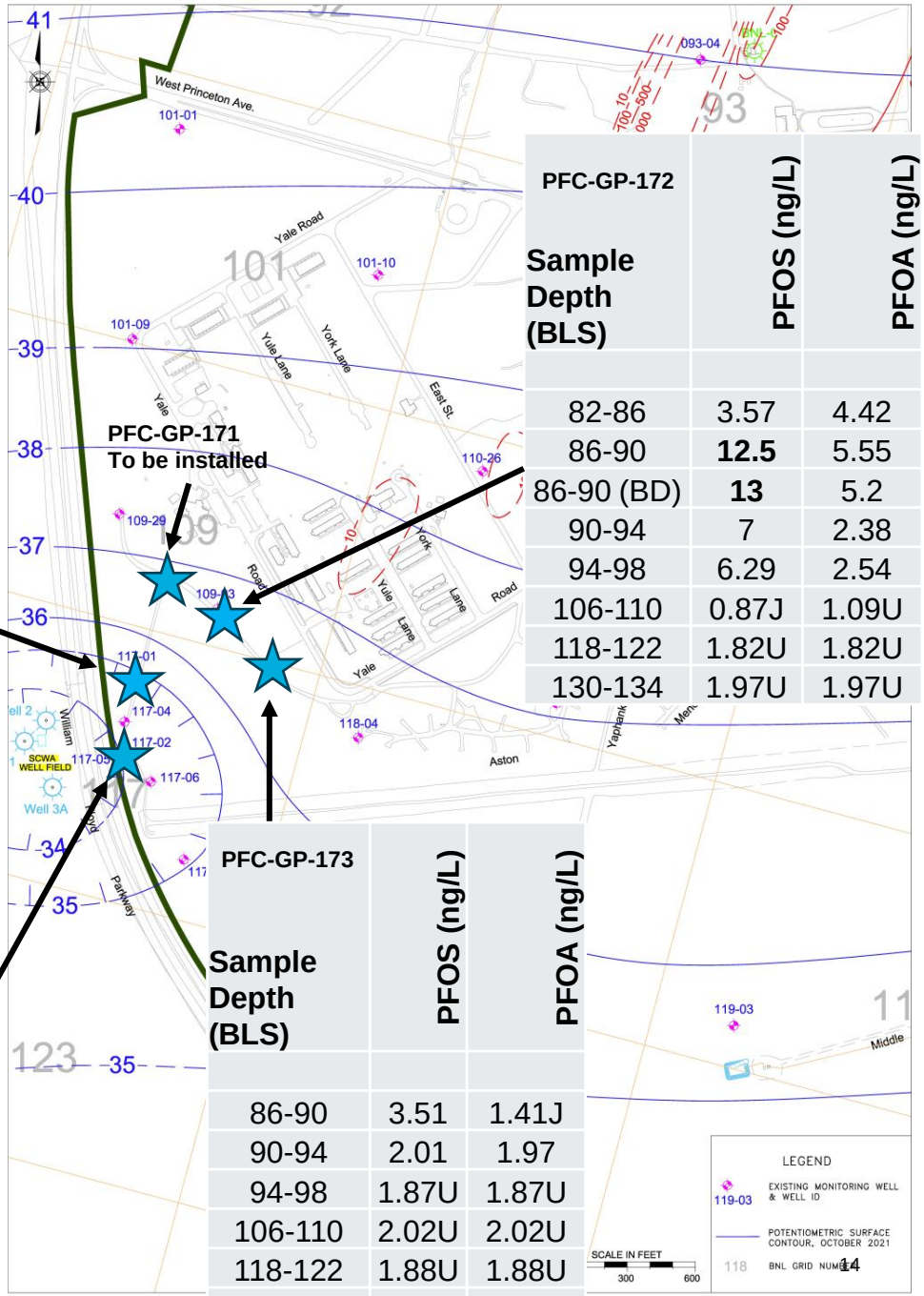
J: Estimated concentration



Temporary Wells
(Dec. 2021 – Jan. 2022)

PFC-GP-170 Sample Depth (BLS)	PFOS (ng/L)	PFOA (ng/L)
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 Sample Depth (BLS)	PFOS (ng/L)	PFOA (ng/L)
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-172 Sample Depth (BLS)	PFOS (ng/L)	PFOA (ng/L)
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

PFC-GP-173 Sample Depth (BLS)	PFOS (ng/L)	PFOA (ng/L)
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

BD: Blind Duplicate Sample

U: Not detected above method detection limit

J: Estimated concentration

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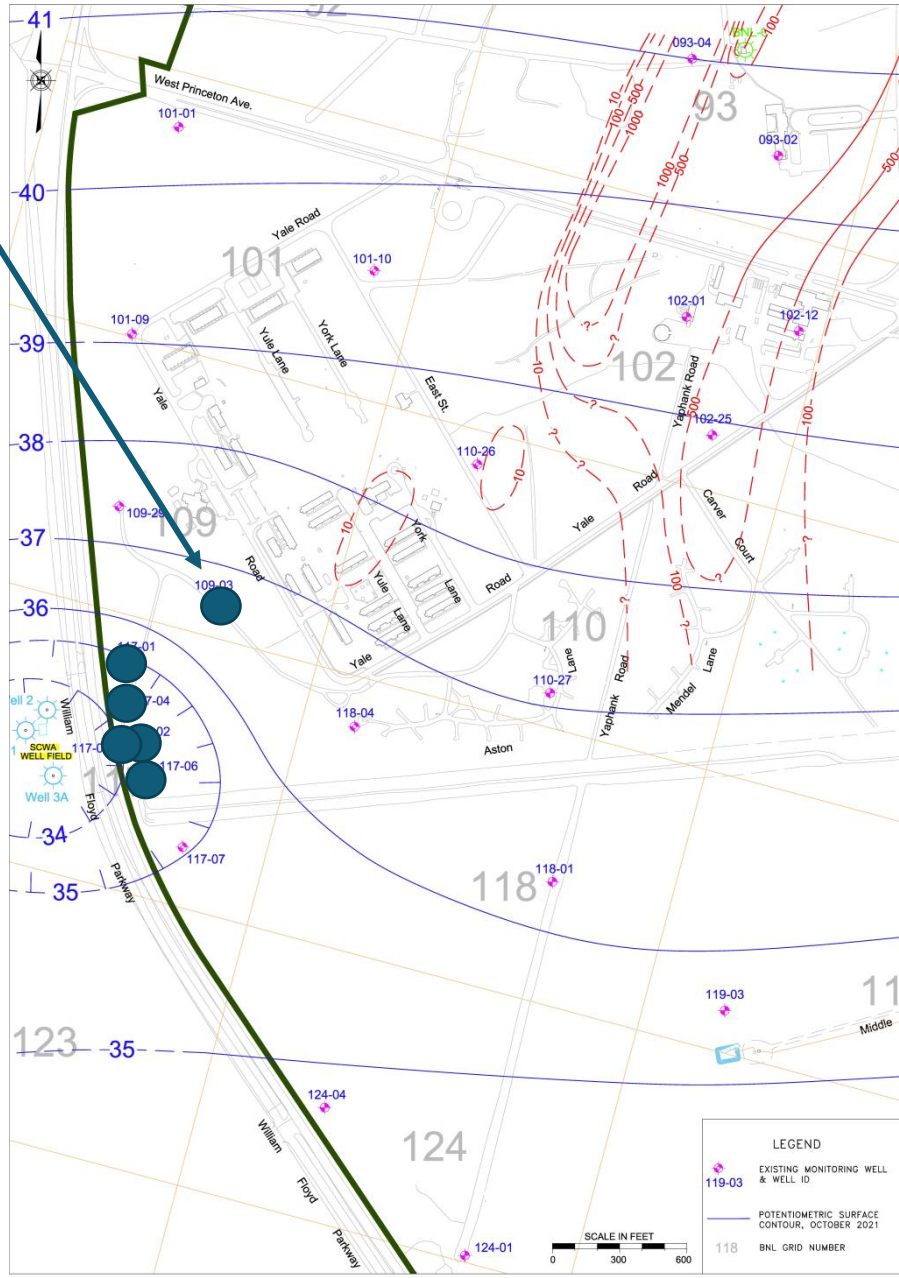
Wm. Floyd Well Field Sentinel Well Monitoring Program

- 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