

Environmental Updates

Brookhaven National Laboratory
Community Advisory Council Review
January 12, 2017

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70 YEARS OF
DISCOVERY

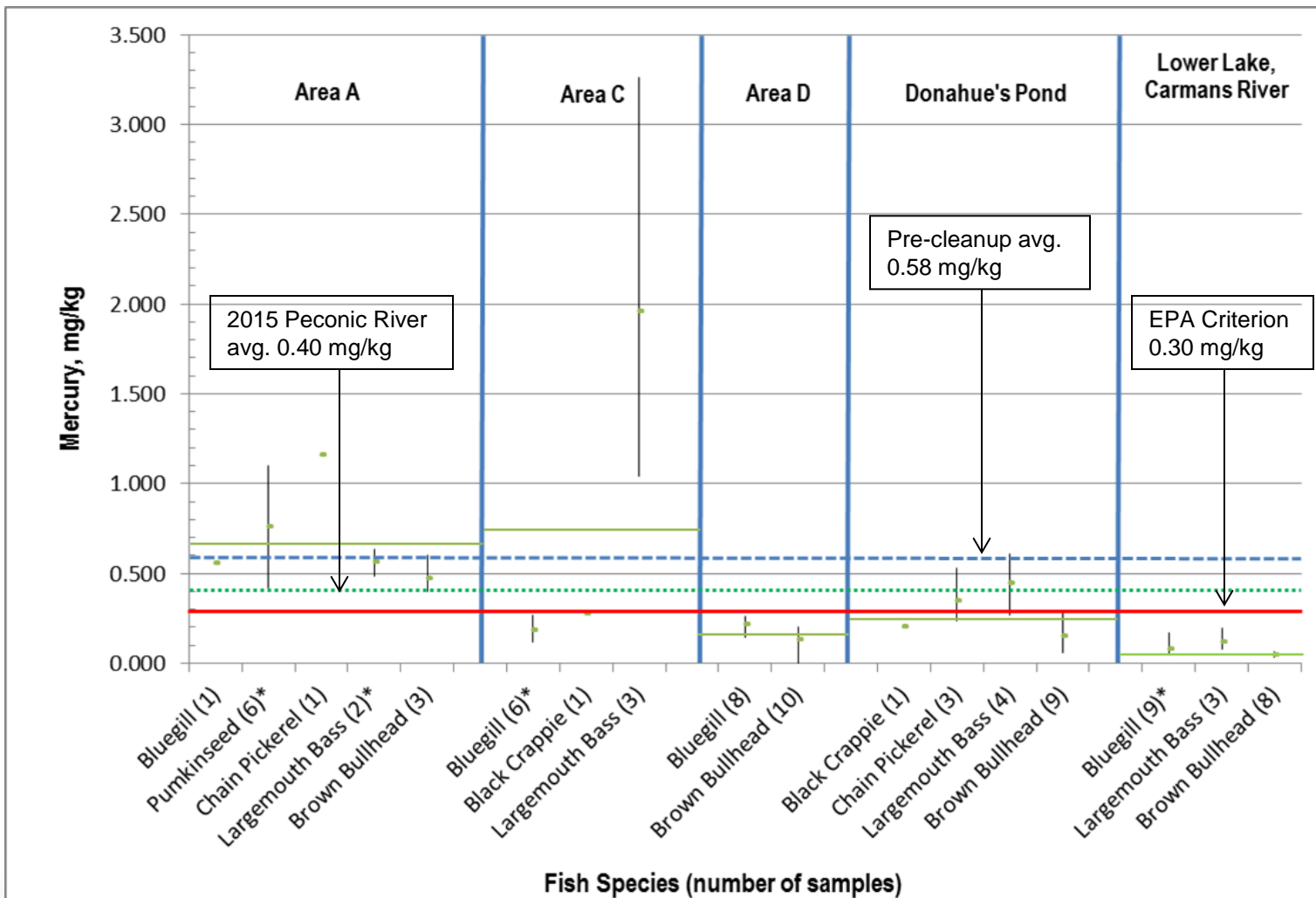
A CENTURY OF SERVICE



Environmental Update Topics

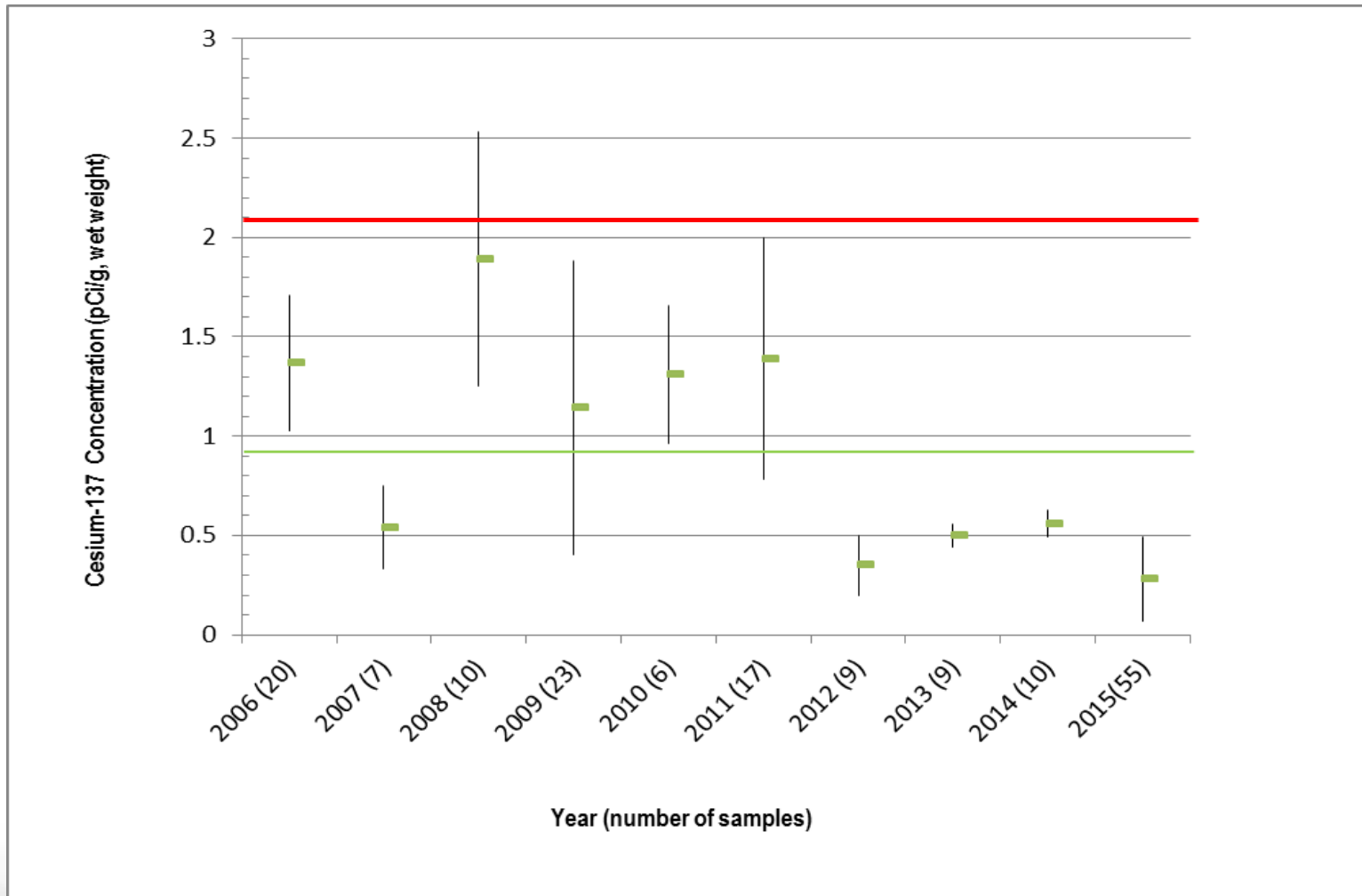
- **Natural Resource Update**
- Building 811 Demolition Project
- Groundwater Updates
 - Former Hazardous Waste Management Facility (Former HWMF) Sr-90 Plume Update
 - Western South Boundary Area VOC Characterization Update
 - EDB Detection in Off-Site Monitoring Well
 - Freon-11 Treatment System
 - 1,4-Dioxane Planned Groundwater Sampling
- Five Year Review

Mercury in Peconic River Fish - 2015



Stepped green line is average at each location - Area A 0.68mg/kg; Area C 0.73 mg/kg; Area D 0.16 mg/kg; Donahue's Pond 0.26 mg/kg; Lower Lake 0.07mg/kg.

Cs-137 in Deer – Ten Year Trend



Red line is pre-cleanup (1998-2001) avg. of 2.09 pCi/g wet weight.
Green line is post-cleanup (2002-2015) avg. of 0.93 pCi/g wet weight.

Peconic River

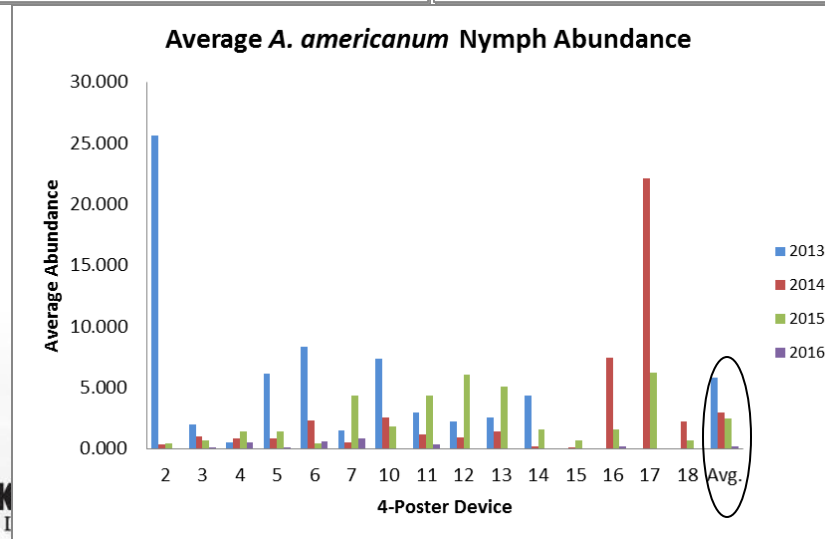
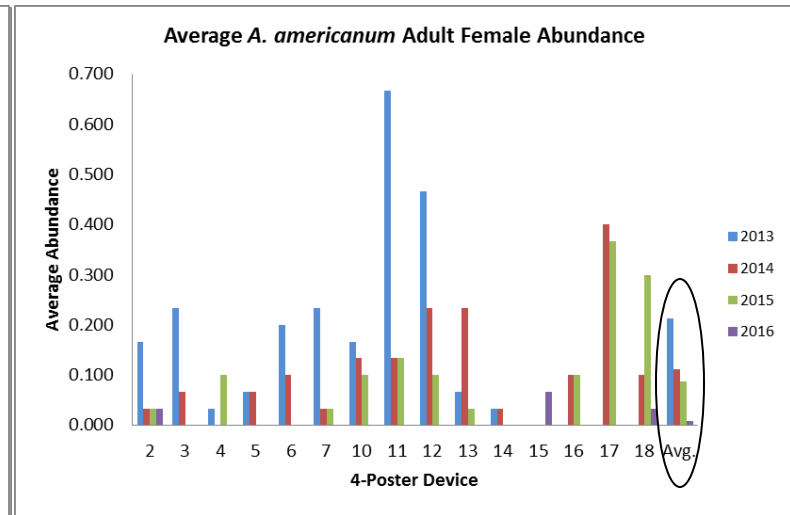
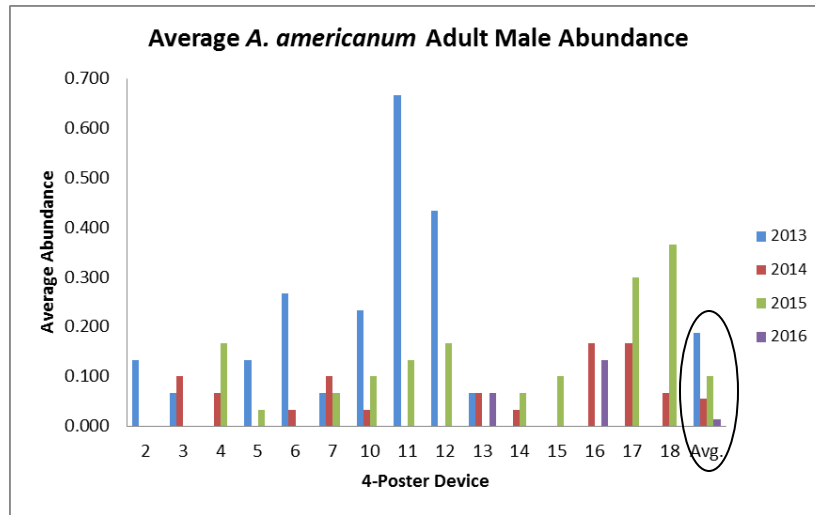
- Last CAC update – October 2016
- Final Plan for Optimization of the Peconic River Remedy, Area PR-WC-06 issued to the regulators – November 2016
- Preparing equivalency permits
- Evaluating waste disposal options
- Procurement is underway for cleanup contractor

Next Steps

- Award contract – March 2017
- Submit plans for review and approval
- Conduct cleanup, preferably under dry conditions – summer 2017

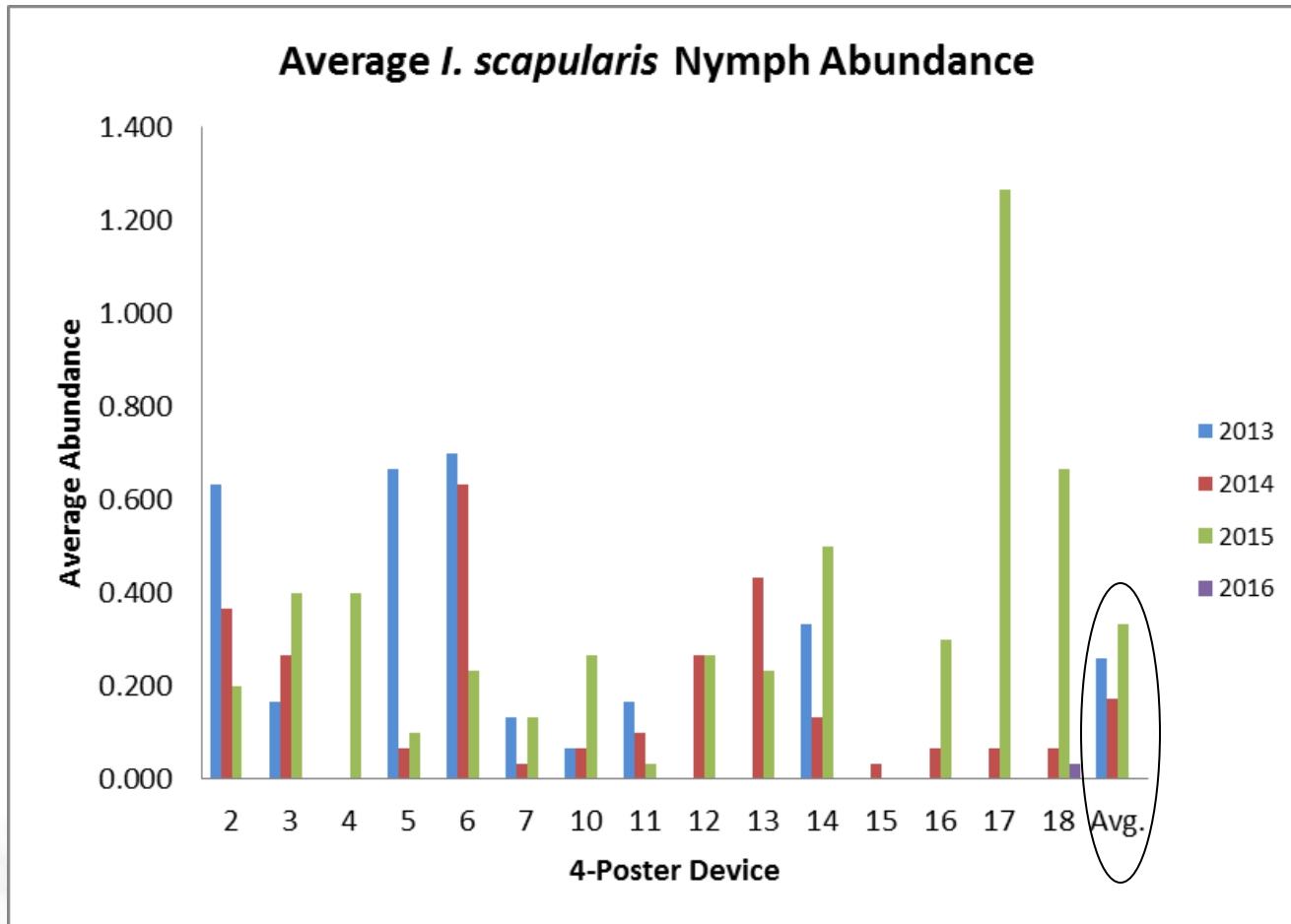
4-Poster Effectiveness

Lone star tick – 96% reduction



4-Poster Effectiveness

Black-legged (Deer) tick – 99% reduction



2017 Deer Management

- Current plans are to remove 200-250 deer
 - Removal will occur mid to late March
 - Work planning and contracting in progress

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Former Waste Concentration Facility (Building 811) Demolition

- Last briefed CAC in June 2016
- Operated from 1947 to 2008 as waste processing facility
- Demo and soil cleanup completed to help reduce environmental liability risk to soil and groundwater
 - Soil excavation up to 18 feet deep
 - Cesium-137 primary contaminant in soil
 - 1,660 cubic yards of soil, concrete, metal, debris disposed of off-site as low level radioactive waste
 - 23,000 pounds of metal recycled
 - Final status survey performed, 32 confirmatory surface soil samples and six Geoprobe core samples obtained
 - Met soil cleanup goals (Cs-137 23 pCi/g, Sr-90 15 pCi/g, and Ra-226 5 pCi/g)
- Total project cost ~\$5.1 Million



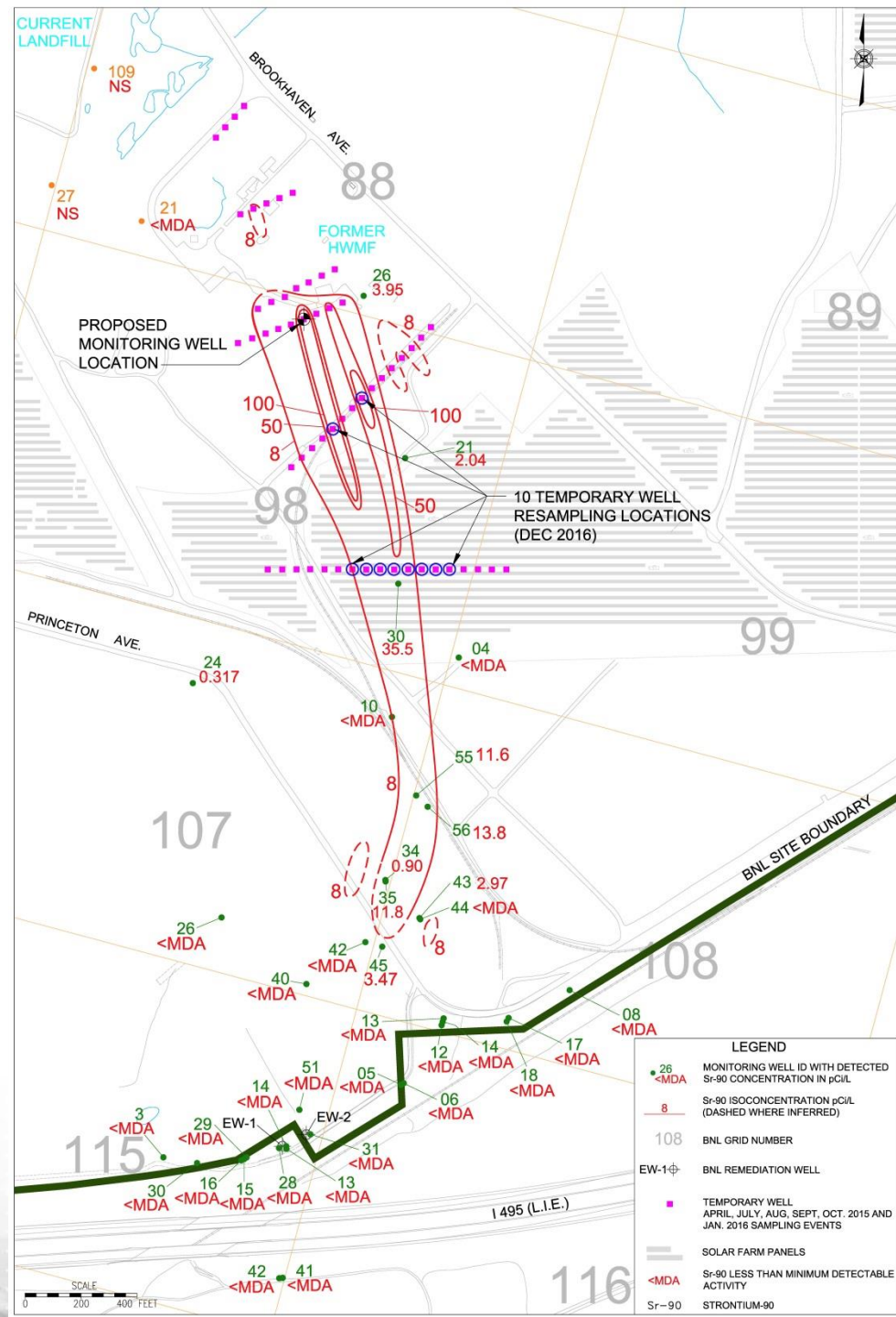
Former Waste Concentration Facility (Building 811) Demolition

- ORISE verified the conclusions from the radiological status survey/soil sampling data
- Work performed safely with no incidents
 - Air monitoring for asbestos, silica, rad. No issues
- Excavation backfilled and seeded – September 2016
- One area of surficial contamination to north of excavation remains, not in original scope. Area was radiologically posted, under institutional controls, and will be addressed in future
- Closeout Report submitted to regulators October 2016 documenting that the cleanup goals were met. There were no comments. Report posted on web in December 2016



Former Hazardous Waste Management Facility Sr-90 Plume Update

- Last briefed CAC November 2016.
- Completed ten temporary wells in December 2016 utilizing our Geoprobe to enhance existing monitoring well network.
- Data from December characterization just beginning to come in.
- Plan to install one source area monitoring well in January/February.
- Data will be reported in the 2016 Groundwater Status Report.

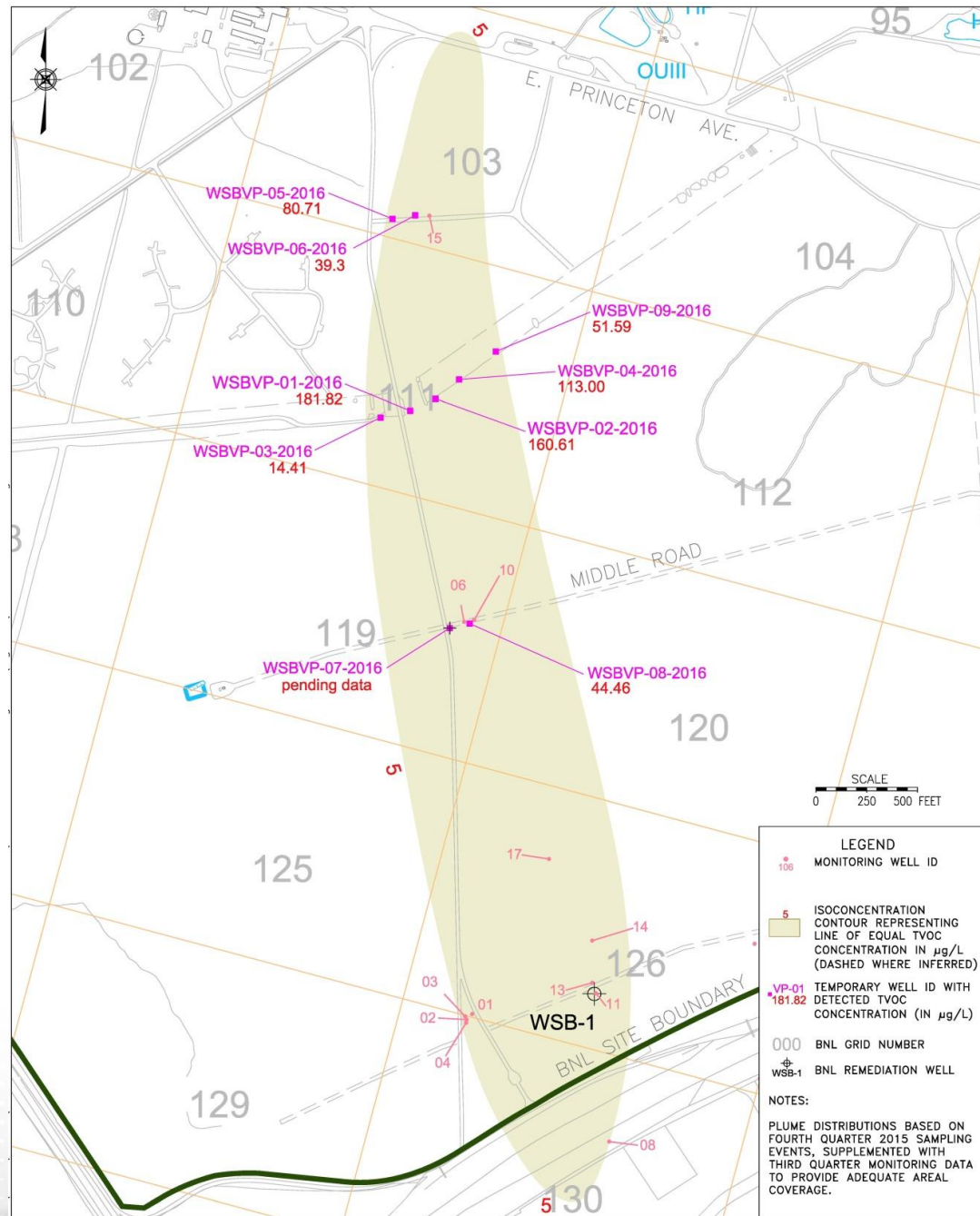


Western South Boundary Area VOC Characterization Update

- Last briefed CAC November 2016
- Installed 2 temporary vertical profile wells as per 2014 GW Status Report recommendation to characterize Freon-12 (February 2016)
- Installed 6 of 7 planned temporary vertical profile wells during November/December 2016
- Currently working at location WSBVP-07

Next Steps

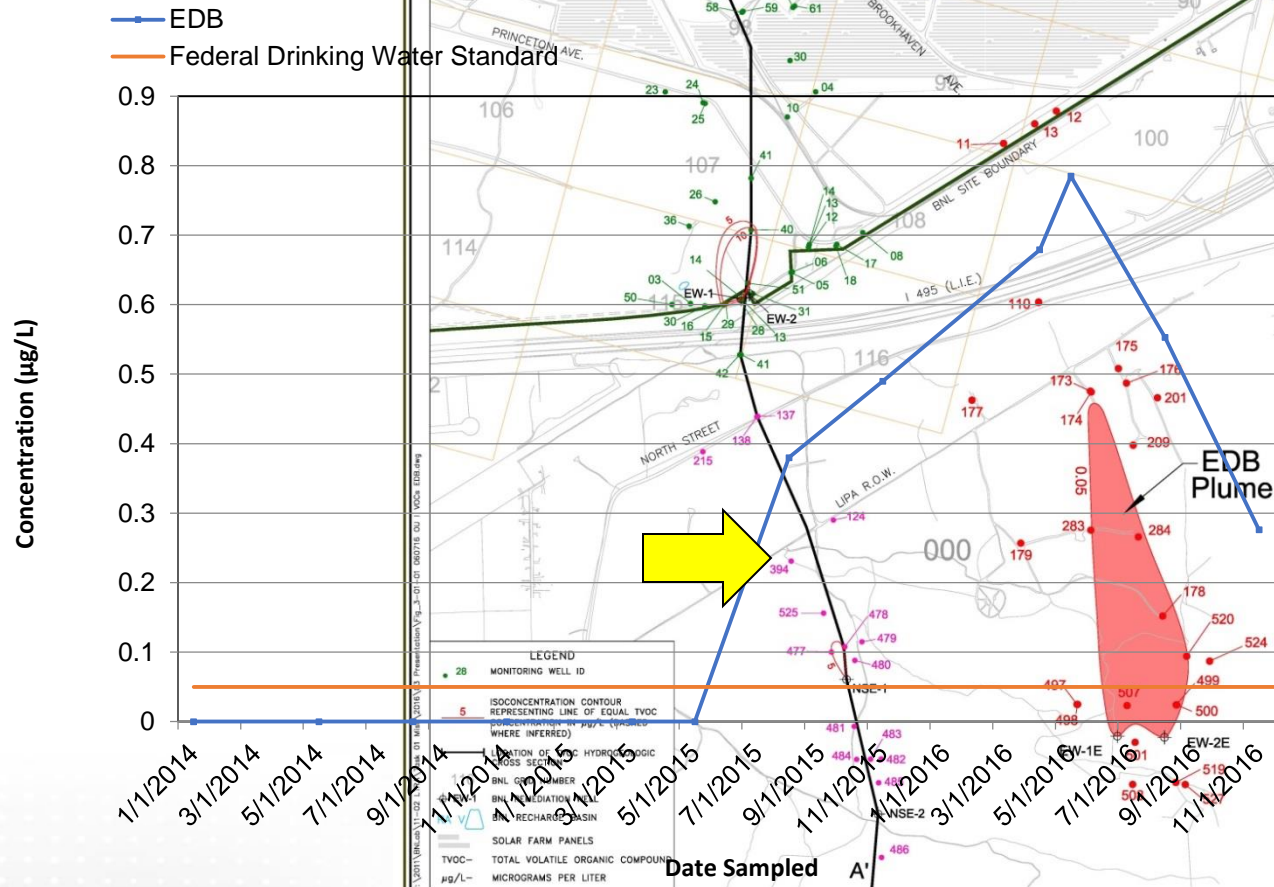
- Complete WSBVP-07, evaluate data and determine if additional locations are necessary
- Once extent of higher concentration area is defined, will utilize groundwater model to simulate future migration.



Ethylene Dibromide (EDB): Well 000-394 Update

- Last briefed CAC November 2016
- Continue to monitor unexpected EDB in North St. East MW 000-394 (178 ft. below grade). Above 0.05 ug/L Drinking Water Standard (DWS) since Summer 2015
- EDB not previously detected off-site in NSE plume
- Concentrations trending downward in past two sampling rounds. No EDB detections in surrounding monitoring wells or extraction well NSE-1
- Quarterly monitoring to continue

Monitoring Well 000-394

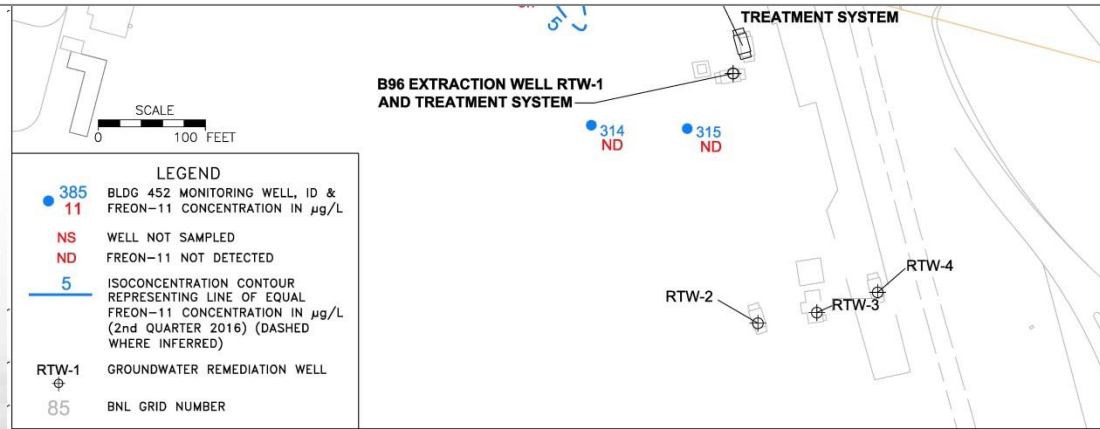
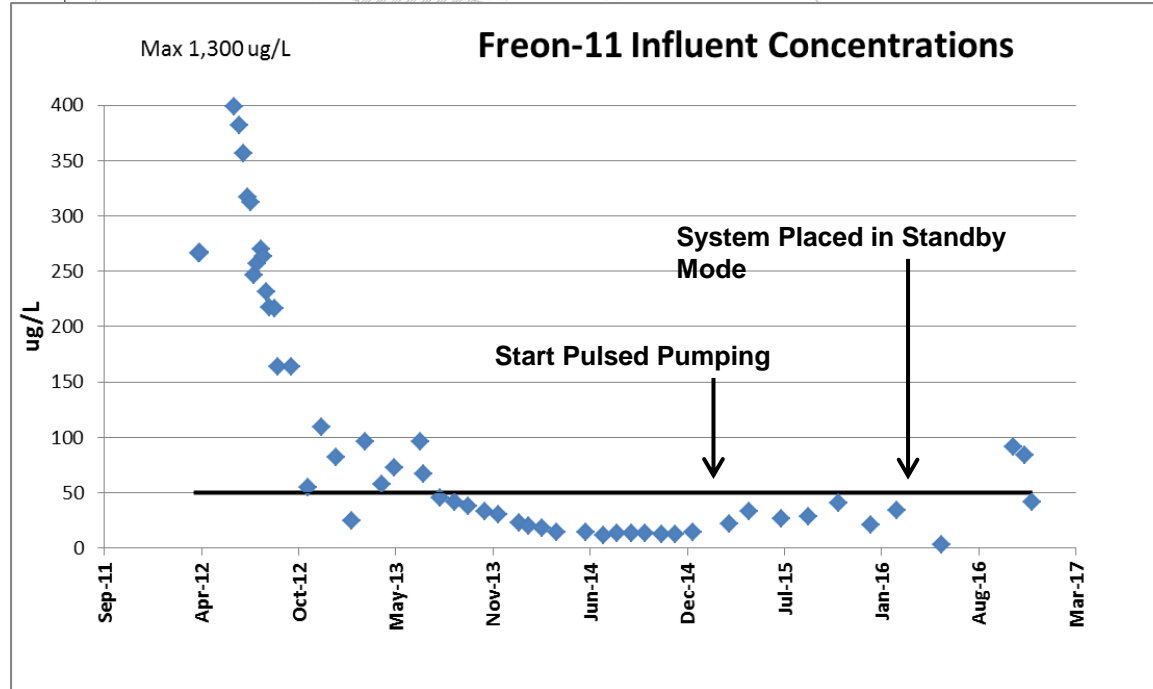
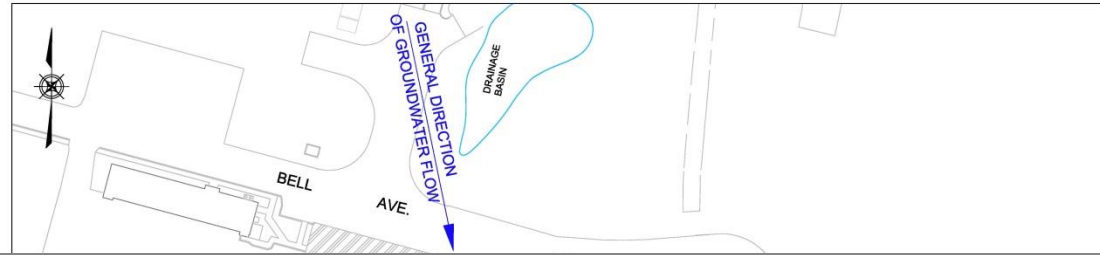


Freon-11 Treatment System Update

- Last briefed CAC in November 2016
- Continued groundwater monitoring following March 2016 system shutdown
- October 2016 data shows Freon-11 above the system capture goal of 50 $\mu\text{g/L}$ in extraction well EW-18 (92 $\mu\text{g/L}$)
- Freon-11 was below 50 $\mu\text{g/L}$ during last round of monitoring well sampling in August
- System temporarily turned back on mid-November
 - November data - 84 $\mu\text{g/L}$
 - December data - 41 $\mu\text{g/L}$

Next Steps

- Continue monthly sampling of EW-18
- Continue operating until Freon-11 concentration in EW-18 remains below 50 $\mu\text{g/L}$ for 2-3 sampling rounds
- Continue operation of Bldg. 96 extraction well
- Next monitoring well sample collection is scheduled for February 2017

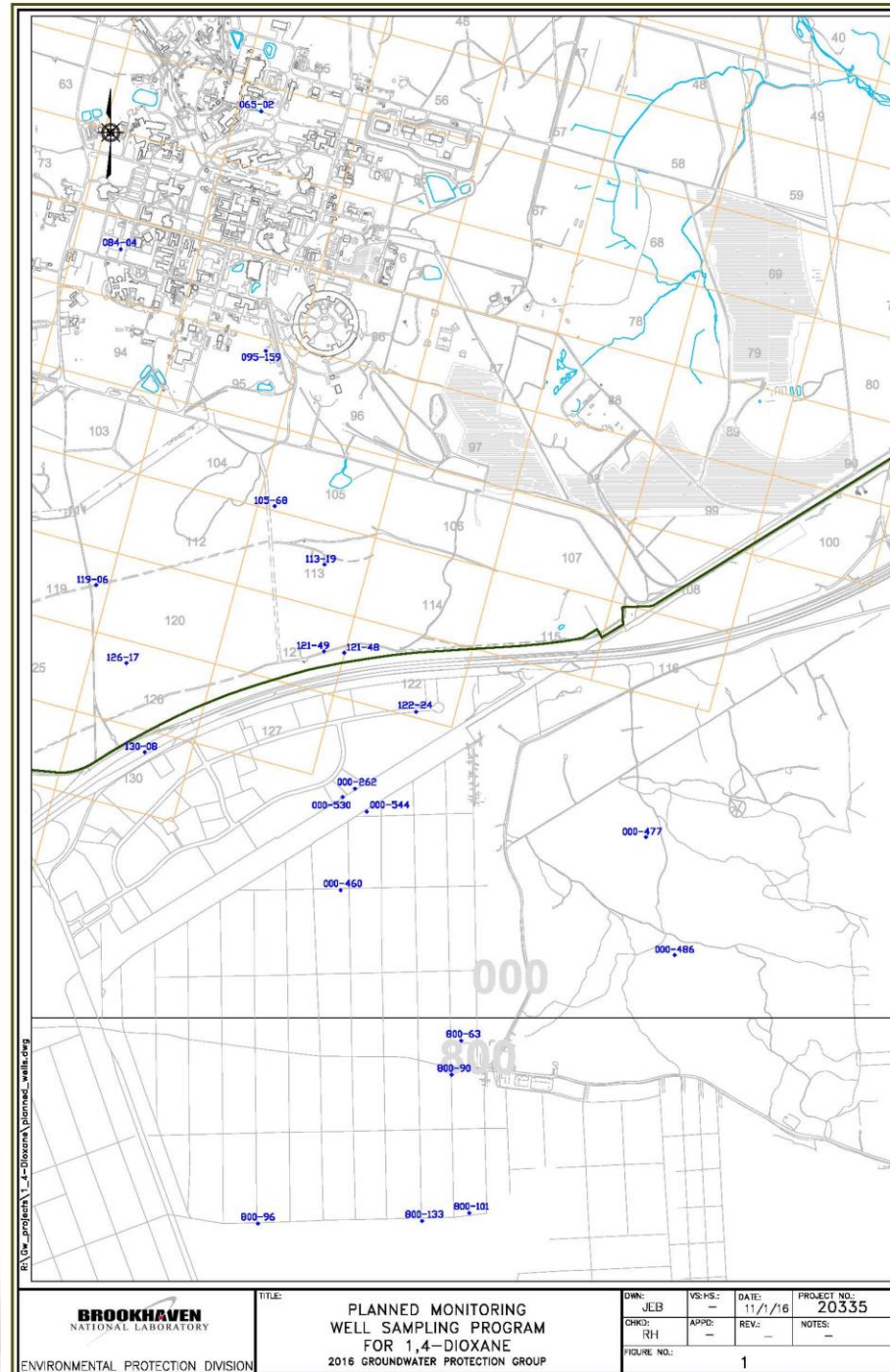


1,4-Dioxane Sampling Update

- Briefed CAC in November 2016
- Used as stabilizer for 1,1,1-Trichloroethane (TCA)
- Submitted plan to regulators late November

Next Steps

- Collect samples from a subset of 22 plume core monitoring wells on and off site associated with historical and current TCA detections utilizing EPA Method 522 (scheduled for late January)
- Brief regulators and CAC on results



2016 Five Year Review Update

- Complete
 - Last briefed CAC in November 2016
 - EPA concurred with overall protectiveness determination
 - Responses to NYSDEC/NYSDOH, EPA, and Suffolk County technical comments submitted for review mid-November
 - Received EPA approval
 - Awaiting State and County concurrence
- Next Steps/Schedule
 - Public availability of June 2016 Five Year Review and Addendum (including responses to regulator comments) – early 2017



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