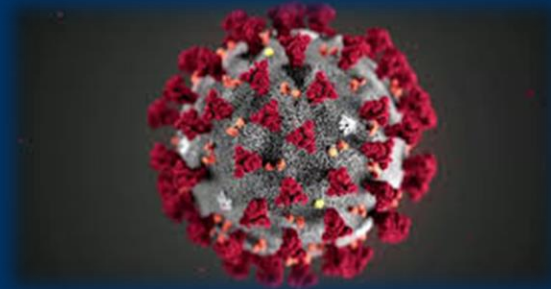


Covid-19 Wastewater Study of Wilmington WWTP Service Area

Public Works Committee Meeting

May 5, 2020



Wastewater Testing for Public Health Surveillance

- Wastewater offers unique opportunity to understand health of large populations without compromising privacy.
- County is working with MIT spinoff Biobot
- Biobot got its start by tracking the use of opioids
- In partnership with Biobot, Cary, NC was able to focus in on opioid hotspots – reduced fatal overdoses by 40%
- Biobot expanded services to Covid 19 testing
- 150 wastewater service providers are participating in pro bono study

How It Works



Biobot will ship participating facilities a sampling kit and sample collection protocols.



Wastewater facilities will collect 24-hour composite samples, and ship the samples back to **Biobot** laboratories.



Biobot will process the sewage samples to concentrate and inactivate viruses.

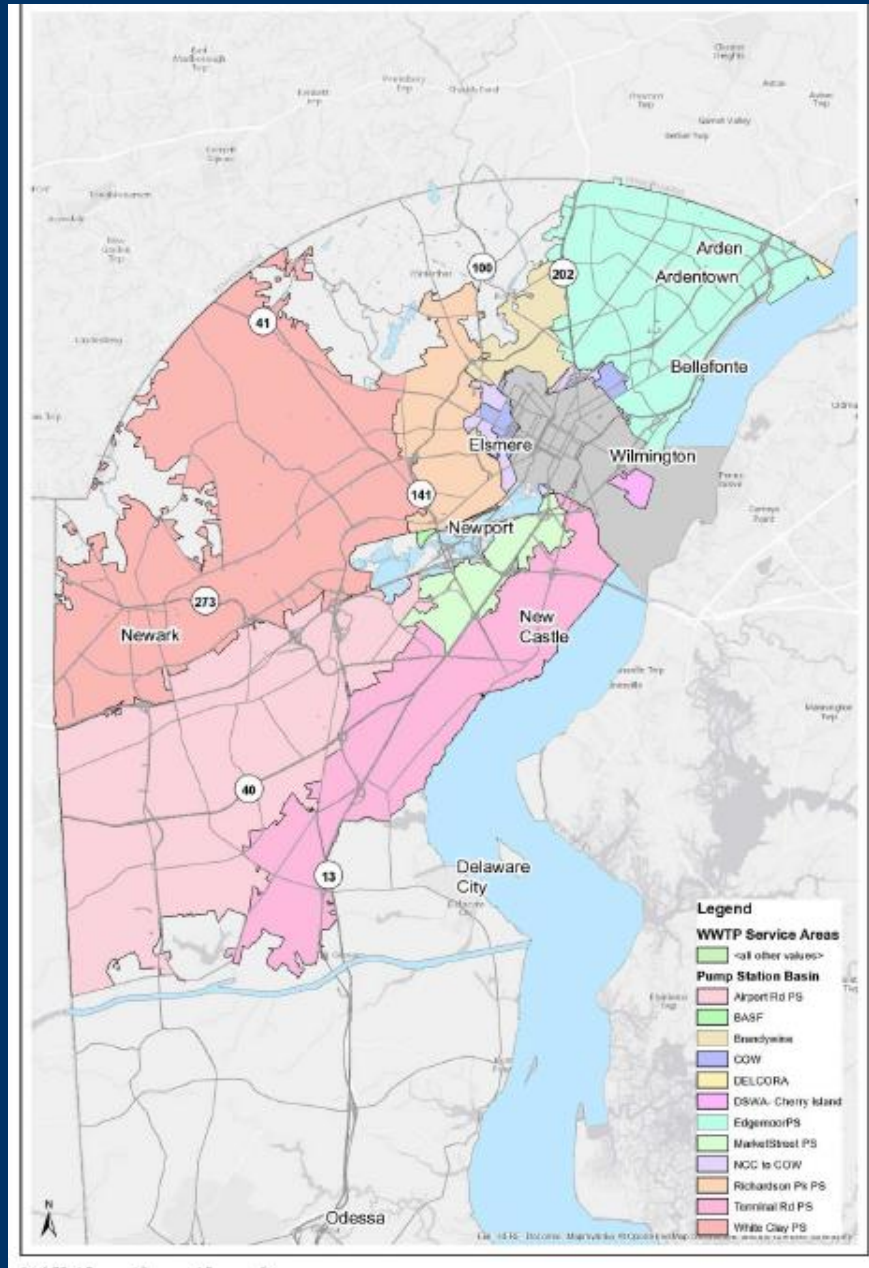


MIT Alm Lab will apply a RT-PCR protocol, adapted from published testing protocols, to detect the SARS-CoV-2 virus.



Biobot will communicate the test results back to participating communities.

Where We Tested



Approximately 500,000 residents

Interpreting the Results



COVID19 sewage sampling
Report provided: May 4, 2020 (updated)

Wilmington Wastewater Treatment Plant

Sample collection date: April 15, 2020

COVID19 confirmed cases in New Castle County, DE

As of April 15, 2020, as reported by USAfacts.org

New cases	Cumulative cases
27	974

SARS-CoV-2 virus in sewage

DETECTED

Virus concentration
per liter of sewage
81,059 copies

Biobot COVID19 case estimate

30,400 cases
(6.1% of catchment population)

SARS-CoV-2 detection over time



Biobot estimates in context

As a point of comparison, a large metropolitan area in Massachusetts had 72,800 copies of SARS-CoV-2 virus per liter of sewage. This translates to an estimated case prevalence of 5.6%.



COVID19 sewage sampling
Report provided: May 4, 2020 (updated)

Wilmington Wastewater Treatment Plant

Sample collection date: April 22, 2020

COVID19 confirmed cases in New Castle County, DE

As of April 22, 2020, as reported by USAfacts.org

New cases	Cumulative cases
49	1,352

SARS-CoV-2 virus in sewage

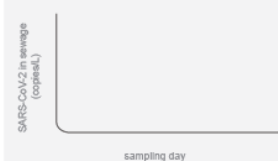
DETECTED

Virus concentration
per liter of sewage
209,806 copies

Biobot COVID19 case estimate

78,800 cases
(16% of catchment population)

SARS-CoV-2 detection over time



Biobot estimates in context

As a point of comparison, a large metropolitan area in Massachusetts had 72,800 copies of SARS-CoV-2 virus per liter of sewage. This translates to an estimated case prevalence of 5.6%.

Key Takeaways

- Indicates actual number of population infected is higher than human testing reveals
- If more people have had the virus:
 - More people have the antibodies and are presumably immune
 - The rates of hospitalization and fatality may be lower than current estimates

Sewer Operations

- This testing does not differentiate between live and dead virus
- Workforce initially surprised/concerned with results
- Measures put in place are protective regardless of prevalence of virus
 - Avoiding unnecessary exposure to wastewater, etc
 - Wearing proper PPE (N95 masks, etc) when necessary
- Sharing results on a weekly basis

Using the Data

- Data May Be Used to:
 - Estimate the scope of the outbreak independent from patient testing or hospital reporting, and include data on asymptomatic individuals,
 - Provide decision support for officials determining the timing and severity of public health interventions to mitigate the overall spread of the disease,
 - Track the effectiveness of interventions and measure the wind-down period of the outbreak, and
 - Provide an early warning for reemergence of the coronavirus (if it does indeed have a seasonal cycle).

Other Takeaways

- Technique is innovative and experimental
- Should be viewed as another tool to assess the spread of the virus and to inform decision-making.
- Not intended to override data provided by the State and other agencies.
- Samples were collected prior to treatment and disinfection by sodium hypochlorite (bleach)

Path Forward

- Continue monitoring at Wilmington WWTP Influent
- Adding 10 additional locations to further breakdown the service area and expand to previously unmonitored areas.
- Continue to share results with State and Local Officials and employees

Additional Testing Sites

