Managing a NPDES Sampling Program

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Lake County General Health District
Public Health
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Geauga Public Health
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Disclaimer

- The materials being presented represent the speakers' own opinions and do NOT reflect the opinions of NOWRA.

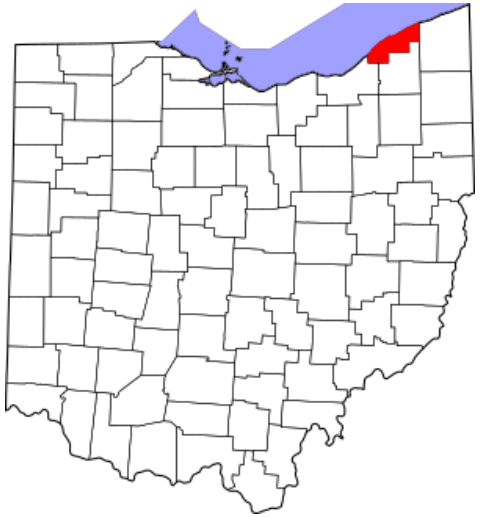
NPDES Sampling Requirements

- Annual sample
- Can be done by either private service provider companies or health department to comply with EPA
- In Geauga county, was not getting done
  - <8% sampling
  - Those sampled were strictly enforced upon while others went unsampled altogether
- Lake County sampled all NPDES since 2007

Geauga County Challenges

- Fourth most NPDES systems in the state
- Residents not accustomed to having system sampled
- "New" policy
- Leveraging lessons learned from Lake county
- Set yourself up for success
  - Get started and improve as you go

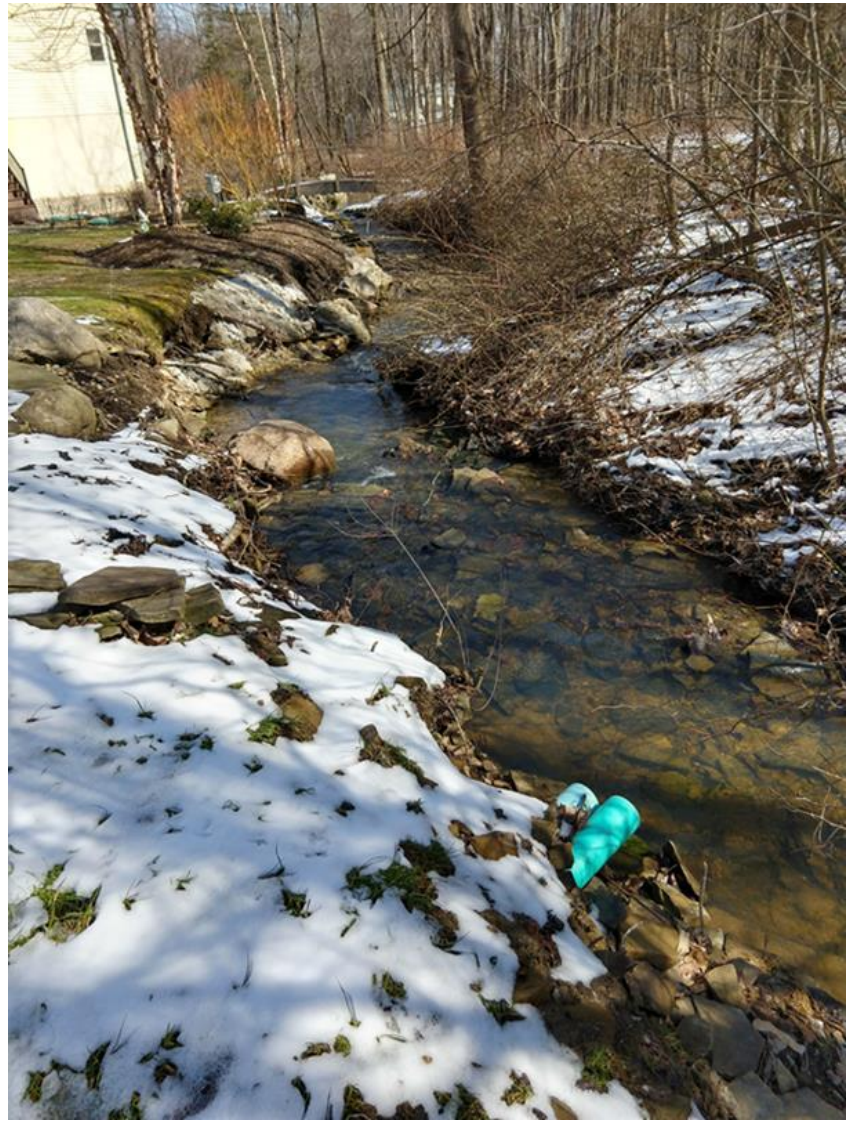
Lake County



Geauga County

Considerations

- **Seasonal vs. year-round sampling**
  - Workload
  - Staffing needs
  - Weather
- **Efficiency**
  - Administrative: billing & mailing results in bulk
  - Field: travel & coordination with the lab
- **Lab**
  - Capacity
  - Costs
  - Control



Seasonal vs. Year-Round Sampling

Seasonal

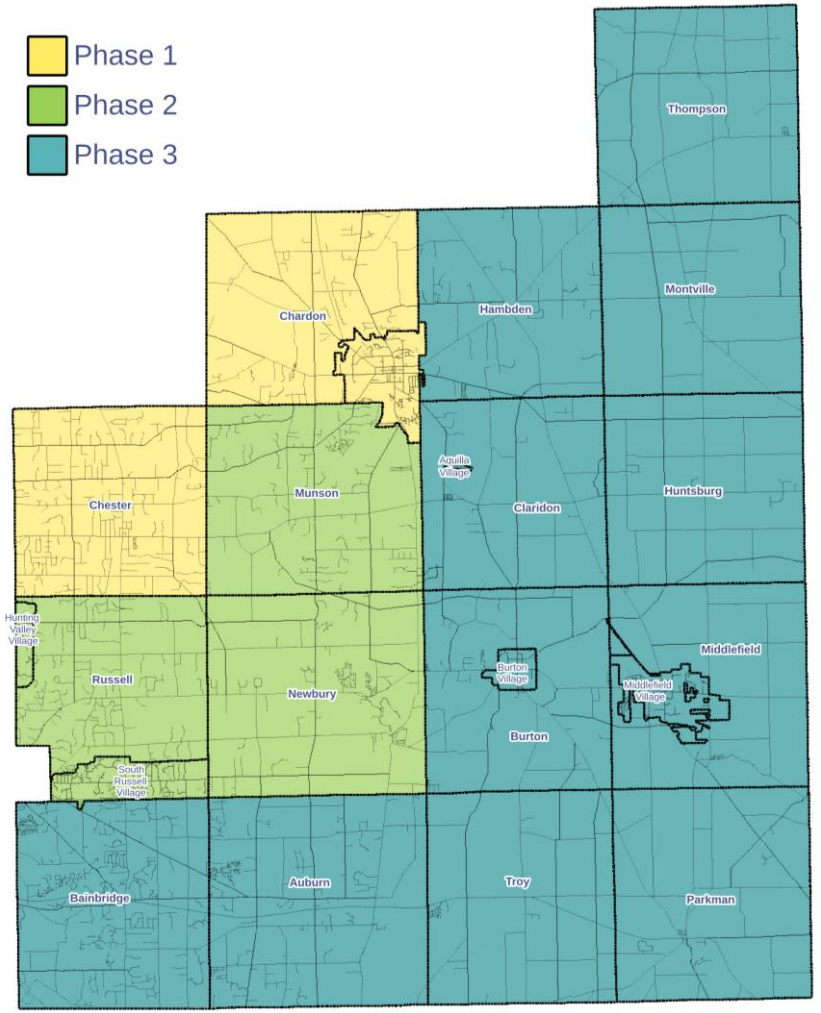
- Can use students (less expensive)
- Residents get used to sampling during same time of year
- Good weather for travel & accessing system components
- Don’t have to worry about changing parameter limits (Ammonia)

Year-Round

- Can spread out large volume of samples
- Not rushed
- Use internal staff (don’t have to train seasonal staff each year)
- Can compensate by focusing on specific areas in different seasons

Plan for Efficiency

- **Split county into 3 area-groups**
  - Distribute workload evenly throughout the year
  - Focus billing/sampling efforts in one area at a time
    - Efficiency of travel
    - Allay homeowner confusion
    - Ability to target public meetings
    - Minimize time between billing for sample and sample collection



Mail in Bulk

- **Notices sent in groups**
  - Bill in bulk in advance of sampling
  - Mail-merge sample result letters in bulk from spreadsheet tracker

Re: Proof of service required for NPDES Home Sewage Treatment System (HSTS) located at:
4321 Made Up Lane, Chesterland, OH 44026

On 2/12/2025 a representative of Geauga Public Health (GPH) collected an effluent sample from the sewage treatment system servicing the above referenced address, per the requirements of the General NPDES Permit which you were granted coverage under to allow you to discharge treated and disinfected sewage effluent to the waters of the state. Below are results of your sample:

Ohio EPA Parameters	Ohio EPA Effluent Limits	Homeowner's Sampling Results
E. coli Bacteria	≤ 410 CFU/ 100mL	2419.6 CFU/ 100mL
Total Suspended Solids (TSS)	≤ 18 mg/L	928 mg/L
Ammonia (NH_3) (Winter Sample)	≤ 4.5 mg/L	42.9 mg/L
Dissolved Oxygen (DO)	≥6.0 mg/L	7.2 mg/L

ACTION REQUIRED: PROOF OF SERVICE REQUIRED WITHIN **30 DAYS**

Please be advised, based on these sample results, your HSTS is creating a public health nuisance and is in violation of Ohio Administrative Code (OAC) 3701-29.

Your Ohio EPA permit requires that you:

- maintain a service contract for the lifetime of the system with a service provider certified by the manufacturer of your system, **NORWECO**
- provide ongoing proof of service to ensure that the system operates properly and does not discharge untreated sewage effluent to waters of the state.

You will be given **30 days** from the date of this letter to provide proof of maintenance. If the violation is not corrected, this matter may result in further administrative enforcement that could lead to legal action. Please submit proof of service to GPH via email to omreports@geaugacountyhealth.org or by mail with Attn: O&M Reports to ensure that your paperwork is processed promptly to verify compliance.

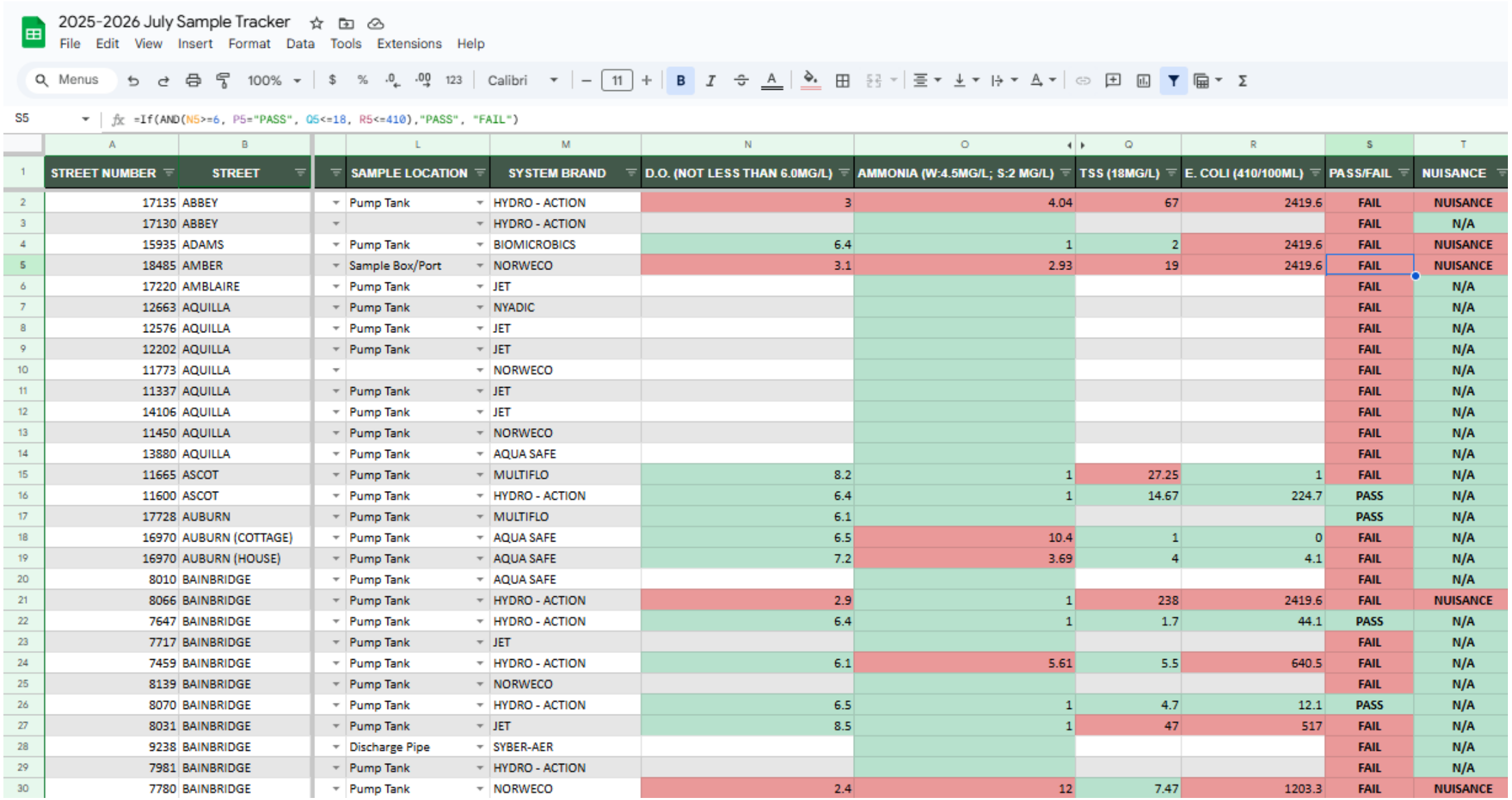
Scan the QR Code for a list of registered service providers that you can contact. You can use any provider that is certified to service **NORWECO** systems. For more information go to https://gphohio.org/om-septic/.

Your cooperation is greatly appreciated. If you have any questions regarding this letter, please contact our office at (440) 279-1914.

Scan for a list of septic providers

Tracking Results

- **Google sheets**
  - All public data
  - Accessible by staff internal and external to agency
  - Live data
  - “Filter Views” allow staff to enter & filter data without interfering with others using at the same time
  - Auto-calculations & automated color-coding minimize manual analysis
  - Exportable to excel for mail-merging result letters in bulk
  - Tracks progress to prevent overlap of efforts



2025-2026 July Sample Tracker

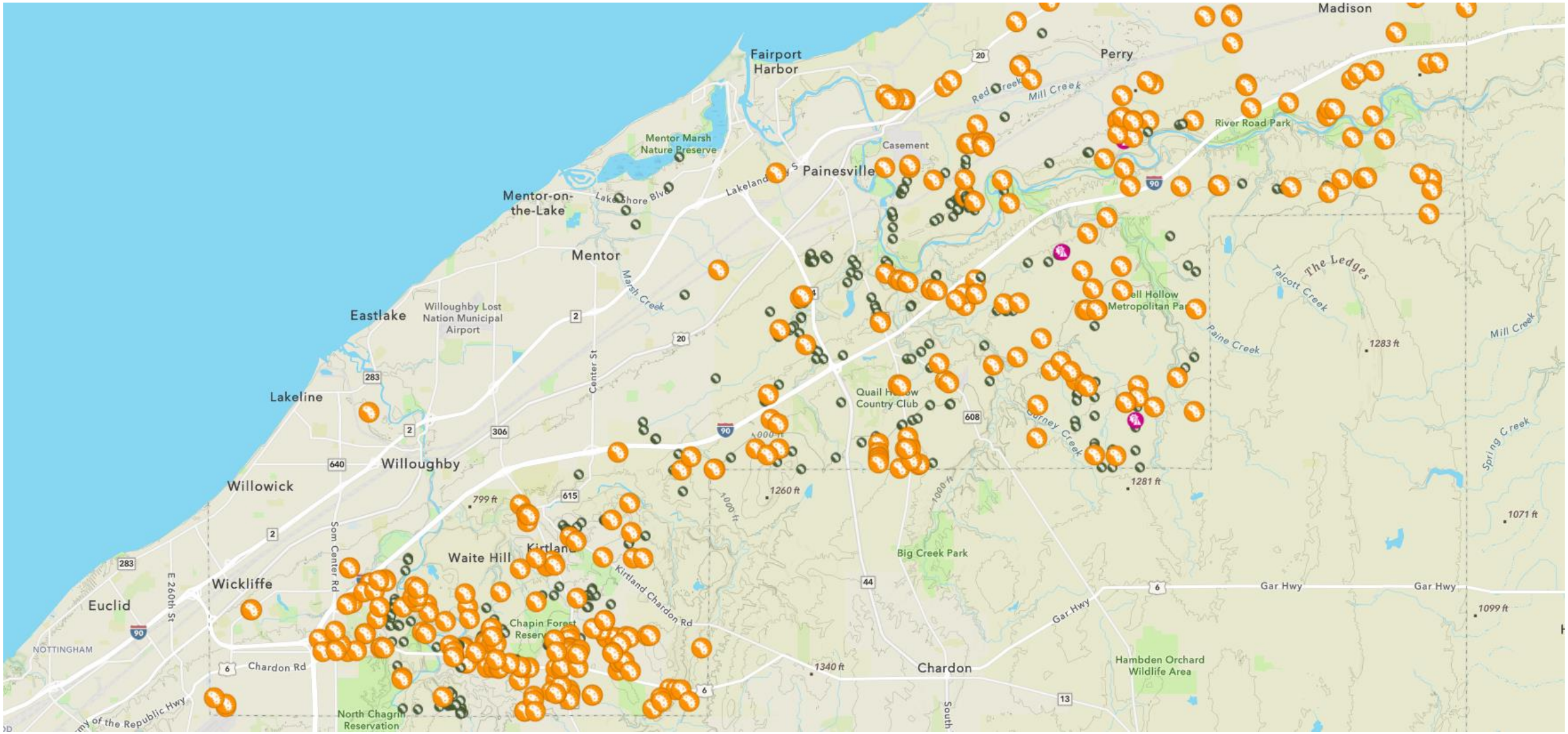
File Edit View Insert Format Data Tools Extensions Help

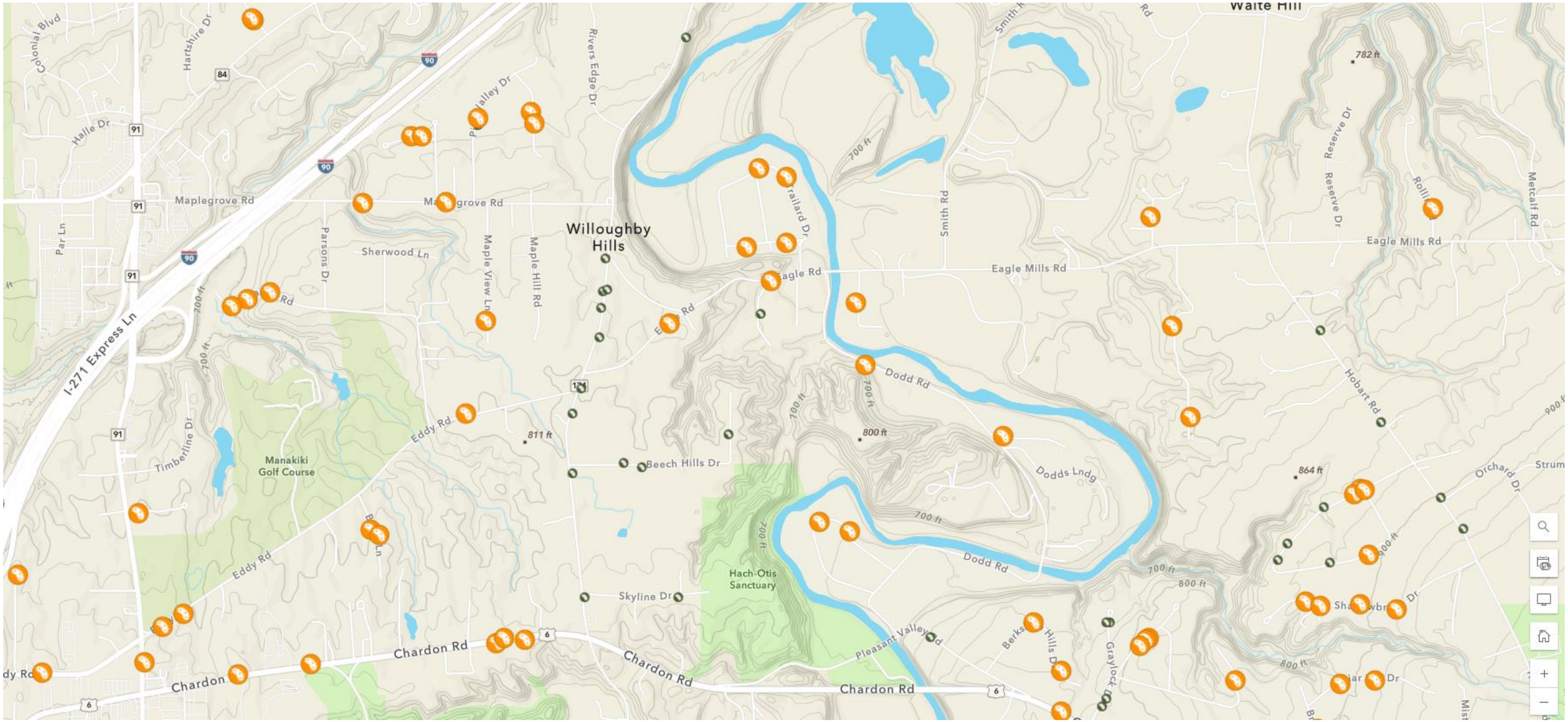
S5 =If(AND(N5>=6, P5="PASS", Q5<=18, R5<=410),"PASS", "FAIL")

	A	B	L	M	N	O	Q	R	S	T
1	STREET NUMBER	STREET	SAMPLE LOCATION	SYSTEM BRAND	D.O. (NOT LESS THAN 6.0MG/L)	AMMONIA (W:4.5MG/L; S:2 MG/L)	TSS (18MG/L)	E. COLI (410/100ML)	PASS/FAIL	NUISANCE
2	17135	ABBEY	Pump Tank	HYDRO - ACTION	3	4.04	67	2419.6	FAIL	NUISANCE
3	17130	ABBEY		HYDRO - ACTION					FAIL	N/A
4	15935	ADAMS	Pump Tank	BIOMICROBICS	6.4	1	2	2419.6	FAIL	NUISANCE
5	18485	AMBER	Sample Box/Port	NORWECO	3.1	2.93	19	2419.6	FAIL	NUISANCE
6	17220	AMBLAIRE	Pump Tank	JET					FAIL	N/A
7	12663	AQUILLA	Pump Tank	NYADIC					FAIL	N/A
8	12576	AQUILLA	Pump Tank	JET					FAIL	N/A
9	12202	AQUILLA	Pump Tank	JET					FAIL	N/A
10	11773	AQUILLA		NORWECO					FAIL	N/A
11	11337	AQUILLA	Pump Tank	JET					FAIL	N/A
12	14106	AQUILLA	Pump Tank	JET					FAIL	N/A
13	11450	AQUILLA	Pump Tank	NORWECO					FAIL	N/A
14	13880	AQUILLA	Pump Tank	AQUA SAFE					FAIL	N/A
15	11665	ASCOT	Pump Tank	MULTIFLO	8.2	1	27.25	1	FAIL	N/A
16	11600	ASCOT	Pump Tank	HYDRO - ACTION	6.4	1	14.67	224.7	PASS	N/A
17	17728	AUBURN	Pump Tank	MULTIFLO	6.1				PASS	N/A
18	16970	AUBURN (COTTAGE)	Pump Tank	AQUA SAFE	6.5	10.4	1	0	FAIL	N/A
19	16970	AUBURN (HOUSE)	Pump Tank	AQUA SAFE	7.2	3.69	4	4.1	FAIL	N/A
20	8010	BAINBRIDGE	Pump Tank	AQUA SAFE					FAIL	N/A
21	8066	BAINBRIDGE	Pump Tank	HYDRO - ACTION	2.9	1	238	2419.6	FAIL	NUISANCE
22	7647	BAINBRIDGE	Pump Tank	HYDRO - ACTION	6.4	1	1.7	44.1	PASS	N/A
23	7717	BAINBRIDGE	Pump Tank	JET					FAIL	N/A
24	7459	BAINBRIDGE	Pump Tank	HYDRO - ACTION	6.1	5.61	5.5	640.5	FAIL	N/A
25	8139	BAINBRIDGE	Pump Tank	NORWECO					FAIL	N/A
26	8070	BAINBRIDGE	Pump Tank	HYDRO - ACTION	6.5	1	4.7	12.1	PASS	N/A
27	8031	BAINBRIDGE	Pump Tank	JET	8.5	1	47	517	FAIL	N/A
28	9238	BAINBRIDGE	Discharge Pipe	SYBER-AER					FAIL	N/A
29	7981	BAINBRIDGE	Pump Tank	HYDRO - ACTION					FAIL	N/A
30	7780	BAINBRIDGE	Pump Tank	NORWECO	2.4	12	7.47	1203.3	FAIL	NUISANCE

Moving Forward

- **GIS Integration**
  - More secure from accidental data manipulation
  - Mapped out for ease of route-planning & tracking of completed areas
  - Internal dashboard for tracking progress by staff, area, day etc.
  - Public portal of locations and results
  - Can attach photos on site of sampling locations etc.
  - Able to generate sample result letters directly out of software (instead of using an external mail merge)


Madison
Fairport Harbor
Perry
Mentor Marsh Nature Preserve
Casement
Painesville
River Road Park
Mentor-on-the-Lake
Mentor
Eastlake
Willoughby Lost Nation Municipal Airport
Lakeline
Willoughby
Willowick
Waite Hill
Wickliffe
Euclid
NOTTINGHAM
Chardon Rd
North Chagrin Reservation
Chapin Forest Reserv
Kirtland Chardon Rd
Big Creek Park
Chardon
Hambden Orchard Wildlife Area
Gar Hwy
Quail Hollow Country Club
The Ledges
Talcott Creek
Paine Creek
Mill Creek
Spring Creek
Burney Creek
Marsh Creek
Center St
Som Center Rd
E 260th St
1283 ft
1281 ft
1260 ft
1071 ft
1099 ft
1340 ft
799 ft


Willoughby Hills
Maplegrove Rd
Sherwood Ln
Parsons Dr
Maple View Ln
Maple Hill Rd
Rivers Edge Dr
Eagle Rd
Eagle Mills Rd
Smith Rd
Reserve Dr
Hobart Rd
Metcalf Rd
Dodd Rd
Dodds Lndg
Beech Hills Dr
Eddy Rd
Timberline Dr
Manakiki Golf Course
Skyline Dr
Hach-Otis Sanctuary
Chardon Rd
Pleasant Valley Rd
Orchard Dr
I-271 Express Ln
Colonial Blvd
Hartshire Dr
Halle Dr
Waite Hill
782 ft
811 ft
800 ft
864 ft
700 ft

From the Field to the Lab

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Lake County Wastewater Lab

- In 2024, the Lake County General Health District (LCGHD) officially launched its internal laboratory
  - Analyze E. coli, Ammonia, and Total Suspended Solids (TSS)
- Also take in samples from Geauga Public Health's NPDES program, Lake County Soil & Water, stream sampling, nuisance investigations and beach sampling program

Former Sample Processing Facilities

- **Wastewater Lab (in county)**
- **Wastewater Lab (out of county)**
- **Local College Lab**
  - Staffed and run by college interns/students

External Lab Issues

- **Workflow**
  - The coordination across different facilities, systems, and steps introduces inefficiencies
- **Increase in Samples**
  - High sample volume exceeded external lab capacity

Local College Lab

- **Intern Recruitment**
  - Performance can be inconsistent
- **Operational Trade-offs**
  - Priority not always aligned with the most streamlined or effective process
  - Utilized methods that used more in-depth lab procedures
- **Quality Concern**
  - Variability in results, there were challenges in trusting the results at times
- **Sampling Timeline**
  - Could only be conducted during the summer months

Need for Change

- **Issues**
  - Increase in lab fees, material, courier cost
  - External labs at max capacity with increase in samples each year
  - Results issues
- **We had 3 options**
  - Increase cost of sampling to the homeowner
  - Find a new affordable lab that can take in all our samples
  - Build and run internal lab
- **Only one option allowed us to maintain and control current fees**

Decision – Internal Lab

- Had the availability to build a lab inside our building suitable to take in all NPDES samples in Lake & Geauga County
- The lab setup was supported by the expertise and hands-on assistance of a wastewater lab manager at a local facility

Cost Benefits

- **Cost Stability despite Initial Investment**
  - Despite significant cost and effort in designing, building, and staffing the lab, running it internally has enabled us to maintain consistent sample fees—protecting homeowners from increases.
    - Same fees for LCGHD for over 10 years.
    - Same for Geauga county – no increase in sampling fees

Internal Lab - Benefits

- **Direct Oversight**
  - Grants full control over sample workflow, scheduling, and analysis standards
  - Processing our own samples ensures manageable workload and prioritization
- **Internal Workload**
  - All sampling is now done in house by full-time employees
  - Has led to a more consistent workflow

Lab Numbers

- **We effectively process approximately 2700 NPDES samples a year**
  - Lake County
    - Appx. 700 a year
  - Geauga County
    - Appx. 2000 a year
- **Appx. 250 other samples a year**
  - Re-samples, Lake County Soil and Water, stream sampling, nuisance investigations, storm water screening sampling, beach samples

Laboratory: Key Facts & Updates

- **No Laboratory Certification Required**
  - Any health department (Ohio) with sufficient space and administrative interest can conduct residential NPDES sample testing
    - Only for wastewater sampling. Not drinking water.
- **Current Initiative: Building Staff Credentials**
  - Ohio Water Environment Association (OWEA) via its Voluntary Wastewater Laboratory Analyst Certification Program
  - Not state mandated or license requirement, but widely adopted as a professional standard in Ohio

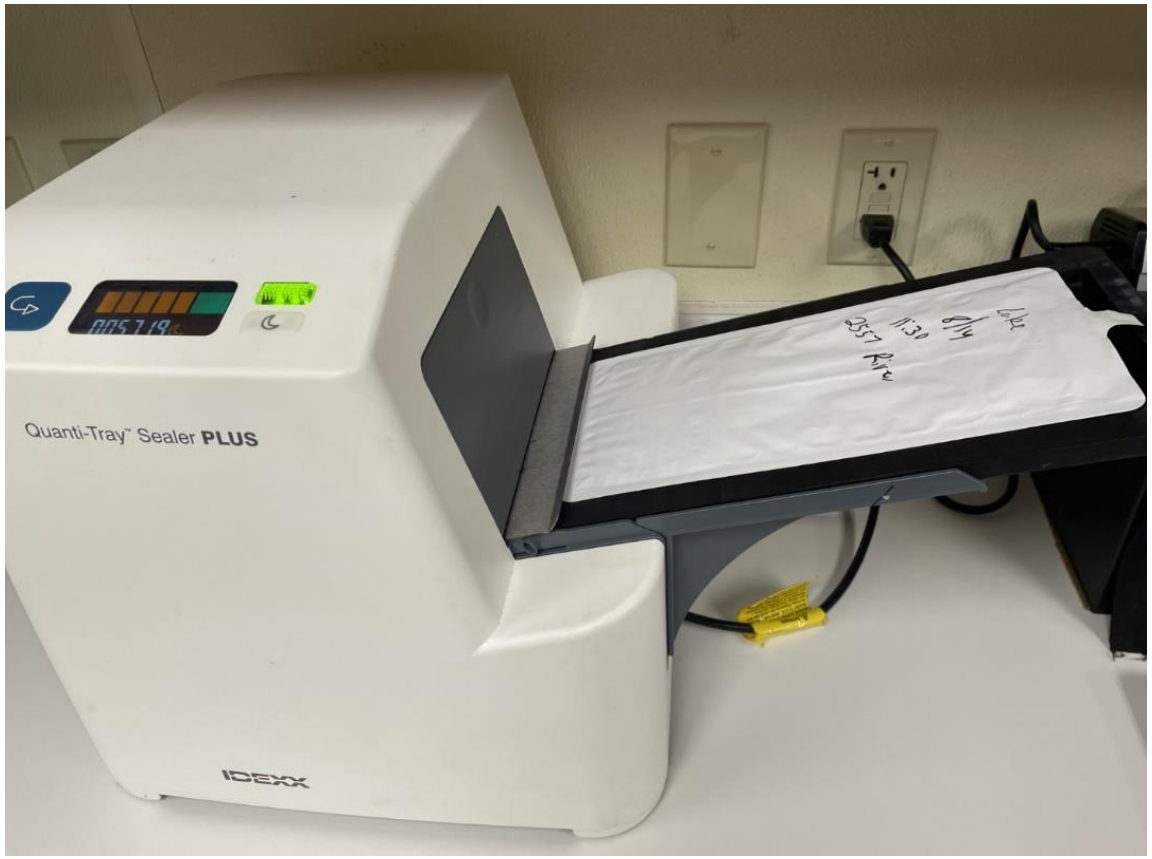
Sample Procedures

- **E. coli**
- **Ammonia**
- **Total Suspended Solids (TSS)**

E. coli

- Add Reagent
- Pour into Quanit-Tray

E. coli



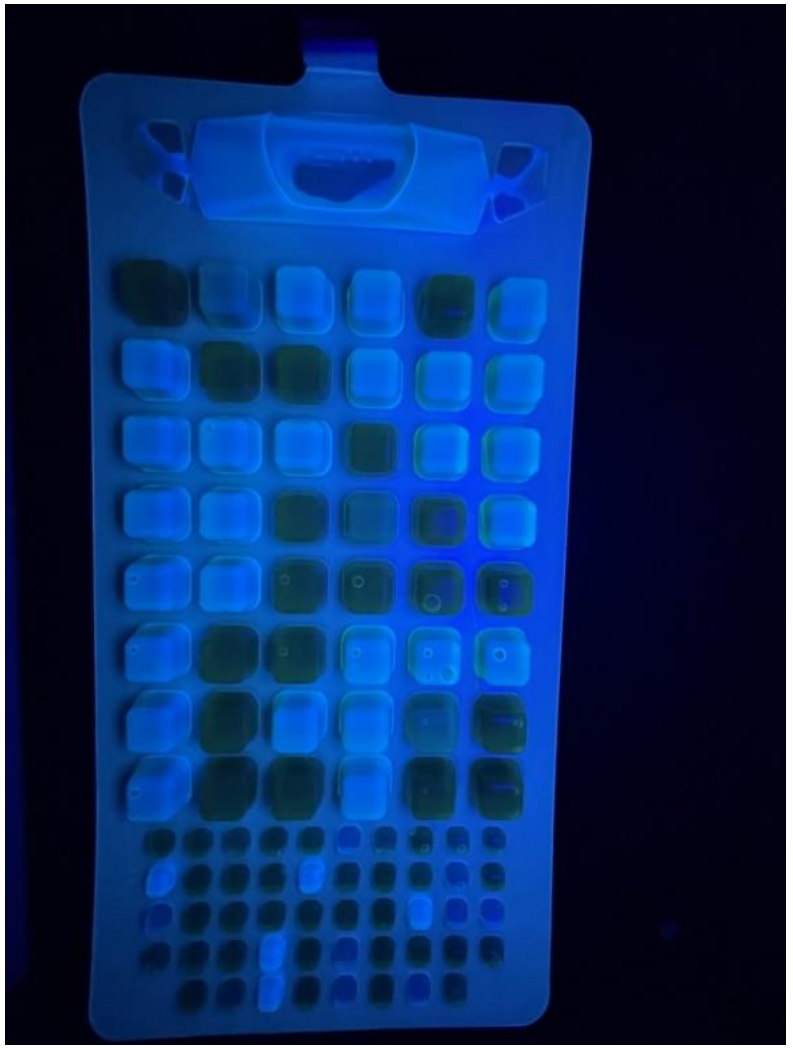
Seal in Quanti-Tray Sealer

E. coli

- Place in incubator for 24 hours

E. coli

Yellow Wells = Positive for Total Coliform



Yellow Wells + Fluorescence = Positive for E. coli

E. coli Results Table

IDEXX Quanti-Tray®/2000 MPN Table

# Large Wells Positive	# Small Wells Positive																						
	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
0	25.3	26.4	27.4	28.4	29.5	30.5	31.5	32.6	33.6	34.7	35.7	36.8	37.8	38.9	40.0	41.0	42.1	43.1	44.2	45.3	46.3	47.4	48.5	49.5
1	26.6	27.7	28.7	29.8	30.8	31.9	32.9	34.0	35.0	36.1	37.2	38.2	39.3	40.4	41.4	42.5	43.6	44.7	45.7	46.8	47.9	49.0	50.1	51.2
2	27.9	29.0	30.0	31.1	32.2	33.2	34.3	35.4	36.5	37.5	38.6	39.7	40.8	41.9	43.0	44.0	45.1	46.2	47.3	48.4	49.5	50.6	51.7	52.8
3	29.3	30.4	31.4	32.5	33.6	34.7	35.8	36.8	37.9	39.0	40.1	41.2	42.3	43.4	44.5	45.6	46.7	47.8	48.9	50.0	51.2	52.3	53.4	54.5
4	30.7	31.8	32.8	33.9	35.0	36.1	37.2	38.3	39.4	40.5	41.6	42.8	43.9	45.0	46.1	47.2	48.3	49.5	50.6	51.7	52.9	54.0	55.1	56.3
5	32.1	33.2	34.3	35.4	36.5	37.6	38.7	39.9	41.0	42.1	43.2	44.4	45.5	46.6	47.7	48.9	50.0	51.2	52.3	53.5	54.6	55.8	56.9	58.1
6	33.5	34.7	35.8	36.9	38.0	39.2	40.3	41.4	42.6	43.7	44.8	46.0	47.1	48.3	49.4	50.6	51.7	52.9	54.1	55.2	56.4	57.6	58.7	59.9
7	35.0	36.2	37.3	38.4	39.6	40.7	41.9	43.0	44.2	45.3	46.5	47.7	48.8	50.0	51.2	52.3	53.5	54.7	55.9	57.1	58.3	59.4	60.6	61.8
8	36.6	37.7	38.9	40.0	41.2	42.3	43.5	44.7	45.9	47.0	48.2	49.4	50.6	51.8	53.0	54.1	55.3	56.5	57.7	59.0	60.2	61.4	62.6	63.8
9	38.1	39.3	40.5	41.6	42.8	44.0	45.2	46.4	47.6	48.8	50.0	51.2	52.4	53.6	54.8	56.0	57.2	58.4	59.7	60.9	62.1	63.4	64.6	65.8
10	39.7	40.9	42.1	43.3	44.5	45.7	46.9	48.1	49.3	50.6	51.8	53.0	54.2	55.5	56.7	57.9	59.2	60.4	61.7	62.9	64.2	65.4	66.7	67.9

Ammonia

- Magnetic Mixer
- Ammonia TNT Vials

Ammonia

Place 0.5mL of sample into TNT vial. Let sit for 15 minutes.

Ammonia

Place vial into spectrophotometer.

Gives ammonia reading.

Total Suspended Solids (TSS)

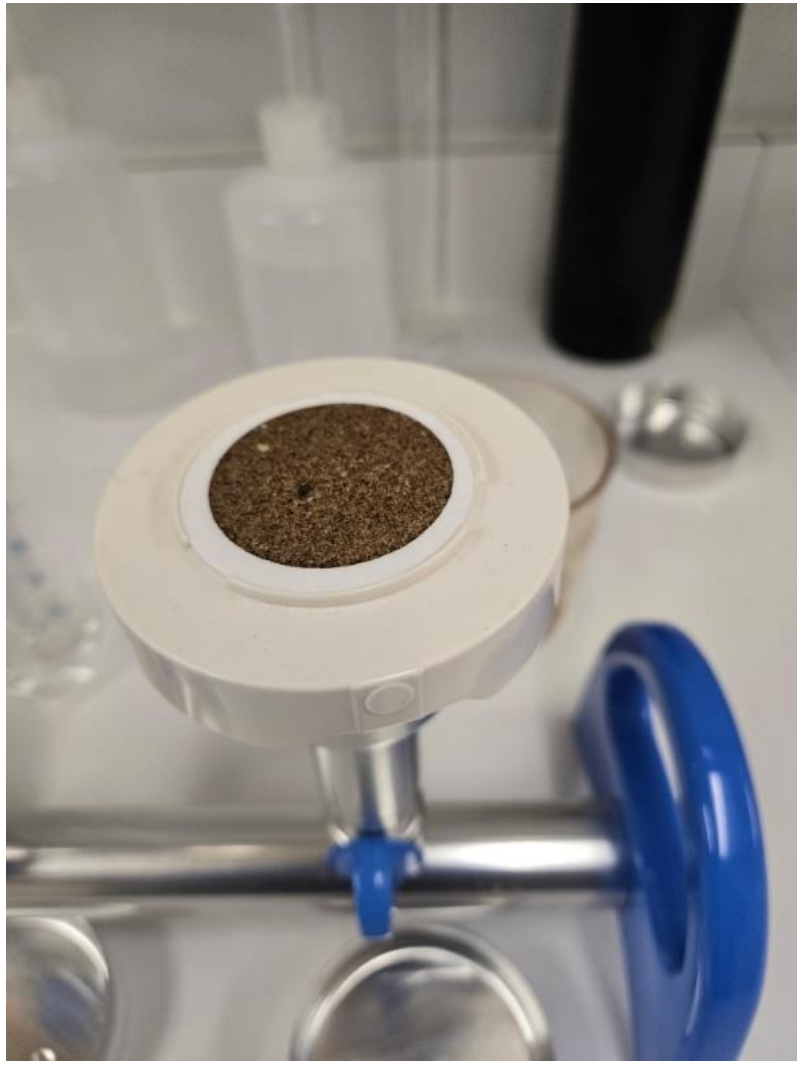
- **Pour 100mL into graduated cylinder**
- **Glass fiber filter paper**

TSS

- **Place filter paper on the manifold.**
- **Pour 100 mL at a time until water flowing through filter slows down or run out of sample.**

TSS

Filter paper examples after wastewater ran through.



TSS

- **Place filter paper in oven for 1 hour**
- **Weigh sample. Plut back in oven. Weigh again.**

Our Approach

- Grounded in diligence, transparency, and a strong commitment to homeowner satisfaction
- We ensure that our methods not only meet regulatory standards but also deliver confidence to the homeowner that their sample is being properly taken and processed

Re-cap

- **Needed Change**
  - Situation caused for a change needed in where samples were taken
- **Implementation Challenges**
  - Establishing the laboratory internally encountered notable delays
- **Value Realized**
  - Benefits of conducting these tests in-house have already significantly outweighed the initial drawbacks

We've benefited immensely from peer support and collaboration. If you're considering launching your own residential NPDES testing laboratory, please reach out for guidance, insights, or further information.

Just some interesting things we run into…

Can’t stand to look at those lids…

Wasps around the tank lid

You can’t make this stuff up

It's not all bad though

QUESTIONS?

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