



Water Quality

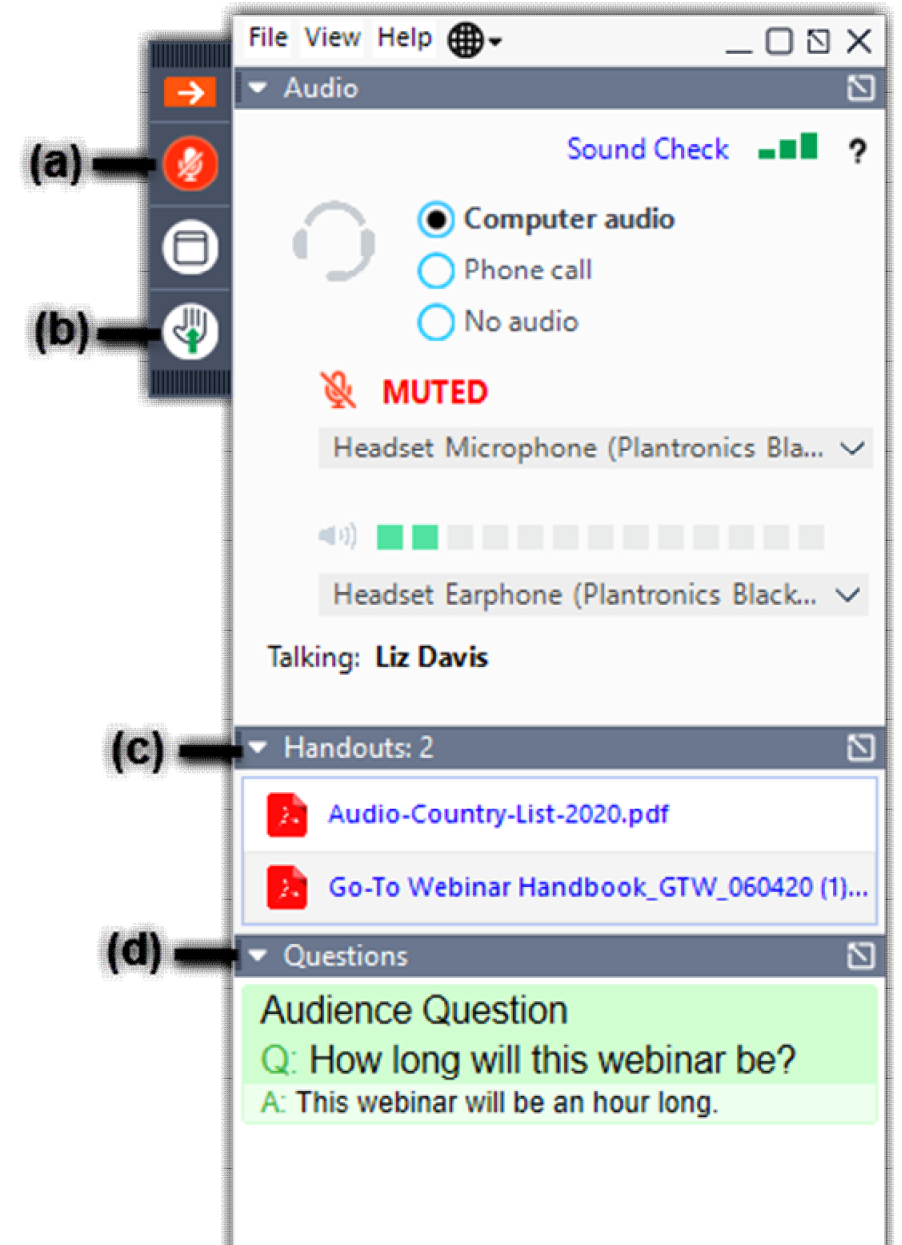
Water Quality Monitoring and Protection

Virginia Department of Environmental Quality
April 30, 2024

How to Use GoToWebinar

- (a) Mute button
- (b) Raise hand button
- (c) Handouts available to download
- (d) Questions box

Please be sure to **mute yourself** during the presentation. Thank you!



Introductions

- DEQ Webinar Learning Series
 - Learn more at www.deq.virginia.gov/eduseries
- Question moderators
 - May Fornari – Piedmont Environmental Justice Coordinator
 - Grace Holmes – Tidewater Environmental Justice Coordinator
- Speaker
 - Kate Miller – Blue Ridge, Southwest, Valley Environmental Justice Coordinator

Welcome & Agenda

- Intro to DEQ
- Definitions and acronyms
- What is water quality?
- Water quality monitoring
- Assessing water quality data
- Planning and implementing water quality improvements
- How can you protect water quality?
- Questions



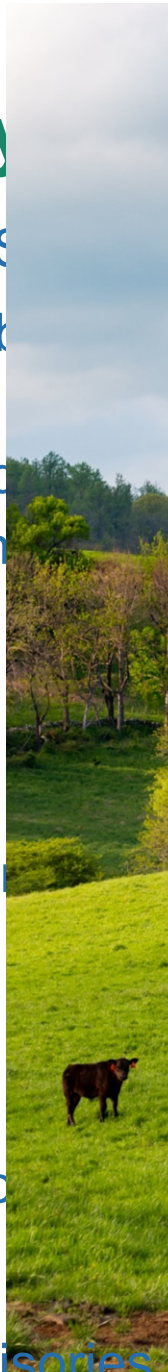
Intro to DEQ

- The environmental agency of the Commonwealth, responsible for laws and regulations related to:
 - Air Quality & Renewable Energy
 - Land Protection
 - Water Quality & Water Supply
- What does that mean in practice?
 - Permits
 - Inspections/Compliance/Enforcement
 - Monitoring
 - **Additional Areas:** Environmental Impact Review, Coastal Zone Management, Groundwater Management, Environmental Enhancement Programs (<https://www.deq.virginia.gov/home> for more)

Definitions and Acronyms

- Water Quality Standards (WQS)
 1. Designated uses of a water body (e.g. recreation)
 2. Criteria to protect designated uses
 - Numeric (e.g. 0.30 mg/kg in tissue)
 - Narrative (e.g. free from substances which interfere with human health*)
 3. Protection of existing uses and high quality/high value waters.
- Point sources
- Non-point sources (NPS)
- TMDL – Total Maximum Daily Load
- IP – Implementation Plan

*deferring to VDH advisories



CUNNINGHAM CREEK

Watershed plan



A plan to reduce bacteria and sediment in the water

Technical Document

March 2, 2018

Prepared by

VA Department of Environmental Quality

In Cooperation with

Local Stakeholders

and

Virginia Tech Biological Systems Engineering

Water Quality – Designated Uses



Aquatic Life



Fish Consumption



Public Water Supplies



Recreation (Swimming)



Shellfishing



Wildlife

- Water bodies that do not meet these standards have “impaired” water quality.

Virginia's Designated Uses & Water Quality Criteria

Public Water Supply	Fish Consumption	Shellfishing	Recreation	Aquatic Life	Wildlife
<ul style="list-style-type: none">• Water Column Toxics	<ul style="list-style-type: none">• Water Column Toxics• Fish Tissue Toxics (MeHg only)	<ul style="list-style-type: none">• Fecal Bacteria	<ul style="list-style-type: none">• E. coli (freshwater)• Enterococcus (marine)	<ul style="list-style-type: none">• Water Column Toxics• pH• Dissolved Oxygen• Temperature• Chlorophyll / Total Phosphorus	<ul style="list-style-type: none">• Water Column Toxics

Examples of Impaired Water Bodies in Virginia

- James River
- Hawksbill Creek
- Map of Impaired Water Bodies (zoomed in)
- 2022 list of impaired water bodies (303(d) list)



Virginia Department of Environmental Quality Appendix 1a - 2022 Impaired Waters - 303(d) List Category 5 - Waters Needing Total Maximum Daily Load Study

Potomac and Shenandoah River Basins

Cause Group - Water Name		Cause Category	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)	Initial List Date	TMDL Dev. Priority
Impaired Use	Cause						
A01R-01-BEN - Dutchman Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			2.94	2018	L
A02R-01-BEN - Catoctin Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			6.53	2020	L
A02R-03-BEN - South Fork Catoctin Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			6.34	2008	L
A02R-05-BEN - Milltown Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			3.91	2022	L
A03R-02-BAC - Clarks Run							
Recreation	Escherichia coli (E. coli)	5A			5.46	2008	L
A03R-03-BEN - Big Spring Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			4.49	2018	L
A05R-01-BEN - Wancopin Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			3.44	2008	L
A05R-02-BEN - Jeffries Branch							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			4.42	2012	L
A05R-03-BEN - Goose Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			10.58	2018	L
A06R-01-BEN - North Fork Goose Creek							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			4.7	2010	L
A06R-01-PH - Jacks Run							
Aquatic Life	pH	5A			3.18	2020	L
A06R-02-BEN - Jacks Run							
Aquatic Life	Benthic Macroinvertebrates Bioassessments	5A			3.18	2018	L
A07R-02-BEN - North Fork Beaverdam Creek							

Water Quality Laws and Regulations

EPA's **Clean Water Act** and Virginia's **State Water Control Law** gives DEQ the authority to protect and regulate water quality.

- **Virginia State Water Control Law** – authorizes DEQ to improve and protect Virginia's waters
- **Clean Water Act (CWA)** – Sections 305(b) and 303(d) require that states monitor and assess their waters, prepare a report every 2 years describing water quality status, and develop plans to restore the quality of waters deemed “impaired.”
- **Virginia Water Quality Monitoring, Information and Restoration Act (WQMIRA)** – an article of State Water Control Law and has similar requirements to CWA, but also requires that Virginia develop implementation plans to restore water quality

Pause!

Any questions before jumping into the next section on how DEQ protects water quality?

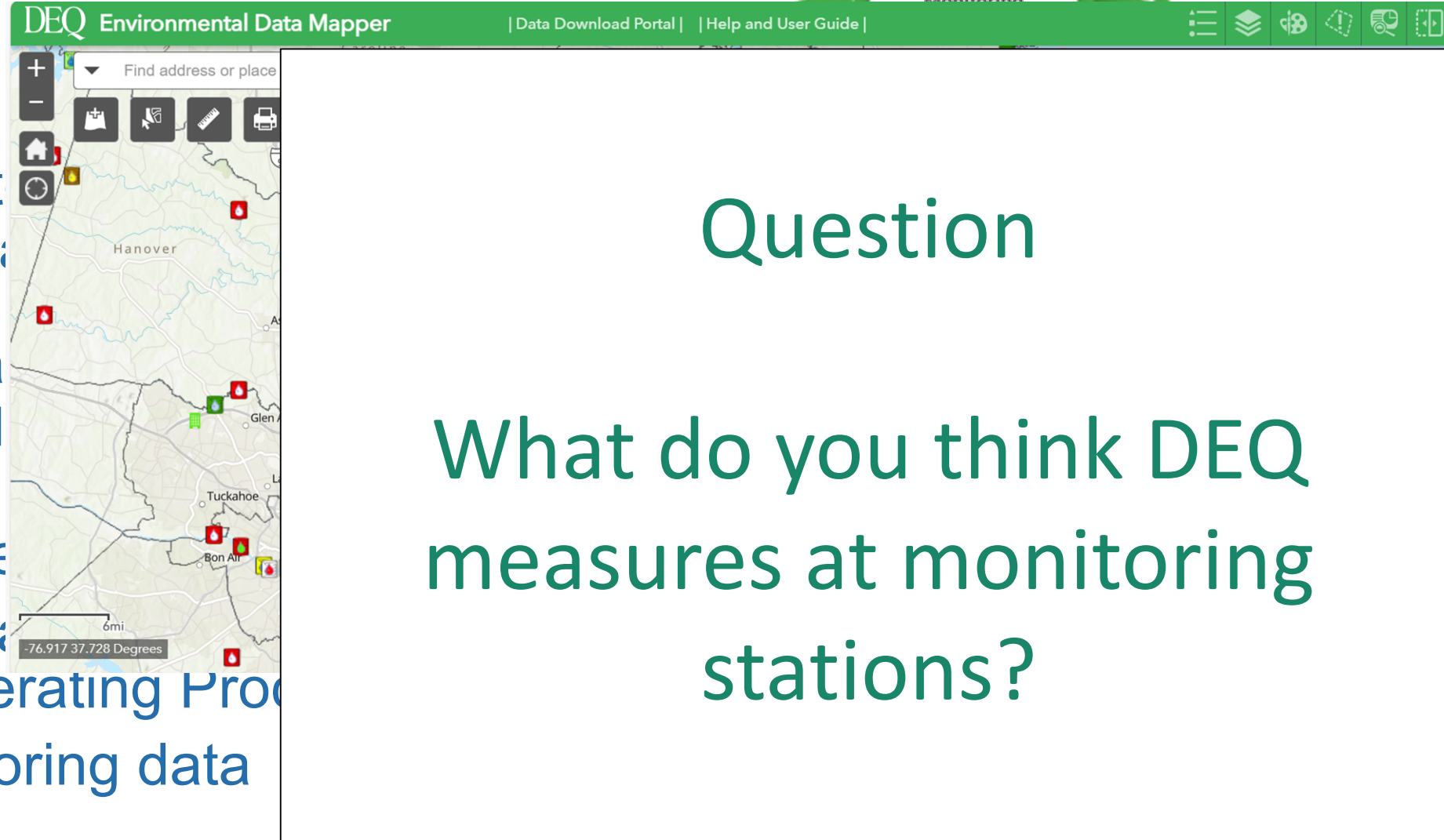
How does DEQ protect water quality?

- DEQ has several water quality programs that are a part of its **Continuous Planning Process (CPP)**
 - Monitoring
 - Assessment/Reporting
 - Cleanup Studies and Implementation
 - Permitting and Other Controls
 - Financing and Other Cleanup Actions



Water Quality Monitoring

- DEQ monitoring in 2024 monitoring stations
 - Chemical data (e.g., dissolved oxygen)
 - Physical data (e.g., temperature)
 - Biological data (e.g., macroinvertebrates)
- Year-round periodic monitoring
- Quality Assurance Standard Operating Procedures
- Citizen monitoring data



Public Involvement in Water Quality Monitoring

- You can nominate a state surface water body for monitoring
- You can submit water quality monitoring data to DEQ
- Data may be used for:
 - List and delist impaired waters on the 303(d) List
 - Identify waters for TMDL development
 - Track progress for waters with approved TMDL and/or IP
 - Target waters for future DEQ monitoring
 - Educate landowners on the water quality impacts of land use activities
- Quality Assurance Plan & Standard Operating Procedures
- Funding available to individuals and organizations (applications generally open in the summer)

Public Involvement in

Answer in the chat

DEQ's Citizen Water Quality Monitoring Grant makes it possible for the James River Association to work with volunteers to test over 30 sites throughout the James River watershed, allowing us to **make sure that the community is informed and knowledgeable about river conditions** before they go out to recreate....Our volunteers are key to the program's success – [one] a Lower James River volunteer expressed the significance of DEQ's support stating, "Folklore exists about whether and when it is safe to swim at our neighborhood beach, so **having the opportunity to contribute data and educate neighbors about using it was the perfect way to help us enjoy the river more and contribute to its improving health.**"

~Caron Sterling, Director of Grants, James River Association

The impact of [the DEQ] funding is immeasurable, enabling us to establish, maintain, and execute **a citizen-based, all-volunteer Water Quality Monitoring Program that supports DEQ efforts to perform Clean Water Act water quality assessments for the lake and the watershed**...The data generated by LACA's Water Quality Monitoring Program also supports our cyanobacteria monitoring program that is **enabling research into identifying the sources of cyanobacteria blooms that have plagued the lake since 2018**...LACA's success story is undeniably intertwined with the funding we receive each year from DEQ's Citizen Water Quality Monitoring program and we are proud to be a partner with DEQ in these efforts.

~Harry Looney, Water Quality Program Manager, Lake Anna Civic Association

How DEQ Uses Public Monitoring Data

- DEQ reviews and classifies public monitoring data into three levels based on quality assurance:
 - **Level I:** no quality assurance or numeric VA water quality standard for the parameter. Data are used for educational purposes, or to identify potential water quality concerns.
 - **Level II:** data have a quality assurance plan and standard operating procedures. Data are used to identify water for follow up monitoring by DEQ and to track performance following TMDL implementation.
 - **Level III:** data have a quality assurance plan and standard operating procedures and are audited to confirm adherence to protocols. Data are used for water quality assessments in accordance with DEQ's Water Quality Assessment Guidance Manual.

How Data is Being Used by DEQ

Example:
Volunteer monitoring in the Chesapeake Bay

Monitoring Project & Parameters	Bay Designated Use Attainment	Non-Bay Criteria Assessments	Estuarine Model	Watershed Model	Bay Trend Analysis	Research/Tool Development
Mainstem	√	√	√		√	√
Tidal Tributary	√	√	√		√	√
Non-Tidal Network		√		√	√	√
Shallow Water Habitat	√		√			√
Living Resources	√		√		√	√
SAV	√				√	√
Estuarine Probabilistic	√	√				
Citizen Monitoring	√	√				√



How Data is Being Used by DEQ

Example: Volunteer monitoring in the Chesapeake Bay

The screenshot shows the Virginia Data Explorer website. At the top is a navigation bar with the DEQ logo, links for Home, About, Contact, and Resources, and buttons for Register and Log in. Below the navigation bar is a welcome message: "Welcome to the Virginia Data Explorer!". This is followed by a paragraph explaining that the tool is for storing and sharing data collected by citizen and non-agency groups monitoring water quality and benthic macroinvertebrates in Virginia. It mentions a partnership with the Virginia Department of Environmental Quality and the Chesapeake Monitoring Cooperative. A link to the Chesapeake Data Explorer is provided. Below this, there is a note about data identification and quality assurance, and a list of responsibilities for data users. At the bottom, there are instructions on how to use the Map and Query tabs. The main content area features a map of Virginia with numerous green dots representing data points. On the left side of the map, there is a "Station Type" legend with "Water Quality" selected and "Benthic Macroinvertebrate" as an option. Below the legend is a "Data Type" dropdown menu. On the right side of the map, there is a legend for map styles: "Open Street Map Gray" (selected), "Open Street Map", "Aerial", and "Counties". A vertical "Instructions" link is on the far right.

DEQ

Home About Contact Resources

Register Log in

Welcome to the Virginia Data Explorer!

The Virginia Data Explorer is a tool for storing and sharing data collected by a network of citizen and non-agency groups who monitor water quality and benthic macroinvertebrates in Virginia in partnership with the [Virginia Department of Environmental Quality](#) and the [Chesapeake Monitoring Cooperative](#). This is a Virginia-specific extension of the CMC Data Explorer that includes waters monitored in Virginia that are outside of the Chesapeake Bay Watershed. Virginia citizen and non-agency groups' data collected within the Chesapeake Bay watershed and outside of Virginia can be viewed and accessed in the [Chesapeake Data Explorer](#).

For more information on citizen and non-agency monitoring in Virginia, visit Virginia DEQ's [Citizen Monitoring website](#).

Data are identified by method and quality assurance level using the [CMC tiered framework](#) and are owned by the data provider(s) and not the Chesapeake Monitoring Cooperative. Data users are:

- Responsible for [properly citing](#) the original data provider. Contact information for data providers can be found [HERE](#).
- Responsible for using provided data in a manner consistent to the quality assurance of the provided data.

Use the **Map tab** to view Water Quality or Benthic Macroinvertebrate data throughout the watershed. Use the **Query tab** to download data and metadata files.

Map Query

Station Type

- ☒ Water Quality
- ☐ Benthic Macroinvertebrate

Data Type

Open Street Map Gray

Open Street Map

Aerial

Counties

Instructions

DEQ accepts water quality data to be reviewed and evaluated for assessment purposes on a continual basis.

- Data collected anywhere within the Commonwealth may be submitted by uploading to the Virginia Data Explorer, developed in partnership with VIMS and the Chesapeake Monitoring Cooperative.

Water Quality Assessments

- Analyzing data
 - In the context of the designated uses (Aquatic life, Fish consumption, Public water supplies, Recreation, Shellfishing, Wildlife)
- Assessing water quality
 - Water Quality Assessment Guidance Manual
- Identifying impaired waters
- Sharing data – working with other state agencies to manage, protect and improve water quality including:
 - Department of Health
 - Department of Conservation and Recreation
 - Department of Wildlife Resources
 - Virginia Energy
 - Marine Resource Commission



Water Quality Reporting

- Biennial Water Quality Assessment Integrated Report (2024)
 - Comprehensive assessment
 - Trends
 - List impaired waters
 - Set priorities for cleanup
- EPA's "How's My Waterway" to learn about specific waterways



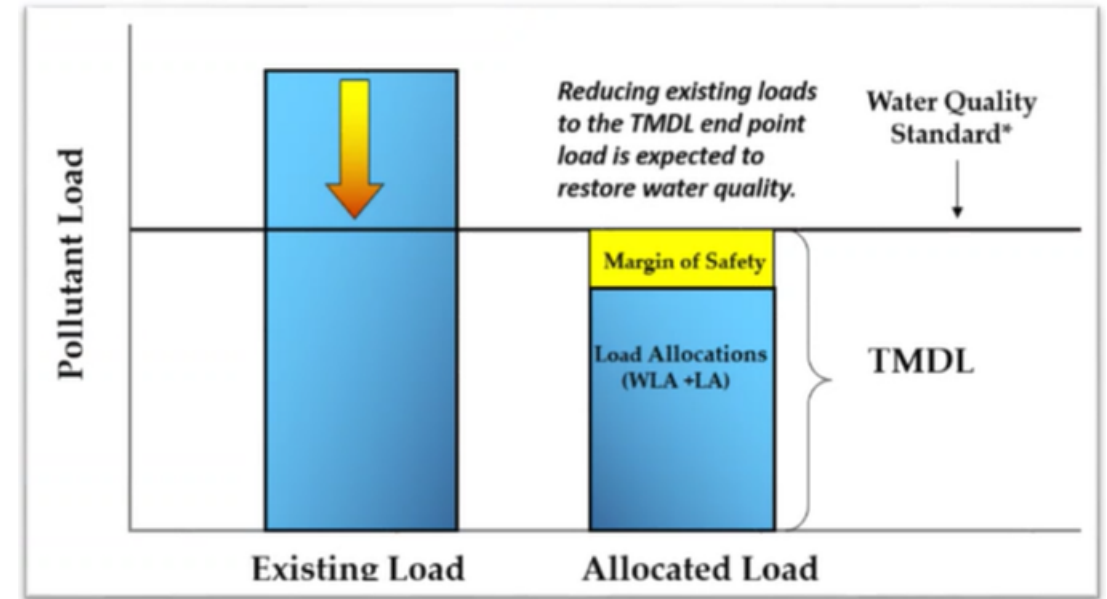
Cleanup Studies (TMDL)

- Total Maximum Daily Load (TMDL)
- Stakeholder input with a TMDL Advisory Group
- Current conditions
- Identifying all sources of pollutants (point sources and non-point sources)
- Setting allocations for pollutant loads (“pollution diets”)



What is a Total Maximum Daily Load (TMDL)?

- The Clean Water Act (CWA) requires states to ID all water bodies that do not meet state water quality standards
- States must calculate how much of a pollutant can be put in these waters without violating the standard and include a margin of safety.
 - That quantity is reported as the **Total Max. Daily Load (TMDL)**.

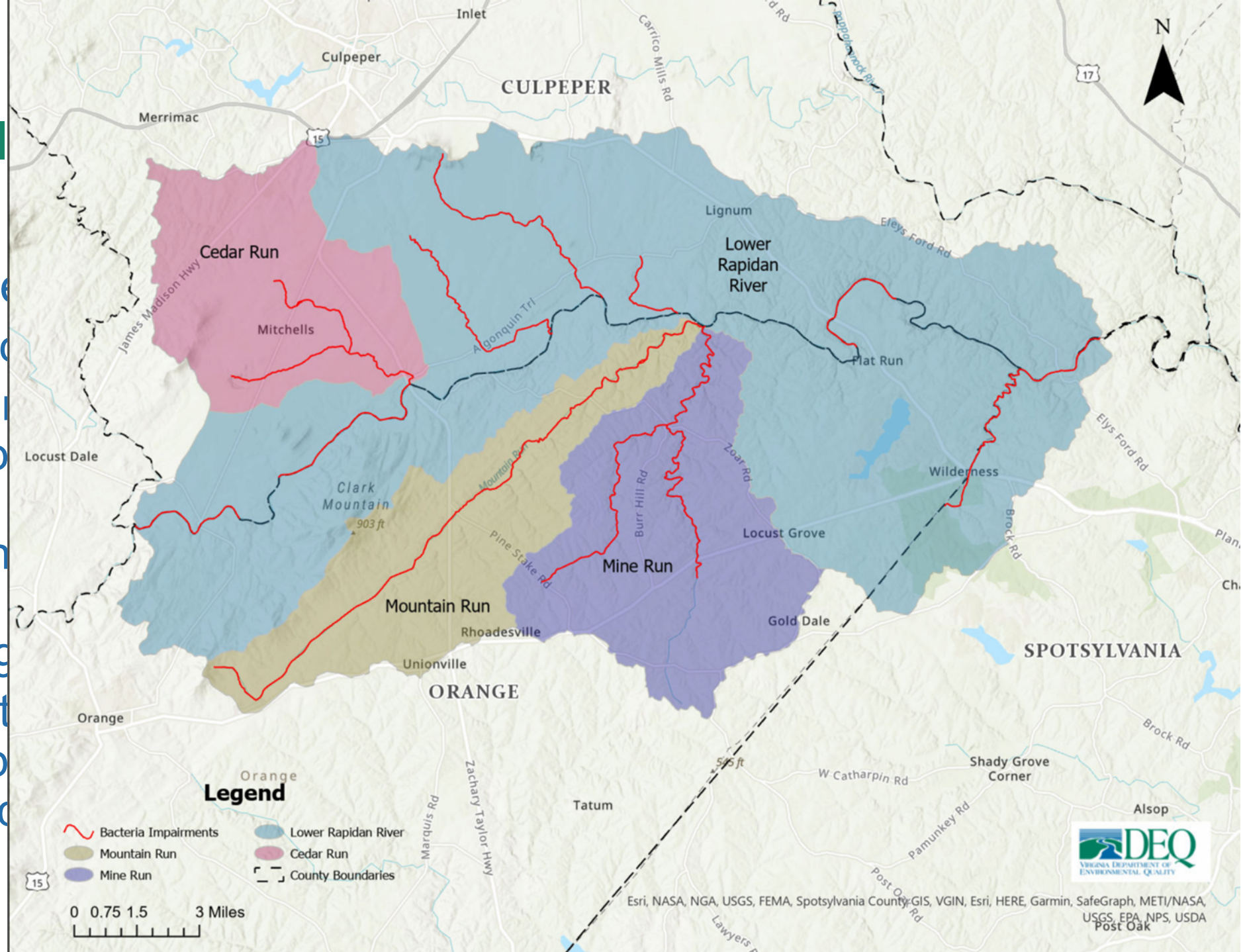


WLA = Wasteload allocation (load allocated to point source pollutants, such as discharges from WWTP)

LA = Load allocation (load allocated to nonpoint source pollutants, such as agricultural runoff)

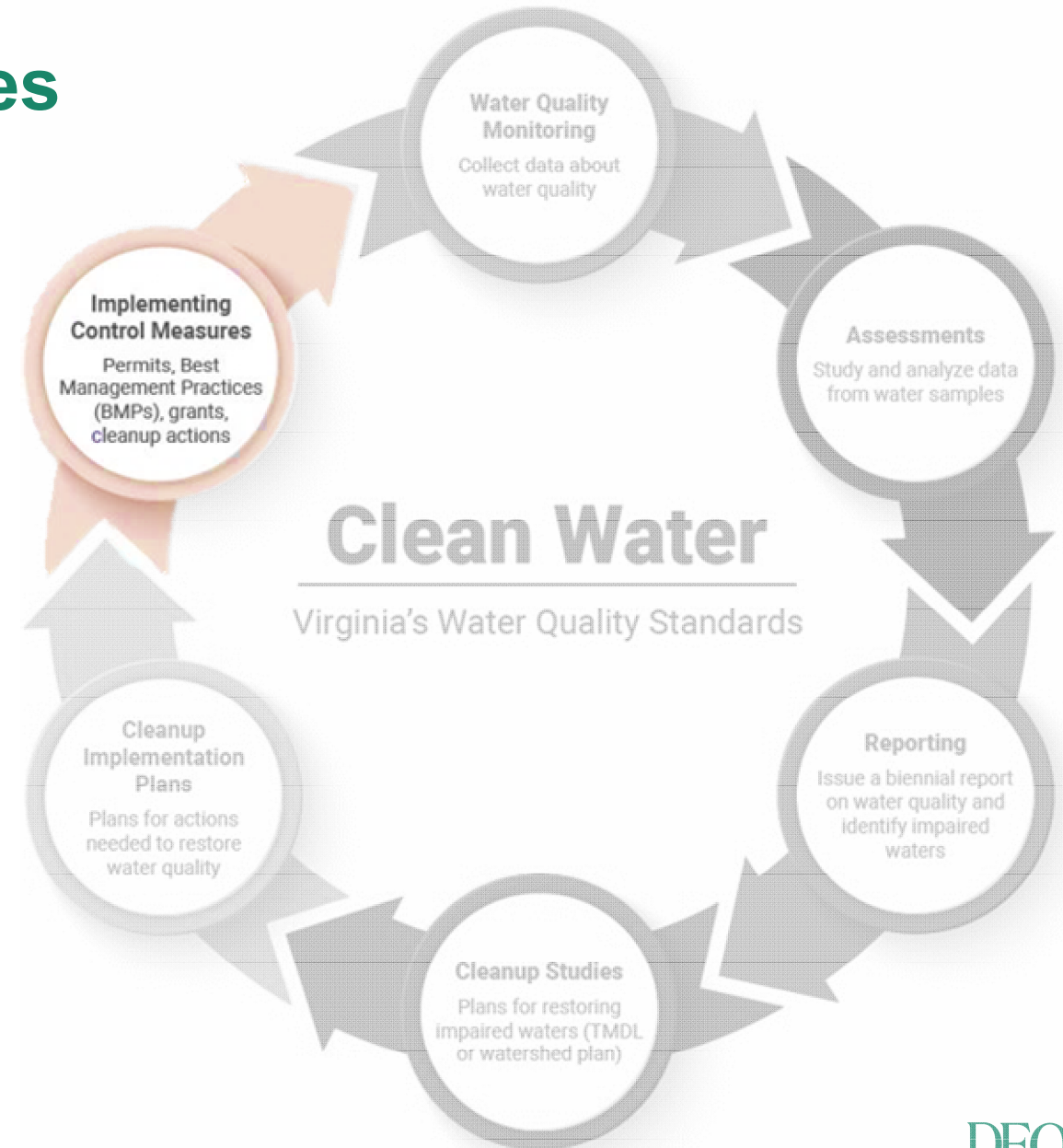
Cleanup Impl

- Cleanup Impl
 - Voluntary so
 - Addresses such as ero
 - intrusion in
 - fertilizer run
 - road salt
 - Federal 319
 - states, territ
 - tribes can b
 - variety of ac



Implementing Control Measures

- Permits (for point sources)
- Best management practices
- Assistance, collaboration, and funding for
 - Local governments & water authorities
 - Soil & Water Conservation Districts
 - Planning District Commissions
 - NGOs & individual landowners



Pause!

Any questions before we move away from the Continuous Planning Process (CPP or 'water wheel')?

Success Story – Little Cub Creek

- Little Cub Creek, in the Roanoke River watershed
- Impaired for E.coli in 2006 list
- TMDL study found that livestock, failing septic systems, pet waste, wildlife, and certain agricultural and urban land uses contributed to the problem
- Best Management Practices (BMPs)
 - 10 miles of stream exclusion fencing
 - 139 acres of afforestation and erosion-reducing agricultural crop practices, plus livestock practices
- Removed from impairment list in 2016

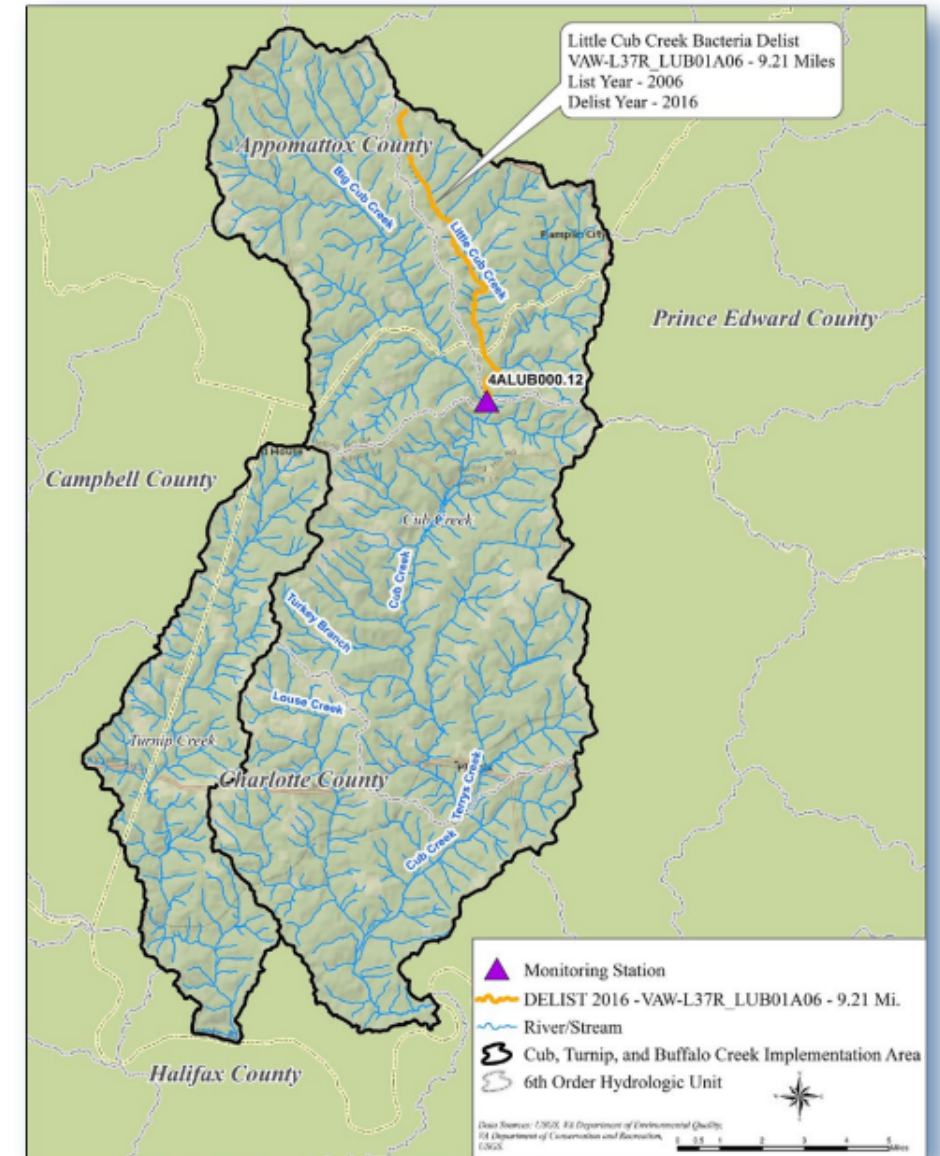




Figure 1. Delisted segment and bacteria monitoring station in the Little Cub Creek watershed.

How can you protect our waters?




Keep litter and
trash in the bin




Use and
dispose of
household
chemicals
properly



Pick up pet
waste




Participate in a
cleanup event
or a storm drain
stenciling
project




Avoid overuse
of lawn and
garden
chemicals



Get involved in
citizen water
quality
monitoring
programs



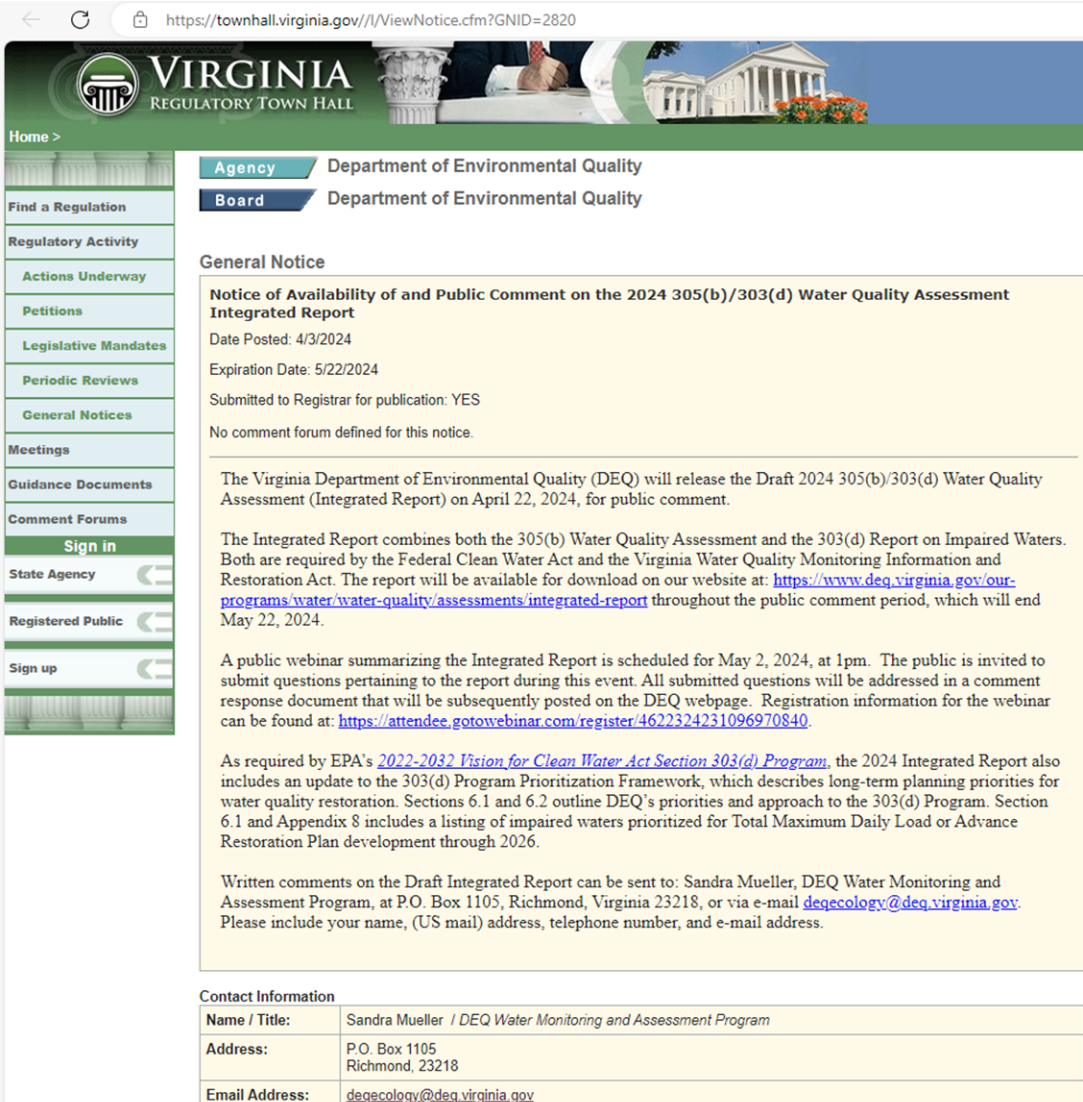
Maintain your
septic system



Tell others
about these
practices

Current Public Participation Opportunity Example:

- Public Comments on DEQ's draft 2024 Water Quality Assessment Integrated Report
 - Public webinar summarizing the draft Integrated Report scheduled for 5/2/2024 @ 1pm
 - Public is invited to submit questions about the report during the webinar
 - Written comments can also be submitted via email or USPS



The screenshot shows the Virginia Regulatory Town Hall website. The header includes the Virginia Department of Environmental Quality logo and navigation links for Agency and Board. A sidebar on the left lists various regulatory activities, with 'General Notices' highlighted. The main content area displays a 'General Notice' titled 'Notice of Availability of and Public Comment on the 2024 305(b)/303(d) Water Quality Assessment Integrated Report'. The notice provides details about the report's release, public comment period, and a public webinar. It also includes contact information for written comments.

General Notice

Notice of Availability of and Public Comment on the 2024 305(b)/303(d) Water Quality Assessment Integrated Report

Date Posted: 4/3/2024
Expiration Date: 5/22/2024
Submitted to Registrar for publication: YES
No comment forum defined for this notice.

The Virginia Department of Environmental Quality (DEQ) will release the Draft 2024 305(b)/303(d) Water Quality Assessment (Integrated Report) on April 22, 2024, for public comment.

The Integrated Report combines both the 305(b) Water Quality Assessment and the 303(d) Report on Impaired Waters. Both are required by the Federal Clean Water Act and the Virginia Water Quality Monitoring Information and Restoration Act. The report will be available for download on our website at: <https://www.deq.virginia.gov/our-programs/water/water-quality/assessments/integrated-report> throughout the public comment period, which will end May 22, 2024.

A public webinar summarizing the Integrated Report is scheduled for May 2, 2024, at 1pm. The public is invited to submit questions pertaining to the report during this event. All submitted questions will be addressed in a comment response document that will be subsequently posted on the DEQ webpage. Registration information for the webinar can be found at: <https://attendee.gotowebinar.com/register/4622324231096970840>.

As required by EPA's *2022-2032 Vision for Clean Water Act Section 303(d) Program*, the 2024 Integrated Report also includes an update to the 303(d) Program Prioritization Framework, which describes long-term planning priorities for water quality restoration. Sections 6.1 and 6.2 outline DEQ's priorities and approach to the 303(d) Program. Section 6.1 and Appendix 8 includes a listing of impaired waters prioritized for Total Maximum Daily Load or Advance Restoration Plan development through 2026.

Written comments on the Draft Integrated Report can be sent to: Sandra Mueller, DEQ Water Monitoring and Assessment Program, at P.O. Box 1105, Richmond, Virginia 23218, or via e-mail deqecology@deq.virginia.gov. Please include your name, (US mail) address, telephone number, and e-mail address.

Contact Information

Name / Title:	Sandra Mueller / DEQ Water Monitoring and Assessment Program
Address:	P.O. Box 1105 Richmond, 23218
Email Address:	deqecology@deq.virginia.gov

Learned objectives

- What is water quality & why it's important
 - Water Quality Standards & Designated Water uses
- How does DEQ protect water quality
- How you can help protect water quality



A wide-angle photograph of a calm body of water, likely a lake or bay, under a vast blue sky. The water is a deep blue with gentle ripples. In the distance, a small, low-lying island or peninsula is visible, covered in dark vegetation. The sky transitions from a deep blue at the top to a lighter, hazy blue near the horizon, where some soft, wispy clouds are visible. A single bird is captured in flight on the left side of the frame. A small, bright white circle, possibly the moon, is visible in the upper right portion of the sky.

Questions?

Upcoming Webinars (Tentative)

- **Tuesday, July 2** – Ambient Air Quality Monitoring in Virginia
- **Tuesday, August 27** – DEQ 101
- **Tuesday, October 22** – DEQ Tools and Resources
- **Tuesday, December 10** – Pollution Prevention

Survey – What are you interested in learning from DEQ?

- Link posted in Chat
- QR code on the right



Thank you for attending!

Photo credits:

- [State park beach \(Department of Conservation and Recreation\)](#)
- Other photos taken by DEQ staff