For technical support issues call: 703-583-3906

Sand Branch Public and Technical Advisory Committee Meetings

PC/Laptop View

Minimize the control panel ➔

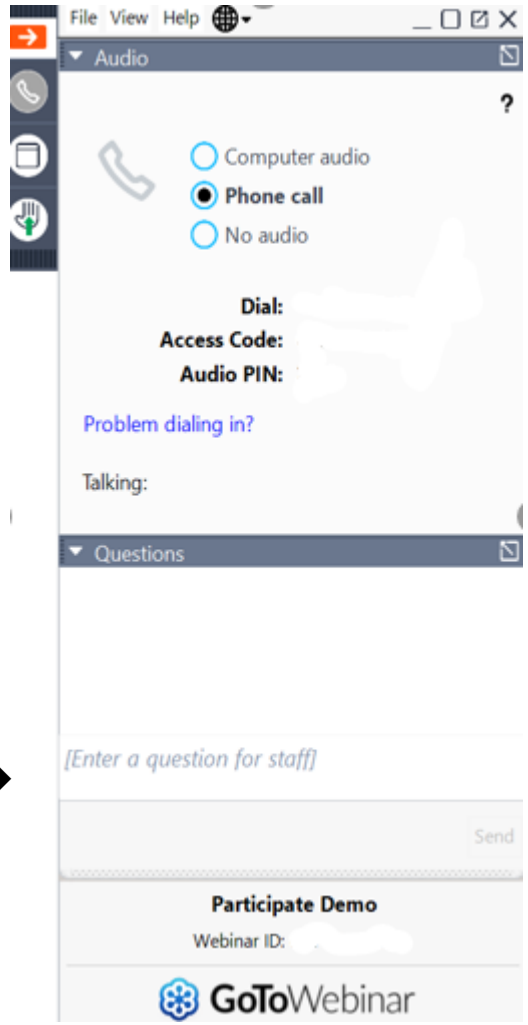
or maximize the control panel

Raise or lower your hand ➔

Select audio method ➚

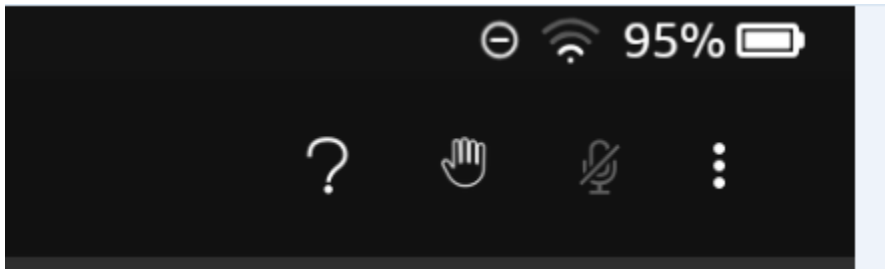
*Phone call provides better quality audio

Enter questions then click send ➔



Mobile Devices View

Android



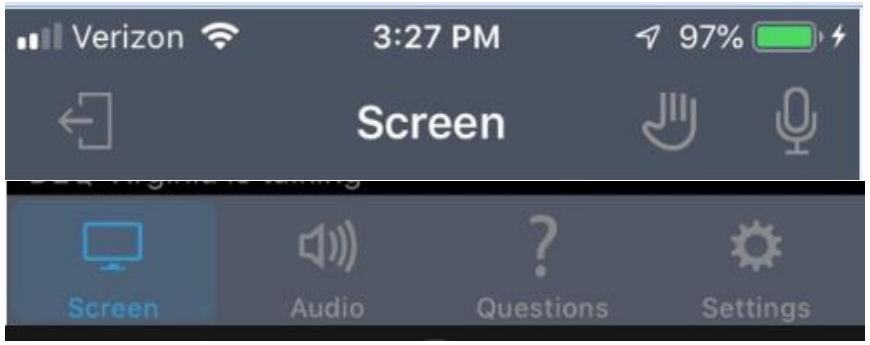
Enter Questions ➚

Raise ➚ Lower Hand

➚ Click 3 dots to open Audio Options

iPhone

Raise ➘ Lower Hand



Audio Options ➚

Enter ➚ Questions

For technical support issues call: 703-583-3906

Sand Branch Benthic TMDL Study

First Public and Technical Advisory Committee Meetings

Sarah K. Sivers
Water Quality Planning Team Lead
Virginia Department of Environmental Quality
October 29, 2020

Agenda

- Welcome and Introductions
  - Opening Remarks / Introductions
  - Meeting Objectives
- Overview of Water Quality Planning
- Water Quality Impairment in Sand Branch
- Overview of the TMDL Study for Sand Branch
- Wrap-up and Next Steps

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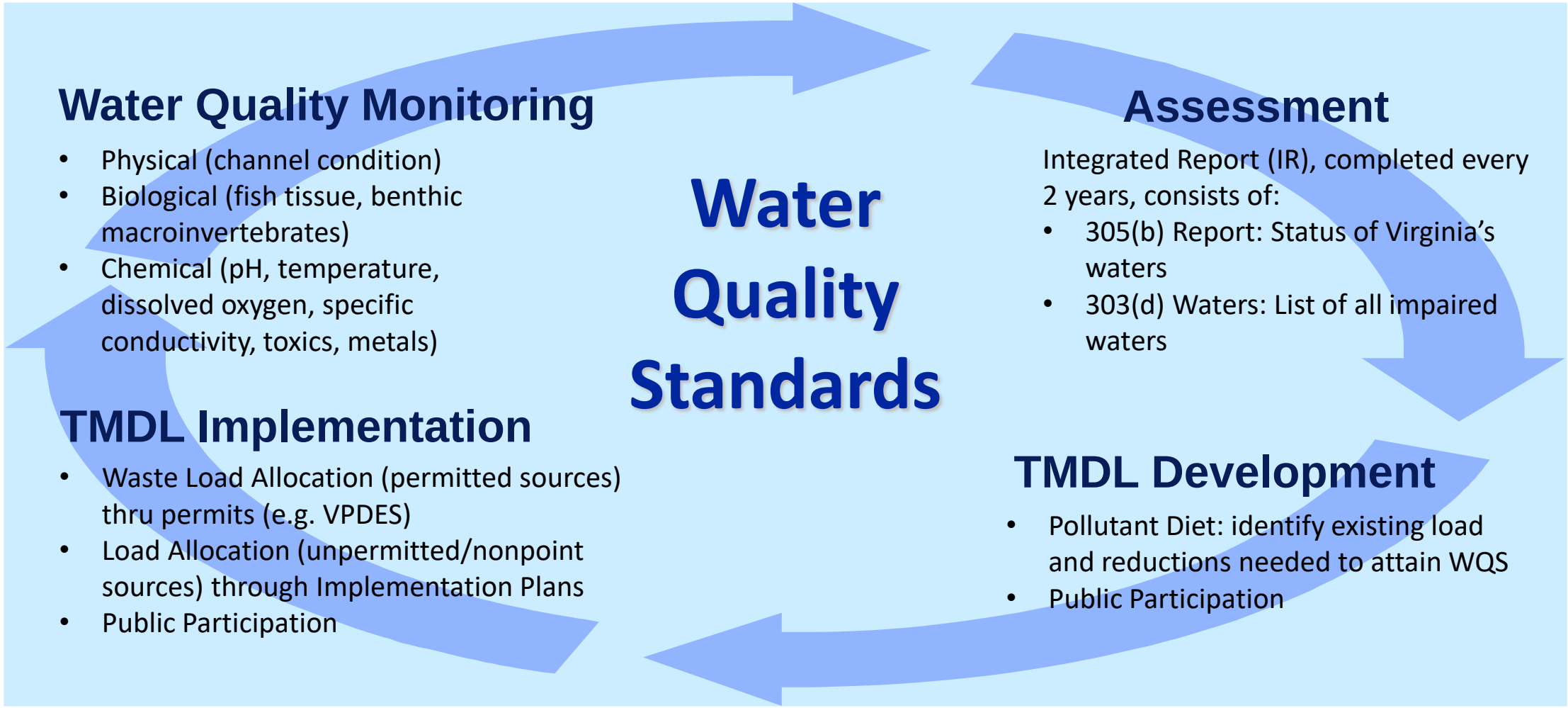
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Overview of Water Quality Planning

Water Quality Standards

- Designated Uses
  - All waters designated for: recreation, aquatic life, wildlife, fish consumption, and shellfish (tidal)
  - Additional use that can be designated: public water supply
- Criteria
  - To protect and maintain designated uses
  - Numeric
  - Narrative
- Anti-degradation
  - Protects and maintains existing water quality from being degraded

Continuous Water Quality Planning Process



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Benthic Macroinvertebrate Community

- One metric to evaluate attainment of the Aquatic Life Use
- Indicator of Biological Community Health
  - Live on the stream bottom 1-2 years, relatively sedentary
  - Indicates long-term effect of pollution and ecosystem impact
  - Evaluated using the Virginia Stream Condition Index (VSCI)
    - Multi-metric index
    - Based upon a reference community of organisms

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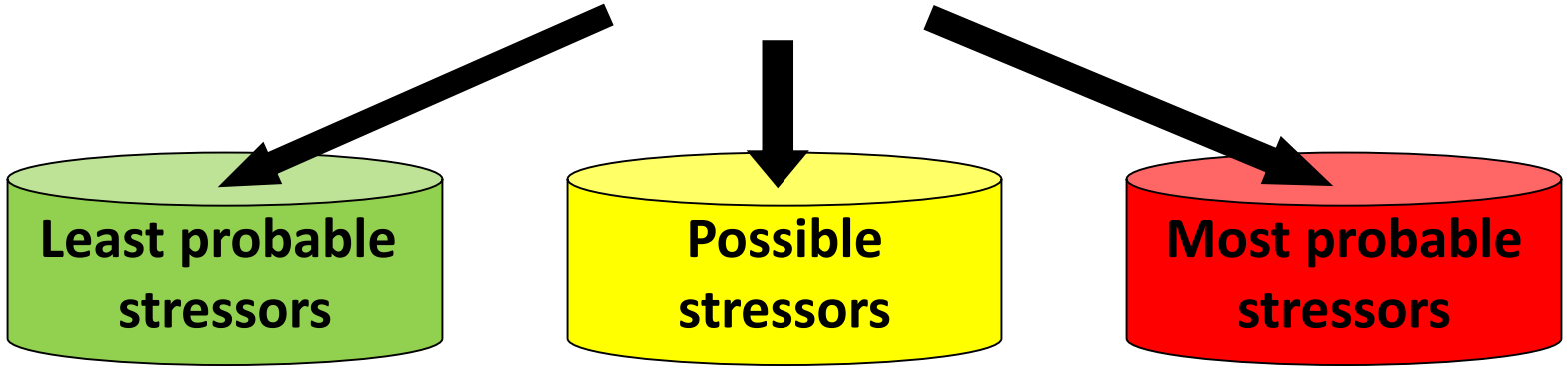
Benthic Stressor Analysis

"What is causing the benthic community to be unhealthy?

1. List all potential causes applicable to the watershed
   - For example: nutrients, sediment, toxics, etc.
2. Analyze the available data and information for and against each possible stressor
   - Such as water chemistry, habitat, land use, point and nonpoint sources
3. Categorize each cause into:



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Total Maximum Daily Load (TMDL)

*A **TMDL** is the total amount of a pollutant a waterbody can receive and still meet the water quality criteria for that pollutant*

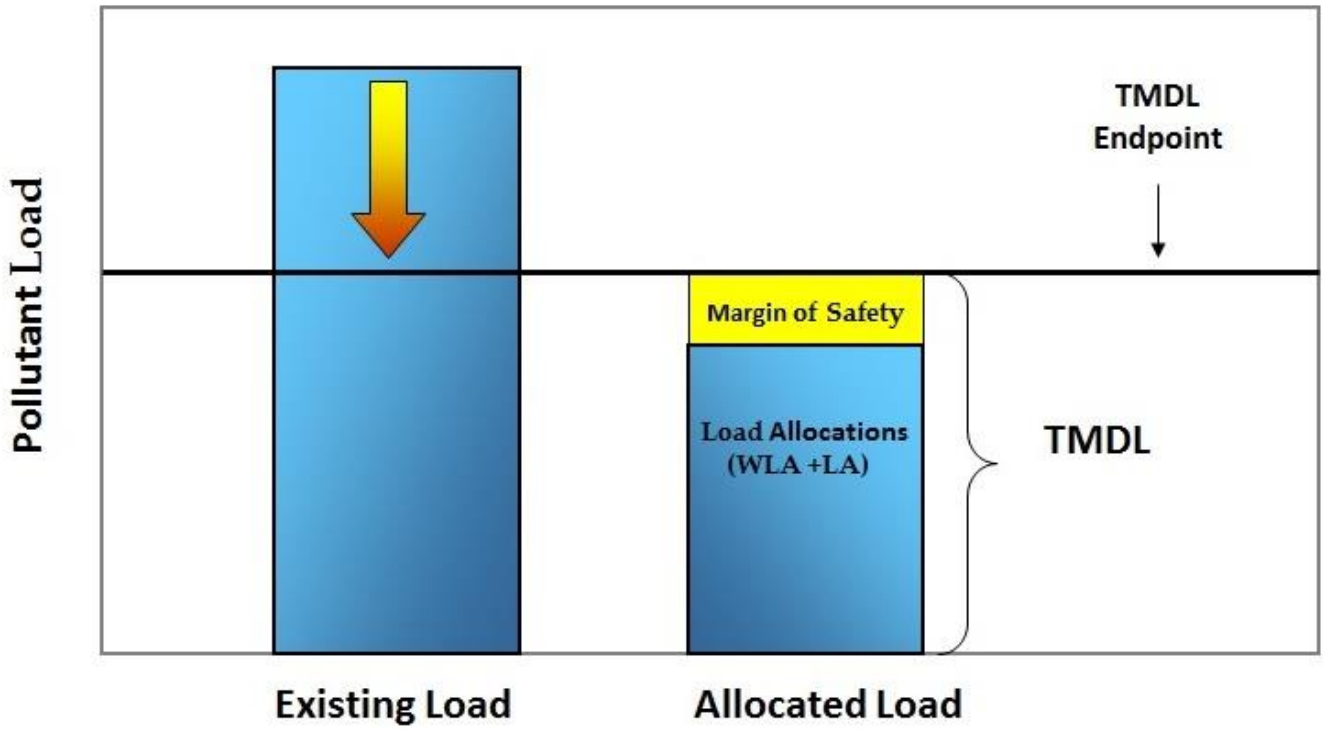
TMDL = WLA + LA + MOS

Where:

WLA = Wasteload Allocation

LA = Load Allocation

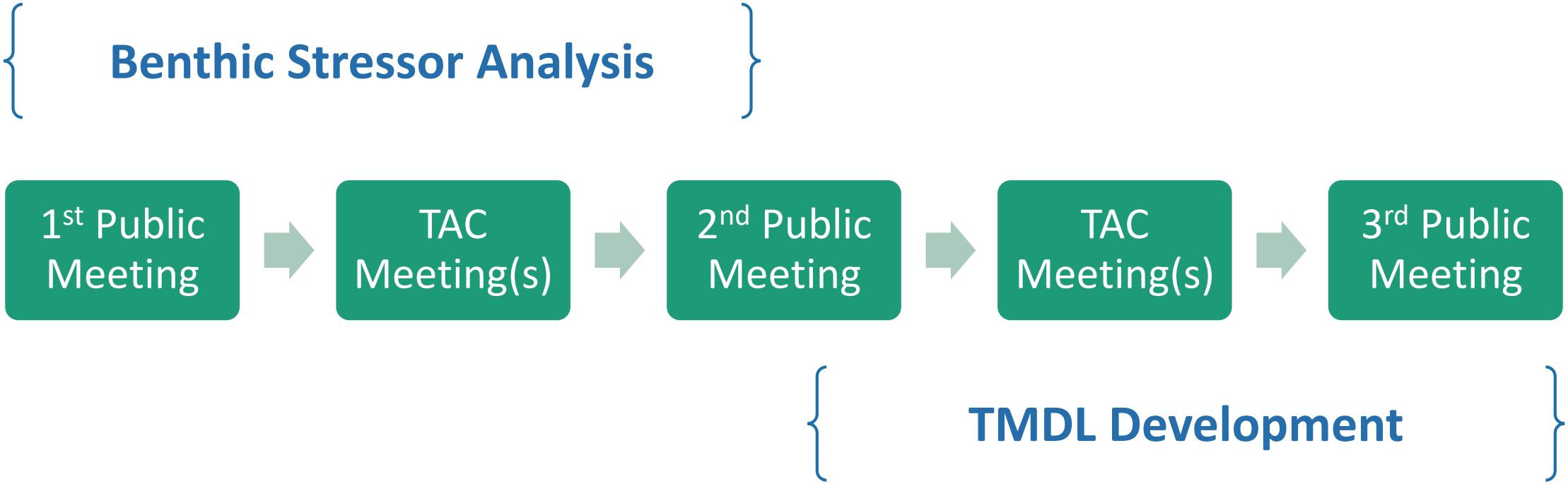
MOS = Margin of Safety



TMDL Development Process

- Characterize the watershed (e.g. land use, soils, hydrology, etc.)
- Identify pollutant sources and associated loadings
- Model the existing baseline condition and projected condition that attains the water quality endpoint
- Calculate pollutant reductions to attain the water quality endpoint
- Assign loadings to wasteload allocations (WLA) and load allocation (LA)

Public Participation in a Benthic TMDL Study



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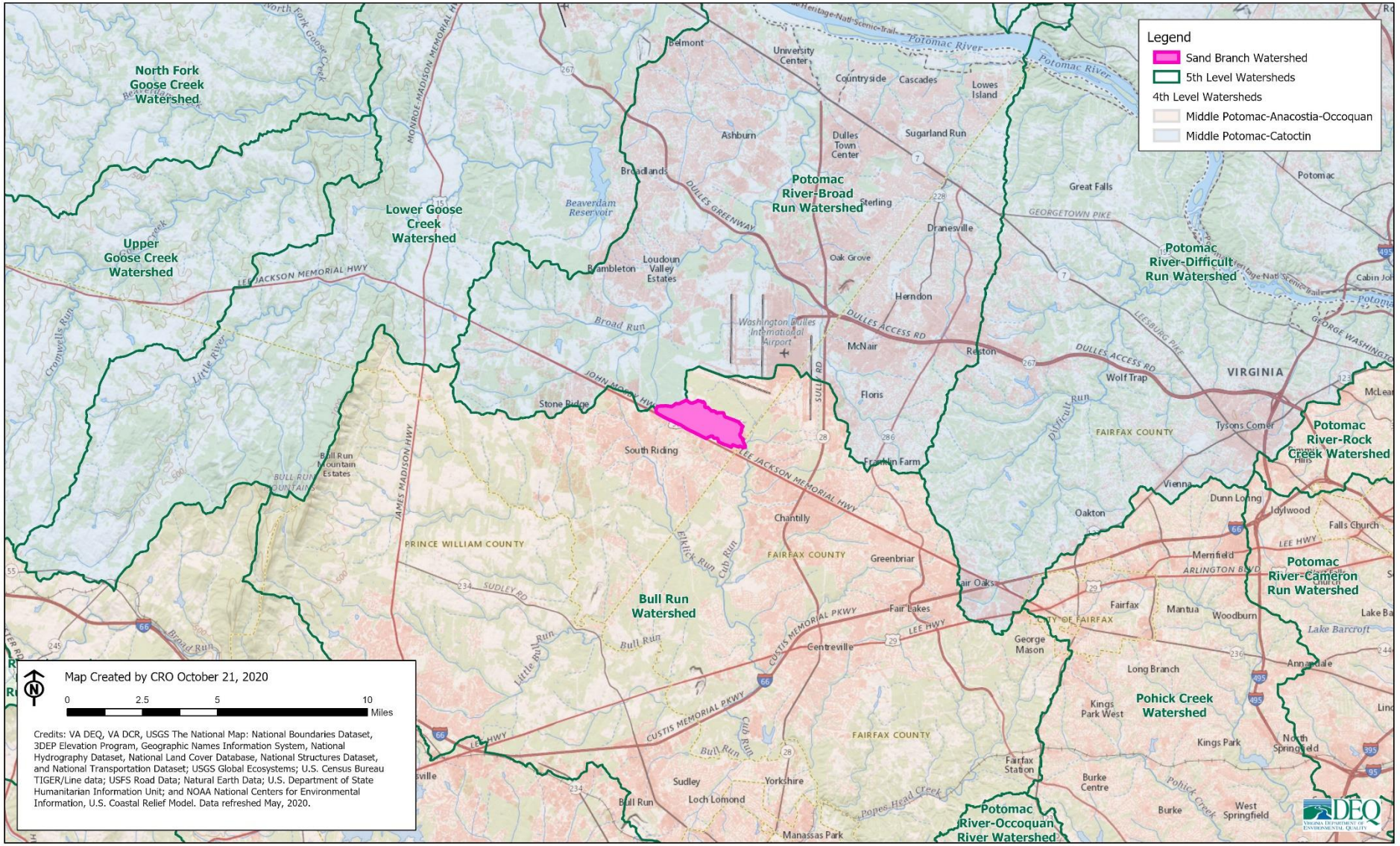
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Quality Impairment in Sand Branch

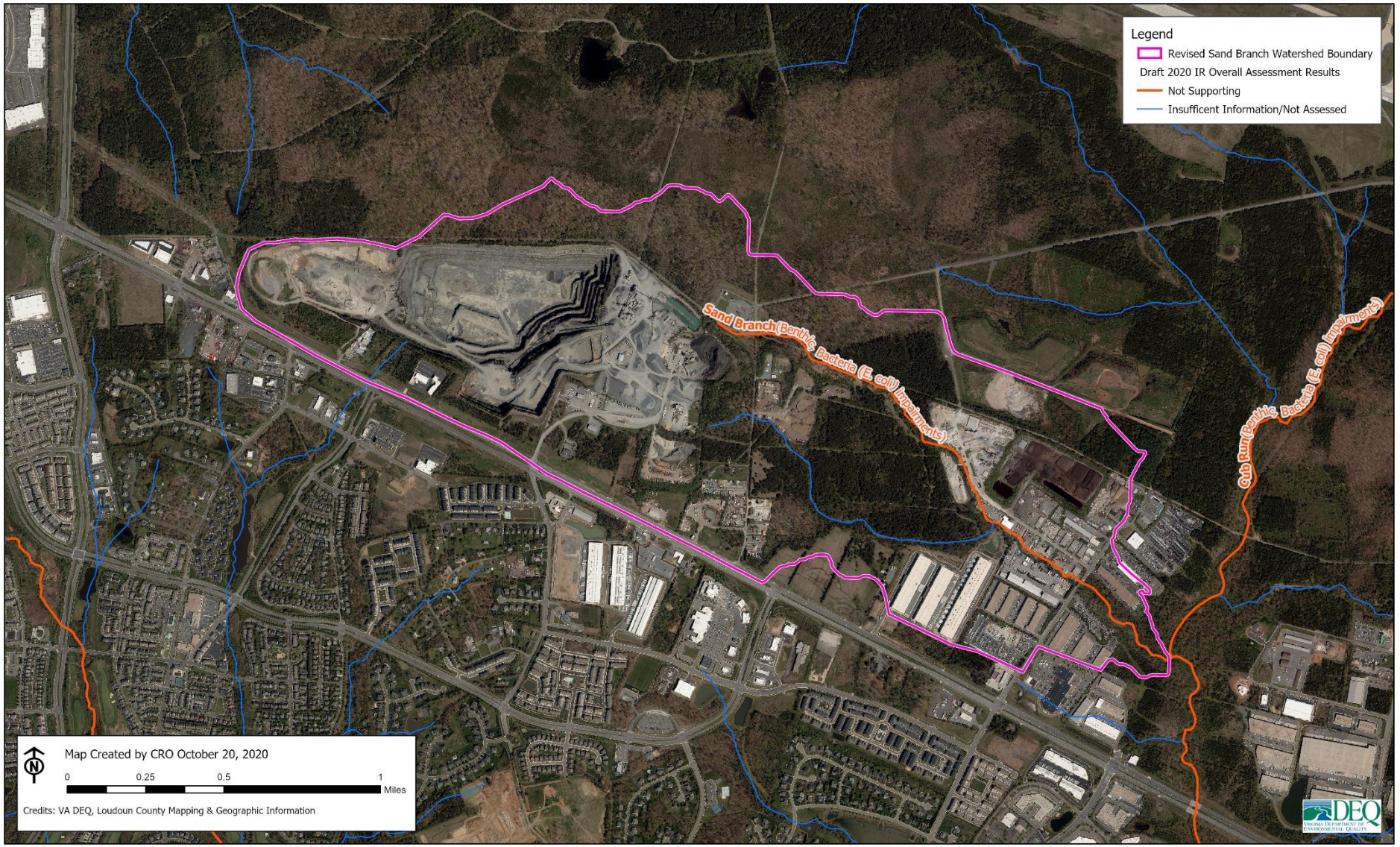
Project Location

Sand Branch Watershed Overview



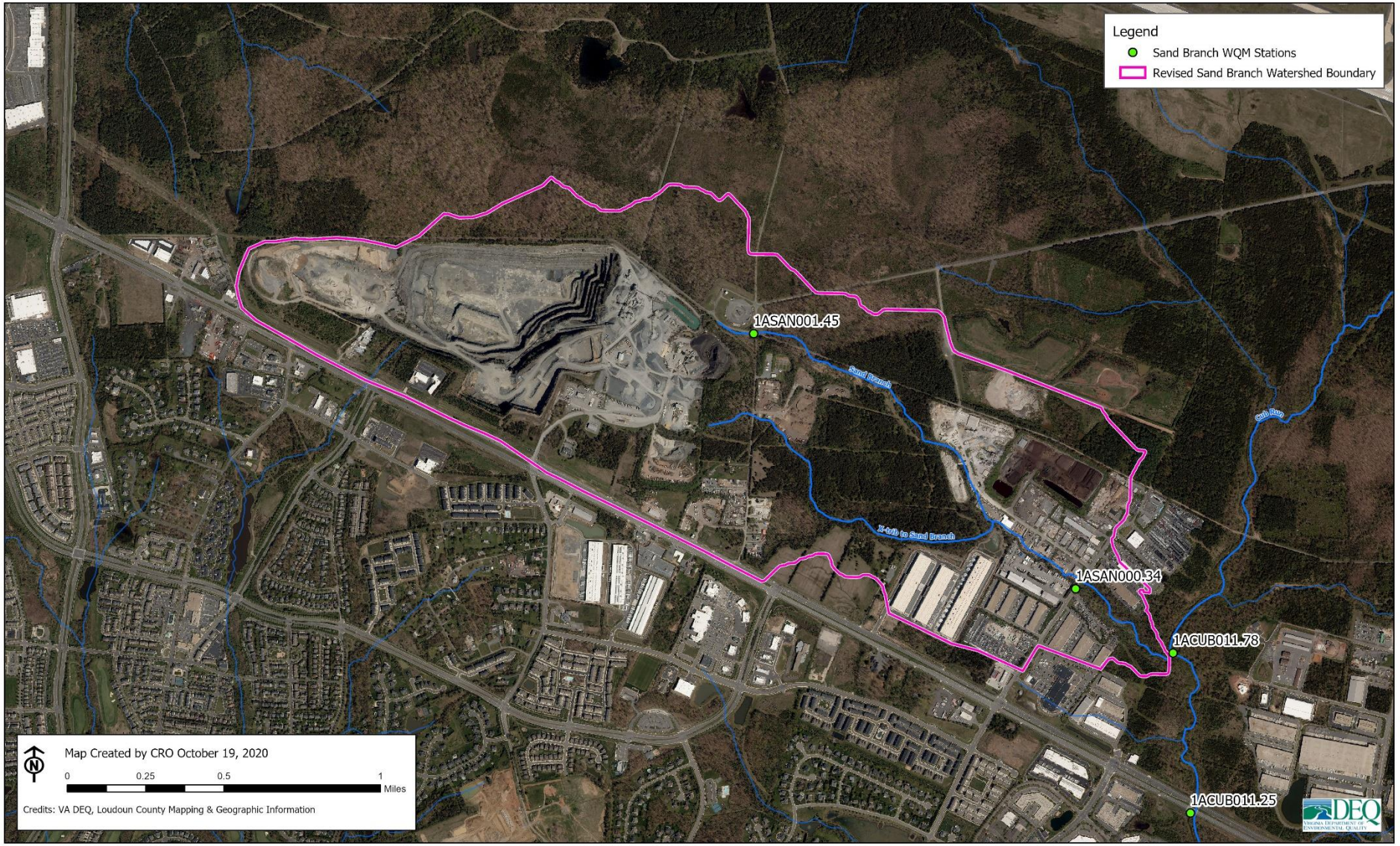
Water Quality Assessment of Sand Branch

Sand Branch Watershed Draft 2020 Assessment Results

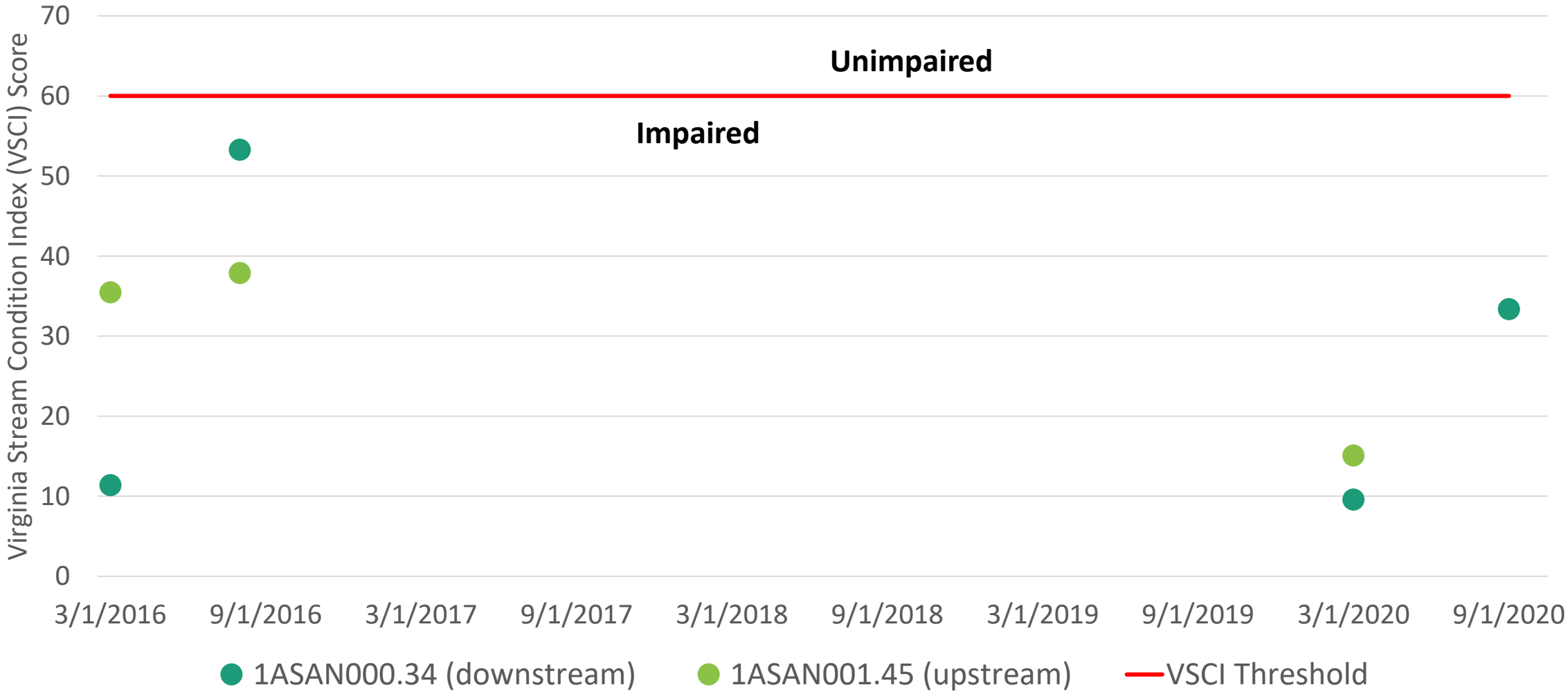


Water Quality Monitoring Locations

Sand Branch Watershed Monitoring Stations



Basis of the Benthic Impairment



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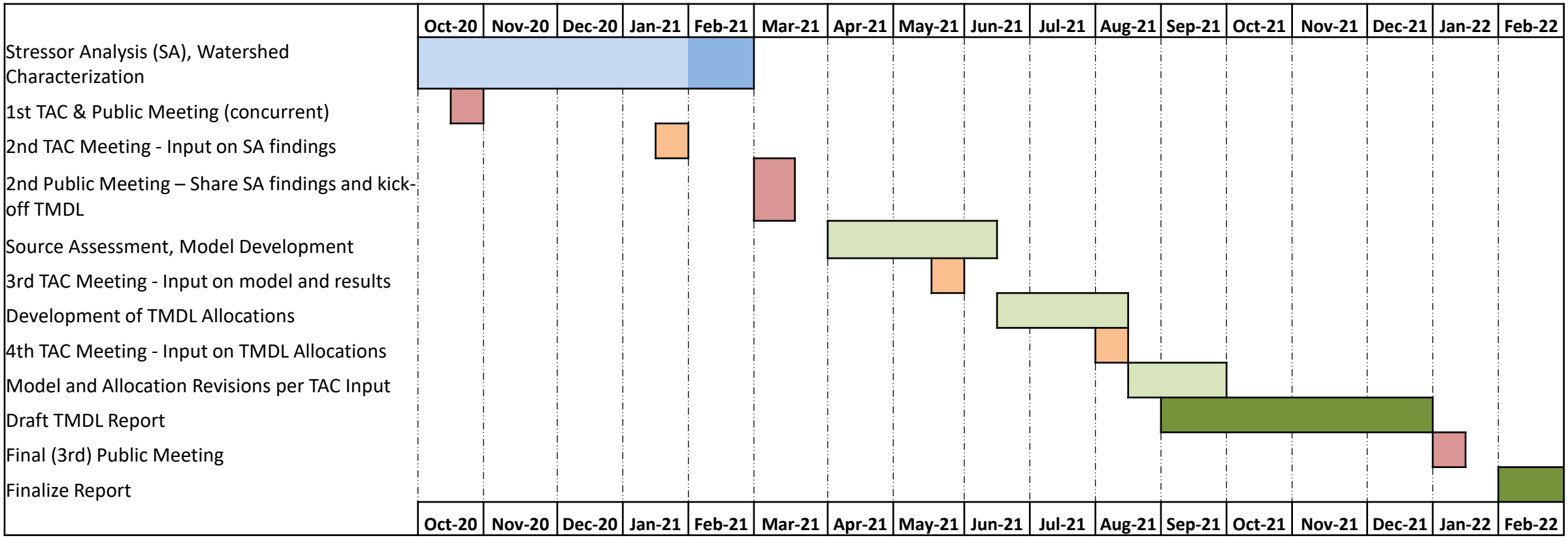
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

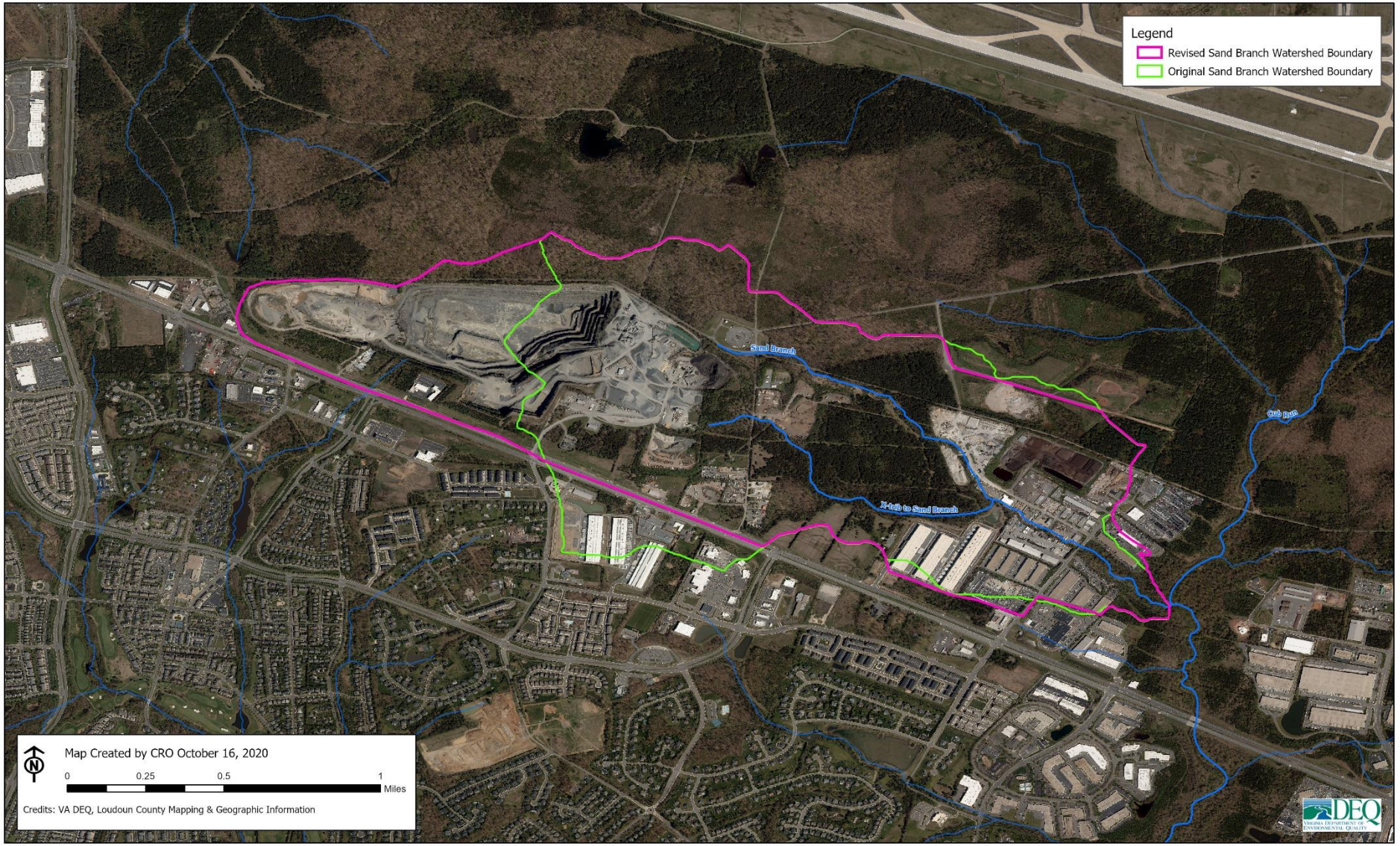
Overview of the TMDL Study for Sand Branch

Project Timeline



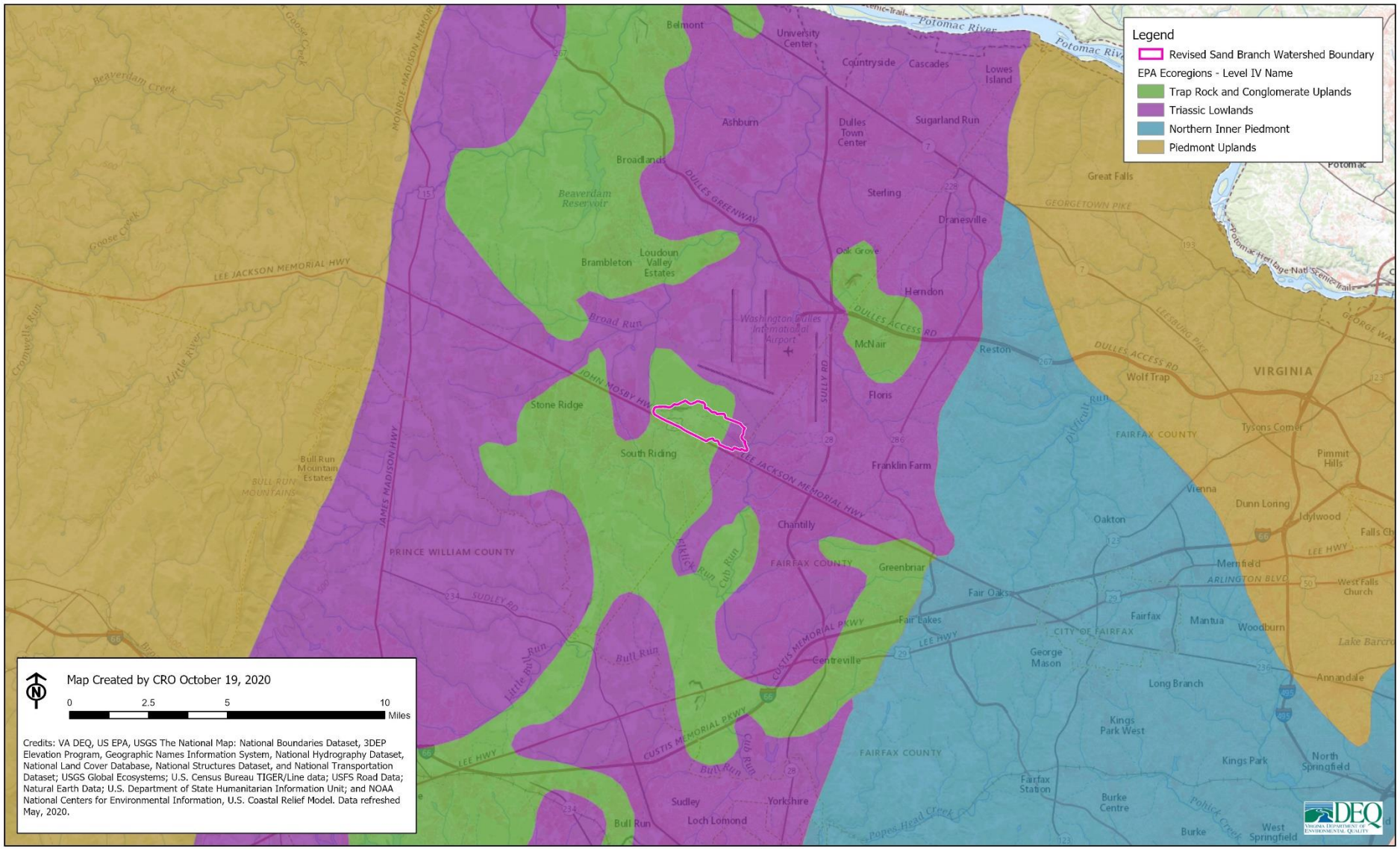
Watershed Boundary

Proposed Sand Branch Watershed Boundary



Ecoregions

Sand Branch Watershed Area Ecoregions



Existing Land Cover

Sand Branch Watershed Virginia Land Cover Data

Class ID	Classification	Total Acres	Percent of Watershed
21	Impervious (extracted)	142.6	16%
22	Impervious (local datasets)	43.61	4.9%
31	Barren	229.56	25.7%
41	Forest	221.44	24.8%
42	Tree	110.07	12.3%
61	Harvested/Disturbed	9.63	1.1%
71	Turf Grass	113.58	12.7%
81	Pasture	15.75	1.8%
91	NWI/Other	7.15	0.8%
	Total	893.39	

Future Land Use

Sand Branch Watershed Future Land Use

Authorized Dischargers

Permit Number	Facility Name	Permit Type
VAR040067	Loudoun County	Municipal Separate Storm Sewer System (MS4) Permit
VA0091430	Loudoun Composting	VPDES IP
VAG110089	Virginia Concrete Company Inc. - Chantilly Plant	Concrete Products GP
VAG110318	Aggregate Industries MAR - Chantilly	Concrete Products GP
VAG110094	Superior Concrete - Dulles	Concrete Products GP
VAG840106	Chantilly Crushed Stone Incorporated	Nonmetallic Mineral Mining GP
VAG406265*	Chantilly Liberty	Domestic Sewage GP
VAR052245	William A Hazel Incorporated - Recycling Facility	Stormwater Industrial GP
VAR050863	Virginia Paving Company - Chantilly Plant	Stormwater Industrial GP

*Potentially falls outside the revised Sand Branch watershed boundary

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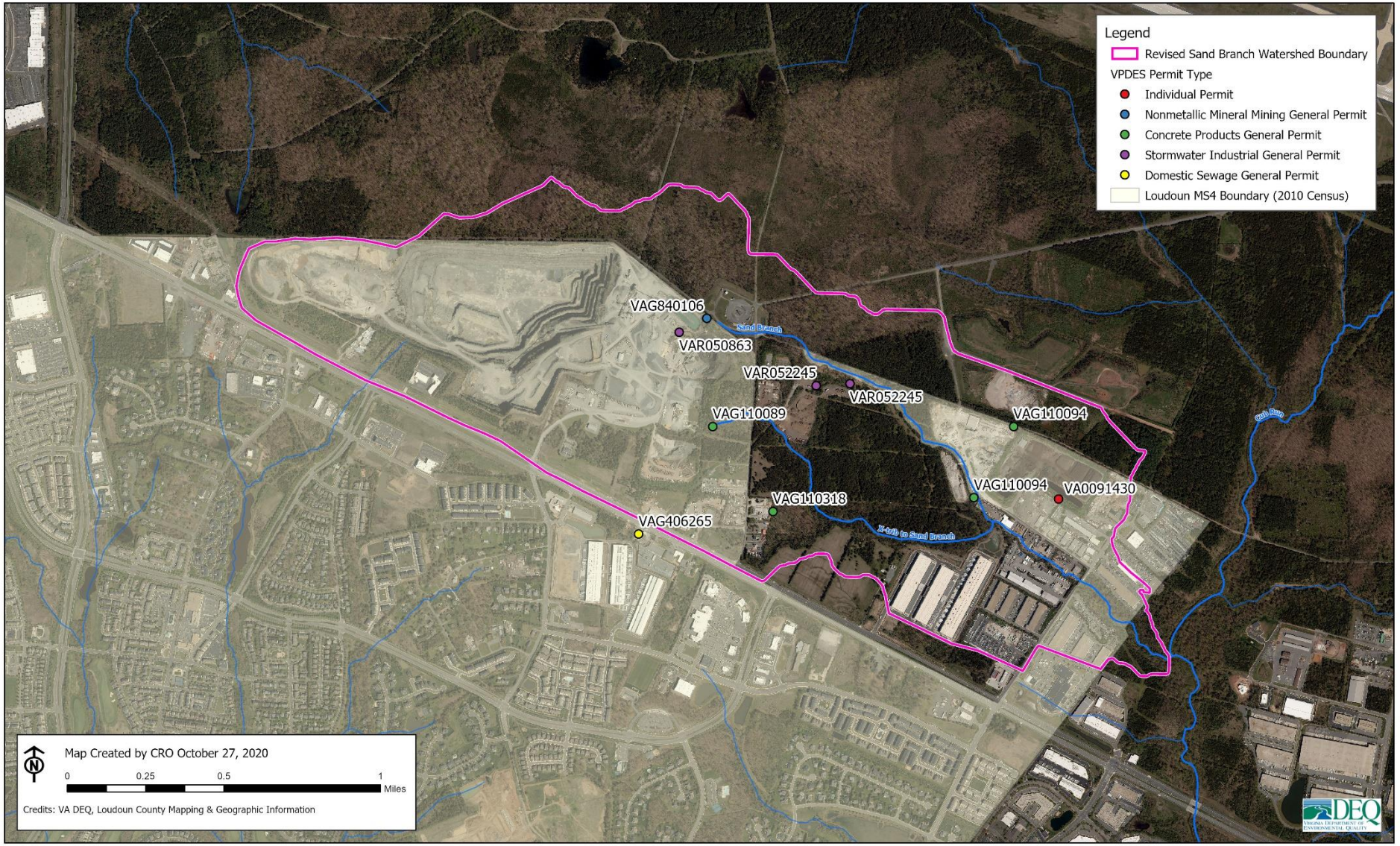
Location of Permitted Dischargers

Sand Branch Watershed Permitted Outfalls



DEQ Water Quality Monitoring Data

- Chemical (2015-2019)
  - Field parameters (pH, dissolved oxygen, specific conductivity, temp.)
  - Solids (total dissolved solids, total suspended solids)
  - Nutrients (nitrogen, phosphorous)
  - Ionic strength
  - Metals
- Benthic (2016 and 2020)
- Toxicity Testing (ambient)
  - Acute and chronic (1 sample - 2020)
  - Ceriodaphnia dupia and Fathead minnow (Pimephales promelas)
- Effluent monitoring (collected by VPDES Permit-holders and DEQ)

Other Data

- Loudoun County – GIS data
  - 2020 aerial imagery
  - 4’ topography contours and spot elevations
  - Natural resource layers (e.g., geology, soils, limestone, trees, wetlands)
  - Land use and zoning
  - Impervious surfaces
  - Infrastructure (e.g., BMPs, structures, pipes, open channels)
  - MS4 boundary
- Fairfax County
  - Cub Run watershed monitoring data (2004-2020): ambient water quality, benthic macroinvertebrates, and stream habitat
- VT Occoquan Watershed Monitoring Lab
  - Cub Run water quality data, 2000-2020 (ST50, near confluence with Bull Run)

Data Analysis In-Progress: Identifying Probable Stressors

- Monitoring data evaluation:
  - Comparison to the Water Quality Standards
  - Stressor Analysis using stressor thresholds developed from DEQ's Freshwater Probabilistic Monitoring Program
  - Seasonal or daily water quality variations
  - USEPA's Causal Analysis/Diagnosis Decision Information System (CADDIS)
- Consider other relevant data:
  - Hydrology (stream flow and precipitation)
  - Potential influence of Triassic Basin geology
  - Surrounding land uses

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Next Steps

- Public Comment Period: October 30th – November 30th
  - Seeking your input on:
    - Interest in being on the Technical Advisory Committee (TAC)?
    - Additional data or information to inform stressor analysis?
  - Email: Sarah.Sivers@deq.virginia.gov
- Hold 2nd TAC meeting:
  - Share results on stressor analysis and the most probable stressor(s) identified
  - Obtain feedback on information shared

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Meeting Feedback

- Questions or Comments on Sand Branch TMDL Project:
  - Sarah Sivers: (703) 583-3898 or Sarah.Sivers@deq.virginia.gov

- Meeting Feedback:
  - Virtual Meeting Public Comment Form

  https://www.deq.virginia.gov/Portals/0/DEQ/Water/TMDL/Electronic_Meetings_Public_Comment_Form.docx
  - Submit to FOIA Board, external to DEQ

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