Georgia Department of Transportation

EROSION CONTROL DAY

Erosion, Sedimentation, & Pollution Control Plans

Representative Sampling
Erosion & Sedimentation Control

Informative Objectives

1. Understand how GDOT fulfills the Georgia NPDES GAR100002 permit and as it pertains to Sampling.

2. Understand the difference between Outfall and Receiving Water Sampling.

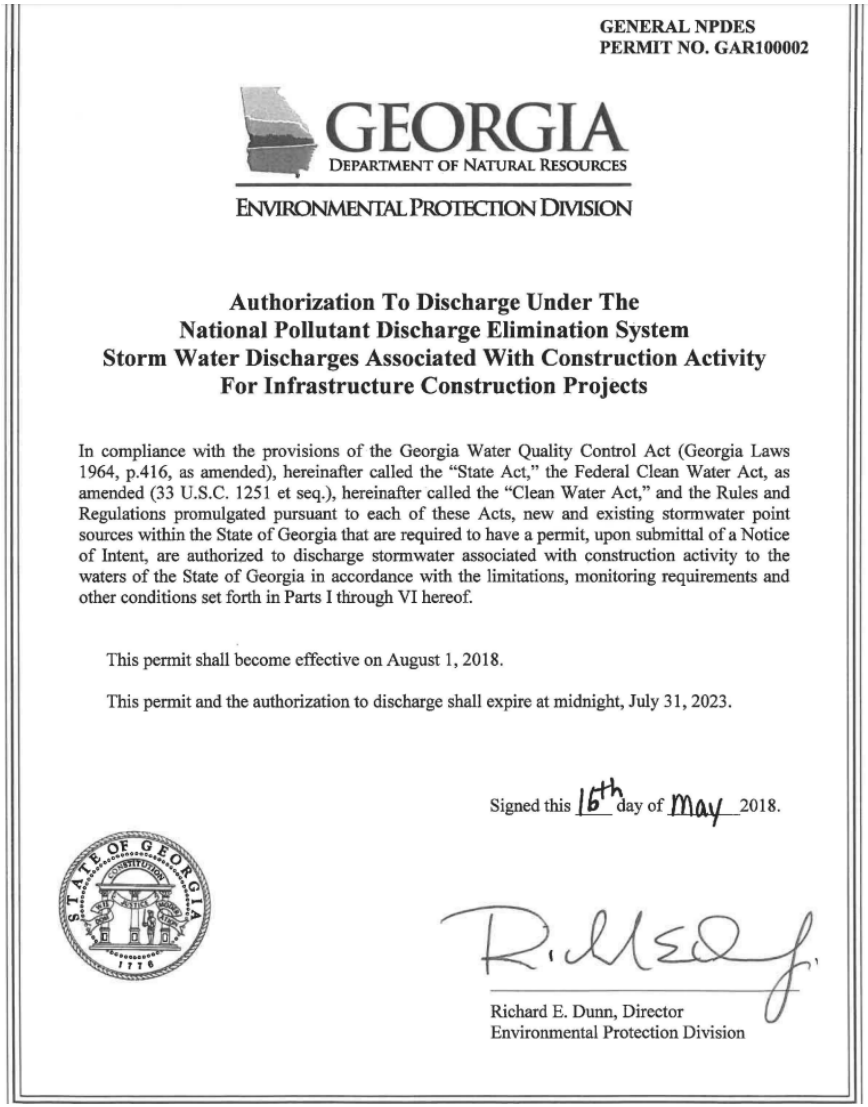
3. Be familiar with how GDOT selects sampling points.

4. Be familiar with Representative Sampling.

5. Understand the importance of Sampling.

NPDES GAR100002 Permit

- Known as the “Infrastructure Permit”
- Applies to all GDOT projects with land disturbance ≥ 1 acre
- Projects with land disturbance ≥ 1 acre but are non-contiguous are exempt.
- Projects that consist solely of routine maintenance without mass grading and construction less than 120 days are exempt.
- Requires Notice of Intent (NOI) to begin land disturbance and Notice of Termination (NOT) after project is complete.



GENERAL NPDES
PERMIT NO. GAR100002

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Authorization To Discharge Under The
National Pollutant Discharge Elimination System
Storm Water Discharges Associated With Construction Activity
For Infrastructure Construction Projects

In compliance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p.416, as amended), hereinafter called the “State Act,” the Federal Clean Water Act, as amended (33 U.S.C. 1251 et seq.), hereinafter called the “Clean Water Act,” and the Rules and Regulations promulgated pursuant to each of these Acts, new and existing stormwater point sources within the State of Georgia that are required to have a permit, upon submittal of a Notice of Intent, are authorized to discharge stormwater associated with construction activity to the waters of the State of Georgia in accordance with the limitations, monitoring requirements and other conditions set forth in Parts I through VI hereof.

This permit shall become effective on August 1, 2018.

This permit and the authorization to discharge shall expire at midnight, July 31, 2023.

Signed this 16th day of May 2018.

Richard E. Dunn, Director
Environmental Protection Division

Sample Point Selection

- **The NPDES GAR100002 permit requires sampling at every outfall or receiving waters or combination thereof. However, for infrastructure projects, representative sampling is allowed.**

- **Outfall Sampling:** An outfall is the location where storm water, in a discernable, confined and discrete conveyance, leaves a facility or construction site or, if there is a receiving water on site, becomes a point source discharging into that receiving water.
  - •Outfall sampling may be selected when there is no receiving water that can be sampled or where the outfall would be more representative of the conditions.
  - •One sample is taken and maximum allowable turbidity value is determined from Appendix B of the permit.

- **Receiving Water Sampling:** A receiving water means State Waters supporting warm-water fisheries or classified as cold-water trout streams; into which construction activity storm water runoff will discharge into directly or indirectly.
  - •Receiving water sampling must occur within an accessible, flowing stream.
  - •A pair of samples are taken (upstream & downstream) and considered one location.
  - •The allowable turbidity increase for cold and warm waters is 10 NTU and 25 NTU, respectively.

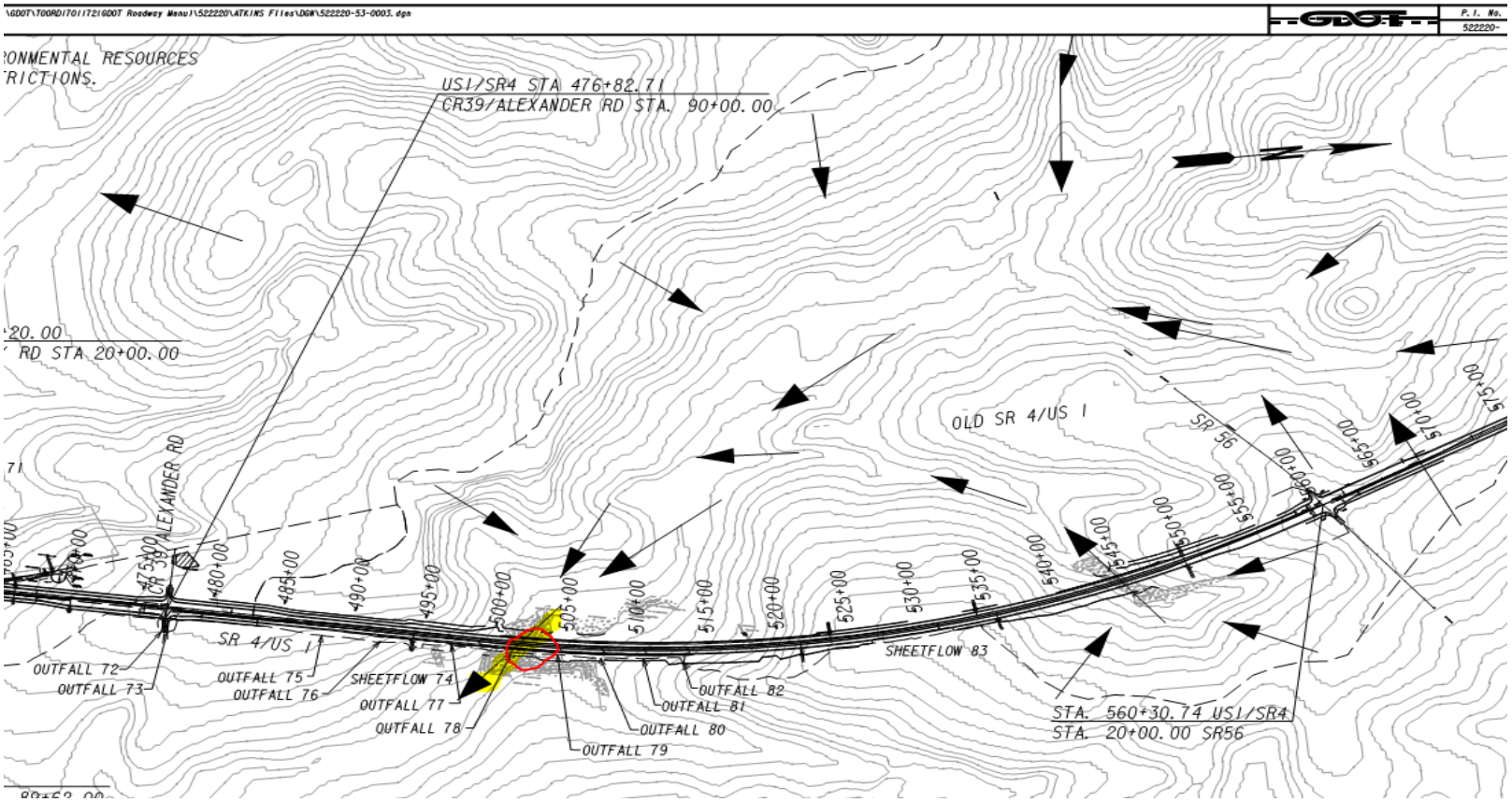
Representative Sampling

- **Representative Sampling** avoids the need to sample every receiving water or outfall. This is important because roadway projects can have several receiving waters and outfalls. The following should be kept in mind:

1. Multiple sampling locations may still be required to represent impacts for all receiving waters and outfalls throughout project area.
2. Sampling locations should be representative of all applicable construction work, including new roadway fill or cut, or roadway widening.
3. If choosing between outfalls, select the outfall with the most land disturbance, drainage area, and/or discharges most directly into a State Water.
4. If choosing between receiving waters, select the one which passes through the project alignment and has greater risk of sedimentation from upstream land disturbances.
5. Sampling shall be provided during each stage of construction and BMP phase. The sampling locations must also be applicable to the stage or phase!

- **GDOT has a standard written justification and analysis in the ESPCP General Notes template. All outfalls are required to be represented in the Sampling table!!!**

Representative Sampling Example



Representative Sampling Example

Note: The Total site area is 173.41 acres.											Representative Sampling Scheme				
SAMPLING INFORMATION											OUTFALL CHARACTERISTICS				
Primary Sampled Feature	Location (Station and Offset)	Name of Receiving Water	Applicable Construction Stage for Sampling	Sampling Type (Outfall or Receiving water)	Drainage Area for Receiving Water (sq mi)	Upstream Disturbed Area (acres)	Warm or Cold Water Stream	Appendix B NTU Value (Outfall Sampling only)	Allowable NTU Increase (Receiving water sampling only)	Location Description	Construction Activity	Disturbed Area (acres)	Average Outfall Slope (Rise/Run)	Soil Erosion Index	Represented Outfall Drainage Basins
3	143+10.94, 77' RT	Altamaha River	All	Outfall	11700	N/A	Warm	100	N/A	End of Existing 36" RCP	Road Widening	3.05	0.0024	8.5	1, 9, 10, 11
22	227+44.30, 76' RT	Altamaha River	All	Outfall	11700	N/A	Warm	100	N/A	End of Proposed Ditch/36 IN RCP	Road Widening	12.43	0.0162	8.5	15, 16, 18, 19, 20, 23
27	264+37.88, 107' LT	Williams Creek	All	Outfall	6.46	N/A	Warm	50	N/A	30 IN RCP	Road Widening	3.34	0.0485	8.5	24, 26, 28
33	300+00, 88' LT	Williams Creek	All	Outfall	6.46	N/A	Warm	50	N/A	36 IN RCP	Road Widening	3.47	0.0126	8.5	30, 31, 32, 34
36	328+08, 82' RT	Altamaha River	All	Outfall	11700	N/A	Warm	100	N/A	24 IN RCP	Road Widening	2.08	0.0547	8.5	37, 38, 41
*47	357+87, 125' LT	IS 21	All	Receiving	0.0124	N/A	Warm	N/A	25	4X4 Box Culvert	Road Widening	5.28	0.0051	8.5	43, 44, 46, 48
50	366+86, 100' LT	Williams Creek	All	Outfall	6.46	N/A	Warm	50	N/A	30 IN RCP	Road Widening	2.15	0.0036	8.5	51, 52, 53
57	381+85, 80' LT	Williams Creek	All	Outfall	6.46	N/A	Warm	50	N/A	Double 36 IN RCP	Road Widening	1.64	0.0436	8.5	54, 55
59	423+73.95, 95' RT	IS 35/Cobb Creek	All	Outfall	0.55	N/A	Warm	50	N/A	Double 6X4 Box Culvert	Road Widening	16.73	0.0039	8.5	58, 61, 62, 63, 64, 64A, 66, 69, 70, 71
78 UP	502+84.36, 125' LT	PS 47	All	Receiving	1.67	N/A	Warm	N/A	25	Double 6X5 Box Culvert	Road Widening	31.55	0.0050	8.5	72, 73, 75, 76, 77, 79, 80, 81, 82
78 DN	501+06.46, 125 RT														

*NOTE: Sample Location 47 has no valid upstream sampling location since this Receiving Water originates on the project.

Identifying Cold-Water Trout Streams

- Trout streams are State Waters classified as either primary trout waters or secondary trout waters, as designated in the Georgia Environmental Rule 391-3-6.03(15)(b):

  https://epd.georgia.gov/existing-rules-and-corresponding-laws

- Excerpt from Georgia Environmental Rule 391-3-6.03(15)(b):

  FULTON COUNTY

  Primary:

  None.

  Secondary:

  1. Chattahoochee River upstream from I-285 West Bridge.

- Other publications that identify trout streams for purposes of fishing are not to be used to identify cold-water streams for the ESPCP.

Measuring Turbidity

- Turbidity is a measure of how much light can pass through the sample.
  - •Turbidity measurements are reported in Nephelometric Turbidity Units (NTU).
  - •Turbidity is not Total Suspended Solids (TSS). TSS has a unit measure of mass per unit volume (i.e. mg/L) and is typically measured by filtering the sample and measuring the weight of particles left in the filter. Nevertheless, turbidity can be estimated from TSS.

From Left to Right: NTU of 5, 50, and 500

- There are various types of instruments and methods used to measure turbidity.

Appendix B NTU Tables - Example

- Appendix B of the NPDES GAR100002 permit has NTU tables for warm-water and cold-water receiving waters used to determine the maximum allowable turbidity value for outfall sampling only.

Project Site Size: 143 ac
Project Disturbed Area: 83 ac
Outfall Disturbed Area: 3 ac
Outfall Drainage Area: 7 ac
Receiving Water Drainage Area: 4642 ac (640 ac=1mi^2)

Warm Water (Supporting Warm Water Fisheries)

Site Size, acres	Surface Water Drainage Area, square miles							
	0-4.99	5-9.99	10-24.99	25-49.99	50-99.99	100-249.99	250-499.99	500+
1.00-10	75	150	200	400	750	750	750	750
10.01-25	50	100	100	200	300	500	750	750
25.01-50	50	50	100	100	200	300	750	750
50.01-100	50	50	50	100	100	150	300	600
100.01+	50	50	50	50	50	100	200	100

ESPCP Sampling Table - Example

Note: The Total site area is X.XX acres.											Representative Sampling Scheme				
SAMPLING INFORMATION											OUTFALL CHARACTERISTICS				
1 Primary Sampled Feature	Location (Station and Offset)	2 Name of Receiving Water	Applicable Construction Stage for Sampling	Sampling Type (Outfall or Receiving water)	Drainage Area for Receiving Water (mi^2)	Upstream Disturbed Area (acres)	Warm or Cold Water Stream	Appendix B NTU Value (Outfall Sampling only)	Allowable NTU Increase (Receiving water sampling only)	Location Description	Construction Activity	Disturbed Area (acres)	Average Outfall Slope (Rise/Run)	3 Soil Erosion Index	4 Represented Outfall Drainage Basins
1 Up	20+00, 200' LT	Sunset Creek	All	Receiving Water	5.0	0	Warm	N/A	25	Upstream	Road Widening	N/A	N/A	N/A	N/A
1 Dn	20+50, 150' RT	Sunset Creek	All	Receiving Water	7.2	6.5	Warm	N/A	25	Downstream	Road Widening	N/A	N/A	N/A	N/A
2 Up	50+00, 200' LT	Sunrise Creek	All	Receiving Water	6.0	1.5	Warm	N/A	25	Upstream	Road Widening	1.5	0.03	2	N/A
2 Dn	50+65, 150' RT	Sunrise Creek	All	Receiving Water	6.0	2	Warm	N/A	25	Downstream	Road Widening	6	0.02	3	1,2,3,4
5	60+60, 120' RT	Full Moon Creek	2	Outfall	5.4	N/A	Warm	50	N/A	End of Ditch	New Road-Fill	2.1	0.02	5	N/A
6	78+37, 100' LT	Soggy Bottom Creek	3	Outfall	5.7	N/A	Warm	50	N/A	End of Ditch	New Road-Cut	3.5	0.03	3	7
8	25+51, 92' RT	Unnamed Trib. to Sunrise Creek	3	Outfall	6.3	N/A	Warm	50	N/A	End of Ditch	New Road-Fill	5	0.1	2	9,10

1. **Primary Sampled Feature:** These are the primary receiving water and outfall sampling locations for the project. Outfall ID#s shall be consistent with Section 53.

2. **Name of Receiving Water:** The nearest State Water identified by an ecologist or "blue-lined" water body identified on the USGS topographic map receiving storm water discharge(s) from the project areas.

3. **Soil Erosion Index:** GDOT project-specific information from Soil Survey Report or the average found in the Geotechnical Manual (04.5.2): http://www.dot.ga.gov/PS/DesignManuals/DesignGuides.

4. **Representative Outfall Drainage Basins:** Outfalls not be sampled but have similar characteristics of the primary outfall location and/or discharging into the same receiving water.

Sampling Selection & Representative Sampling Questions?

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Erosion Control

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Topics

Worksite Erosion Control Manual (WECS Manual)

Worksite Erosion Control Supervisor (WECS)

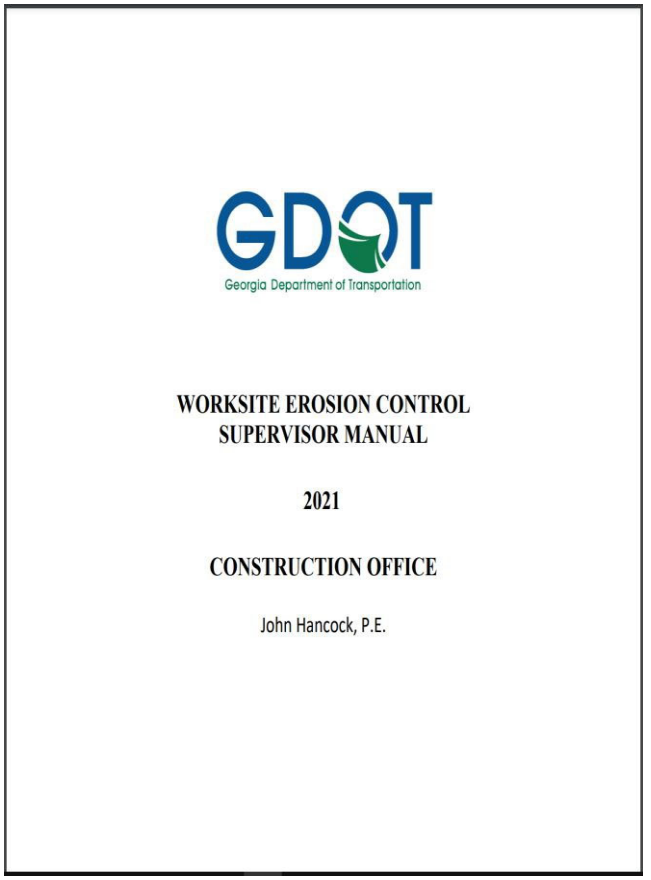
Sampling Requirements

Common Erosion on Construction Projects

Best Management Practices (BMPs)

Erosion Control Manual (WECS Manual)

- Erosion and Sediment Control Practices
- Responsibilities/Duties of the WECS
- Installation & Maintenance of Erosion Control Devices (BMPs)
- Inspections, Documentation and Reporting
- Erosion Control Related Details and Standard Specifications
- Erosion Sediment and Pollution Control Plans (ESPCP)
- State Water Buffers, Buffer Variances and Buffer Exemptions
- Erosion Control Laws & NPDES GAR 100002 Permit Requirements
- Memorandum of Agreements with Ga. EPD



Worksite Erosion Control Supervisor (WECS)

- Has day to day operational control of the erosion and sediment control on the construction site
- Responsible for ensuring all BMPs (temporary and permanent) are properly installed and maintained
- Recognize areas of potential erosion and sedimentation problems and takes initiative to address areas before they become problems
- Coordinates on a daily basis with the responsible parties of all land disturbing operations on the project
- Provides EC documentation and mark ups for “as built” plans
- Provides an alternate substitute who performs the duties of WECS, when the WECS is not available

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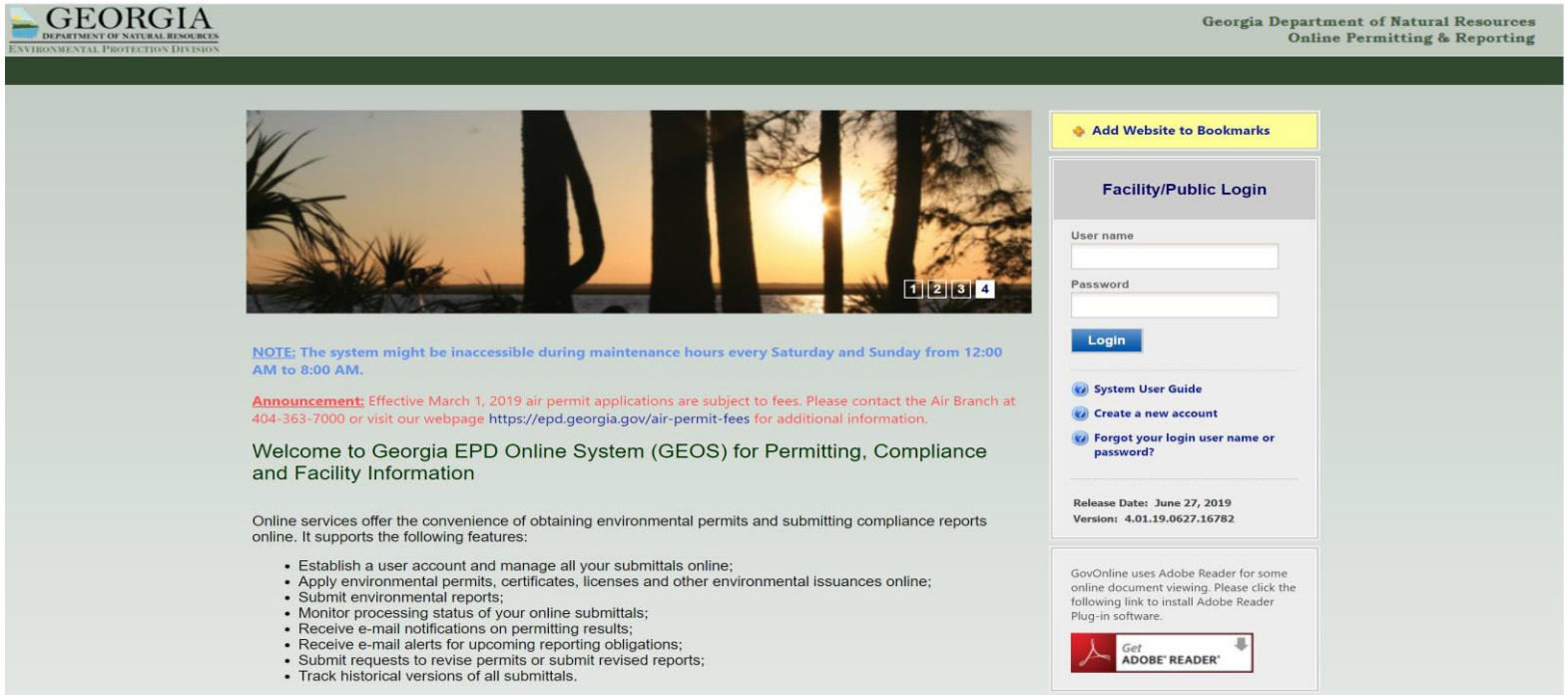
Sampling

Testing water quality through Nephelometric Turbidity Units (NTU) values

Sampling

GDOT submits sampling to EPD through GEOS

- The Department will log into GEOS and submit samples by the timeframe outlined in the permit for the respective construction sites



Common Erosion on Construction

Any disturbed or unprotected soil is subject to erosion

Some of the more common erosion that can be seen on construction sites are

Large areas of mass grading

Areas where soil has yet to be compacted

Ditch lines or any areas of concentrated flow

How do we help to minimize erosion on construction?

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Best Management Practices(BMPs)

Erosion can be minimized through proper use of BMPs

There are 3 key items that make up an effective BMP –

- Design
- Installation
- Maintenance

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Best Management Practices(BMPs)

Temporary Sediment Basin

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Best Management Practices(BMPs)

Silt Fence

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Best Management Practices(BMPs)

Silt Fence Fabric Check Dam

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Best Management Practices(BMPs)

Silt Control Gate

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Best Management Practices(BMPs)

Stone Check Dam

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Best Management Practices(BMPs)

Stone Filter Ring

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Best Management Practices(BMPs)

Stone Filter Berm

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Best Management Practices(BMPs)

Rock Filter Dam

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Best Management Practices(BMPs)

Rip Rap Channel

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Best Management Practices(BMPs)

Benched Slope, Matting & Temporary Slope Drain Pipe

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Best Management Practices(BMPs)

Rip Rap Channel, Slope Mat, Silt Fence, Slope Drain

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Best Management Practices(BMPs)

Turbidity Curtain (Staked)

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Best Management Practices(BMPs)

Turbidity Curtain (Floating)

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Best Management Practices(BMPs)

Grassing

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Questions?