

DRAFT Meeting Minutes  
Thursday, July 23, 2020  
Point Source Nutrient Reductions Review (PSNR Review)

Work Group (WG)  
Electronic-only Meeting on GoToWebinar

Members Present: George Hayes, Ted Henifin, Adrienne Kotula, Chris McDonald, Chris Pomeroy, Peggy Sanner, and Bill Street.

Members Absent: None.

Other Attendees: Melanie Davenport, Drew Hammond, John Kennedy, Allan Brockenbrough, Austen Stevens, Gary Graham, Alison Thompson, W. Brandon Bull, James Martin, Clifton Bell, Jamison Brunkow, Tim Castillo, Jane Chiffriller, John Derosa, Allison Dienes, Patrick Fanning, KC Filippino, Steven Herzog, Lawrence Heyd, Lawrence Hoffman, Laurissa Hoyle, Anna Killius, Jessica Lassiter, Lewis Linker, Whitney Ketchmark, Anna Killius, Timothy Mitchell, Andrew Parker, Jim Pletl, Lisa Reynolds, Joe Wood, and Andrea Wortzel.

The meeting convened at 1:34 p.m. and adjourned at 2:59 p.m.

1. **Introductions and Meeting Logistics** [Kevin Vaughan, DEQ]. Mr. Vaughan checked in the WG members (Attachment 1), made sure they had good audio connections, introduced the on-line attendees that were present for the electronic meeting, and introduced the staff members physically present for the meeting in the DEQ training room. The Agenda (Attachment 2) and the WQIF Needs Assessment (Attachment 3) had been provided to members for information before the meeting.
2. **Workgroup Charge** [Melanie Davenport, DEQ]. Using Attachment 4, Ms. Davenport briefed the work group on the requirements of the General Assembly budget bill (2020 Acts of Assembly, Chapter 1289, Item 377, subsection F 2) that is the basis for convening the work group. The objective is to assist DEQ with reviewing the assumptions used in estimating effluent nutrient concentrations, reviewing wastewater facility trends, and identifying cost-effective options for achieving load levels that will provide reasonable assurance of achieving the Chesapeake Bay TMDLs. A report by DEQ is due to various legislative groups by December 1<sup>st</sup> of this year. The group was reminded to send all communications to the group through Mr. Graham (the DEQ contact person) and avoid using “reply to all” feature of email, in order to ensure compliance with public meeting requirements of the Freedom of Information Act.
1. **Alternatives and Costs Discussion** [Allan Brockenbrough, DEQ]. Mr. Brockenbrough opened the meeting up for discussion of alternatives to the Department’s proposal for regulatory changes to meet the Chesapeake Bay TMDL, generally referred to as the “floating waste load allocation (WLA)” approach as presented in Virginia’s Phase 3 Watershed Implementation Plan (State Initiative #52). Several alternatives had been proposed prior to the meeting of the work group, including a “hybrid” plan that was developed by VAMWA (Attachment 5).
  - a. Members asked that the WQIF Needs Assessment to be explained in some detail so that the work group could start discussions on alternatives and the results of the original survey with and without the “floating cap” option. Mr.

Brockenbrough indicated that further details of the needs assessment would be provided at the next meeting.

- b. A discussion of the assumptions on which the Phase III WIP was based produced no general agreement between members on whether any additional reductions from wastewater point sources were needed at all. Mr. Brockenbrough presented Attachment 6 to explain that the floating wasteload allocation (WLA) concept was initiated to achieve additional nutrient reductions from the point source sector in recognition that more difficult reductions in the nonpoint source sectors continue to lag despite the Commonwealth's best efforts. The additional point source reductions were part of the initial WIP III planning process and were not developed in response to load reduction shortfalls in the Potomac or Eastern Shore basins or the perceived increase in Potomac point source loads created by the input deck assumptions. A member commented that the SWIFT reductions alone would produce all those needed reductions in the James River basin and that DEQ should demonstrate the actual point source progress in the Potomac basin to EPA. Other members indicated that reductions need to be equitable and that trends across a number of sectors indicate the need for more reductions from the point source sector.
  - c. Members also asked for more background data on:
    - i. The costs for each of the DEQ "floating cap" alternatives discussed in earlier meetings.
    - ii. Cost estimates for all of the other alternatives.
    - iii. What running the 2018 Potomac Basin flows and concentration limits would produce in terms of the needed nutrient reductions.
    - iv. What a table of the existing trends (including other sectors), WIP III assumption levels, the proposed scenarios, and the costs associated with those scenarios would show.
    - v. Load reductions arising from the costs of the improvements proposed.
2. **Next Steps** [Allan Brockenbrough, DEQ]. Mr. Brockenbrough asked that members provide any additional data needs to Mr. Graham (DEQ) by Wednesday, July 29, 2020. DEQ will then produce a comprehensive list of data needs for the next meeting and send the list out to the work group members. A member asked that a list of the alternatives to be considered also be provided to the members.

A [recording of the meeting](#) is available for review on-line.

Attachments:

1. Work Group Member List.
2. Final Meeting 1 Agenda.
3. 2020 WQIF Needs Assessment.
4. Point Source Nutrient Reduction Workgroup – Meeting #1
5. VAMWA Hybrid Plan.
6. SectorbyBasin (CAS-19) Spreadsheet

Attachment 1

**COMMONWEALTH OF VIRGINIA  
STATE WATER CONTROL BOARD**

**POINT SOURCE NUTRIENT REDUCTIONS REVIEW WORK GROUP**

**Workgroup Facilitators**

Melanie Davenport, DEQ

Allan Brockenbrough, DEQ

**Work Group Members**

George Hayes, Chesterfield County

Ted Henifin, HRSD

Chris McDonald, Virginia Association of Counties, or named designee

Chris Pomeroy, Virginia Association of Municipal Water Agencies, Inc.

Peggy Sanner, Chesapeake Bay Foundation, or named designee

Bill Street, James River Association, or named designee

Adrienne Kotula, Chesapeake Bay Commission

**DEQ Staff**

Gary Graham, DEQ, Agency Contact

## Attachment 2

### Final Agenda

Point Source Nutrient Reduction Review Work Group  
Meeting No. 1 – July 23, 2020, 1:30 p.m.

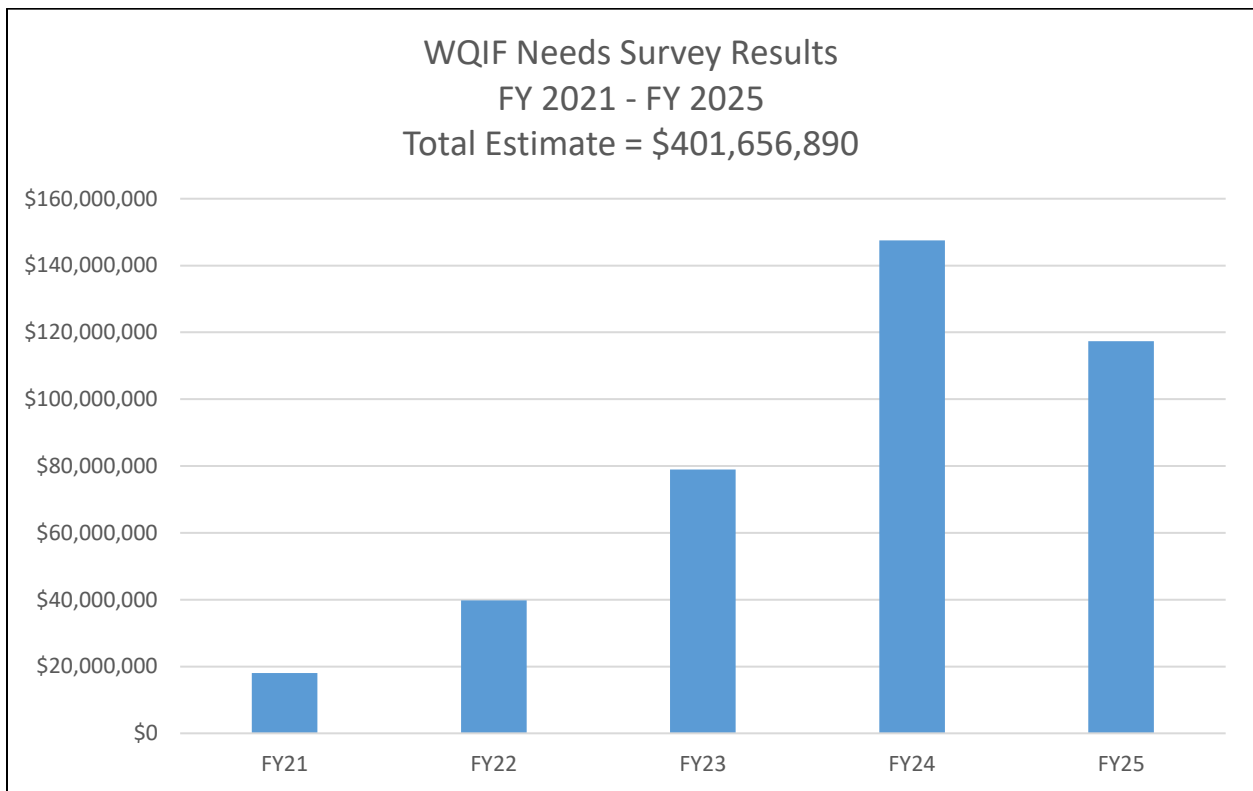
1. Meeting Logistics
2. Introductions
3. Workgroup Charge
4. Alternatives Discussion
5. Estimating Costs
6. Next Steps

## Attachment 3

2020 WQIF Needs Assessment

## Annual Funding Needs for Water Quality Improvement Fund (WQIF) Point Source Grants

The Water Quality Improvement Fund (WQIF) is a special permanent, nonreverting fund established to provide Water Quality Improvement Grants in accordance with the provisions of the Virginia Water Quality Improvement Act of 1997. In accordance with § 10.1-2134.1 of the *Code of Virginia* the Department of Environmental Quality, in consultation with stakeholders, including representatives of the Virginia Association of Municipal Wastewater Agencies, local governments, and conservation organizations, is required to annually determine an estimate of the amount of Water Quality Improvement grant funding expected to be requested by local governments for projects that are related to point source pollution and are eligible for grant funding. For the fiscal years 2021 to 2025, an estimate of \$769 million may be required from state funds as well as locality financial contributions to meet water quality goals. Approximately 52% of this total (\$401.6 million) could be needed from the WQIF.



The methodology for estimating the amount of Water Quality Improvement grant funding expected to be requested by local governments was established by DEQ in consultation with wastewater stakeholders from the Virginia Association of Municipal Wastewater Agencies (VAMWA). An electronic survey was created in consultation with stakeholders and distributed to significant dischargers in the Chesapeake Bay watershed. During the survey period two virtual tutorial and question and answer sessions were held with the VAMWA membership. The survey requested: 1) general information, 2) programmatic information, and 3) total project cost with no time horizon. General information included facility name and contact information. Programmatic information was requested on future WQIF funding needs over a five year time horizon (FY 2021 to FY 2025). This timeframe was selected because it generally aligns with the time horizons of typical Capital Improvement Plans (CIP). Total estimated project costs were also requested with no specified time horizon. This amount is assumed to include costs needed for the entire project beyond FY 2025.

A total of 29 responses to the survey were received identifying a programmatic funding need over the five year time horizon and total project costs. Programmatic funding need amounts were then multiplied by the estimated eligible grant percentage to determine the WQIF eligible funding need. The grant percentage from the previous WQIF grant for each locality was utilized for the calculation. Total estimated project costs were also multiplied by the estimated eligible grant percentage for each locality to determine the total WQIF eligible funding need. Two respondents had not previously received a WQIF grant, but were assigned percentages based on data available for their respective regions.

The overall project costs for those anticipating to request WQIF funds total \$769,010,229 through FY 2025. Based on the estimated eligible grant percentage for each respondent, the amount of programmatic WQIF point source funding needed through FY 2025 is \$401,656,890. The following is a breakdown of WQIF point source funding need by fiscal year:

- FY 2021 – \$18,018,474
- FY 2022 – \$39,792,860
- FY 2023 – \$78,961,097
- FY 2024 – \$147,518,333
- FY 2025 – \$117,366,125

These amounts include estimated funding needed for facilities to meet current permit limits and funding needed for future Chesapeake Bay WIP Phase III floating waste load allocations. Additionally, needs were included for nutrient removal technology and wastewater conveyance infrastructure projects.

WQIF Grants	2020 WQIF Needs Survey Results					Total Need (2020 - 2025)
	2021-2022 Biennium		2023-2024 Biennium		2025	
	FY21	FY22	FY23	FY24	FY25	
Applicant	\$18,018,474	\$39,792,860	\$78,961,097	\$147,518,333	\$117,366,125	\$401,656,890
<b>TOTALS</b>	<b>\$57,811,334</b>		<b>\$226,479,430</b>		<b>\$117,366,125</b>	<b>\$401,656,890</b>

The total estimated project costs identified by respondents is \$1,230,947,484. Of that total, the amount of WQIF eligible project costs is estimated to be \$790,010,229. Based on the estimated eligible grant percentage for each respondent, the amount of WQIF point source funding needed with no specified time horizon totals \$409,006,890.

2020 WQIF Needs Survey Results - Total Project Costs (no time horizon)		
Est Total Project Costs	WQIF Eligible Project Costs	Est Eligible Grant Amount
\$1,230,947,484	\$790,010,229	\$409,006,890

In order to improve upon the data collection methods, DEQ, with stakeholder participation, intends to re-evaluate the methodology utilized to determine the estimate of WQIF point source grant requests prior to conducting the needs assessment next year.

Attachment 4

Point Source Nutrient Reduction Workgroup – Meeting #1





If you are experiencing connection problems please call Kevin Vaughan at (804) 698-4470

# Point Source Nutrient Reduction Review Work Group Meeting No. 1 - July 23, 2020

## Agenda

1. Meeting Logistics
2. Introductions
3. Work Group Charge
4. Alternatives Discussion
5. Estimating Costs
6. Next Steps

## Budget Provision – Item 377 #6c

"F.2. The Department shall work with permittees operating under the Chesapeake Bay Watershed Nutrient General Permit and interested stakeholders through a workgroup including local government representatives, the Chesapeake Bay Foundation and the James River Association to review the assumptions used in estimating the effluent nutrient concentrations and trends of wastewater facilities and to identify cost-effective options to achieve wastewater nutrient load levels with reasonable assurance consistent with the needs of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan. The review shall be completed and provided to the Chairs of the House Appropriations Committee, the Senate Finance and Appropriations Committee, the House Committee on Agriculture, Chesapeake and Natural Resources, the Senate Committee on Agriculture, Conservation, and Natural Resources and the Virginia delegation of the Chesapeake Bay Commission by December 1, 2020. The Department shall continue issuing Water Quality Improvement Fund grants for additional nutrient removal projects in accordance with the appropriations under Items 379 and C-70 of this act and §§ 10.1-1186.01 and 10.1-2117 of the Code of Virginia."

### **Explanation:**

(This amendment directs The Department of Environmental Quality to review the assumptions used to estimate nutrient concentrations and trends of wastewater facilities and to identify cost-effective options to achieve wastewater nutrient load levels consistent with the needs of Phase III of the Watershed Implementation Plan.)

Attachment 5

VAMWA Hybrid Plan

**DRAFT “HYBRID” APPROACH ELEMENTS FOR WQMPR RAP DISCUSSION  
NOT APPROVED OR RECOMMENDED – NOT FOR ATTRIBUTION  
JULY 9, 2020**

The June 25, 2020 WQMP Regulation RAP meeting identified the concept of a potential Hybrid Approach incorporating elements of (a) DEQ’s Floating Cap concept and (b) VAMWA’s previously-recommended approach to achieving Phase III WIP wastewater performance levels, including a deferred effective date for Floating Caps based on a performance trigger concept similar to recent legislation affecting other nutrient source sectors under the Phase III WIP. This outline captures various potential Hybrid Approach elements, numerous combinations of which would provide a heightened level of “Reasonable Assurance.”

- 1. Continue Overall Excellent Operations of All Upgraded Facilities (Reasonable Assurance)**
  - a. This is a goal of all facilities in all basins
  - b. Current operations under existing regulations are better than WIP3 Wastewater Input Deck levels (lbs/yr TN and TP load basis)
  - c. That by definition provides Reasonable Assurance of WIP3 Wastewater performance without added regulation, but the below Hybrid Approach goes far above and beyond that for added assurance with substantial additional local and State (normal WQIF) spending
  
- 2. HYBRID FOR ADDED REASONABLE ASSURANCE: Enact Virginia Wastewater Reasonable Assurance Adaptive Management Strategy Now Based on Hybrid Below of**
  - a. Revised WIP3 Floating Cap elements (below) and
  - b. Revised VAMWA Alternative elements (below)
  
- 3. (VERY) OPTIONAL COST-EFFECTIVE METHOD: Target Performance Optimization Incentive Grants for Cost-Effective Reductions from Existing Nutrient Removal Facilities in the WIP3-Critical Potomac River Basin (Non-Essential Extra Assurance if Desired by DEQ)**
  - a. Pilot incentive program in Potomac basin because Potomac has highest NPS need, has large PS facilities and basin drives the WIP3 credit needs, and also for WQIF budgetary reasons
  - b. WQIF grant fund incentive pool for POTWs at (research needed) estimated \$1M CY2022, \$3M CY2023, and \$5M CY2024 to determine cost-benefit and overall value
  - c. Award pro rata share of pool through Nutrient Exchange to POTWs based on each 0.1 mg/l TN increment < WLA concentration and actual POTW flow
  - d. *NOTE: DEQ’s prior NOIRA Agency Background Document objection that this requires a change in law and State appropriations is noted; this element is good for water quality and cost-effectiveness, but NOT AT ALL essential to WIP3 attainment under the Hybrid Concept*
  
- 4. ADDITIONAL PROJECTS IN PROGRESS: Pursue Certain New Priority Projects Now (Non-Essential Extra Assurance)**
  - a. Pursue Priority Projects for treatment upgrades / consolidations by volunteering owners (all in progress)
    - i. HRSD/Chesapeake-Elizabeth WWTP Consolidation (Below-Fall-Line (BFL) James)
    - ii. Spotsylvania County/Massaponax WWTP – Spotsylvania/FMC WWTP – City of Fredericksburg WWTP Consolidation (BFL Rappahannock)
    - iii. South Central Wastewater Authority WWTP Upgrade (BFL James)

- iv. These projects represent approximately \$350 million in local (sewer rate funded) and State (normal WQIF funded) investments
- b. Continue WQIF appropriations and track WQIF expenditures on Priority Projects
- c. These projects are above and beyond WIP3 Wastewater Input Deck levels and thus are Extra Assurance

**5. OPTIONAL REGULATORY ACTION: Adopt Targeted WLA Reduction Amendments Now in York and James Rivers (Non-Essential Extra Assurance if Desired by DEQ)**

- a. York BFL: Reduce final WLAs for POTWs > 5 MGD to 5 TN basis (down from 6, i.e., 17%)
- b. James BFL: Reduce final WLAs for POTWs > 5 MGD to 5 TN basis (down from Lower James water quality-based average of 8.2 (2017-2021) and 6.4 (2022-2025), except for the standard “Special Cases” (CSO Systems, Hopewell); also transition down HRSD CE WWTP Design Flow
- c. These reductions are estimated to require several hundreds of millions of dollars of local (sewer rate funded) and State (normal WQIF funded) investments
- d. Regulation effective 1/1/2023 with 1/1/2026 compliance date

**6. OPTIONAL REGULATORY BACKSTOP: Enact New Regulatory Backstop Now (Non-Essential Extra Assurance, Although Significant Opposition Exists to Floating Cap Element)**

- a. Enact trigger based on aggregate of Significant POTWs discharging > WIP3 Wastewater Input Deck level (adjusted for WIP3-style interbasin trades, any committed upgrades / construction-in-progress, and any plant upsets with individual remedy)
- b. Track and report basin and statewide POTW actual loads during 2023 – 2025 against WIP3 Wastewater Input Deck levels
- c. If aggregate of adjusted Significant POTWs discharge > WIP3 Wastewater Input Deck level in any 2 of the 3 years 2023 – 2025, then Floating Cap kicks-in automatically for POTWs >5 MGD 7/1/2026 with a 2030 compliance date
  - i. Potomac – As proposed by DEQ (facilities’ allocated WLAs based on 4 TN and 0.3 TP originally)
  - ii. Rappahannock – As proposed by DEQ (facilities were allocated WLAs based on 4 TN and 0.3 TP originally)
  - iii. Eastern Shore – As proposed by DEQ (facilities were allocated WLAs based on 4 and 0.3 originally)
  - iv. York BFL – Base Floating Cap for facilities with DF=1.0 on 5 TN and 0.4 TP (5 TN being a potential policy-based compromise between science-based / EPA adopted TMDL at 6 TN and DEQ’s proposed 4 TN)
  - v. York AFL – Base Floating Cap for facilities with DF<1.0 on current WLA basis (6 TN and 0.4 TP due to long-established science on less tidal and main stem delivery and less water quality benefit and EPA adopted TMDL)
  - vi. James BLF/Lower (HRSD) – Base Floating Cap for facilities with DF=1.0 on current 5 TN and 0.5 TP (these being a potential policy-based compromise reduction down from science-based approximately 8.2 TN and 0.6 TP bubble averages under long-established science on less tidal and main stem delivery and less water quality benefit and EPA adopted TMDL)
  - vii. James BFL/Middle – Base Floating Cap for facilities with DF=1.0 on current 5 TN and 0.405 TP

- viii. James AFL – Base Floating Cap for facilities with DF<1.0 on current WLA basis (6 TN and 0.405 TP due to long-established science on less tidal and mainstem delivery and less water quality benefit and EPA adopted TMDL)
- ix. Reuse – Floating Caps to be calculated based on flow treated per DEQ RAP explanation to encourage reuse
- x. Special Cases – Use current WLA concentration basis (Hopewell, CSO) or drinking water quality reservoir protection-based loading (UOSA 12/18/19 documentation) for established facility-specific reasons
- d. If Floating Cap triggered, facilities still retain their full WLAs as DEQ previously proposed and would comply with both
- e. Maintain Best-in-the-Nation Trading Program
  - i. Trading Generally – Trading of Standard Credits (those resulting by facility achieving an actual load less than Floating Cap) would remain an available compliance method for meeting above Floating Cap as DEQ proposed
  - ii. MS4 Trades – Permittees may use or trade their annual Floating Cap Credits to MS4s for temporary compliance trades (in addition to any Standard Credits)
  - iii. New/Expanded Facilities – Similarly Permittees may use or trade their annual Floating Cap Credits for new/expanded discharges (an unlikely need given DEQ Nutrient Offset Fund WLA recovery proposals and BFL York and BFL Lower James WLA reductions)
  - iv. Backup Credit Supply – The Nutrient Exchange can access the Nutrient Offset Fund on an emergency back-up basis at Nutrient Exchange Class A Credit Price
  - v. Existing DEQ-approved JH Miles trade in Lower James to be maintained, not rescinded, to maintain credit trading market integrity
- f. Codify by legislation in 2021 Session (More Reasonable Assurance)
- g. Statute to require regulation be effective 1/1/2023, requiring a 2026 Floating Cap trigger evaluation and, if triggered, a statewide 2030 compliance date

**7. OPTIONAL: HRSD SWIFT Program Tracking (Non-Essential Extra Assurance if Desired by DEQ)**

- a. Track progress of HRSD SWIFT program for multiple facilities
- b. SWIFT facility underground injection may reduce HRSD surface water loads by an estimated additional 75% below the reduced loads shown above for BFL Lower James)
- c. Forecast benefits over implementation period (currently plan is rolling implementation 2024 to 2032)
- d. Realize further benefits over time to DEQ Nutrient Offset Fund for PS offset purposes

**8. Miscellaneous**

- a. This comprehensive POTW program replaces 2030 POTW WLA review
- b. Additional WIP3 benefits achieved from various smaller projects (Elkton, Little Falls, etc.) and other currently-unspecified POTW projects as they materialize over time
- c. DEQ intends additional WIP3 benefits to be achieved from reasonable implementation of 2020 Industrial WLA review

7/9/2020 Draft

**Total Nitrogen (Lbs/yr Delivered, Municipal Only)**

Basin	A. WLA 2017 Watershed General Permit	B. WLA Targeted Amendments	C. Floating Cap Original WIP3	D. 2025 Forecast w/o Priority Projects	E. 2025 Forecast w/ Priority Projects	F. 2025 Forecast w/ Priority Projects & Potomac Incentive	G. Floating Cap Revised/ Deferred
Potomac	2,670,347	2,670,347	2,230,100	1,457,275	1,457,275	1,374,832	2,230,394
Eastern Shore	14,619	14,619	5,041	3,764	3,764	3,764	5,041
Rappahannock	443,070	443,070	271,400	285,207	243,699	243,699	271,400
York	534,521	487,037	230,680	287,468	287,468	287,468	296,513
James	10,186,684	8,367,148	4,757,013	6,589,441	4,731,773	4,731,773	5,392,602
	Meets Floating Cap Original WIP3 w/ WIP3's Interbasin Trades?:			YES	YES	YES	

**Notes:**

- WIP3 Basis: WIP3 is premised on TP to TN conversions and interbasin trades of James credits to the other basins at applicable ratios; for example, every 1 lb TN reduced in Potomac alleviates 5.8 lbs TN to be reduced in and transferred by WIP3 from the James to Potomac; these trades are included in WIP3 but not illustrated here.
- Column A: Existing municipal WLAs based on 2017 Watershed General Permit.
- Column B: Amendments applied to BFL municipal point sources w/ > 5 MGD design flow in York and James basins. York TN concentration basis is reduction from 6 to 5 mg/L TN. James TN concentration basis is reduction from 8.2 to 5 mg/L. Special cases applied (CSO and Hopewell per DEQ WLA concentration, UOSA corrected based on reservoir protection load).
- Column C: Floating cap according to original WIP3 definition (4 mg/L TN, 2018 high wet year flows, all significant municipal point sources)
- Column D: Based on 2018 as conservative projection of 2025 flow as in WIP, and repeat of 2018 concentration performance.
- Column E: Priority projects included:
  - York: Spotsylvania/Fredericksburg/Massaponax consolidation (assume operating at 3.8 mg/L TN for compliance buffer)
  - James: South Central Wastewater Authority upgrade (assume operating at 3.8 mg/L TN for compliance buffer)
  - James: Closure of Chesapeake-Elizabeth WWTP
 Priority projects not yet included: Elkton, Stafford/Little Falls
- Column F: For illustration purposes only (research on feasibility and costs needed) this hypothetical assumes performance incentives achieve aggregate average 0.2 mg/L TN reduction from municipal point sources > 5 MGD in Potomac, excluding UOSA special case. The 82,443 lbs/yr reduction is equivalent to a 462,990 lbs/yr reduction in James basin based on WIP3's interbasin transfer ratios.
- Column G: Floating cap applied to municipal point sources > 5 MGD design flow. Special cases same as Column B. Based on 2018 flows. Concentration bases:
  - Higher Effectiveness: Potomac, East. Shore, and Rapp.: 4 mg/L
  - Lower Effectiveness: York and James BFL: 5 mg/L (reduced)
  - Lowest Effectiveness: York and James AFL: 6 mg/L (retained)



7/9/2020 Draft

**Total Phosphorus (Lbs/yr Delivered, Municipal Only)**

Basin	A. WLA 2017 Watershed General Permit	B. WLA Targeted Amendments	C. Floating Cap Original WIP3	D. 2025 Forecast w/o Priority Projects	E. 2025 Forecast w/ Priority Projects	F. 2025 Forecast w/ Priority Projects & Potomac Incentive	G. Floating Cap Revised/ Deferred
Potomac	169,175	169,175	168,874	56,680	56,680	56,680	168,930
Eastern Shore	1,078	1,078	372	375	375	375	372
Rappahannock	39,705	39,705	24,180	16,942	16,942	16,942	24,180
York	36,506	36,506	18,990	20,500	20,500	20,500	27,314
James	660,192	660,192	273,277	461,925	400,933	400,933	432,517

Notes:

WIP3 Basis: WIP3 is premised on TP to TN conversions and interbasin trades of James credits to the other basins at applicable ratios; for example, every 1 lb TN reduced in Potomac alleviates 5.8 lbs TN to be reduced in and transferred by WIP3 from the James to Potomac; these trades are included in WIP3 but not illustrated here.

Column A: Existing municipal WLAs based on 2017 Watershed General Permit.

Column B: TN drives WIP3 TP to TN conversions and interbasin trades but still reduce Lower James from 0.7 to 0.5 mg/L TP.

Column C: Floating cap according to original WIP3 definition (0.3 mg/L TP, 2018 flows, all significant municipal point sources)

Column D: Based on 2018 as conservative projection of 2025 flow as in WIP, and repeat of 2018 concentration performance.

Column E: Priority projects included:

- Rappahannock: Spotsylvania FMC/Fredericksburg/Massaponax consolidation (set to 2018 load)
- James: South Central Wastewater Authority upgrade (assume operating at 0.25 mg/L for compliance buffer)
- James: Closure of Chesapeake-Elizabeth WWTP
- Priority projects not yet included: Elkton, Stafford/Little Falls

Column F: No change because Potomac incentives were assumed to prioritize and target TN given TN issue driving WIP3.

Column G: For illustration purposes only (research on feasibility and costs needed) this hypothetical assumes performance incentives achieve aggregate average 0.2 mg/L TN reduction from municipal point sources > 5 MGD in Potomac, excluding UOSA special case. The 82,443 lbs/yr reduction is equivalent to a 462,990 lbs/yr reduction in James basin based on WIP3's interbasin transfer ratios.

Attachment 6

SectorbyBasin (CAS-19) Spreadsheet

Row Labels	2010 Nitrogen	2018 Nitrogen	WIP3 Nitrogen	Nitrogen Δ	Potential Floating WLA TN reductions (all significant)	Potential Floating WLA TN reductions (≥ 5 MGD only)
<b>VA Eastern Shore of Chesapeake Bay (CBWS Portion Only)</b>	<b>2,500,611</b>	<b>2,268,380</b>	<b>1,523,901</b>	<b>744,480</b>	<b>1,590</b>	<b>0</b>
Natural	360,728	339,269	301,473			
Agriculture	1,599,445	1,582,063	937,370			
Developed	241,143	252,357	206,151			
Septic	59,364	58,378	46,363			
Wastewater	239,930	36,313	32,544			
<b>VA James River Basin (CBWS Portion Only)</b>	<b>31,942,026</b>	<b>23,993,085</b>	<b>21,022,130</b>	<b>2,970,954</b>	<b>2,752,457</b>	<b>2,688,929</b>
Natural	5,687,640	5,472,850	5,127,445			
Agriculture	4,506,579	4,398,566	2,843,671			
Developed	4,376,911	4,619,043	4,201,735			
Septic	640,433	673,416	569,283			
Wastewater	16,730,463	8,829,210	8,279,997			
<b>VA Potomac River Basin (CBWS Portion Only)</b>	<b>18,555,667</b>	<b>17,892,513</b>	<b>15,508,893</b>	<b>2,383,620</b>	<b>4,509</b>	<b>0</b>
Natural	3,154,519	3,143,793	3,006,768			
Agriculture	7,389,514	7,710,018	5,168,494			
Developed	3,393,529	3,658,563	3,302,186			
Septic	751,899	818,562	740,103			
Wastewater	3,866,206	2,561,577	3,291,342			
<b>VA Rappahannock River Basin (CBWS Portion Only)</b>	<b>8,414,391</b>	<b>8,388,742</b>	<b>6,518,744</b>	<b>1,869,998</b>	<b>52,177</b>	<b>0</b>
Natural	2,072,726	2,042,594	1,902,211			
Agriculture	4,423,918	4,403,045	2,816,075			
Developed	1,112,217	1,169,346	1,066,018			
Septic	308,477	332,998	310,097			
Wastewater	497,053	440,758	424,343			
<b>VA York River Basin (CBWS Portion Only)</b>	<b>6,905,086</b>	<b>6,414,427</b>	<b>5,335,807</b>	<b>1,078,620</b>	<b>60,420</b>	<b>31,908</b>
Natural	1,827,349	1,813,233	1,633,436			
Agriculture	2,464,385	2,487,050	1,741,187			
Developed	1,075,341	1,139,059	1,020,879			
Septic	238,502	253,469	214,813			
Wastewater	1,299,509	721,616	725,492			
<b>Grand Total</b>	<b>68,317,781</b>	<b>58,957,147</b>	<b>49,909,474</b>	<b>9,047,673</b>	<b>2,871,153</b>	<b>2,720,837</b>

Row Labels	2010 Phosphorus	2018 Phosphorus	WIP Phosphorus	Phosphorus Δ	Potential Floating WLA TP reductions (all significant)	Potential Floating WLA TP reductions (≥ 5 MGD only)
<b>VA Eastern Shore of Chesapeake Bay (CBWS Portion Only)</b>	<b>184,538</b>	<b>175,177</b>	<b>139,777</b>	<b>35,399</b>	<b>206</b>	<b>0</b>
Agriculture	59,132	55,193	32,077			
Developed	17,970	18,454	14,869			
Natural	100,218	97,869	90,988			
Septic	3	3	3			
Wastewater	7,213	3,658	1,840			
<b>VA James River Basin (CBWS Portion Only)</b>	<b>2,793,402</b>	<b>2,471,666</b>	<b>2,096,938</b>	<b>374,728</b>	<b>249,961</b>	<b>241,856</b>
Agriculture	412,713	359,353	236,058			
Developed	494,358	519,671	469,943			
Natural	919,307	881,859	790,610			
Septic	553	553	553			
Wastewater	966,470	710,230	599,775			
<b>VA Potomac River Basin (CBWS Portion Only)</b>	<b>2,283,197</b>	<b>1,994,233</b>	<b>1,691,951</b>	<b>302,282</b>	<b>2,848</b>	<b>0</b>
Agriculture	815,707	813,506	549,288			
Developed	467,426	498,021	446,090			
Natural	563,416	541,077	495,835			
Septic	378	378	378			
Wastewater	436,270	141,250	200,360			
<b>VA Rappahannock River Basin (CBWS Portion Only)</b>	<b>963,337</b>	<b>876,102</b>	<b>745,490</b>	<b>130,613</b>	<b>1,870</b>	<b>0</b>
Agriculture	298,955	252,556	164,017			
Developed	157,881	159,593	147,983			
Natural	443,022	420,293	390,229			
Septic	309	309	309			
Wastewater	63,170	43,352	42,951			
<b>VA York River Basin (CBWS Portion Only)</b>	<b>590,342</b>	<b>553,283</b>	<b>522,735</b>	<b>30,548</b>	<b>5,965</b>	<b>156</b>
Agriculture	54,651	44,255	33,542			
Developed	100,499	104,724	94,307			
Natural	320,628	316,850	293,827			
Septic	-	-	-			
Wastewater	114,565	87,455	101,059			
<b>Grand Total</b>	<b>6,814,815</b>	<b>6,070,461</b>	<b>5,196,891</b>	<b>873,569</b>	<b>260,850</b>	<b>242,012</b>