

VPDES PERMIT FACT SHEET

This document provides the pertinent information concerning the legal basis, scientific rationale and justification for the reissuance of the VPDES permit listed below. This permit is being processed as a Major, Industrial permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq. The discharge results from the operation of a facility manufacturing organic and inorganic chemicals. This permit action includes the addition of five stormwater outfalls (Outfalls 901, 902, 903, 912, 913), one process outfall (Outfall 005), and one internal outfall (Outfall 302); renumbering of one internal outfall (Outfall 401 is now Outfall 103); removal of one internal outfall (Outfall 301); revised effluent limitations; revised and new special conditions; a Schedule of Compliance to achieve new ammonia limitations; and a schedule to achieve the Best Technology Available (BTA) to minimize adverse environmental impacts from impingement and entrainment at the cooling water intake structure.

1. Facility Name and Address / Location: SIC Codes: 2869 - Industrial Organic Chemicals
 AdvanSix Resins & Chemicals LLC 2873 – Agricultural Chemicals
 905 East Randolph Road 2819 – Industrial Inorganic Chemicals
 Hopewell, VA 23860 4691 – Steam Generation
2. Permit No. VA0077763 Existing Permit Expiration Date: July 31, 2021
 This permit was administratively continued on July 8, 2021
3. Owner Contact:
 Andrew M. Girvin, Plant Manager
 905 East Randolph Road
 Hopewell, VA 23860 Telephone No: (804) 541-5742
4. Application Complete: Date: June 23, 2021
 Permit Drafted By: Jeanne Puricelli Date: April 19, 2022, April 27, 2023, May 12, 2023, May 19, 2023,
 June 8, 2023, June 16, 2022, August 11, 2023, October 19, 2023
 February 23, 2024, March 29, 2024
 Reviewed By: Joy Abel Date: June 2, 2022, June 30, 2022, April 27, 2023
 Reviewed By: Azra Bilalagic Date: August 2, 2022, April 27, 2023, May 12, 2023, June 15, 2023,
 August 14, 2023

Public Comment Period: October 31, 2023 to November 30, 2023

Newspaper: *Richmond Times Dispatch and the Progress-Index*

5. Receiving Stream Classification (see flow frequency memo provided as **Attachment A**):

<u>Outfall</u>	<u>Rivermile</u>	
001	2-GRV001.20	Gravelly Run
002	2-XGI000.28	Gravelly Run, UT
003	2-PTH000.66	Poythress Run
005	2-JMS007.03	James River
901	2-GRV001.20	Gravelly Run
902	2-XGI000.28	Gravelly Run
903	2-PTH000.66	Poythress Run
904	2-JMS077.09	James River
905	2-JMS077.18	James River
906	2-JMS077.27	James River
907	2-PTH000.23	Poythress Run (tidal)
908	2-XGI000.20	Gravelly Run, UT
909	2-GRV001.18	Gravelly Run
910	2-GRV000.91	Gravelly Run
911	2-JMS076.95	James River
912	2-PTH000.36	Poythress Run
913	2-XGI000.30	Gravelly Run, UT
Basin:	James	
Subbasin:	Lower James River	
Section:	1	
Class:	II	

Special Standards: None

Tidal: Yes

On 303(d) List?: Yes

6. **Operator License Requirements (18VAC160-20-130.C & 9VAC25-31-200.C):** The Virginia Department of Professional and Occupational Regulation requires licensed operators for certain wastewater works. Licensure has not been required historically for this facility, due to the limited scope of wastewater treatment provided for facility effluent which primarily consists of cooling water. However, with the addition of Outfall 005, a Class II Operator is required due to the size of the treatment (>0.5 MGD) and the advanced technology (ammonia stripping, biological treatment, or reverse osmosis), per GM 04-2022.
7. **Reliability Class (9VAC25-790-300):** Not required as this facility is not subject to the referenced Sewage Collection and Treatment Regulations.
8. **Permit Characterization:**
 (x) Private (x) Existing Discharge (x) Reissuance (x) Industrial (x) Water Quality Limited
 (x) Stormwater Management Plan (x) Discharge to 303(d) Listed Segment
 (x) Whole Effluent Toxicity Program required

9. **Wastewater Flow and Treatment:**

Table 1 – Wastewater Sources, Treatment, and Flows for each Outfall

Outfall Number	Wastewater Source	Treatment	Max* Flow (MGD)
001	Non-contact cooling water from Hydroxylamine Production	None	83.5
	Non-contact cooling water from Oximation & Rearrangement	None	
	Contact cooling water from Ammonia Sulfate Production (Internal Outfall 101)	None	
	Non-contact cooling water from Ammonia Sulfate Production	None	
	Non-contact cooling water from Sulfuric Acid Production	None	
	Steam Generation (Internal Outfall 103)	Oil/water separator	
	Non-contact cooling water from Service Buildings	None	
	Stormwater Runoff (Outfall 901)	None	
002	Non-contact cooling water from Phenol Purification & Hydrogenation	None	66.8
	Non-contact cooling water from Caprolactam Purification	None	
	Non-contact cooling water from Hydroxylamine Hydrolysis	None	
	Non-contact cooling water from Oximation & Rearrangement	None	
	Stormwater Runoff (Outfall 902)	None	
	Emergency deluge system for Phenol Purification & Hydrogenation**	None	
003	Non-contact cooling water for Ammonia Production	None	15.2
	Water treatment for Ammonia Production (Belco Unit)	Neutralization***	
	Non-contact cooling water from Ammonia Production (Internal Outfall 302)	Oil/water separator	
	Non-contact cooling water from Synthesis Gas Production	None	
	Stormwater Runoff (Outfall 903)	None	
004	Compliance Outfall for Hopewell Water Renewal pretreatment permit (VA0066630). Not used for this permit.		N/A
005 (new)	Marine Operations stormwater	TBD	0.72
	Groundwater remediation flows		
901, 902, 903 (new)	Stormwater to process water outfalls 001, 002, and 003	None specified	Varies

Outfall Number	Wastewater Source	Treatment	Max* Flow (MGD)
904 -913	Stormwater to James River, Poythress Run and Gravelly Run	None specified	Varies
101	Contact cooling water from ammonium sulfate fertilizer evaporative barometric condenser units (EV19 and EV27)	None	25.5
103 (formerly 401)	Internal outfall of floor drains from Power House	Oil/water separator	0.07
302 (new)	Internal outfall of non-contact cooling water and oil-impacted stormwater for the Kellogg area.	Oil/water separator	
998	Combined Outfalls 001 and 002 for application of ammonia and heat limits to Gravelly Run	N/A	N/A
999	Combined Outfalls 001, 002, 003, and 005 for monitoring of cBOD ₅	N/A	N/A

*Max Flow from Monthly Maximum DMR data 9/2016 to 4/2021 (**Attachment E**)

**Deluge system is operated in an emergency only and drenches the phenol purification and hydrogenation area (Area 6) with water in the event of an explosive condition or fire. Special Condition Part I.C.9 of the permit addresses sampling and reporting requirements in the event the deluge systems operates.

***Neutralization: Acid-impacted regeneration wastewater from the Belco ion-exchange units is treated with caustic addition in a neutralization tank. Tank is sampled for pH prior to discharge to Outfall 003.

See **Attachment B** for a facility diagram, process flow chart, and maps of the outfall locations.

10. **Sludge Disposal:** This facility does not generate wastewater sludge.

11. **Discharge Location Description:**

Table 2 – Outfall Locations and Receiving Streams

Outfall	Latitude			Longitude			Receiving Water
	Deg	Min	Sec	Deg	Min	Sec	
001	37	17	53	-77	16	14	Gravelly Run to James River
002	37	17	51	-77	16	25	Gravelly Run to James River
003	37	18	13	-77	16	43	Poythress Run to James River
005							James River
901	37	17	53	-77	16	14	Gravelly Run to James River
902	37	17	51	-77	16	25	Gravelly Run to James River
903	37	18	13	-77	16	43	Poythress Run to James River
904	37	18	22	-77	16	0.0	James River
905	37	18	25	-77	16	3.0	James River
906	37	18	28	-77	16	7	James River
907	37	18	27	-77	16	22	Poythress Run to James River
908	37	17	50	-77	16	16	Gravelly Run to James River
909	37	17	54	-77	16	10	Gravelly Run to James River
910	37	17	49	-77	16	5	Gravelly Run to James River
911	37	18	20	-77	15	58	James River
912	37	18	21	-77	16	28	Poythress Run to James River
913	37	17	39	-77	16	10	Gravelly Run to James River

All stormwater outfalls (901 – 913) discharge to the James River either directly or via Gravelly Run or Poythress Run. See Attachment B for a map of the outfall locations.

Name of USGS topographic map: Hopewell, 099D (See **Attachment B**)

12. Material Storage: Materials used in the manufacturing process are stored under roof. Fuel oils are stored in aboveground storage tanks located within bermed areas. Discharges from the storage tank containment areas are permitted via internal outfalls.
13. Ambient Water Quality Information: See **Attachment A** for the Flow Frequency Memorandum. See **Attachment C** for ambient data for the James River.

Although the facility discharges process water to various streams, the permit limits have historically been based on the dilution of the James River at the confluence with those streams. The James River is tidally influenced at the facility, and previously determined dilution ratios have been used to calculate process water permit limits. Water quality data from monitoring station 2-JMS075.04 is used to characterize the James River. The station is located on the James River at Red Buoy 107 approximately two miles downstream of this facility.

The James River is classified as tidal freshwater in the Water Quality Standards; therefore, the freshwater criteria have been applied. It is considered Migratory Spawning and Nursery habitat.

The James River has historically been considered a Tier 1 water. The Richmond-Crater Water Quality Management Plan allows the dissolved oxygen in the river to be depressed to 5.0 mg/L, which was the water quality standard at the time that the plan was adopted.

303(d) Listed Segments (TMDL): During the 2022 305(b)/303(d) Water Quality Assessment Integrated Report, the James River was considered a Category 5D water ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The Recreation Use is impaired due to E. coli exceedances. The Aquatic Life Use is impaired due to inadequate submerged aquatic vegetation (SAV), excessive chlorophyll *a*, an altered estuarine benthic macroinvertebrate community, and high pH. The Fish Consumption Use is impaired due to PCBs in fish tissue; in addition, kepone, arsenic, DDD, DDT, and mercury are considered non-impairing observed effects. The Wildlife Use is fully supporting.

Tidal Poythress Run was also considered a Category 5D water. The Aquatic Life Use is impaired due to inadequate SAV; PCBs in sediment are a non-impairing observed effect. The Fish Consumption Use is impaired due to a PCB advisory; in addition, the VDH fish consumption advisory for kepone is an observed effect. The Recreation- and Wildlife Uses were not assessed.

Nontidal Gravelly Run and XGI – Gravelly Run UT were not assessed for any designated use (Category 3A).

Nontidal Poythress Run was impaired of the Fish Consumption-, Aquatic Life-, and Wildlife Uses due to water column PCB exceedances of both the Human Health – Other Surface Waters WQS and the Aquatic Life/Wildlife WQS. It is considered a Category 5A water (a "Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The Recreation Use was not assessed.

Attachment A data for Outfalls 001, 002, and 003 show that kepone, PCBs, and arsenic were all not detected in the discharge. Therefore, the facility should neither cause nor contribute to the impairments/observed effects listed above.

The AdvanSix – Hopewell facility (which was previously called Honeywell-Hopewell) was originally assigned an E. coli wasteload allocation in the James River and Tributaries – Hopewell to Westover Bacterial TMDL, which was approved by the EPA on 7/10/2008 and by the SWCB on 4/28/2009. It was later determined that "the facility does not discharge E. coli bacteria in its effluent, and should therefore not have been given a WLA." (EPA). The WLA was subsequently removed in 2009 through a TMDL modification.

This facility discharges directly to the lower James River tidal freshwater estuary in the Chesapeake Bay watershed segment JMSTF1. The receiving stream has been addressed in the Chesapeake Bay TMDL, approved by EPA on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a, and submerged aquatic vegetation (SAV) impairments in the mainstem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (Las) and point-source waste load allocations (WLAs) for Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185 and 9VAC25-260-310. This facility is considered a Significant Chesapeake Bay wastewater discharger. All Significant Chesapeake Bay wastewater dischargers in the Lower Tidal Freshwater James River segment (JMSTF1) have been assigned aggregate WLAs of 2,477,971.77 pounds per year TN, 93,415.85 pounds per year TP, and 14,909,246 pounds per year TSS.

Implementation of the Chesapeake Bay TMDL is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP), approved by EPA on December 29, 2010, Virginia's Phase II WIP, submitted to EPA on March 20, 2012, and Virginia's Phase III WIP, submitted to EPA on August 23, 2019. The approved WIPs recognize that the TMDL nutrient WLAs for Significant Chesapeake Bay wastewater dischargers are set in two regulations: 1) the Water Quality Management Planning Regulation (9VAC25-720); and 2) the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia" (9VAC25-820). The WIPs further outline that since TSS discharges from wastewater facilities represent an insignificant portion of the Bay's total sediment load, they may be considered in the aggregate. The WIPs also state that wastewater discharges with technology-based TSS limits are considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. DEQ has provided coverage under the VPDES Nutrient General Permit (GP) for this facility under permit VAN040082. The requirements of the Nutrient GP currently in effect for this facility are consistent with the Chesapeake Bay TMDL. This individual permit includes technology-based load limits for TSS limits applied at internal outfall 101 that are also consistent with the Chesapeake Bay TMDL and WIPs.

In addition, the individual permit has limits for cBOD₅, ammonia, and DO that are consistent with the RCWQMP in that they provide protection of instream DO concentrations to at least 5.0 mg/L. However, implementation of the full Chesapeake Bay WIP, including GP reductions combined with actions proposed in other source sectors, is expected to adequately address ambient conditions such that the proposed effluent limits of this individual permit are consistent with the Chesapeake Bay TMDL, and will not cause an impairment or observed violation of the water quality standards for DO, chlorophyll a, or SAV.

14. Antidegradation Review and Comments: Tier 1 X Tier 2 Tier 3

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9VAC25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect those uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. The receiving streams, Gravelly Run and Poythress Run discharge into the James River. Because the mixing zone study for the AdvanSix and Hopewell Water Renewal process water discharges utilizes the James River, the tier determination was applied to the James River. The James River is determined to be a Tier 1 waterbody. The James River is considered impaired due to low dissolved oxygen in addition to other impairments discussed in item 13 above. The 2020 303(d) Impaired Waters Fact Sheets are included in **Attachment A**.

15. Site Inspections: DEQ inspection conducted March 1 and March 7, 2022 by Brad Ricks. EPA Region III inspections conducted April 27, 2021 and June 20, 2022. Inspection reports are shown in **Attachment D**.

16. Effluent Screening & Limitation Development:

Attachment L provides the 1994 mixing zone study, fisheries survey, and time-to-lethality evaluations for Gravelly Run.

Attachment M contains the 2009-2013 GLEC Instream Monitoring Study.

Attachment N provides the Brown and Caldwell Technical Memorandum which documents the methodology of the current ammonia mixing zone application.

Attachment E presents applicable effluent data reported on Discharge Monitoring Reports (DMRs) and data submitted with the EPA application forms.

Attachment F presents the evaluations of several pollutants of concern for limit development including WQS, reasonable potential analyses, and STATS evaluations for Outfalls 001 and 002. The evaluation of ammonia from Outfall 998 is presented independently from the evaluation of other toxic parameters.

Attachment G documents the application of Federal Effluent Guidelines, 40CFR 414, to Outfall 101.

Attachment H documents the effluent limitation development for Outfall 003.

Attachment V documents the effluent limitation development for Outfall 005.

Attachment W documents the interim ammonia effluent limitations for Outfall 998.

Attachment X documents the Kellogg Cooling Tower drainage to Poythress Run.

Table 3: Basis of Effluent Limitations for process wastewater discharges, Outfalls 001, 002, 003, 005, 101, 103, 302, 998, 999

PARAMETER	Outfall	BASIS	DISCHARGE LIMITS			
			MO AVG	WK AVG	MIN	MAX
001 Flow (MGD)	001, 002, 003, 101, 103, 302	NA	NL	NA	NA	NL
002 pH (S.U.)	001, 002, 003, 101, 005	2, 3	NA	NA	6.0	9.0
630 Heat (BTU/Day x10 ¹⁰)	001, 002	3, 5	NA	NA	NA	NL
630 Heat (BTU/Day x10 ¹⁰)	003	3, 5	NA	NA	NA	1.5
630 Heat (BTU/Day x10 ¹⁰)	998	3, 5	NA	NA	NA	14.5
159 cBOD ₅ (mg/L)	001, 002, 003	3	NL	NA	NA	NL
159 cBOD ₅ (kg/d)	999	3	NL	NA	NA	NL
429 cBOD ₅ - intake (kg/d)	999	3	NL	NA	NA	NL
865 Dissolved Oxygen (DO) (mg/L)	001, 002, 003, 005	1	6.1	NA	NA	NA
039 Ammonia – N (mg/L)	001, 002, 101	3	NL	NA	NA	NL
039 Ammonia – N (mg/L) Final	998	2	0.746 mg/L 382 kg/d	NA	NA	1.02 mg/L 523 kg/d
039 Ammonia – N (mg/L) Interim	998	6	1.72 mg/L 516 kg/d	NA	NA	2.87 mg/L 1001 kg/d
039 Ammonia – N	003	2	NL mg/L 719 kg/d	NA	NA	NL mg/L 1,438 kg/d
039 Ammonia – N	005	2	9.26mg/L 25.2kg/d	NA	NA	17.0mg/L 46.3kg/d
004 TSS	005	3	30 mg/L 82 kg/d	NA	NA	45 mg/L 120 kg/d
196 Total Recoverable Zinc	005	2	904 µg/L	NA	NA	904 µg/L
203 Total Recoverable Copper	005	2	98.6 µg/L	NA	NA	98.6 µg/L
792 Total Nitrogen, Annual Average (mg/L)	005	3	12 mg/L	NA	NA	NA

PARAMETER	Outfall	BASIS	DISCHARGE LIMITS			
			MO AVG	WK AVG	MIN	MAX
40 CFR 414 Chemical Parameters	101	4	NL mg/L various, kg/d	NA	NA	NL mg/L various, kg/d
159 cBOD ₅ (2 condensers in service)	101	1, 4	1,247 kg/day	NA	NA	6,700 kg/day
159 cBOD ₅ (1 condenser in service)	101	1, 4	1,247 kg/day	NA	NA	4,000 kg/day
004 TSS (2 condensers in service)	101	4	4,300 kg/day	NA	NA	14,000 kg/d
004 TSS (1 condenser in service)	101	4	2,600 kg/day	NA	NA	8,400 kg/d
224 Total Organic Carbon (TOC) (net)	001, 002, 003	3	NL	NA	NA	10 mg/L
012 Total Phosphorus	001, 002, 003	3	2.0 mg/L	NA	NA	NL
004 Total Suspended Solids (TSS)	103	3	30 mg/L NL kg/d	NA	NA	100 mg/L NL kg/d
257 Total Petroleum Hydrocarbons (TPH-DRO)	103, 302	3	NL (mg/L)	NA	NA	15 mg/L

1. Richmond Crater Water Quality Management Plan (**Attachment G**)
2. Water Quality Standards
3. Professional Judgment
4. Federal Effluent Guideline (40 CFR 414) (**Attachment G**)
5. Professional Judgement, based on Thermal Effects Study (**Attachment K**)
6. Professional Judgement, based on Schedule of Compliance rationale in Section 16 and 19 and Attachment W

Outfall 999 (Combined Outfalls 001, 002, 003, and 005)

cBOD₅ Monitoring (Part I.A.1): Professional Judgment. Effluent monitoring for cBOD₅ was combined into one outfall in order to evaluate the loading impact of the entire facility directly to the allocation established in the Richmond Crater Water Quality Management Plan (RCWQMP). Intake monitoring for this parameter was also included to compare the quantity in the influent with that in the effluent. DMR data is found in **Attachment E**. This reissuance adds the new Outfall 005 to combined outfall 999 for cBOD₅ monitoring, in order to assess the impact of the entire facility.

Assessment of data from September 2016 – April 2021 demonstrated a monthly average cBOD₅ loading of 1,260 kg/d compared to a RCWQMP limitation of 2,750 lb/d (1,247 kg/d) (see **Attachment G**). It is noted that river intake cBOD₅ average monthly loading during this same period was 1,215 kg/d, indicating that the use of intake water is resulting in low net discharge of cBOD₅. The calculated net cBOD₅ is shown in the DMR data in **Attachment E**, and averages 44 kg/d from September 2016 to April 2021. However, the data also show that this facility's net average monthly discharge of cBOD₅ exceeded the RCWQMP discharge of 1,247 kg/day in August 2018, September 2019, and December 2019, as highlighted in the DMR data in **Attachment E**. For this reason, intake cBOD₅ monitoring frequency is being increased from 1 per year to 1 per month.

Outfall 998 (Combined Outfalls 001 and 002)

Heat: Professional Judgment. Honeywell (now AdvanSix) conducted a thermal study of Bailey Bay and the James River to determine the effect of heat on the river. The Thermal Effects Study dated December 21, 1989 indicates that a suitable zone of passage exists in the James River (see **Attachment K**). Heat limitations determined using conditions applicable at the time of the study were 9.3E10 BTU/day at Outfall 001 and 5.2E10 BTU/day at Outfall 002. In a prior permit reissuance, Outfall 998 was developed to create a combined compliance point for this parameter, as requested by the permittee, which resulted in a total heat of 14.5E10 BTU/day. Due to the proximity and convergence of Outfall 001 and Outfall 002, combining those two outfalls into a single compliance point does not allow for any additional thermal loading from the facility. Accordingly, effluent temperature and flow information are measured at the individual outfalls and limited on the DMR for the combined outfall (Outfall 998). The approved

study established the existing limitation for maximum allowable heat and no water quality based need to lower that number is evident; thus the heat limitation remains at 14.5E10 BTU/day.

Ammonia, Final Limitation: Water Quality Based Effluent Limitation. For Final ammonia limitations, see **Attachment F** for the reasonable potential analysis, limitation development discussion, and technical memoranda; **Attachment G** for the RCWQMP; and **Attachments L, M, and N** for the associated monitoring studies and allocation methodology.

As shown in Attachment F, the Gravelly Run ammonia allocation was distributed 45% to AdvanSix and 55% to Hopewell Water Renewal in the previous permit, per written agreement between the parties, and that distribution has been carried forward in this permit reissuance. AdvanSix has requested a 50%/50% distribution for this permit, which DEQ has not accepted because no written agreement has been provided to DEQ. This distribution of the Gravelly Run ammonia allocation can be amended in the future by modification of both permits when a new written distribution agreement, and permit modification requests by both permittees, are submitted to DEQ.

Ammonia, Interim Limitation: The permittee will comply with the ammonia limitations by upgrading the process control for the ammonium sulfate crystallization process, as contained in the special condition Part I.C.27 and the schedule of compliance in Part I.D.1.

During the initial process of evaluating the compliance schedule and phased implementation plan, the Revised Ammonia Freshwater Criteria: Phase Implementation Program Guidance (draft guidance dated June 2, 2022) requires an interim ammonia limit to be established based on the Highest Achievable Condition (HAC). The HAC was evaluated per the draft guidance. The ammonia discharged from this facility comes from the barometric condenser cooling water, which has no treatment process. However, the ammonia discharge can be controlled to a certain extent through the operation of the Area 11 processes (upgrades to the Area 11 process control is the chosen method of compliance for the ammonia limitations). It is also noted that a substantial amount of the ammonia detected at compliance outfall 998 is ammonia contained in the raw cooling waters (pass through from the James River). For these reasons, the HAC was previously determined to be the 99th percentile of the existing discharge. Because the HAC is based on the actual uncontrolled ammonia discharge data, the interim limit should be met without any upgrades to the Area 11 processes. In other words, the interim limit is based on the current operating conditions over the recent permit term.

The HAC analysis used the four most recent years of DMR data (at the time of the analysis), from 5/10/2019 to 4/10/2023, which are found in **Attachment W**. The interim ammonia limitations for Outfall 998 in Part I.A.2 for this permit reissuance can be summarized as:

Limit Type	Monthly Average		Maximum	
	mg/L	kg/day	mg/L	kg/day
2016 Limit	4.13	2,117	5.74	2,940
Interim Limit (HAC)	1.72	516	2.87	1001
Final Limit	0.746	382	1.02	523

Individual Outfalls 001, 002, and 003

Heat: Monitoring only for Outfalls 001 and 002. The heat limitation is applied to combined Outfall 998, which is discussed above and based on the thermal effects study. A separate limitation has historically been placed on Outfall 003 due to its separation distance from Outfalls 001 and 002. For Outfall 003, the existing limitation, also based on the thermal effects study found in **Attachment K**, established the maximum allowable heat. Because no water quality based need to lower that limit is evident, the heat limitation for Outfall 003 will remain at 1.5E10 BTU/day.

pH: The permit requires continuous monitoring for pH at Outfalls 001, 002 and 003 (see Parts I.A.3, 7 and 8 of the permit). pH probes currently installed at outlets 1, 2 and 3 (immediately upstream of Outfall 001), at outlets 4 and 5 (immediately upstream of Outfall 002) and the N CTWR and G Exit (immediately upstream of Outfall 003) shall be used as backup, secondary probes to ensure monitoring for pH at all times, and uninterrupted monitoring during periods of calibration and maintenance. During periods where the outlet probes are used, the minimum and maximum

pH values among all of the probes for a respective outfall shall be reported and will be used by DEQ to determine compliance. If the pH values for all of the outlet probes for a respective outfall are in compliance, then the outfall will be considered in compliance. However, any exceedance of pH limits at any of the outlets will constitute a limit exceedance at the respective outfall (see permit special condition I.C.7).

cBOD₅: Monitoring only at Outfalls 001, 002, and 003. See discussion at combined Outfall 999 above.

Ammonia: Ammonia for Outfalls 001 and 002 is limited as a combined outfall to Gravelly Run at Outfall 998 (see above discussion). Outfall 003 ammonia limits are explained in **Attachment H**.

TOC net: The TOC maximum limitation of 10 mg/L net at each individual outfall 001, 002, and 003 is based on the approach taken for permitting non-contact cooling waters by the Petroleum Refining guidelines in 40 CFR Part 419. This limitation serves as leak detection to indicate process wastewaters combining with the non-contact cooling water waste streams. The Petroleum Guidelines indicates 5 mg/L TOC in such discharges. However, in the case of AdvanSix, the cooling water is untreated river water. The final outfalls may also contain stormwater and in some cases, wastewater discharges from internal outfalls. Given those factors, a net TOC limitation of 10 mg/L was previously established and is considered appropriate for this facility.

DO: Dissolved Oxygen monthly average minimum DO of 6.1 mg/L is based on the Richmond Crater Water Quality Management Plan (RCWQMP), which is found in **Attachment G**.

Total Phosphorus: These limitations were initially included in the permit in accordance with the State Policy for Nutrient Enriched Waters. This policy has since been superseded with new nutrient regulations, guidelines, and the issuance of the Nutrient General Permit; however, associated guidance (GM07-2008) indicates that concentration limitations shall remain in the permit unless or until superseded by another concentration limit.

Thallium: Both total and dissolved thallium was reported in samples from Outfalls 001, 002, 003, and the James River in the following concentrations:

Table 4: Thallium Sample Results

Parameter	Outfall 001	Outfall 002	Outfall 003	James River
Dissolved Thallium (µg/L)	25	39	36	38
Total Thallium (µg/L)	39	37	40	36

It is noted that the Human Health Criteria for dissolved Thallium is 0.47 µg/L. Ambient data from DEQ monitoring of the James River (Storet) for Thallium are presented in **Attachment C** and show no concerning results. The test results provided within the Attachment A Water Quality Criteria Monitoring appear to indicate that the ambient concentration of thallium in the James River is nearly 100 times higher than the Human Health Criteria. The testing was conducted per EPA Method Number 200.7, which uses inductively coupled plasma-atomic emission spectrometry (ICP-AES) for determination of trace metals. A review of literature found that inductively coupled plasma spectrometry (ICP-AES) can produce unreliable results for thallium measurements (Remediation Journal, September 2010), so the high sampling results are suspicious. The test results also show that the source of the Thallium (if the tests are correct) would be the James River itself, as the source of the cooling water. The results show that AdvanSix is not a source of Thallium. Therefore, further analysis is not required.

Nonylphenol: Nonylphenol was detected in samples from Outfalls 001, 002, 003, and the James River.

Table 5: Nonylphenol Sample Results

Parameter	Outfall 001	Outfall 002	Outfall 003	James River
Nonylphenol (µg/L)	8	6	6	8

Nonylphenols are a class of chemicals which include surfactants used in a variety of applications, including laundry detergents, industrial applications, and commercial products. It is noted that the James River chronic water quality criteria WLA for nonylphenol is 6.6 µg/L, and the test results indicate that all outfalls show reasonable potential to exceed the chronic WLA. However, the results also show that the source of the Nonylphenol is the James River itself, as the source of the cooling water. AdvanSix is not responsible for any discharge of Nonylphenol, so further investigation is not needed.

Reasonable Potential of all other Toxic parameters: All detected parameters at Outfalls 001 and 002 were evaluated for reasonable potential to exceed water quality standards at the edge of the Gravelly Run mixing zone, as explained in **Attachment F**. All detected parameters at Outfall 003 were evaluated for reasonable potential to exceed water quality standards of the James River, as explained in **Attachment H**.

Whole Effluent Toxicity (WET) Testing: WET testing is required per GM00-2012 due to the facility's status as a Major Industrial permit. Toxicity has not been an issue at process water Outfalls 001, 002, and 003, and the annual WET testing requirement is continued in this permit. See **Attachment J** for Whole Effluent Toxicity evaluation. Toxicity of stormwater is discussed at each individual stormwater Outfalls 901 to 913.

Outfall 101

Ammonia: Outfall 101 is the source of process ammonia discharged from contact cooling water, and monitoring only is applied on a Professional Judgment basis. The ammonia limitation is applied to the Gravelly Run combined Outfall 998 (see discussion above).

cBOD₅, TSS, pH, Organic Chemicals, Plastics, and Synthetic Fibers parameters: See **Attachment G** for the discussion involving the application of Federal Effluent Guideline (40 CFR 414) and the Richmond Crater Water Quality Management Plan (RCWQMP) which establish mass loading limitations at Outfall 101. RCWQMP is provided in **Attachment G**. The Federal Effluent Guidelines require load limitations for the Outfall 101, which are calculated from the effluent flows, as shown in Attachment G. Load limitations have increased with this permit reissuance due to an increase in effluent flow from the previous permit. Concentration limits remain unchanged. See Section 17 for discussion of anti-backsliding. Annual monitoring for Federal Effluent Guideline (40 CFR 414) limitations in Part I.A.4 is carried forward for this reissuance. The EPA Questions and Answers Memo (Q and A) for the Organic Chemical, Plastics, and Synthetic Fibers (OCPSF) Effluent Limitations Guidelines (found in Attachment G) states in Answer 7 that the monitoring frequency should be determined on a case-by-case basis, and the minimum monitoring frequency shall not be less than once per year. DEQ considered the nature and effect of the discharge in determining that an annual frequency is appropriate. The discharge of Outfall 101 combines with a significant flow of non-contact cooling water before discharging through Outfall 001. Limitations for toxic parameters in Outfall 001 are based on a mixing zone study, as described in Attachment G, where the instream waste concentration for Outfall 001 is 50.2% for acute, and 2.59% for chronic. This means that the effect of a limitation exceedance from Outfall 101 would not correlate to an exceedance on the James River. Additionally, Outfall 101 has not reported any exceedance of limitations. For these reasons, annual monitoring is appropriate for Outfall 101.

Outfall 301

Outfall 301 (stormwater collected by the #6 fuel oil storage containment dike) has been removed because the #6 fuel oil storage tank has been removed from service.

Outfall 103 (formerly Outfall 401)

TPH: Professional Judgement, limitation carried forward from the 2016 reissuance. Outfall 103 is the discharge from the oil/water separator which collects the floor drain system from the steam generation area and therefore has the potential to discharge petroleum.

TSS: Professional Judgement, limitation carried forward from the 2016 reissuance. These limitations were borrowed from the Steam Power Effluent Guidelines and are carried forward from the 2016 permit.

Outfall 302

This new outfall was identified during a 2022 inspection at the facility. The oil/water separator will be monitored consistent with the oil/water separator at Outfall 103.

TPH: Monitoring based on Professional Judgement. Limitation of 15 mg/L Total Petroleum Hydrocarbons, Diesel Range Organics (TPH-DRO) based on professional judgement of oil/water separator technology.

Outfall 005 (this is a new outfall)

This new outfall is added for the discharge of the treatment system associated with the Marine Operations Improvement Plan per special condition I.C.25. The permittee has committed to collecting and treating the

stormwater from the Marine Operations area, and this outfall is added in order to establish effluent limitations which will allow the permittee to design the treatment system. The permittee has determined that the design flow for the treatment system will be 0.72 MGD to accommodate the stormwater flows from a 10-year storm event. The new process will discharge to the James River through a diffuser.

Flow, pH: The pH limitation is based on water quality criteria per 9VAC25-260-50. Continuous recorded monitoring is applied at the request of the permittee.

DO: Dissolved Oxygen monthly average minimum DO of 6.1 mg/L is based on the Richmond Crater Water Quality Management Plan (RCWQMP), which is found in **Attachment G**.

TSS: Limitations based on Professional Judgement by applying the Secondary Treatment Regulations in 40 CFR Part 133 to this outfall. Monitoring frequency per GM 14-2013. TSS loading limits were calculated as follows, to two significant figures:

$$30 \text{ mg/L} \times 3.785 \text{ (kg/MG/(mg/L))} \times (0.72 \text{ MGD}) = 81.75 = 82 \text{ kg/day Monthly Average}$$

$$45 \text{ mg/L} \times 3.785 \text{ (kg/MG/(mg/L))} \times (0.72 \text{ MGD}) = 122.6 = 120 \text{ kg/day Monthly Average}$$

Ammonia, Total Recoverable Zinc, and Total Recoverable Copper: These limitations are water quality based effluent limitations. See **Attachment V** for documentation. These parameters are known to exist in high concentrations in the current discharges from this area, which will be treated and discharged through Outfall 005, and therefore water quality based effluent limitations are appropriate. The STATS analysis used 100 ug/L for copper, 1000 ug/L for zinc, and 30 mg/L for ammonia in order to force a limit. Monitoring frequency and sample type are based on Professional Judgement by applying GM14-2003 to this outfall, using the guidance for a municipal 0.72 MGD treatment plant.

The discharge will be constructed with a diffuser at the discharge point. The modeling for the proposed diffuser is found in **Attachment V**. The dilution ratios used for calculation of permit limits are 12:1 acute and 24:1 chronic.

Ammonia: Ammonia loading limits were calculated as follows, using three significant figures:

$$9.26 \text{ mg/L} \times 3.785 \text{ (kg/MG/(mg/L))} \times (0.72 \text{ MGD}) = 25.2 \text{ kg/day Monthly Average}$$

$$17.0 \text{ mg/L} \times 3.785 \text{ (kg/MG/(mg/L))} \times (0.72 \text{ MGD}) = 46.3 \text{ kg/day Daily Maximum}$$

The Richmond Crater Water Quality Management Plan (found in **Attachment G**) allows an ammonia wasteload allocation of 10,326 lb/day from this facility which is 4,684 kg/day. This permit allows a maximum day discharge of 1,001 kg/day of ammonia via Outfall 998 Interim limit in Part I.A.2 and 1,438 kg/day through Outfall 003 per Part I.A.8 ammonia limits. The total maximum day ammonia discharge from this facility through Outfalls 005, 998, and 003 is 2,485 kg/day which is less than the RCWQMP allocation of 4,684 kg/day.

Hardness, Total Recoverable Iron, Total Recoverable Aluminum: Monitoring only per Professional Judgement to provide data for future permit reissuances. Because metals limits are a function of hardness, data is needed to evaluate limits during the next reissuance. The waste stream being treated is known to be high in aluminum and iron, although neither of these metals currently has a water quality standard; however aluminum standards are currently being developed. Total recoverable metals testing is required (as opposed to dissolved metals testing) by Professional Judgement to allow sampling of all metals parameters simultaneously.

cBOD₅: Monitoring only per Professional Judgement. Outfall 005 has been added to reporting Outfall 999 in order to evaluate the loading impact of the entire facility directly to the allocation established in the Richmond Crater Water Quality Management Plan (RCWQMP). See discussion in Outfall 999 for further discussion.

TN: The TN limit of 12 mg/l is based on Professional Judgement and it provides a minimum treatment standard for stormwater, groundwater seeps and any groundwater captured and treated in the 31+ acre Marine Operations area (see Special Conditions, Part I.C.17, 19, and 25). Concentrations of Ammonia-N in the stormwater and groundwater seeps indicate that the area is affected by the historic transport, handling and loading of Ammonium Sulfate fertilizer. This permit requires the capture of these flows and that a high level of treatment be provided at either (a) the AdvanSix site or (b) the Hopewell Water Renewal facility. The TN limit of 12 mg/l on Outfall 005 ensures that a high level of treatment is provided regardless of the treatment option selected. The TN limit of 12 mg/l is equivalent to the concentration basis for the Hopewell Water Renewal facility. Either alternative is expected to reduce existing

TN loads from the Marine Operations area by at about 200,000 lb/year (over historical levels), as well as address potential ammonia, zinc, and copper issues in the current stormwater discharge. In recognition of the significant load reductions under either option, DEQ is allowing the combined flows treated and discharged under alternative (a) to be incorporated under a new Outfall 504 under the watershed general permit (VAN040082) and be covered under the wasteload allocation assigned to the process wastewater for the AdvanSix. As part of the comprehensive plan to address all water regulatory issues at this facility (stormwater, ammonia, 316b), AdvanSix has further committed to retiring a cumulative 216,000 lbs/year of their assigned TN wasteload allocation to the Nutrient Offset Fund by the year 2032. The retirement will be done in a phased approach, where AdvanSix will retire the allocations after the equivalent TN reductions are realized, based on this schedule:

- 148,000 pounds by 2027
- Additional 48,000 pounds by 2029
- Additional 20,000 by 2032

If the permittee designs and installs a technology to produce a lower TN discharge, then the special condition in I.C.4.b allows the permit to be modified to incorporate technology-based effluent concentration limitations in conjunction with installation of nutrient control technology. The monitoring frequency is assigned to reflect the Nutrient General Permit requirements of VAN040082.

Toxicity Testing: Quarterly Whole Effluent Toxicity (WET) Testing is required for the new discharge. See **Attachment V** for WET Memo and evaluation. Quarterly testing is appropriate to provide a minimum of 10 test results to analyze for reasonable potential of toxicity. Both acute and chronic testing is appropriate due to the continuous nature of discharge. As shown in Attachment E, the stormwater that will be treated by the new system has shown a high level of toxicity in the past, and therefore the treated effluent may have potential for toxicity.

EPA Form 2C and Attachment A monitoring: Submittals are required within 90 days of commencement of discharge, per special condition I.C.24. The permit may be modified or, alternatively, revoked and reissued to incorporate limits for any of the substances listed in Attachment A.

Stormwater Evaluation: Outfalls 901 – 913

Guidance Memo 96-001 recommends that chemical-specific water quality-based limits not be placed on stormwater outfalls at this time. Exceptions would be where a VPDES permit for a stormwater discharge has been issued that includes effluent limitations (backsliding must be considered before these limitations can be modified) and where there are reliable data, obtained using sound, scientifically defensible procedures, which provide the justification and defense for an effluent limitation. EPA memorandum "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on those WLAs'" dated November 26, 2014, states, "EPA recommends that NPDES permitting authorities use the experience gained in developing WQBELs to design effective permit conditions to create objective and accountable means for controlling stormwater discharges." There are no effluent limitations proposed for this permit. Therefore, in lieu of limitations, pollutants are assessed against screening criteria developed solely to identify those pollutants that should be given special emphasis during development and assessment of the Stormwater Pollution Prevention Plan (SWPPP).

In accordance with GM14-2003, each screening criterion is established as the most stringent of either two times the applicable pollutant's acute criterion as outlined by the *Virginia Water Quality Standards* (WQS) (which is a function of the receiving stream), or the pollutant's benchmark monitoring concentration as contained in DEQ's VPDES Industrial Stormwater General Permit (ISWGP) (9VAC25-151-10 et seq.). ISWGP Sector C is specifically applicable to stormwater discharges at this facility under the following applicable industrial activities: Agricultural Chemicals (SIC 2873), Industrial Organic Chemicals (SIC 2869), and Industrial Inorganic Chemicals (SIC 2819). The calculation of two times the acute criterion takes into account the receiving stream and effluent characteristics and is calculated using the MSTRANTI Spreadsheet for wasteload allocations. The MSTRANTI Spreadsheet is used only as a tool to calculate two times the acute criterion for the stormwater evaluation, and all documentation is found in **Attachment I**.

Attachment E contains the DMR and application data submitted by the permittee. Any data that contained pollutants above the established two times acute screening criteria triggered the need for quarterly monitoring of that specific pollutant in Part I.A of the permit for that outfall. Annual Whole Effluent Toxicity (WET) Testing is also required by GM14-2003 when pollutants exceed two times the acute water quality criteria. The screening criteria are then utilized in the permit as a comparative value in Part III of the permit to determine if correction actions are needed. Semi-annual monitoring is required for pollutants identified above their respective benchmark concentration contained in the ISWGP in 9VAC25-151.

The SWPPP required by Part III.D of the permit is designed to reduce pollutants in stormwater runoff. Pollutant specific monitoring results above the established comparative value or whole effluent toxicity testing which results in an LC₅₀ of less than 100% effluent will justify the need to reexamine the effectiveness of the SWPPP and any best management practices (BMPs) being utilized. The goal of the SWPPP is to reduce pollutants to the maximum extent practicable. Part III.A.1 requires an annual report is to be submitted to the Piedmont Regional Office and shall include the data collected the previous year with an indication if the SWPPP or any BMPs were modified based on the monitoring results.

Each stormwater outfall has been evaluated against the 2x acute water quality criteria at the discharge point, and any applicable benchmarks, following GM14-2003. A comparison of effluent data to each pollutant's screening criteria is presented in Tables 7 to 19 below for each stormwater outfall. The DMR data and application data is found in **Attachment E**. Monitoring was established for the pollutants noted in Tables 7a through 19a below.

All stormwater eventually discharge to the James River. However, there are three different ways that the water quality criteria (WQC) is calculated for the stormwater outfalls. Discharges to Gravelly Run (outfalls 901, 902, 908, 909, 910 and 913) take into consideration the allocated mixing zone and the fact that the stormwater will be dominated by the flows to Gravelly Run before it reaches the James River. Discharges to Poythress Run (903, 907, 912) take into consideration the fact that Poythress Run has historically been considered an intermittent stream, and it is essentially created by the flow from Outfall 003. Discharges directly to the James River (904, 905, 906, and 911) use the 2x acute WQC at their discharge to the James River. Further explanation is provided with Outfall 901 for Gravelly Run, Outfall 903 for Poythress Run, and Outfall 904 for the James River discharges.

Attachment I contains WQC calculations and documentation.

Table 6: Description of Stormwater Outfalls

Outfall	Outfall Location	WQC used	Impervious Area (acres)	Total Area Drained (acres)	SIC Codes ¹	Storm water Sector ²
901*	Gravelly Run	Edge Mixing Zone	23.15	34.52	2873, 2869, 2819	C
902*	Gravelly Run	Edge Mixing Zone	2.20	2.45	2869	AE
903*	Poythress Run	At James River	6.88	8.25	2873	C
904	James River	Calculated acute WQC	6.89	8.47	2873	C
905	James River	Calculated acute WQC	3.98	4.43	2873, 2819	C
906	James River	Calculated acute WQC	10.95	14.28	2873, 2819	C
907	Poythress Run	At James River	2.79	2.82	2869, 2873	C
908	Gravelly Run	Edge Mixing Zone	1.04	1.32	2869	AE
909	Gravelly Run	Edge Mixing Zone	0.43	0.43	2873	C
910	Gravelly Run	Edge Mixing Zone	0.15	0.72	2869	AE
911	James River	Calculated acute WQC	0.14	0.47	2869	AE
912^	Poythress Run	At James River	3.30	4.13	2869, 2873, 2819	C
913#	Gravelly Run	Edge Mixing Zone	3.90	3.90	4911	AD

*New Outfalls

^ Currently permitted by VAR052505, coverage will be transferred into this reissued permit and general permit will be terminated

Currently permitted by VAR050553, coverage will be transferred into this reissued permit and general permit will be terminated

¹SIC Code identified in the permit application

²Industrial Stormwater Sector based on SIC Code from permit applications and existing VAR052505 and VAR05053 permits

The benchmarks applied to this facility are determined by the SIC codes provided by the application information. The SIC codes determine the manufacturing sectors regulated by 9VAC25-151. The SIC codes, manufacturing sectors, and benchmarks are shown below:

Sector	Parameter	Benchmark Value
Agricultural Chemicals Sector C, Agricultural Chemicals SIC 2873 (Nitrogenous Fertilizers)	Total Nitrogen	2.2 mg/L
	Total Recoverable Iron	1.0 mg/L
	Total Recoverable Zinc	120 µg/L
	Total Phosphorus	2.0 mg/L
Industrial Inorganic Chemicals Sector C SIC 2819 (Industrial Inorganic Chemicals, Not Elsewhere Classified)	Total Recoverable Aluminum	750 µg/L
	Total Recoverable Iron	1.0 mg/L
	Total Nitrogen	2.2 mg/L
Sector AE SIC 2869 (Industrial Organic Chemicals, Not Elsewhere Classified)	Facilities with no analytical benchmark monitoring requirements	

For at least two permit cycles, DEQ has noted high levels of ammonia, aluminum, iron, copper, and zinc in the stormwater discharges at this facility. Facility inspections have documented widespread tracking of ammonium sulfate fertilizer from transportation, storage and material handling activities, as well as an insufficient level of housekeeping, sweeping, and cleaning to meet expected pollutant loads. The June 30, 2022 Chesapeake Bay TMDL Action Plan submitted by the facility reported 149,000 pounds per year of Total Nitrogen discharged through the existing stormwater outfalls 904 to 913. The discharge of TN through new Outfalls 901, 902 and 903 was reported at 122,000 pounds/year, for a total stormwater discharge of 271,000 pounds of TN per year. Historical facility stormwater loads have been calculated at much higher annual TN discharges, so reductions over historical levels may be seen, but do not yet meet expected pollutant loads.

The monitored stormwater outfalls currently discharging show the following ammonia concentrations:

	904	905	906	907	908	909	911
Screening Value (New Criteria)	8.27	16.6	12.2	0.784	3.6	3.6	19.2
1/10/2017	5	144	2,070	2,070	35	35	794
4/10/2017	241	388	3,625	3,625	101	101	970
7/10/2017	17	789	2,655	2,655			293
10/10/2017	47	707	2,358	2,358			822
1/10/2018	43	237	2,650	2,650	137	137	927
4/10/2018	262	605	549	549	63	63	667
7/10/2018	8	434	2,368	2,368	225	225	944
10/10/2018	1,725	177	355	355	57	57	18
1/10/2019	171	91	1,148	1,148	8	8	16
4/10/2019	1,607	246	310	310	63	132	970
7/10/2019	1,072	93	680	680	36	36	809
10/10/2019	327	238	482	482	742	742	991
1/10/2020	168	173	560	560	5,395	5,395	1,019
4/10/2020	432	82	920	920	38	38	970
7/10/2020	2,013	56	1,715	98	29	29	499
10/10/2020	214	97	152	97	4	4	552
1/10/2021	252	23	1,550	55	10	10	811
4/10/2021	1,490	189	1,418	62	72	72	808
7/10/2021	2,489	259	1,314	75	9	9	724
10/10/2021	1	135	731	116	1,167	1,167	769
1/10/2022	76	35	23	20	8	8	217
4/10/2022	1,555	154	1,781	88	12	12	447
7/10/2022	96	191	1,502	67	8	8	131
Average	622	241	1,344	931	391	395	659
Maximum	2,489	789	3,625	3,625	5,395	5,395	1,019

Shading indicates results above screening value

Outfalls 901, 902, and 903

Outfalls 901, 902, and 903 have been added to the permit to account for the stormwater entering Outfalls 001, 002, and 003, respectively, through the runoff from the interior of the facility. The Form 2F provides the only data available for these new outfalls (relevant Form 2F data is found in **Attachment E**). Sampling results for pollutants that do not have a corresponding WQS or benchmark value were not included because a limit cannot be determined for these pollutants.

Previous permit reissuances have required monitoring of stormwater that discharges directly to the surface waters of the James River and Gravelly Run (Outfalls 904-911). The stormwater that discharges through the process wastewater Outfalls 001, 002, and 003 was not directly monitored in the previous permits. Although Outfalls 001, 002 and 003 are monitored once per week for ammonia, and once per day for Total Organic Carbon, those 24-hour composite samples do not effectively sample and quantify the stormwater pollutants, due to the large cooling water flows that dominate Outfalls 001, 002, and 003. AdvanSix has done an extensive site investigation to delineate the impervious areas and industrial activities associated with new Outfalls 901, 902, and 903. Outfall 901 drains a total of 34.52 acres through 136 discrete discharge locations. Outfall 902 drains a total of 2.45 acres through 27 discrete discharge locations. Outfall 903 drains a total of 8.25 acres through 50 discrete discharge locations. AdvanSix used stormwater test results, stormwater volumes, and type of industrial activity to determine a designated sampling point to be used for monitoring Outfalls 901, 902, and 903. The initial 213 discharge points were reduced to 24 for final evaluation, and included 16 individual discharge points in the 901 drainage area, 3 discharge points in the 902 drainage area, and 5 discharge points in the 903 drainage area. The determination of each designated sampling point (i.e. 901, 902, and 903) involved a ranking system which considered drainage area, industrial use, and TOC and ammonia test results. AdvanSix's process of identifying the designated sampling point to provide the data for the below analysis is provided in **Attachment U**, which contains a detailed explanation and maps of the areas. Until a new identification plan is implemented per Special Condition I.C.21, the sampling plan in Attachment U shall be used.

DEQ generally agrees with the methodology in Attachment U for identifying the designated sampling point for the 901/902/903 drainage areas. EPA's Industrial Stormwater Monitoring and Sampling Guide (Final Draft March 2009) discusses methods to monitor sheet flow and drainage areas where samples are difficult to obtain. The intent of special condition I.C.21 is to require an annual review of the sampling approach, so that the permittee's sampling efforts can evolve over time. The justification for this iterative sampling approach is the unusual nature of the 213 discharge points (outfalls), the age and size of the facility, and the large number of environmental projects that permittee is undergoing simultaneously.

Outfall 901:

Outfall 901 has been categorized by the owner with SIC codes 2873, 2869 and 2819, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals and Sector C Industrial Inorganic Chemicals are required for this outfall. The SIC code 2869 does not have benchmarks associated with it. In addition, monitoring results that exceed the calculated 2xAcute WQC will require toxicity testing and quarterly monitoring. Because this is a new outfall, a total of 4 samples for TN, TP, and TSS are required to verify the aggregate wasteload allocations under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay, per GM14-2011.

Outfall 901 discharges to Gravelly Run, which uses a complex mixing zone analysis to calculate water quality standards. Water quality standards are not applied within the mixing zone. The mixing zone is defined by flows from AdvanSix 001 and 002, and Hopewell 001, and therefore, any stormwater contribution will be dominated by the flows from AdvanSix 001, 002 and Hopewell 001 by the time the stormwater reaches to edge of the mixing zone where WQC are applied. This stormwater analysis uses the acute water quality criteria that was calculated for the reasonable potential analysis of Gravelly Run ammonia and other toxic parameters (**Attachment F**). The Gravelly Run criteria is applied at a 2x acute criteria for the stormwater analysis. The acute criteria can be summarized:

Table 7: Water Quality Criteria Used for Outfall 901

Parameter	Units	Acute WQC	2x Acute WQC
Ammonia*	mg/L	1.80	3.60
Zinc, dissolved^	µg/L	78.1	156
Copper, Dissolved^	µg/L	8.57	17.1
Lead, Dissolved ¹	µg/L	55.7	111

*Acute criteria WQS at BC-1 after %AR applied, see Attachment F for discussion.

^See Attachment F for calculation of zinc and copper WQC at the edge of the mixing zone. Acute WQC from Table 1.

¹See MSTRANTI Output for the Gravelly Run Mixing Zone in Attachment F for WLA of Lead.

Table 7a: Outfall 901 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	125		17.1	Form 2F
Lead, Total	µg/L	15		111	Form 2F
Zinc, Total	µg/L	1,010	120	156	Form 2F
Iron, Total	µg/L	16,400	1,000		Form 2F
Aluminum, Total	µg/L	3,870	750		Form 2F
pH	S.U.	5.5		6.0 – 9.0 ⁽²⁾	Form 2F
Total Phosphorus	mg/L	0.51	2.0		Form 2F
Ammonia – N	mg/L	621		3.6	Form 2F
Total Nitrogen	mg/L	672	2.2		Form 2F

¹ Highest reported value from the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

Table 7b: Outfall 901 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NL	NL	1 per 3 Months	Grab
004 Total Suspended Solids (mg/L)	5	NA	NL	1 per 6 Months	Grab
012 Total Phosphorus (mg/L)	2, 5	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2, 5	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 6	NA	NL	1 per 3 Months	Grab
068 TKN (mg/L)	5	NA	NL	1 per 6 Months	Grab
389 Nitrite + Nitrate (mg/L)	5	NA	NL	1 per 6 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 6	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 6	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour	3, 6	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48	3, 6	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260).

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 and SIC 2819

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards..

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals.

5 = Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay.

6 = Professional Judgement (PJ) for annual toxicity testing paired with ammonia, copper, and zinc testing from the same sample.

pH, ammonia, and dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003.

Total nitrogen, total phosphorus, total recoverable aluminum, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual benchmark monitoring is applied for in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value is the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to the exceedance of screening criteria.

TSS, TKN, and Nitrite + Nitrate: Because this outfall is a new outfall with this reissuance, monitoring for nutrients is required in order to verify the aggregate wasteload allocations for the Chesapeake Bay TMDL.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria for the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, cobalt, BOD₅, nitrate+nitrite, TKN, TSS, magnesium, manganese, molybdenum, sulfate, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, as described in Section 14 this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are

consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. GM14-2013 recommends annual toxicity testing for outfalls that exceed the 2x acute screening criteria. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing, based on professional judgement. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.1.

Outfall 902

Outfall 902 discharges to Gravelly Run. The calculation of 2x acute water quality criteria is provided in Outfall 901 and shown in Table 7. The permit reissuance application EPA Form 2F categorized Outfall 902 with SIC code 2869, Industrial Organic Chemical Not Elsewhere Classified, which does not require benchmark monitoring per 9VAC-151-380. However, the reported sampling results in EPA Form 2F show elevated levels of ammonia, total nitrogen, aluminum, iron, zinc, and copper which are indicative of ammonium sulfate fertilizer impacts seen elsewhere on this site. Therefore, DEQ has applied the benchmark monitoring requirements for SIC 2873, Nitrogenous Fertilizers, and SIC 2819, Industrial Inorganic Chemicals, which are applicable to this facility but were not designated for this area in Form 2F. These SIC codes are applied on a Professional Judgement basis so that further monitoring data can be collected. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing. Because this is a new outfall, a total of 4 samples for TN, TP, and TSS are required to verify the aggregate wasteload allocations under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay, per GM14-2011.

Table 8: Water Quality Criteria Used for Outfall 902

Parameter	Units	Acute WQC	2x Acute WQC
Ammonia*	mg/L	1.80	3.60
Zinc, dissolved [^]	µg/L	78.1	156
Copper, Dissolved [^]	µg/L	8.57	17.1
Lead, Dissolved ¹	µg/L	55.7	111

*Acute criteria WQS at BC-1 after %AR applied, see Attachment F for discussion.

[^]See Attachment F for calculation of zinc and copper WQC at the edge of the mixing zone. Acute WQC from Table 1.

¹See MSTRANTI Output for the Gravelly Run Mixing Zone in Attachment F for WLA of Lead.

Table 8a: Outfall 902 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	21		17.5	Form 2F
Zinc, Total	µg/L	938	120	156	Form 2F
Iron, Total	µg/L	6,360	1,000		Form 2F
Aluminum, Total	µg/L	971	750		Form 2F
pH	S.U.	7.6		6.0 – 9.0 ⁽²⁾	Form 2F
Total Phosphorus	mg/L	0.16	2.0		Form 2F
Ammonia – N	mg/L	120		3.60	Form 2F
Total Nitrogen**	mg/L	122	2.2		Form 2F

¹ Highest reported value from the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

**Total Nitrogen was incorrectly reported as 1.8 mg/L. TN is the sum of TKN + Nitrite+Nitrate. However, because ammonia > TKN, TN was calculated as the sum of ammonia + Nitrite+Nitrate, which is 120+ 1.8 = 122 mg/L

Table 8b: Outfall 902 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
004 Total Suspended Solids (mg/L)	5	NA	NL	1 per 6 Months	Grab
012 Total Phosphorus (mg/L)	2, 5	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2, 5	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 6	NA	NL	1 per 3 Months	Grab
068 TKN (mg/L)	5	NA	NL	1 per 6 Months	Grab
389 Nitrite + Nitrate (mg/L)	5	NA	NL	1 per 6 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 6	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 6	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour	3, 6	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3, 6	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC codes 2873 and 2819 applied on a Professional Judgement (PJ) basis

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards.

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals

5 = Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay.

6 = Professional Judgement (PJ) for annual toxicity testing paired with quarterly ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH did not exceed water quality standards, but quarterly monitoring is applied in place of semi-annual benchmark monitoring on a professional judgement basis to provide more data. Quarterly monitoring for these parameters is applied in accordance with GM14-2003.

Total nitrogen, total phosphorus, total recoverable aluminum, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of screening criteria.

TSS, TKN, and Nitrite + Nitrate: Because this outfall is a new outfall with this reissuance, monitoring for nutrients is required in order to verify the aggregate wasteload allocations for the Chesapeake Bay TMDL.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria for the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, boron, BOD₅, magnesium, manganese, nitrate+nitrite, TKN, 4-Nitrophenol, sulfate, TSS, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should

not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. GM14-2013 recommends annual toxicity testing for outfalls that exceed the 2x acute screening criteria. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing, based on professional judgement. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.1.

Outfall 903

The permit reissuance application EPA Form 2F categorized Outfall 903 with SIC code 2873, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals is required for this outfall. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing. Because this is a new outfall, a total of 4 samples for TN, TP, and TSS are required to verify the aggregate wasteload allocations under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay, per GM14-2011.

Because Poythress Run is considered an intermittent stream on AdvanSix property, water quality standards have historically been applied at the confluence of Poythress Run and the James River. Because the non-contact cooling water from Outfall 003 will dominate any stormwater contribution by the time it reaches the James River, it is appropriate to use the physical characteristics of Outfall 003 when calculating the WQC at the confluence of Poythress Run and the James River. **Attachment I** contains the calculation of WQC for Poythress Run.

Table 9: Outfall 903 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	57		17.1	Form 2F
Zinc, Total	µg/L	110	120	156	Form 2F
Iron, Total	µg/L	1,970	1,000		Form 2F
pH	S.U.	7.8		6.0 – 9.0 ⁽²⁾	Form 2F
Total Phosphorus	mg/L	0.20	2.0		Form 2F
Ammonia – N	mg/L	0.79		0.784	Form 2F
Total Nitrogen	mg/L	3.7	2.2		Form 2F

¹ Highest reported value from the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved. See Attachment I for calculation of 2x Acute criteria.

Table 9a: Outfall 903 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
004 Total Suspended Solids (mg/L)	5	NA	NL	1 per 6 Months	Grab
012 Total Phosphorus (mg/L)	2, 5	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2, 5	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3	NA	NL	1 per 3 Months	Grab
068 TKN (mg/L)	5	NA	NL	1 per 6 Months	Grab
389 Nitrite + Nitrate (mg/L)	5	NA	NL	1 per 6 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
196 Total Recoverable Zinc (µg/L)	2	NA	NL	1 per 6 Months	Grab

442 Dissolved Copper (µg/L)	3	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour	3	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48	3	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Monitoring included based on Professional Judgement (PJ)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring quarterly monitoring for parameters that exceed 2x acute water quality standards and annual toxicity testing

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals

5 = Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay.

pH, dissolved copper, ammonia: The maximum detected concentration for copper and ammonia exceeded two times the applicable acute water quality standard criteria. The pH is being monitored to provide data for calculating the acute screening criteria and to ensure the water quality standards are not exceeded. Quarterly monitoring for these parameters is applied in accordance with GM14-2003.

Total nitrogen, total phosphorus, total recoverable iron, total recoverable zinc: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

TSS, TKN, and Nitrite + Nitrate: Because this outfall is a new outfall with this reissuance, monitoring for nutrients is required in order to verify the aggregate wasteload allocations for the Chesapeake Bay TMDL.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria for the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate aluminum, barium, , BOD₅, magnesium, manganese, molybdenum, nitrate+nitrite, sulfate, tin, TKN, TSS, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for copper and ammonia, and it is applied on an annual basis in accordance with GM14-2003.

Outfall 904

Outfall 904 discharges directly to the James River. The calculation of 2x acute water quality criteria is documented in **Attachment I**. The discharge from this outfall will be terminated when the Marine Operations Area Improvements projects are implemented, per Part I.C.25 of the permit, and this outfall is scheduled for removal prior to the next permit reissuance.

The permit reissuance application EPA Form 2F categorized Outfall 904 with SIC code 2873, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals is required for this outfall. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 10: Outfall 904 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
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Copper, Total	µg/L	1,100		34.3	DMR Data
Lead, Total	µg/L	8		249	Form 2F
Zinc, Total	µg/L	7,500	120	292	DMR Data
Iron, Total	µg/L	39,700	1,000		DMR Data
pH	S.U.	5.2 – 8.8		6.0 – 9.0⁽²⁾	DMR Data
Total Phosphorus	mg/L	0.56	2.0		DMR Data
Ammonia – N	mg/L	2,013		8.27	DMR Data
Total Nitrogen	mg/L	2,460	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved. See Attachment I for calculation of 2x Acute criteria.

Table 10a: Outfall 904 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 4	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 4	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 4	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour	3, 4	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48	3, 4	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards.

4 = Professional Judgement (PJ) for annual toxicity testing paired with quarterly ammonia, copper, and zinc testing.

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003.

Total nitrogen, total phosphorus, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required in order to compare with the quarterly toxicity testing.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, cobalt, BOD₅, COD, TSS, TKN, aluminum, magnesium, manganese, nitrate+nitrite, sulfate, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. Additionally, WET testing results for this outfall (found in Attachment E) indicate toxicity in 4 out of the 8 samples. Toxicity testing is specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing during this permit term to allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample.

Outfall 905

Outfall 905 discharges directly to the James River. The calculation of 2x acute water quality criteria is documented in **Attachment I**. The discharge from this outfall will be terminated when the Marine Operations Area Improvements projects are implemented, per Part I.C.25 of the permit. This outfall will be removed prior to the next permit reissuance.

Outfall 905 has been categorized by the owner with SIC codes 2873 and 2819, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals and Sector C Industrial Inorganic Chemicals are required for this outfall. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 11: Outfall 905 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	525		18.4	DMR Data
Zinc, Total	µg/L	3,800	120	167	DMR Data
Iron, Total	µg/L	24,300	1,000		DMR Data
Total Phosphorus	mg/L	0.53	2.0		DMR Data
Aluminum, Total	µg/L	22,200	750		DMR Data
pH	S.U.	3.6 – 6.9		6.0 – 9.0 ⁽²⁾	DMR Data
Ammonia – N	mg/L	789		16.6	DMR Data
Total Nitrogen	mg/L	804	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved. See Attachment I for calculation of 2x Acute Criteria.

Table 11a: Outfall 905 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 4	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (mg/L)	2, 3, 4	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 4	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	3, 4	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3, 4	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 and 2819

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ) for annual toxicity testing paired with quarterly ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable aluminum, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of screening criteria.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, BOD₅, COD, TSS, TKN, nitrate+nitrite, magnesium, manganese, sulfate, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. Additionally, as shown in Attachment E, there have been two toxicity tests reported for this outfall during the permit term, with one of the tests indicating toxicity. Toxicity testing is specified to be conducted annually on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing during this permit term. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.I.

Outfall 906

Outfall 906 discharges directly to the James River. The calculation of 2x acute water quality criteria is documented in **Attachment I**. The discharge from this outfall will be terminated when the Marine Operations Area Improvements projects are implemented, per Part I.C.25 of the permit. This outfall will be removed prior to the next permit reissuance.

Outfall 906 has been categorized by the owner with SIC codes 2873 and 2819, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals and Sector C Industrial Inorganic Chemicals are required for this outfall. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 12: Outfall 906 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	817		65.0	DMR Data
Zinc, Total	µg/L	3,200	120	519	DMR Data

Iron, Total	µg/L	17,000	1,000		DMR Data
Aluminum, Total	µg/L	9,390	750		DMR Data
pH	S.U.	4.0 – 7.1		6.0 – 9.0⁽²⁾	DMR Data
Total Phosphorus	mg/L	0.56	2.0		DMR Data
Ammonia – N	mg/L	3,625		12.2	DMR Data
Total Nitrogen	mg/L	2,590	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved. See Attachment I for calculation of 2x Acute Criteria.

Table 12a: Outfall 906 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 4	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 4	NA	NL	1 per 3 Months	Grab
203 Dissolved Copper (µg/L)	3, 4	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	3, 4	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3, 4	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 and 2819

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ) for annual toxicity testing paired with quarterly ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable aluminum, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of screening criteria.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, boron, BOD₅, COD, cobalt, magnesium, manganese, nitrate+nitrite, TKN, sulfate, TSS, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent

with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required annually due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. Additionally, two toxicity test results have been submitted, as shown in Attachment E, and both tests indicate toxicity. Toxicity testing for this permit term is specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.1.

Outfall 907

Outfall 907 discharges to Poythress Run. See discussion of 2x WQC calculations in Outfall 903. The discharge from this outfall will be terminated when the Marine Operations Area Improvements projects are implemented, per Part I.C.25 of the permit. This outfall will be removed prior to the next permit reissuance.

The permit reissuance application EPA Form 2F categorized Outfall 907 with SIC codes 2869 and 2873, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals is required for this outfall. There are no benchmark monitoring requirements for Sector AE which includes SIC 2869. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 13: Outfall 907 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria	Data Source
Copper, Total	µg/L	502		17.1	DMR Data
Zinc, Total	µg/L	3,900	120	156	DMR Data
Iron, Total	µg/L	10,300	1,000		DMR Data
pH	S.U.	4.3 – 7.1		6.0 – 9.0 ⁽²⁾	DMR Data
Total Phosphorus	mg/L	0.31	2.0		DMR Data
Ammonia – N	mg/L	3,625		0.784	DMR Data
Total Nitrogen	mg/L	2,590	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved. See Attachment I for calculation of 2x Acute Criteria.

Table 13a: Outfall 907 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 4	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 4	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 4	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	3, 4	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3, 4	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 and 2869

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ) for toxicity testing paired with quarterly ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to the agricultural chemicals subcategory. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of screening criteria.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate aluminum, barium, boron, cobalt, BOD₅, COD, magnesium, manganese, nitrate+nitrite, TKN, TSS, and sulfate since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required annually due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing during this permit term. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.I.

Outfall 908

Outfall 908 discharges to Gravelly Run. The calculation of 2x acute WQC is provided in the discussion of Outfall 901 above.

The permit reissuance application EPA Form 2F categorized Outfall 908 with SIC code 2869, Industrial Organic Chemical Not Elsewhere Classified, which does not require benchmark monitoring per 9VAC-151-380. However, the reported DMR sampling results show elevated levels of ammonia, total nitrogen, aluminum, iron, zinc, and copper which are indicative of ammonium sulfate fertilizer impacts seen elsewhere on this site. Therefore, DEQ has applied the benchmark monitoring requirements for SIC 2873 on a Professional Judgement (PJ) basis for Nitrogenous Fertilizers, which is applicable to this facility but was not designated for this area.

Table 14: Outfall 908 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	540		17.5	DMR Data
Lead, Total	µg/L	5		111	Form 2F
Zinc, Total	µg/L	15,400	120	156	DMR Data

Iron, Total	µg/L	60,700	1,000		DMR Data
pH	S.U.	4.4 – 7.1		6.0 – 9.0⁽²⁾	DMR Data
Total Phosphorus	mg/L	3.25	2.0		DMR Data
Ammonia – N	mg/L	5,395		3.60	DMR Data
Total Nitrogen	mg/L	816	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

Table 14a: Outfall 908 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 5	NA	NL	1 per 3 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 5	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 5	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	5	NA	NL	1 per 6 Months	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	5	NA	NL	1 per 6 Months	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 applied on a Professional Judgement (PJ) basis.

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals

5 = Professional Judgement (PJ) for semi-annual toxicity testing paired with quarterly ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of screening criteria.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria in the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, BOD₅, COD, magnesium, manganese, TSS, TKN aluminum, sulfate, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying

assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. For this outfall, toxicity testing is applied on a semi-annual basis on a Professional Judgement basis due to magnitude of the exceedance of 2x acute screening criteria for copper, zinc, and ammonia. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing during this permit term. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for semi-annual paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.1.

Outfall 909

Outfall 909 discharges to Gravelly Run. The calculation of 2x acute WQC is provided in the discussion of Outfall 901 above.

The permit reissuance application EPA Form 2F categorized Outfall 909 with SIC code 2873, therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals is required for this outfall. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 15: Outfall 909 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	2,160		17.5	DMR Data
Zinc, Total	µg/L	15,400	120	156	DMR Data
Iron, Total	µg/L	60,700	1,000		DMR Data
Aluminum, Total	µg/L	33,000	750		DMR Data
pH	S.U.	4.4 – 7.9		6.0 – 9.0 ⁽²⁾	DMR Data
TRC	mg/L	0.02		0.038	Form 2F
Total Phosphorus	mg/L	3.3	2.0		DMR Data
Ammonia – N	mg/L	5,395		3.60	DMR Data
Total Nitrogen	mg/L	816	2.2		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals values are for dissolved.

Table 15a: Outfall 909 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 5	NA	NL	1 per 3 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 5	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 5	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	5	NA	NL	1 per 6 Months	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	5	NA	NL	1 per 6 Months	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals

5 = Professional Judgement (PJ) for semi-annual toxicity testing paired with quarterly ammonia, copper, and zinc.

6 = Professional Judgement (PJ) based on testing results

pH, ammonia, dissolved copper: The maximum detected concentrations for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable aluminum: Monitoring is continued on a Professional Judgement basis due to extremely high results

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedances of screening criteria.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria in the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, BOD₅, COD, magnesium, manganese, nitrate+nitrite, sulfate, TKN, TSS, and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. For this outfall, toxicity testing is applied on a semi-annual basis on a Professional Judgement basis due to the magnitude of the exceedance of 2x acute screening criteria for copper, zinc, and ammonia. Additionally, monitoring data show that 6 out of 8 toxicity tests have indicated toxicity. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, and copper testing during this permit term. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.I.

Outfall 910

Outfall 910 discharges to Gravelly Run. The calculation of 2x acute WQC is discussed with Outfall 901.

The permit reissuance application EPA Form 2F categorized Outfall 908 with SIC code 2869, Industrial Organic Chemical Not Elsewhere Classified, which does not require benchmark monitoring per 9VAC-151-380.

Table 16: Outfall 910 Stormwater Effluent Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	216	17.5	DMR Data
Zinc, Total	µg/L	600	156	DMR Data

Parameter	Units	Highest Result ⁽¹⁾	2x Acute Criteria ⁽³⁾	Data Source
Iron, Total	µg/L	12,500		DMR Data
Aluminum, Total	µg/L	7,040		DMR Data
pH	S.U.	7.8 – 8.3	6.0 – 9.0 ⁽²⁾	DMR Data
Total Phosphorus	mg/L	1.24		DMR Data
Ammonia – N	mg/L	2.8	3.60	DMR Data
Total Nitrogen	mg/L	9.6		DMR Data

¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

*Sample could not be obtained due to no discharge, so Form 2F was not completed for this outfall.

Table 16a: Outfall 910 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
004 Total Suspended Solids (mg/L)	2	NA	NL	1 per 6 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
068 TKN (mg/L)	2	NA	NL	1 per 6 Months	Grab
389 Nitrite + Nitrate (mg/L)	2	NA	NL	1 per 6 Months	Grab
039 Ammonia (mg/L)	2, 5	NA	NL	1 per 6 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
448 Dissolved Zinc (µg/L)	3	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	6	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	6	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	3	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Monitoring included based on Professional Judgement (PJ)

2 = Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay.

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring annual toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards and annual Toxicity testing.

4 = Professional Judgement (PJ), to provide hardness data for calculation of acute screening criteria for metals

5 = Professional Judgement (PJ) to require semi-annual ammonia monitoring to provide data for future permitting

6 = Professional Judgement (PJ)

pH, dissolved copper, and dissolved zinc: The maximum detected concentration for both copper and zinc exceeded two times the applicable acute water quality standard criteria and therefore quarterly monitoring for dissolved copper and dissolved zinc are appropriate. The pH is being monitored to provide data for calculating the acute screening criteria and to ensure the water quality standards are not exceeded. Quarterly monitoring for these parameters is applied in accordance with GM14-2003.

Total recoverable aluminum, total recoverable iron: Semi-annual monitoring for these parameters is applied on a Professional Judgement basis (PJ) due to elevated concentrations detected in the past. Additional monitoring will determine if the drainage area should be categorized by additional SIC codes.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is

required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required in order to compare with the quarterly toxicity testing.

Ammonia: Ammonia monitoring is implemented on a Professional Judgement basis on a semiannual schedule. The two ammonia test results reported during the permit term (see Attachment E) do not indicate exceedance of water quality criteria, but the exceedances of the screening criteria for copper and zinc at this outfall are similar to other outfalls with elevated ammonia discharges.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria in the next permit reissuance.

TSS, TKN, Nitrite + Nitrate, total nitrogen, total phosphorus: This outfall has limited data available due to lack of discharges. Therefore, monitoring for nutrients is required in order to verify the aggregate wasteload allocations for the Chesapeake Bay TMDL, per GM14-2011. Three samples are required, instead of the usual four, since the DMR data shows one result was submitted during the previous permit term.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for copper and zinc, and it is applied on an annual basis in accordance with GM14-2003.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate aluminum, total nitrogen, total phosphorus, COD, and TSS since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of total nitrogen, total phosphorus, BOD₅, COD, and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Submittal of Form 2F: EPA Form 2F has not been completed for this outfall, due to lack of discharge flow. DMR data show that this outfall has not discharged since 2018. Special Condition C.16 requires submittal of Form 2F when flow resumes.

Outfall 911

Outfall 911 discharges directly to the James River. The calculation of 2x acute water quality criteria is documented in **Attachment I**. The discharge from this outfall will be terminated when the Marine Operations Area Improvements projects are implemented, per Part I.C.25 of the permit. This outfall will be removed prior to the next permit reissuance.

The permit reissuance application EPA Form 2F categorized Outfall 911 with SIC code 2869, Industrial Organic Chemical Not Elsewhere Classified, which does not require benchmark monitoring per 9VAC-151-380. However, the reported DMR data show elevated levels of ammonia, total nitrogen, total phosphorus, aluminum, iron, zinc, and copper which are indicative of ammonium sulfate fertilizer contamination seen elsewhere on this site. Therefore, DEQ has applied the benchmark monitoring requirements for SIC 2873, Nitrogenous Fertilizers, which is applicable to this facility but was not designated for this area. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing.

Table 17: Outfall 911 Stormwater Effluent Benchmark and Screening Criteria Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	113		32.9	DMR Data
Zinc, Total	µg/L	175	120	281	DMR Data
Iron, Total	µg/L	22,800	1,000		DMR Data
Aluminum, Total	µg/L	3,100	750		DMR Data
pH	S.U.	6.1 – 6.5		6.0 – 9.0 ⁽²⁾	DMR Data
Total Phosphorus	mg/L	27.9	2.0		DMR Data
Ammonia – N	mg/L	1,019		19.2	DMR Data

Total Nitrogen	mg/L	1,138	2.2		DMR Data
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¹ Highest reported value from October 2016 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals values are dissolved. See Attachment I for calculation of 2x Acute Criteria.

Table 17a: Outfall 911 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
012 Total Phosphorus (mg/L)	2	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 5	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 5	NA	NL	1 per 6 Months	Grab
442 Dissolved Copper (µg/L)	3, 5	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	4	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour	5	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	5	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Monitoring included based on Professional Judgement (PJ)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873 applied on a Professional Judgement (PJ) basis

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring quarterly monitoring for parameters that exceed 2x acute water quality standards

4 = Professional Judgement (PJ)

5 = Professional Judgement (PJ) for annual toxicity testing paired with ammonia, copper, and zinc testing

pH, ammonia, dissolved copper: The maximum detected concentration for ammonia and copper exceeded two times the applicable acute water quality standard criteria. The pH is being monitored to provide data for calculating the acute screening criteria and to ensure the water quality standards are met. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require quarterly whole effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable zinc, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable aluminum: Semi-annual monitoring for this parameter is applied on a Professional Judgement basis (PJ) due to elevated concentrations detected in the past. Additional monitoring will determine if the drainage area should be categorized by additional SIC codes.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria in the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, BOD₅, COD, magnesium, manganese, nitrite+nitrate, sulfate, TKN, TSS and titanium since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of BOD₅, COD, nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for copper and ammonia, per GM 14-2003. Additionally, two toxicity tests were conducted on this outfall during the permit term (shown in Attachment E), with one of the two tests failing. Toxicity testing is specified to be conducted on the same sample with the ammonia, zinc, and copper testing. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.I.

Outfall 912

AdvanSix identified this outfall in 2020 while completing a comprehensive stormwater evaluation of the site. This outfall is currently permitted under Industrial Stormwater General Permit VAR052505, which will be terminated upon reissuance of VA0005291. Outfall 912 discharges to Poythress Run. See discussion of 2 x Acute WQC calculations in Outfall 903.

The VAR052505 permit categorizes this outfall with SIC 2869, 2819 and 2873. Therefore the semi-annual benchmark monitoring for Sector C Agricultural Chemicals and Sector C Industrial Inorganic Chemicals are required for this outfall. The SIC code 2869 does not have benchmarks associated with it. In addition, monitoring results that exceed the calculated 2xAcute WQC will require quarterly monitoring, and also require WET testing. Because this is a new outfall, a total of 4 samples for TN, TP, and TSS are required to verify the aggregate wasteload allocations under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay, per GM14-2011. However, because one TMDL sampling has already been completed, the permit requires three more.

Table 18: Outfall 912 Stormwater Effluent Benchmark Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	52		17.1	Form 2F
Zinc, Total	µg/L	1,430	120	156	Form 2F
Iron, Total	µg/L	21,400	1,000		DMR
Aluminum, Total	µg/L	6,300	750		DMR
pH	S.U.	4.8		6.0 – 9.0 ⁽²⁾	Form 2F
TRC	mg/L	0.09		0.04	Form 2F
Total Phosphorus	mg/L	1.03	2.0		DMR
Ammonia – N	mg/L	5.96		0.784	Form 2F
Total Nitrogen	mg/L	816	2.2		DMR

¹ Highest reported value from the 2021 permit reissuance application and the 1/10/2022 DMR

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

Table 18a: Outfall 912 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 3 Months	Estimate
002 pH (S.U.)	1	NA	NL	1 per 3 Months	Grab
004 Total Suspended Solids (mg/L)	5	NA	NL	1 per 6 Months	Grab
012 Total Phosphorus (mg/L)	2, 5	NA	NL	1 per 6 Months	Grab
013 Total Nitrogen (mg/L)	2, 5	NA	NL	1 per 6 Months	Calculated
039 Ammonia (mg/L)	3, 6	NA	NL	1 per 3 Months	Grab
068 TKN (mg/L)	5	NA	NL	1 per 6 Months	Grab

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
389 Nitrite + Nitrate (mg/L)	5	NA	NL	1 per 6 Months	Grab
137 Hardness as CaCO ₃ (mg/L)	4	NA	NL	1 per 6 Months	Grab
158 TRC (mg/L)	3, 6	NA	NL	1 per 3 Months	Grab
196 Total Recoverable Zinc (µg/L)	2, 3, 6	NA	NL	1 per 3 Months	Grab
442 Dissolved Copper (µg/L)	3, 6	NA	NL	1 per 3 Months	Grab
361 Total Recoverable Iron (µg/L)	2	NA	NL	1 per 6 Months	Grab
410 Total Recoverable Aluminum (µg/L)	2	NA	NL	1 per 6 Months	Grab
711 Toxicity, Final Acute <i>C. dubia</i> 48 hour (TUa)	3, 6	NA	NL	1 per Year	Grab
712 Toxicity, Final Acute <i>P. promelas</i> 48 hour	3, 6	NA	NL	1 per Year	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150 for SIC 2873, 2819, and 2869

3 = Professional Judgement (PJ) in accordance with Water Quality Standards (9 VAC 25-260) and GM14-2003 Industrial Stormwater Section requiring toxicity testing and quarterly monitoring for parameters that exceed 2x acute water quality standards and

4 = Professional Judgement (PJ) to provide hardness data for calculation of acute screening criteria for metals

5 = Nonsignificant dischargers are subject to aggregate wasteload allocations for TN, TP, and Sediment under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay.

6 = Professional Judgement (PJ) for annual toxicity testing paired with ammonia, copper, TRC, and zinc testing

pH, dissolved copper, TRC: The maximum detected concentrations for copper and TRC exceeded two times the applicable acute water quality standard criteria. The pH exceeded water quality standards. Quarterly monitoring for these parameters is applied in accordance with GM14-2003. Exceedances of screening criteria require whole quarterly effluent toxicity (WET) testing per Part III.A.1.b.

Total nitrogen, total phosphorus, total recoverable iron: These parameters are required by ISWGP benchmark Sector C applicable to agricultural chemicals and industrial organic chemicals subcategories. Semi-annual monitoring is applied in accordance with GM14-2003.

Total recoverable zinc: The maximum detected concentration for this parameter exceeded both the benchmark value and two times the acute water quality standards. The most limiting value was the benchmark value, so monitoring is required as total recoverable zinc to compare to the benchmark value. However, quarterly sampling is required due to exceedance of the screening criteria.

TSS, TKN, and Nitrite + Nitrate: Because this outfall is a new outfall with this reissuance, monitoring for nutrients is required in order to verify the aggregate wasteload allocations for the Chesapeake Bay TMDL. Because one sample event has been reported under VAR052505, only three additional samples will be required in the reissued permit.

Ammonia: The ammonia concentration provided in the Form 2F exceeded two times the applicable acute water quality standard criteria. Additionally, the TN of 816 mg/L reported on the 1/10/2022 DMR indicates that ammonia is very likely in exceedance of water quality standards, because the TN in this site's stormwater is predominantly in ammonia form.

Hardness: The calculation of water quality criteria for metals is dependent upon the hardness of the discharge. Therefore, hardness monitoring is added at a semiannual frequency to provide adequate data for calculating water quality criteria in the next permit reissuance.

Other Parameters: The general criteria in 9VAC25-260-20.A was used to evaluate barium, magnesium, manganese, nitrate+nitrite, TKN, TSS and sulfate since these parameters have no corresponding numeric water quality criteria or stormwater benchmarks. The detections of nitrate+nitrite, TKN and TSS are parameters that can produce turbidity and/or nourish undesirable or nuisance aquatic plant life. However, this facility is included in the Chesapeake Bay TMDL, as described in Section 14, and therefore should not contribute to the impairments described in Section 14 if

the facility's discharges are consistent with the TMDL. Compliance with the underlying assumptions of the Chesapeake Bay TMDL is required per Part III.C.2.c of the permit through the Chesapeake Bay TMDL Action Plan.

Toxicity Testing: Whole Effluent Toxicity Testing is required due to exceedance of 2xAcute criteria for ammonia, copper and zinc, per GM 14-2003. Toxicity testing is also specified to be conducted on a paired, or simultaneous, sample with the ammonia, zinc, TRC, and copper testing. This will allow confirmation of whether there is a correlation to be established between the toxic parameters (ammonia, zinc, TRC copper) and the final acute toxicity of the sample. The requirement for paired toxicity monitoring is appropriate to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act, per 9VAC25-31-210 and 220.1.

Outfall 913

Outfall 913 is located on the former City Point Energy Center, which is now owned by AdvanSix. Operations at the facility ceased in mid-2019, and the site is currently being demolished and reclaimed. The facility is currently permitted under Industrial Stormwater General Permit VAR050553, and AdvanSix has requested that the one remaining outfall be incorporated into VA0005291 so that VAR050553 can be terminated. Although industrial activity has ceased at this facility, one stormwater outfall remains which drains the residual coal field through a settling basin, and discharges to Gravelly Run. Benchmark monitoring for Sector AD, Non-classified Facilities, is applied to this outfall. Limitations for coal pile runoff are not applicable because the coal pile has been removed, and only unusable coal debris remains. Continued benchmark monitoring for TSS and pH are applicable. DMR data since the facility closure has not exceeded either benchmark.

Outfall 913 discharges to Gravelly Run. The calculation of 2x acute WQC is provided in Outfall 901.

Table 19: Outfall 913 Stormwater Effluent Benchmark Evaluation

Parameter	Units	Highest Result ⁽¹⁾	Benchmark Value	2x Acute Criteria ⁽³⁾	Data Source
Copper, Total	µg/L	4		17.5	Form 2F
Zinc, Total	µg/L	80		156	Form 2F
pH	S.U.	8.4		6.0 – 9.0 ⁽²⁾	DMR Data
TSS	mg/L	16	100		DMR Data
TRC	mg/L	0.03		0.038	Form 2F

¹ Highest reported value from July 2020 – April 2021, including the 2021 permit reissuance application.

² This range is identified by the Virginia Water Quality Standards (9VAC25-260-10 et seq.).

³ Metals are dissolved.

Table 19a: Outfall 913 Basis for Monitoring Requirements

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		MIN	MAX	FREQUENCY	SAMPLE TYPE
199 Flow (MG)	NA	NA	NL	1 per 6 Months	Estimate
002 pH (S.U.)	1, 2	NA	NL	1 per 6 Months	Grab
004 Total Suspended Solids (mg/L)	2	NA	NL	1 per 6 Months	Grab

NL = No Limitation; NA = Not Applicable.

1 = Water Quality Standards (9 VAC 25-260)

2 = Sector-specific stormwater requirements 9VAC-151-150, Sector AD, Non-classified Facilities

All parameters disclosed during the application process, from both the Form 2F and the DMR data reported since the shutdown of industrial activity, show no exceedances of benchmark or water quality criteria. Total recoverable copper, total recoverable zinc, and total recoverable chloride (TRC) were compared to corresponding water quality criteria and no monitoring or limitations are needed. Detections of barium, boron, iron, aluminum, magnesium, manganese, molybdenum, and sulfate are not expected to violate the general criteria found in 9VAC25-260-20.A.

Benchmark monitoring for Sector AD, Non-classified Facilities, is applied to this outfall.

Section 316(b) Requirements Applicable to Cooling Water Intake Structures for Existing Facilities: Evaluation and Best Technology Available (BTA) determination is contained in **Attachment S**.

17. **Antibacksliding:**
The permit expresses the load limitations at Outfall 101 as required by the applicable federal effluent guideline (see **Attachment G**). Load limitations have increased, but only as a factor of increased flow, while concentration limits remain unchanged. Antibacksliding does not apply to minimum effluent limitations promulgated by EPA, per DEQ Guidance Memorandum 00-2011.

All other effluent limitations are at least as stringent as those required by the 2016 permit.

18. **Compliance Schedules**
As discussed in **Attachment F**, this permit establishes more stringent effluent limitations for Ammonia at Outfall 998. Where new and more restrictive effluent limitations are established, it is allowable to provide a period of time for the permittee to achieve compliance. Part I.D.1 of the permit provides a schedule of compliance for ammonia limits.

As discussed in Attachment S, this permit establishes a determination for the Best Technology Available for impingement and entrainment effects from the cooling water intake structure, per the requirements of the Clean Water Act section 316(b) for existing facilities, per 40 CFR 125.90 et al. Part I.E.9 of the permit provides a schedule of compliance for the design and construction of new screening technology for the cooling water intake.

19. **Special Conditions:**
Whole Effluent Toxicity (WET) Testing – Part I.B.
Rationale: The VPDES Permit Regulation, 9VAC25-31-210 and 220.I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. This industrial category of facilities is identified in Agency guidance for inclusion in the toxics monitoring program. See **Attachment J** for the WET Evaluation for Outfalls 001, 002, and 003 and **Attachment V** for Outfall 005.

Special Conditions – Part I.C:

Special Condition C.1 – Notification Levels

Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200.A for all manufacturing, commercial, mining, and silvicultural dischargers.

Special Condition C.2 – Operation and Maintenance Manual Requirement

Rationale: Required by Code of Virginia § 62.1-44.16; VPDES Permit Regulation, 9VAC25-31-190.E, and 40 CFR 122.41(e). These require proper operation and maintenance of the permitted facility. Compliance with an O&M manual ensures this.

Special Condition C.3 – Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9VAC25-31-190.J.4 and 220.I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limitation or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values. For nutrient reporting calculations, §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this definition is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

Special Condition C.4 – Reopeners

Rationale:

- i. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a

TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act **as long as they do not violate applicable effluent guidelines or water quality standards.**

- ii. 9VAC25-40-70.A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
- iii. 9VAC25-31-390.A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Special Condition C.5 – Closure Plan

Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure industrial sites and treatment works are properly closed so that the risk of untreated waste water discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law.

Special Condition C.6 – Water Quality Criteria Reopener

Rationale: VPDES Permit Regulation, 9VAC25-31-220.D requires effluent limitations to be established which will contribute to the attainment or maintenance of the water quality standards.

Special Condition C.7 – pH Excursions

Rationale: 40 CFR 401.17 establishes lengths of time per event and per month during which continuously monitored pH values can be outside the designated range of 6.0 to 9.0 S.U.

Special Condition C. 8 – Process Wet Well Operations

Rationale: This special condition recognizes the possibility of an overflow from the wet well system if the design runoff flow is exceeded.

Special Condition C.9 – Emergency Deluge System Monitoring

Rationale: This special condition requires monitoring of any discharge from an emergency deluge system that would be activated in the event of an explosive condition or fire in a specific process area.

Special Condition C. 10 – Dissolved Oxygen Requirements

Rationale: This special condition clarifies the intent and reporting of the DO limitations established in Part I.A

Special Condition C.11– TOC Reporting

Rationale: This special condition provides instructions detailing the net TOC value calculations.

Special Condition C.12 – Heat and Ammonia Calculations

Rationale: This special condition provides instructions detailing the calculations of heat discharged (BTU/day) and the flow weighting for ammonia at Outfall 998.

Special Condition C.13 – Best Management Practices

Rationale: The receiving stream is considered impaired for bacteria. This special condition helps to address this impairment. VPDES Permit Regulation, 9VAC25-31-220.K, requires the use of best management practices where applicable to control or abate the discharge of pollutants when numeric effluent limits are infeasible, or the practices are necessary to achieve or to carry out the purpose and intent of the Clean Water Act and State Water Control Law.

Special Condition C.14 – Concept Engineering Report (CER)

Rationale: §62.1-44.16 of the Code of Virginia requires industrial facilities to obtain DEQ approval for proposed discharges of industrial wastewater. A CER means a document setting forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

Special Condition C.15 – Materials Handling / Storage

Rationale: 9VAC25-31-50.A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Special Condition C.16 – Form 2F Sampling

Rationale: In some cases, applicant may not have been able to comply with the Form 2F stormwater sampling requirements due to the lack of a representative storm event. This special condition requires the permittee to sample and submit data from a storm event to fulfill the requirements of Form 2F.

Special Condition C.17 – Seep Response Plan

Background: Inspection reports from both DEQ and EPA have documented liquids seeping from the ground at this facility. Because these materials have the potential to impact State waters, both through surface water discharges and through groundwater contamination, this special condition requires the owner to identify, report, and remediate the seeps in the Marine Operations Area with the potential to impact State waters.

Rationale: 9VAC25-31-50.A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effects of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The VPDES Permit Regulation, 9VAC25-31-210 and 220.I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

Special Condition C.18 – Stormwater Conveyance System Study

Background: Inspection reports from both DEQ and EPA have documented dry weather flows to stormwater outfalls. Industrial Stormwater General Permit VAR52505 was issued due to the identification of new stormwater drainage to Outfall 003 that was previously not known to exist. In recognition of the size, complexity, and age of the infrastructure at this permitted facility, a comprehensive investigation is warranted to identify potential risks and prevent illicit and unauthorized discharges to state waters.

Rationale: State Water Control Law §62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effects of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law.

Special Condition C.19 – Groundwater Monitoring for the Marine Operations Area

Background: Stormwater sampling in the Marine Operations area has shown elevated levels of ammonia, copper and zinc in stormwater discharges containing ammonium sulfate. Additionally, EPA testing conducted on the dry weather flow from Outfall 911 had a TN concentration of 907 mg/L. The dry weather flow from Outfall 906 had a TN of 1,480 mg/L and the dry weather flow from Outfall 904 had a TN concentration of 111 mg/L. These results indicate a high concentration of Total Nitrogen (assumed to be ammonia since ammonia is a known contaminant in the Marine Ops area) that is exiting the ground via dry weather flows. While many of these dry weather flows have been mitigated, including movement of the flow from Outfall 911 to the facility process system, investigation of these flows is still ongoing. Therefore, this study will characterize the groundwater and determine whether correct action is needed. This groundwater quality characterization study is appropriate due to the stormwater infiltration and evidence of groundwater contamination via dry weather flows in the Marine Operations Area.

Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. State Water Control Law at §62.1-44.3 defines 'State Waters' to include all water under the ground. The groundwater monitoring program will provide information needed to determine whether this facility is impacting groundwater quality on site. In recognition of the size, complexity and age of the infrastructure at this permitted facility, a comprehensive groundwater investigation is warranted to identify potential risks and prevent illicit and unauthorized discharges to state waters.

Special Condition C.20 – Enhanced Inspection and Housekeeping in Ammonium Sulfate**Storage/Handling/Transport Areas**

Background: Inspection reports from both DEQ and EPA have documented impacts from the ammonium sulfate manufactured onsite. Stormwater monitoring continues to show impacted runoff from this facility. Therefore, this special condition will require the permittee to implement enhanced procedures to inspect and clean the ammonium sulfate handling, storage and transport areas on a daily basis. The intent of this special

condition is prevent the ammonium sulfate from reaching state waters through stormwater runoff. Reductions in ammonium sulfate runoff will support compliance with the facility's Chesapeake Bay TMDL Action Plan.

Rationale: 9VAC25-31-50.A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste. The VPDES Permit Regulation, 9VAC25-31-210 and 220.I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

Special Condition C.21 – Adaptive Management Plan for Stormwater and Annual Report

Background: Stormwater Outfalls 901, 902, and 903 have been added to this permit reissuance, as described in Section 16. This special condition establishes a framework for monitoring the stormwater produced by 45+ acres within the interior of the plant, through 213 discharge points. This special condition uses an iterative sampling approach to identify the highest ammonia discharge points and allows the permittee to focus resources on reducing pollution from those areas. The nitrogen reduction achieved through this iterative approach will support compliance with the facility's Chesapeake Bay TMDL Action Plan.

Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters.

Special Condition C.22 – Gravelly Run Field Study

Rationale: This special condition allows the permittee to voluntarily provide new information to inform the calculation of ammonia limits for Gravelly Run. This special condition is completely voluntary and does not provide any basis of defense for exceedance of ammonia limitations.

Special Condition C.23 – Licensed Operator Requirement

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia 54.1-2300 et seq, Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18 VAC 160-30-360 et seq.), require licensure of operators.

Special Condition C.24 – EPA Form 2C and Water Quality Criteria Monitoring

Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the impact to State waters.

Special Condition C.25 – Marine Operations Area Improvements

Background: The Marine Operations Area has a long history of stormwater impacts from the facility's fertilizer product. This is documented in both inspection reports which identify ammonium sulfate loss and tracking from transportation, storage and handling, and in monitoring results showing elevated levels of ammonia and whole effluent toxicity in the stormwater (see Attachment E for data, and Section 16 for analysis). The permittee has voluntarily agreed to this condition. This project is included in the facility's Chesapeake Bay TMDL Action Plan. This special condition provides an enforceable schedule for the Chesapeake Bay TMDL Action Plan compliance date.

Rationale: This special condition is added with the consent of the permittee.

Special Condition C.26 – Building 12 Stormwater Elimination

Background: Building 12 stores ammonium sulfate fertilizer after its manufacture, and is then transported by truck to either shipping or packaging. Due to the nature of the operation, Building 12 has a documented history of tracked and drifting fertilizer. This special condition has been added to require the stormwater drains directly outside Building 12 to be directed to the process sewer. These projects are included in the facility's Chesapeake Bay TMDL Action Plan, and this special condition is part of an enforceable schedule for compliance with the Chesapeake Bay TMDL Action Plan compliance date.

Rationale: This special condition is added with the consent of the permittee.

Special Condition C.27 – Area 11 Process Improvements for Ammonia Reductions

Rationale: This special condition is added with the consent of the permittee to achieve compliance with new ammonia limitations at Outfall 998. A more detailed scope is contained in the letter from AdvanSix dated February 28, 2024, found in Attachment Y.

Special Condition C.28– Stormwater Contaminant Elimination Plan

Background: Inspection reports from both DEQ and EPA have documented contamination with the fertilizer product manufactured onsite. Stormwater monitoring continues to show toxic runoff. The permittee has agreed to improvements in the Marine Operations area but this special condition will address the other areas which still need attention.

Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the impact to State waters. The permit in Part II.F prohibits discharge of industrial wastes and deleterious substances to State waters. 9VAC25-31-50.A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Special Condition C.29 – Kellogg Cooling Tower Drainage to Poythress Run

Rationale: Added at the request of the permittee based on previously approved Notice of Planned Change requests and documentation in **Attachment X**.

Part I.D.1 Schedule of Compliance for Ammonia

Rationale: 9VAC25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under them.

Part I.D.2 Schedule of Compliance for Chesapeake Bay TMDL Action Plan

Background: The 2016 permit required this facility to achieve facility-wide nutrient and sediment loading values consistent with the Chesapeake Bay TMDL by June 30, 2024. This facility is challenged in achieving those stormwater loading values due to the fact that it manufactures ammonium sulfate fertilizer, which impacts the stormwater discharges at this facility and has done so for many decades. Additionally, this facility is one of the world's largest single-site producers of ammonium sulfate fertilizer, and extensive capital improvements are needed for this permittee to achieve the facility-wide nutrient loading for stormwater. Therefore, a schedule of compliance is appropriate. This schedule will result in compliance with the Chesapeake Bay TMDL Action Plan by June 30, 2028, which allows compliance as soon as possible given consideration of the multiple capital projects and new compliance requirements of the 2023 permit, including:

Major Components of the Chesapeake Bay TMDL Action Plan:

- Marine Operations Area Stormwater Collection and Treatment (I.C.25)
- Building 12 Stormwater Elimination (I.C.26)
- Adaptive Management Plan for Stormwater (I.C.21)

Other Compliance Requirements for this Permit:

- Schedule of Compliance for Ammonia (I.D.1)
- Pilot study of fine screens for compliance with 316(b) requirements (I.E.7)
- Enhanced Inspections and Housekeeping in Ammonium Sulfate Storage/Handling/Transport Areas (I.C.20)
- Stormwater Conveyance System Study (I.C.18)
- Seep Response Plan (I.C.17)
- Groundwater Monitoring for Marine Operations Area (I.C.19)
- Stormwater Contaminant Elimination Plan (I.C.28)

The ten projects, studies, and plan developments listed above are competing for resources. The facility is able to absorb only so much work by the engineering, plant, and construction staff at the site and within the region. Due to these resource limitations, DEQ has determined that “as soon as possible” in this case should be June 30, 2028.

Rationale: 9VAC25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under them.

Part I.E 1: Interim §316(b) Best Technology Available (BTA)

Background: Interim BTA requirements were established for the 2016 permit. These requirements are carried forward until the final design, as established by the pilot study and approved by DEQ, are installed and operational.

Rationale: Federal regulations at 40 CFR §§125.98(b)(5) and (b)(6) mandate that for permits issued before July 14, 2018, for which an alternate schedule has been established for the submission of information required by 40 CFR §122.21(r), must include interim BTA requirements in the permit based on best professional judgment on a site-specific basis. This special condition outlines interim BTA practices to minimize impingement and entrainment mortality and adverse impacts to aquatic organisms.

Part I.E 2: Impingement and Entrainment Control Technology Preventative Maintenance

Rationale: VPDES Permit Regulation 9VAC25-31-190.E requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit.

Part I.E 3: Monitoring Requirements

Rationale: VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA, and regulations. Federal regulation at 40 CFR §125.96(e) requires visual inspections or the employment of remote monitoring devices to be conducted at least weekly during the period any cooling water intake structure is in operation, to ensure any technologies operated are maintained and operated to function as designed, including those installed to protect federally-listed threatened or endangered species or designated critical habitat.

40 CFR §125.96 authorizes DEQ to establish monitoring requirements and specific protocols as appropriate. Provisions for inspection waivers, adverse weather conditions, and deficiency discoveries were developed, using comparable provisions found in the VPDES General Permit for Stormwater Discharges Associated with Industrial Activity, 9VAC25-151-70, Part I.A.2.e, A.3. and A.6.b as a foundation.

Part I.E 4: Annual Certification Statement Requirements

Rationale: VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA, and regulations. Federal regulations at 40 CFR §125.97(c) requires the permittee to annually submit a certification statement signed by a responsible corporate officer reporting whether there have been substantial modifications to the operation at any unit at the facility that impacts cooling water withdrawals or operation of the cooling water intake structures, or if information contained in the previous year's annual certification remains pertinent.

Part I.E 5: Measures to Protect Federally-listed Threatened or Endangered (T&E) Species, Designated Critical Habitat, and Fragile Species or Shellfish

Rationale: VPDES Permit Regulation 9VAC25-31-330 authorizes the board to include conditions in the permit in response to advice submitted in writing to the DEQ from the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, or any other state or federal agency with jurisdiction over fish, wildlife, or public health that the imposition of specified conditions are necessary to avoid substantial impairment of fish, shellfish, or wildlife resources and to the extent the board determines the conditions are necessary to carry out the provisions of the regulation, the law, and of the CWA.

In addition, VPDES Permit Regulation 9VAC25-31-165.C requires existing facilities with cooling water intake structures to meet requirements under §316(b) of the CWA determined by the department on a case-by-case, best professional judgment (BPJ) basis. 40 CFR §§125.94(a)(1), 125.94(g), 125.96(g), and 125.97(g) authorize DEQ to establish additional control measures, monitoring, and reporting requirements in the permit designed to minimize incidental take, reduce or remove more than minor detrimental effects to federally-listed threatened or endangered species or designated critical habitat, or avoid jeopardizing federally-listed species or destroying or adversely modifying designated critical habitat (e.g. prey base).

State Water Control Law §62.1-44.5.A.3 and VPDES Permit Regulation 9VAC25-31-50.A.2 prohibit the alteration of the physical, chemical, or biological properties of State waters and making them detrimental to

animal or aquatic life, except in compliance with a permit issued by the Board. In addition, VPDES Permit Regulation 9VAC25-31-190.E requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit.

State Water Control Law §62.1-44.21 and VPDES Permit Regulation 9VAC25-31-190.H authorizes the Board to require owners to furnish plans, specifications, and other pertinent information as may be necessary to accomplish the purposes of the State Water Control Law. In addition, federal regulations at 40 CFR §125.94(g) and §125.97(e) authorize DEQ to establish additional permit monitoring and reporting requirements. Information provided by the permittee under this special condition may be used as a foundation to address other reporting requirements of 40 CFR §125.98(k).

Part I.E 6: Federal Endangered Species Act Compliance

Rationale: State Water Control Law §62.1-44.5.A.3 and VPDES Permit Regulation 9VAC25-31-50.A.2 prohibits the alteration of the physical, chemical or biological properties of State waters and making them detrimental to animal or aquatic life, except in compliance with a permit issued by the Board.

In addition, VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA and regulations. 40 CFR §125.98(j) stipulates that nothing in Subpart J of Part 125 of the Code of Federal Regulations authorizes the take, as defined at 16 U.S.C. 1532(19), of threatened or endangered species of fish or wildlife. Such take is prohibited under the Endangered Species Act unless it is exempted pursuant to 16 U.S.C 1536(o) or permitted pursuant to 16 U.S.C 1539(a). Absent such exemption or permit, any facility must not take threatened or endangered species. 40 CFR §125.98(b)(1) requires all NPDES permits for facilities subject to §316(b) of the Clean Water Act to include as a permit condition the specific language of this special condition.

Part I.E.7 Schedule of Compliance for Impingement and Entrainment BTA

Rationale: 9VAC25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law, and regulations promulgated under them.

Part I.E.8 BTA Reopener

Rationale: 9VAC25-31-190.F and 9VAC31-390.A allow permits to be modified, revoke and reissued, or terminate for cause. This permit contains a schedule of compliance which requires a pilot study. Should any new information show cause for the BTA finding to be subsequently revised or amended based on new or additional information, this reopener clause allows for modification of the permit.

Part II, Conditions Applicable to All VPDES Permits

Rationale: The VPDES Permit Regulation at 9VAC25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

Part III Stormwater Monitoring Requirements, Stormwater Management Evaluation; General Stormwater Special Conditions, Benchmark Monitoring, Stormwater Pollution Prevention Plan

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-10 defines discharges of stormwater from industrial activity. 9 VAC 25-31-120 requires a permit for these discharges. The general stormwater requirements, Stormwater Pollution Prevention Plan (SWPPP) requirements, and monitoring requirements of the permit are derived from the VPDES General Permit Regulation for Discharges of Stormwater Associated with Industrial Activity (VAR05), 9 VAC 25-151-10 et seq. VPDES Permit Regulation, 9 VAC 25-31-220 K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numerical effluent limits are infeasible or the practices are necessary to achieve effluent limits or to carry out the purpose and intent of the Clean Water Act and State Water Control Law.

The previous permit required this facility to achieve facility-wide nutrient and sediment loading values consistent with the Chesapeake Bay TMDL by June 30, 2024. This facility is challenged in achieving those stormwater loading values due to the fact that it manufactures ammonium sulfate fertilizer, which impacts the stormwater discharges at this facility and has done so for many decades. Additionally, this facility is one of the world's largest single-site producers of ammonium sulfate fertilizer, and extensive capital improvements are needed for this permittee to achieve the facility-wide nutrient loading for stormwater. Therefore, a

schedule of compliance is appropriate. Part III.C.2.c requires compliance with the Chesapeake Bay TMDL Action Plan by June 30, 2028, which allows compliance as soon as possible given consideration of the multiple capital projects and additional compliance requirements of the 2023 permit. Compliance with the Chesapeake Bay TMDL Action Plan will be achieved through implementation of three special conditions in Part I of the permit: Part I.C.25 Marine Operations Area Improvements, Part I.C.26 Building 12 Stormwater Elimination, and Part I.C.21 Adaptive Management Plan for Stormwater. These special conditions set interim requirements and enforceable dates for their achievement. The annual reporting requirements of Part III.C.2.d will provide progress reports to the department.

20. Changes to the Permit

Part I.A.1 Outfall 999					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
cBOD ₅ - Intake	No Change	No Change	1 per Year	1 per Month	See discussion in Section 16
Outfall 999 has been updated to include Outfall 005 for the calculation of facility cBOD ₅					

Part I.A.2a Outfall 998 (this was I.A.2 in the 2016 permit)					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Ammonia (as N) – Final limit	5.74 mg/L (daily max); 4.13 mg/L (Monthly Avg)	1.02 mg/L (daily max); 0.746 mg/L (Monthly Avg)	No Change		See discussion, Attachment F
Ammonia (as N) – Final limit	2,940 kg/day (daily max); 2,117 kg/day (Monthly Avg)	523 kg/day (daily max); 382 kg/day (Monthly Avg)	No Change		See discussion, Attachment F
Ammonia (as N) – Interim Limits	None	2.87 mg/L (daily max); 1.72 mg/L (Monthly Avg)	No Change		See Section 16
Ammonia (as N) – Interim Limits	None	1001 kg/day (daily max); 516 kg/day (Monthly Avg)	No Change		See Section 16
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.2.a					

Part I.A.4a Outfall 101 (was I.A.4 in the 2016 permit)					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
cBOD ₅ Maximum	6,200 kg/d	6,700 kg/d	No Change		See discussion of technology based limitations in Attachment G
TSS Monthly Average	4,000 kg/d	4,300 kg/d			
TSS Maximum	13,000 kg/d	14,000 kg/d			
Mass loading limitations for all applicable parameters specified by 40 CFR 414.101 Subpart J have been updated based on current flows					

Part I.A.5 Outfall 302
Changes: Outfall 301 (stormwater collected by the #6 fuel oil storage containment dike) has been removed because the #6 fuel oil storage tank has been removed from service. Outfall 302 (oil/water separator at the Kellogg Unit) is new and all monitoring and limitations are new. See Section 16 for discussion of new outfall and limitations and monitoring requirements.

Part I.A.6 Outfall 103 (previously Outfall 401)
Changes: Outfall 401 was renumbered to Outfall 103 to comply with numbering convention specified in GM14-2003.

Part I.A.9 Outfalls 901 and 902
Outfalls 901 and 902 are new. All limitations and monitoring requirements are new. See Section 16 for discussion of these new outfalls, and limitations and monitoring requirements.

Part I.A.10 Outfall 903
Outfall 903 is new. All limitations and monitoring requirements are new. See Section 16 for discussion of this new outfall, and limitations and monitoring requirements.

Part I.A.11 Outfall 904					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to Outfall 904
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per Year	

Part I.A.11 Outfall 904					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per Year	
Chemical Oxygen Demand (COD)	Parameter removed				Benchmark monitoring is only required for the parameters listed for the SIC codes associated with the industrial activity occurring in the drainage area of the outfall.
Total Suspended Solids (TSS)	Parameter removed				
Total Kjeldahl Nitrogen (TKN)	Parameter removed				
Total Recoverable Copper	Parameter removed				
Total Recoverable Aluminum	Parameter removed				
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.11					

Part I.A.12 Outfalls 905 and 906					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to each Outfall 905, 906, and 909
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Total Recoverable Aluminum	No Change		1 per Year	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per Year	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per Year	
Chemical Oxygen Demand (COD)	Parameter removed				Removed because monitoring is not required by Sector C benchmark monitoring
Total Suspended Solids (TSS)	Parameter removed				
Total Kjeldahl Nitrogen (TKN)	Parameter removed				
Total Recoverable Copper	Parameter removed				Monitoring is replaced with dissolved metals monitoring
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.12					

Part I.A.13 Outfall 907					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to each Outfall 907
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per Year	See discussion in Section 16 for rationale of all changes to each Outfall 907
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per Year	
Total Recoverable Copper	Parameter removed				Monitoring is replaced with dissolved metals monitoring
Chemical Oxygen Demand (COD)	Parameter removed				Removed because monitoring is not required by Sector C benchmark monitoring
Total Suspended Solids (TSS)	Parameter removed				
Total Kjeldahl Nitrogen (TKN)	Parameter removed				
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.13					

Part I.A.14 Outfall 908					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to each Outfall 908
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Hardness as CaCO3	----	NL	----	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	See discussion in Section 16 for rationale of all changes to each Outfall 908
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per 6 Months	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per 6 Months	
Total Recoverable Copper	Parameter removed				Monitoring is replaced with dissolved metals monitoring
Chemical Oxygen Demand (COD)	Parameter removed				Removed because monitoring is not required by Sector C benchmark monitoring
Total Suspended Solids (TSS)	Parameter removed				
Total Kjeldahl Nitrogen (TKN)	Parameter removed				
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.14					

Part I.A.15 Outfall 909					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to Outfall 909
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Total Recoverable Aluminum	No Change		1 per Year	1 per 6 Months	
Hardness as CaCO ₃	----	NL	----	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per 6 Months	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per 6 Months	

Part I.A.15 Outfall 909					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Chemical Oxygen Demand (COD)	Parameter removed				Removed because monitoring is not required by Sector C benchmark monitoring
Total Suspended Solids (TSS)	Parameter removed				
Total Kjeldahl Nitrogen (TKN)	Parameter removed				
Total Recoverable Copper	Parameter removed				Monitoring is replaced with dissolved metals monitoring
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.15					

Part I.A.16 Outfall 910					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of changes to Outfall 910
Ammonia	No Change		1 per 3 Months	1 per 6 Months	
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Kjeldahl Nitrogen (TKN)	No Change		1 per Year	1 per 6 Months	
Total Suspended Solids (TSS)	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Total Recoverable Aluminum	No Change		1 per Year	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Chemical Oxygen Demand (COD)	Parameter removed				Parameter is not required by Sector C benchmarks
Total Recoverable Copper	Parameter removed				Replaced by dissolved metals monitoring
Total Recoverable Zinc	Parameter removed				Replaced by dissolved metals monitoring
Nitrite+Nitrate	----	NL	----	1 per 6 Months	See discussion in Section 16 for rationale of changes to Outfall 910
Hardness as CaCO ₃	----	NL	----	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Dissolved Zinc	----	NL	----	1 per 3 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per Year	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per Year	

Part I.A.16 Outfall 910					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.16					

Part I.A.17 Outfall 911					
The changes summarized below are relative to Part I.A.9 of the previous permit.					
Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change
	From	To	From	To	
Flow	No Change		1 per Year	1 per 3 Months	See discussion in Section 16 for rationale of all changes to Outfall 911
Total Nitrogen	No Change		1 per Year	1 per 6 Months	
Total Phosphorus	No Change		1 per Year	1 per 6 Months	
Total Recoverable Aluminum	No Change		1 per Year	1 per 6 Months	
Hardness as CaCO ₃	----	NL	----	1 per 6 Months	
Dissolved Copper	----	NL	----	1 per 3 Months	
Total Recoverable Zinc	No Change		1 per 3 Months	1 per 6 Months	
Total Recoverable Iron	No Change		1 per Year	1 per 6 Months	
Toxicity, Final Acute <i>C. dubia</i> 48 hour	----	NL	----	1 per Year	
Toxicity, Final Acute <i>P. promelas</i> 48 hour	----	NL	----	1 per Year	
Total Recoverable Copper	Parameter removed				Replaced by dissolved metals monitoring
Total Kjeldahl Nitrogen (TKN)	Parameter removed				Parameter is not required by Sector C benchmarks
Chemical Oxygen Demand (COD)	Parameter removed				
Total Suspended Solids (TSS)	Parameter removed				
Footnotes were added, changed, and renumbered as necessary to reflect changes in Part I.A.17					

Part I.A.18 Outfall 912
Outfall 912 is a new outfall. All limitations and monitoring requirements are new. See Section 16 for discussion of this new outfall, and limitations and monitoring requirements.

Part I.A.19 Outfall 913
Outfall 913 is a new outfall. All limitations and monitoring requirements are new. See Section 16 for discussion of this new outfall, and limitations and monitoring requirements.

Part I.A.20 Outfall 005
Outfall 005 is a new outfall. All limitations and monitoring requirements are new. See Section 16 for discussion of this new outfall, and limitations and monitoring requirements.

Part I Special Conditions	
Special Condition Changed	Changes and Rationale
B. Whole Effluent Toxicity	Part I.B Reporting Schedule updated with new compliance and submittal dates. Part I.B.2 is a new condition added for Outfall 005.
C.3 Compliance Reporting	Added Quantification Level for Total Recoverable Zinc, Dissolved Zinc, and Dissolved Copper. Added standard language for Nutrient Monitoring and Nutrient Reporting Calculations
C.11 TOC Reporting	Added detailed instructions for sampling and calculation of net TOC
C.12 Heat and Ammonia Calculations	Changed title to include ammonia. Added language to specify the measurement points and measurements used in the heat calculations. Added language to specify flow-weight ammonia concentrations for Outfall 998.
C.16 Form 2F Sampling	This special condition was changed from requiring Form 2F submittal for Outfall 911, to requiring Form 2F submittal for Outfall 910. Form 2F was not submitted for Outfall 910 due to lack of flow.
C.17 Seep Response Plan	New. See Section 19 for background and rationale for this new special condition.
C.18 Stormwater Conveyance System_Study	New. See Section 19 for background and rationale for this new special condition
C.19 Groundwater Monitoring for the Marine Operations Area	New. See Section 19 for background and rationale for this new special condition
C.20 Enhanced Inspection and Housekeeping in Ammonium Sulfate Storage/Handling/Transport Areas	New. See Section 19 for background and rationale for this new special condition
C.21 Adaptive Management Plan for Stormwater and Annual Report	New. See Section 19 for rationale. See Section 16 discussion of Outfalls 901/902/903.
C.22 Gravelly Run Field Study	New. Added at the request of the permittee.
C.23 Licensed Operator Requirement	New. Added to require operator for the new Marine Operations treatment plant. See Section 19 rationale.
C.24 Water Quality Criteria Monitoring and EPA Form 2C	New. Added to require monitoring after Outfall 005 begins discharging. See Section 19 rationale.
C.25 Marine Operations Area Improvements	New. Added to require improvements in order to resolve long standing runoff issues. See Section 19 rationale.
C.26 Building 12 Stormwater Elimination	New. Added to incorporate Chesapeake Bay TMDL Action Plan commitments into the permit, with the consent of the permittee. See Section 19 for further rationale.
C.27 Area 11 Process Improvements for Ammonia Reductions	New. Section 19 for further rationale.
C.28 Stormwater Contaminant Elimination Plan	New. Section 19 for further rationale.
C.29 Kellogg Cooling Tower Drainage to Poythress Run	New. Added at the request of the permittee.
Stormwater Parts D, E, F, G, H of the 2016 permit	Stormwater from the 2016 permit was removed and replaced by Part III Industrial Stormwater Management Conditions and Requirements
D.1 Schedule of Compliance with Ammonia Limits	New. See Section 19 for background and rationale for this Schedule of Compliance.
D.2 Schedule of Compliance for Chesapeake Bay TMDL Action Plan	New. See Section 19 for background and rationale for this Schedule of Compliance.
E.1 to 6 Special Conditions for Cooling Water Intake Structures per Section 316b of the Clean Water Act	Renumbered from Part I.I in the previous permit to Part E.1 in this permit. I.3 was removed. Monitoring requirements in E.3 are changed to daily. All others renumbered only.

Part I Special Conditions	
Special Condition Changed	Changes and Rationale
E.7 Schedule of Compliance for Impingement and Entrainment BTA	New. See Section 19 for background and rationale for this Schedule of Compliance.
E.8 BTA Reopener	New. See Section 19 for rationale.

Part II Conditions Applicable to All VPDES Permits
Updated with current boilerplate language.

Part III Industrial Stormwater Management Conditions and Requirements
Part III replaces Part I.D-H General Stormwater Special Conditions of the previous permit. The Part III stormwater language reflects the current industrial stormwater language. Benchmarks and comparative values are discussed in Section 16.

21. Variances/Alternate Limits or Conditions: None.
22. Public Notice Information required by 9VAC25-31-280.B:

First Comment period: 10/31/2023 to 11/30/2023

Publishing Newspaper: *Richmond Times Dispatch* and the *Progress-Index*

Publication Dates: October 31, 2023 and November 7, 2023

Second Comment period:

Second Public Notice Publication Dates:

Public Hearing Public Notice Publication Date:

All pertinent information is on file and may be inspected or copied by contacting Jeanne Puricelli at:

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Persons may comment in writing or by email to the DEQ on the proposed permit action and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment.

23. Additional Comments:
- Previous Board Action: The facility has received six warning letters and five notices of violation during the permit term. Issues included: unpermitted discharges of cooling water, cyclohexanone, methyl ethyl ketoxmime, and oil; fish kill; non-continuous monitoring; incomplete and late DMR submittals; sanitary sewer overflows; limitation violations for TSS, TOC, cBOD₅, pH; late submittal of application forms; lack of training documentation; insufficient housekeeping; unpermitted discharges; and incorrect DMR data.
 - Staff comments:
 - Planning conformance statement: The discharge is in conformance with the existing planning documents for the area.

- (2) Controversial Permit Assessment: During the term of the 2016 permit and previous years, there was no significant interest during the public comment periods regarding the permitted activities at this facility.
- (3) Fees: Permit maintenance fees are up to date, last paid on 9/19/2023.
- (4) e-DMR Participation: The facility participates in the e-DMR program as of 9/25/2014.
- (5) Virginia Environmental Excellence Program (VEEP) Participation: The facility is not enrolled in the VEEP program.
- (6) Effluent Monitoring Reductions: Monitoring reductions were not evaluated due to the compliance history of this facility. The facility has received seven Warning Letters and four Notices of Violation during the permit term.
- (7) General Permit Registration:

Nutrient -This facility has registered under the VPDES Chesapeake Watershed General Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia. The facility's registration number VAN040082.

ISWGP - This facility holds two permits for coverage under 9 VAC 25-151 for the General VPDES Permit for Discharges of Storm Water Associated with Industrial Activity: VAR052505 and VAR050553 which will be replaced by Outfalls 912 and 913 respectively with the reissuance of this permit. The ISWGPs will be terminated after reissuance of this permit.

- (8) The Time-to-Lethality Evaluation for HRWWTF and Gravelly Run Fishery Survey are included in Attachment L. The Time-to-Lethality Study was performed in conjunction with the mixing zone and wasteload allocation study; this study evaluates the toxicity of the HRWWTF effluent to drifting organisms so as to demonstrate compliance with the WQS narrative criteria that states no Board approved mixing zone can cause lethality to passing or drifting organisms. The Fishery Survey demonstrates that the HRWWTF and Honeywell discharges into Gravelly Run do not prevent the movement of passing or drifting organisms, as required in the Virginia WQS.

Outfalls 001, 002 and 003 geographically discharge to Gravelly Run (Outfalls 001 and 002) and Poythress Run (Outfall 003). However, water quality analyses are based on the James. This approach was approved by the State Water Control Board in their March 28, 1995 meeting; see **Attachment O**.

The permit expired on July 31, 2021. The application was submitted in a timely manner and thus the permit had been administratively continued since the expiration date.

- (9) Financial Assurance: Financial assurance does not apply to this facility because it does not treat sewage generated by private residences per 9 VAC 25-650-10 et seq. and is not identified in Appendix B of GM01-2002 (Implementation Guidance for Financial Assurance Regulation, 9 VAC 25-650-10 et seq.).
- (10) State Corporation Commission (SCC) Registration: This facility is registered with the SCC. See **Attachment P**.

c. Other Agency Comments

- (1) EPA comments and DEQ responses are found in **Attachment Z**.
- (2) VDH comments: VDH stated in a March 24, 2021 memo that the nearest upstream raw water intake is under tidal influence and is located on the Appomattox River approximately 5.0 miles upstream from Outfall 001, 5.2 miles upstream of Outfall 002, and 3.3 miles from Outfall 003, which are the three primary industrial waste outfalls for the facility. See **Attachment Q**.
- (3) DCR-DNH comments: DCR-DNH indicated that Atlantic sturgeon is a natural heritage resource of concern. DCR also recommends use of UV/ozone to replace chlorination, but this comment is not applicable to this facility because chlorine is not used. DCR also recommended coordination with NOAA Fisheries and VDWR due to presence of Atlantic sturgeon. Comments provided on April 2, 2021. See **Attachment R**.
- (4) DWR comments: DWR did not request to comment on the VPDES discharge. DWR provided comments on the cooling water intake structure regarding 316(b) regulations, found in **Attachment S**.

- (5) USFWS comments: USFWS commented on June 12, 2021 that the discharge is not near known critical habitat, except for Atlantic sturgeon, and recommended contacting NOAA Fisheries regarding the sturgeon. See **Attachment R**.
 - (6) NOAA Fisheries comments: NOAA Fisheries provided specific comments regarding DO, pH, TSS, Nutrients, Bacteria, and Metals, shown in **Attachment R**. All of the parameter-specific recommendations are met by the limitations of the permit.
 - d. Owner Comments: The owner provided comments by email on 6/13/2023, 6/15/2023 and 6/16/2023. See **Attachment Y**.
 - e. Public Notice comments: **[add comment summary and responses with reference to attachments]**
 - f. Local Government Notification of Public Notice: Local government officials were notified of the first public comment period on October 30, 2023. Local government officials were notified of the public hearing and comment period on January 18, 2024. This hearing was postponed due to permittee requesting modifications to the permit. Local officials were notified of the public comment period for the modified permit and the public hearing on April 19, 2024. In accordance with the Code of Virginia §62.1-44.15:01, the following individuals received the notifications: Johnny Partin, City of Hopewell Mayor; Dr. Concetta Manker, City of Hopewell Manager; and E. Jay Ellington, Executive Director, Crater Planning District Commission. These officials were notified by email of the public participation opportunities and were sent the legal notices.
24. NPDES Permit Rating Worksheet: Total Score 220. See **Attachment P**.

25. Fact Sheet Attachments:

Attachment A Flow Frequency Memorandum, 303(d) Fact Sheets
Attachment B Maps and Process Flow Chart
Attachment C Ambient Data James River
Attachment D Site Inspections
Attachment E Facility DMR and Application Data
Attachment F Effluent Limitation Development Outfalls 001/002/998
Attachment G Federal Effluent Guidelines 40 CFR 414 at Outfall 101 and RCWQMP
Attachment H Effluent Limitation Development Outfall 003
Attachment I Stormwater Evaluation Outfalls 901 - 913
Attachment J Whole Effluent Toxicity Evaluation, Outfalls 001/002/003
Attachment K Thermal Effects Study
Attachment L Gravelly Run Mixing Zone Studies and Supporting Documents
Attachment M Instream Monitoring Study, GLEC 2013
Attachment N Brown and Caldwell Technical Memorandum
Attachment O SWCB Meeting Minutes, March 1995
Attachment P NPDES Industrial Rating Worksheet and State Corporation Commission status
Attachment Q VDH Coordination Response
Attachment R T&E Coordination
Attachment S Requirements Applicable to Cooling Water Intake Structures for Existing Facilities (316b)
Attachment T Brown and Caldwell Memo: Technical Basis for Revised Gravelly Run Ammonia Wasteload Allocations, September 21, 2021 and DEQ Response
Attachment U Stormwater Supplement to Application Form 2F Outfalls 901, 902, 903
Attachment V Effluent Limitation Development Outfall 005
Attachment W Calculation of Interim Gravelly Run Ammonia Limitations
Attachment X Limitation Analysis for Kellogg Cooling Tower Drainage to Poythress Run
Attachment Y Owner Comment and DEQ Reply
Attachment Z EPA Comments and DEQ Reply
Attachment 1: Public Comments Received and DEQ Response
Attachment 2: Public Hearing Comments