VPDES PERMIT PROGRAM FACT SHEET

This document gives pertinent information concerning 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 9VAC25-260-00 et seq. The discharges result from the production of nitrocellulose, nitroglycerin, TNT, diethylene glycol dinitrate and propellants, treatment of sanitary sewage and the burning of coal to produce steam and electricity. This permit action consists of updating boilerplate, deleting Outfall 024 (water plant), adding three outfalls, adding PCB PMP requirements, and adding 316(b) requirements.

1. Facility Name and Address:
   Radford Army Ammunition Plant (RFAAP)
   4050 Pepper's Ferry Road, P.O. Box 1 Radford AAP
   Radford, VA 24143

   Location: State Route 114 North of Radford, Montgomery & Pulaski County

   SIC Codes:

2821	Industrial inorganic chemicals, oleum
2869	Industrial organic chemicals, propellant, dinitrotoluene
2873	Nitrogenous fertilizers, nitric acid
2892	Explosives, nitroglycerin, trinitrotoluene
2899	Chemicals and chemical preparations, fireworks
4911	Electric Services
4952	Sewerage Systems
4953	Refuse Systems

2. Permit No. VA0000248 Expiration Date: June 10, 2015

3. Owner Contact: Alicia Masson, LTC, US Army
   Title: Commanding Officer
   U.S. Army ACO
   Telephone No: 540-639-8711

   Operator Contact: Mr. Jay Stewart
   Title: Environmental Manager
   BAE Systems, Ordnance Systems Inc.
   Telephone No: 540-639-7631

4. Application Complete Date: December 11, 2014
   Permit Drafted By: Kevin A. Harlow DEQ-BRRO Date: April 9, 2015
   Reviewed By: Becky France Date: 4/23/2015
   Public Comment Period Dates: from May 6, 2015 to June 8, 2015

5. Receiving Stream: New River and Stroubles Creek (outfalls 012, 014, 031, 032)
   Basin: New River Subbasin: N/A Tidal: No On 303(d) list? Yes
   Section: 2a Class: IV Special Standards: PWS, v

New River critical flows upstream of Outfall 004:
7-Day, 10-Year Low Flow: 559 MGD 1-Day, 10-Year Low Flow: 449 MGD
30-Day, 5-Year Low Flow: 725 MGD Harmonic Mean Flow: 1520 MGD
30-Day, 10-Year Low Flow: 646 MGD Tidal: No On 303(d) List: Yes

Critical flows for each outfall are found in the **Attachment B**.

6. Licensed Operator Requirements: Class I

7. Reliability Class: I

8. Permit Characterization:
( ) Private (X) Federal ( ) State ( ) POTW
( ) Possible Interstate Effect ( ) Interim Limits in Other Document (attach to Fact Sheet)

9. Provide a brief description of the wastewater treatment system and provide a general description of the production cycle(s) and activities of the facility.

The Radford Army Ammunition Plant (RFAAP) is an installation responsible to the U.S. Army Operations Support Command whose mission is to manufacture propellants, explosives, and chemical materials as assigned. Commercial industries operate on site as tenants. These include propellant manufacture and loading, fireworks loading, machining, and storage. The RFAAP industrial complex owned by the U.S. Army and operated by a contractor, BAE Systems, Ordnance Systems Inc. In addition to the manufacturing operations, there are two coal fired power plants, three water treatment plants and two sewage treatment plants. About half of the buildings are in standby mode including the continuous automated multi base line (CAMBL) and continuous automated single base line (CASBL), 1st rolled powder, oleum manufacturing, one of the water plants and one power plant. Green Lines A, B and C manufacture solvent based propellant. Currently, the B-line is inactive and New River Energetics (NRE), a subsidiary of Alliant Techsystems, is operating the A-line. This permit is written to authorize discharge from facilities currently in standby mode assuming they may become active.

Most of the manufacturing operations are performed in batches or on a semi-continuous basis. Many are operated continuously to fill storage tanks and then are shut down when the tanks are full. Manufacturing operations that can be performed continuously include nitric acid (ammonia oxidation), nitric and sulfuric acid concentration, nitrocellulose nitration, nitroglycerin, trinitrotoluene and dinitrotoluene and recovery of ethanol and ether by distillation. Nitrocellulose purification is operated in a batch mode.

For ease of keeping track of the facilities, further descriptions are discussed in order by the outfall that receives wastewater. Outfalls are not numbered sequentially. Outfalls have been taken out of service over the years. In order to avoid confusion, outfalls have not been renumbered

Outfall 004 receives stormwater runoff. The former treatment works, which consisted of settling in the main ditch, was cleaned out in 1995. Cooling water was removed from this outfall at the same time. Also at that time most of the storm water that was routed to this outfall was redirected to Outfall 005. This was accomplished by installing a dam in the line to Outfall 004 and an adjacent

connecting pipe to the Outfall 005 collection system. An overflow remains in place to allow flow to Outfall 004 if the connecting pipe will not carry the stormwater flow or if it becomes blocked. It is possible that any overflow to Outfall 004 during a large storm event could also include cooling water. As a result of this work Outfall 004 only receives storm water from the coal pile pad and areas between the coal pile and the Outfall 004 discharge location.

Outfall 401 is designated to monitor discharge from the coal pile runoff clarifier. Adjustment of pH and solids removal is provided by this system. This discharge is similar to those listed in steam electric effluent guidelines, 40 CFR 423 for coal pile runoff, as such, permit limits for TSS and pH are continued for this outfall.

Outfall 402 consisted of a dry-weather discharge which was an overflow of cooling water and water break water from the Outfall 005 collection system. This occurred due to a blockage of the connecting pipe from Outfall 004 collection system to Outfall 005 which was installed in 1995. This blockage has been removed and dry-weather flow is no longer occurring. This is an internal outfall to Outfall 004.

Outfall 005

This treatment system now receives stormwater, non-contact cooling water, and nitrocellulose purification pit overflow. The collection system for Outfall 005 includes a system to allow overflow of excess flow to Outfall 004. See description for Outfall 004 for details. Wastewater from nitrocellulose manufacture was removed from the C-line waste acid treatment system in 1994. Wastewater from C-line nitrocellulose manufacture is routed to the A-B line waste acid treatment system and outfall 007. In the past, this outfall has received wastewater from oleum manufacturing; however, it is doubtful that the plant will ever be started again due to the low price of commercial sulfuric acid. Oleum railcar transfer does occur in this drainage area. To make oleum, elemental sulfur is burned in air to form sulfur dioxide which is then converted to sulfur trioxide. Sulfuric acid is formed when sulfur trioxide is absorbed in water. Additional sulfur trioxide is added to sulfuric acid to form oleum [$H_2S_2O_7$]. In the past there have been small amounts of elemental sulfur spilled in the rail car unloading area. Stormwater from tank dikes is routed to this outfall. On more than one occasion chemical leaks or spills have been directed to this outfall. The C-line waste acid treatment system used slaked lime to adjust the pH of wastewater. Dual settling basins with wooden baffles treated with chromated copper arsenate (CCA) are provided to increase the basin's retention time. New baffles are added periodically. Sludge has historically been buried in unlined pits adjacent to the river. There are several of these calcium sulfate sludge pits on-site. They are being managed in accordance with an EPA Region III Corrective Action Permit. Currently this is not considered a hazardous waste.

Outfall 006

Cooling water, stormwater, and raw water overflow comprise most of the flow through this outfall. Leaks and spills from the power house, and the air compressor house (bldg. 700) also go to outfall 006. Discharges from separators in the green lines hydraulic pump houses have been connected to the bioplant. Oil/water separators are used to treat leaks from all of these except the power house. Discharges into the power house trench drains are similar to those listed as low volume wastes in steam electric effluent guidelines, 40 CFR 423. Floors in the compressor house are mopped with a degreaser weekly, those in the compressor house are hosed down weekly and floors in the power house are dry swept. Separators from vehicle washing discharging to this outfall were removed in 1999. Stormwater from the truck flyash loading area is routed to a small settling basin and then to the A,B-line waste acid treatment plant.

Paved areas of the Green C-Line are washed down once a week in the active areas that drain to outfall 006. Trench drains immediately adjacent to the manufacturing buildings are routed to the bioplant. Wet and dry cyclones are used in the NRE dryers to remove NC and graphite particles. Since the cyclones are not 100% efficient there is the potential for these particles to be exhausted to the atmosphere. Downspouts on the building roofs collect particles and drain to the Bioplant.

Outfall 007

Waste acid from the nitric acid concentrator/sulfuric acid concentrator (NAC/SAC) is monitored for pH and conductivity as it moves toward the A-B line waste acid treatment system. Sodium carbonate is added to the settling basin to buffer the pH above 6.0 if lime did not keep the pH above 6.0. Cooling water for the AOP is routed to this treatment system in case there are acid leaks. Trench drains around the base of the AOP also drain here.

Process wastewater from nitrocellulose (NC) purification, NC nitration and power house blowdowns are treated here as well. Stormwater flowing to this unit is limited to that falling on roofs of manufacturing buildings and from the fly ash truck loading area.

Slaked lime is added to the wastewater as needed for pH adjustment. The resulting calcium sulfate sludge is settled in a concrete basin. Calcium sulfate sludge is dredged from equalization basins and placed in an approved offsite landfill.

A multiport diffuser was installed in May 1998. Five of the seven eight inch ports are currently in use. The remaining two ports are being reserved for future expansion.

Outfall 014

Several spring seeps at the foot of the hill between HWMW4 and SWMU "O" feed the discharge along with stormwater and possible discharges from line breaks. During the April 1999 site visit conducted by Lewis Pillis a fuel oil odor was detected. This was reported to be the result of a large oil leak in 1984, from which the product was never found. Non-contact cooling water was removed from this outfall in 1992, when the process for manufacturing inert gas was changed to a pressure swing operation. Ground water monitoring in this area is required by the facility RCRA Corrective Action Permit.

Outfall 017

Stormwater from a portion of the open propellant burning area discharges through a small settling pond and outfall 017. Waste propellant, which may contain leaded compounds, is burned once a day

in shallow open pans. Ash is collected and disposed of after TCLP testing.

Ground water in this area is being monitored as part of the DEQ-Waste Division ground water monitoring program. A monitoring well is located adjacent to the constructed pond.

Outfall 026
The main sewage treatment plant has a design capacity of 1.0 MGD. It has been operated at significantly reduced flows for the past few decades. The plant consists of two primary sedimentation basins in series followed by a trickling filter, a final clarifier, chlorination and dechlorination. Sludge undergoes anaerobic digestion and drying on open beds prior to being shipped offsite to a RCRA-D landfill. Influent to the main STP comes from restrooms, the plant laundry, stormwater, and the main laboratory.

Outfall 028
Sanitary wastewater in the horseshoe area was formerly routed to a 0.07 MGD Imhoff tank. However, the treatment system is now deactivated. Due to current population use, septic tanks are now being used to collect sewage from the Horseshoe Area of the plant. In the event usage requirements increase, RFAAP retains the use of this facility. When the facility was operation, a four cell concrete basin was used to provide additional treatment. Chlorine disinfection and dechlorination were also present. Unused filtered water was routinely added prior to chlorination to provide adequate flow for disinfection. Observations for flow are routinely performed to assure the outfall received no flow. Sludge is not routinely removed from the treatment system.

Outfall 029
Process wastewater from the manufacture of nitroglycerin (NG), propellant, TNT (not active) and DNT (not active), still bottoms from Solvents Area, munitions manufacturing, stormwater, fireworks manufacturing, and research activities are routed to the bioplant for treatment. Mobile carbon columns are used to pretreat individual waste streams containing 2,4-dinitrotoluene since biological treatment may not completely remove this compound. The bioplant consists of a divided 7 million gallon equalization basin, several banks of rotating biological contactors (RBCs), and secondary clarification. Sludge is aerobically digested and pressed with a plate and frame press.

Outfall 291
This is an internal outfall for the wastewater from the TNT Wastewater Pre-Treatment Facility. The wastewater is conveyed to the bioplant for further treatment prior to discharge from Outfall 029. Also, in the event of leaks or cooling tower maintenance operations, cooling water is discharged to the TNT Wastewater Pre-Treatment facility.

Outfall 030
This is a newly permitted outfall that represents previously identified outfall "3E". Flow to this outfall consists of stormwater, line breaks, and intermittent non-contact cooling water. Stormwater Outfall 041 previously was a representative outfall for "3E". The stormwater drainage areas for "3E" includes green lines, closed acidic lagoon (SWMU 5), green line B [standby], part of A-line, and the chemical grind house

Stormwater Outfalls
There are over 100 stormwater outfalls in the manufacturing area of the RFAAP. Sources of pollutants in stormwater not already mentioned include controlled and uncontrolled air emissions. Some raw materials are ground or screened and may be emitted through vents. Grinding of 2-

nitrodiphenylamine [CAS # 119-75-5], potassium nitrate, potassium sulfate and ethyl and methyl centralite (diethyldiphenylurea) takes place in the B-line area [bldg. 3524] which drains to Outfall 030 (SW outfall 3E). Potassium chlorate/perchlorate is ground in [bldg. 3691, SW outfall 004] three or four times per year. Exhaust air in these operations is filtered through bag houses. Raw materials are also weighed in the grind house or the mix house. Weigh stations are equipped with exhaust hoods that vent to wet collectors. Fugitive emissions of graphite are generated in the finishing area which is in the drainage area for outfall 3L. Blenders and can packers are fitted with wet scrubbers to remove excess graphite glaze (3I, 3L, 10B). Solvents and nitroglycerin are emitted uncontrolled from multibase propellant dryers in the NRE Area (006). Solvents may be removed from exhaust plumes by stormwater falling in the area of the single base solvent system (006).

Sandblasting of painted parts from process lines is conducted in bldg. 4706. Particulate emissions from this are controlled by a cyclone.

Through the Army ARMS initiative several private companies are located on the RFAAP property. Wastewater from these operations, if present, is treated by the on-site facilities.

Table I NUMBER AND DESCRIPTION OF DRY WEATHER OUTFALLS

Outfall	Source of Discharge (Operations contributing flow)	Treatment Description Unit by Unit	Flow, MGD Long term average
005	Non-contact cooling water, Oleum wastewater (if operational), Stormwater, Nitrocellulose purification pit overflow due to pump and alarm failure, water line breaks	None	0.42
006	Non-contact cooling water, Raw Water Overflow, Stormwater, Power House Wash Down	None	11.0
007	NC manufacturing manufacturing and purification, Acid manufacturing and purification, acid reclamation, Powerhouse wastewater, non-contact cooling water	lime or $NaCO_3$ neutralization, settling	2.62
014	Spring, line breaks, and SW	None	0.1
026	Sanitary STP (Design flow = 1.0 MGD) including lab, laundry and cafeteria	Primary sedimentation, Trickling filter, Secondary clarifier, Anaerobic digestion, Drying beds, Chlorination, Dechlorination	0.17
028	Sanitary STP (Design flow = 0.07 MGD)	Imhoff tank Sedimentation basin Chlorination Dechlorination	0.000
029	Propellant, TNT, explosives, munitions manufacturing, solvent still bottoms, fireworks manufacture, research activities, stormwater	Pretreatment of DNT wastewater; Bioplant - EQ basin, screening, pre-aeration, RBCs, coagulation, flocculation, aerobic digestion, thickening, chemical conditioning, pressure filtration; landfill	0.79
030	Intermittent non-contact cooling water, water line breaks, and stormwater (SW Outfall 3E)	None	1.55
031	Stormwater (SW Outfall 3M), Possible spring water and/or water line breaks	None	1.00

032	Stormwater (SW Outfall 3W), Possible spring water and/or water line breaks	None	0.257
044	Stormwater (SW Outfall 15C), Possible spring water and/or water line breaks	None	0.014

Stormwater Zones:

004 (401)	Coal pile runoff [401]; SW zone B	settling and pH adjustment for coal pile runoff
012	SW Zone F	TNT manufacturing area
017	SW zone A, flash area	Settling basin
031	SW Zone G	
032	SW Zone G	
041	SW zone G	
044	SW zone E	
050	SW zone D	
054	SW zone C	

In the permit application, RFAAP identifies stormwater outfalls with an alphanumeric code, important industrial areas are noted below:

2A	NG1, 1st rolled powder [standby], edge of coal pile railcar unloading, SWMUs 40 [sanitary landfill] and 71 [flash burn metal pipes], water treatment, several springs in NG1 and WTP areas
3L	Blending and packing houses wet cyclones from buildings 1826 and 1876
3I	part of blend & pack house 1827/1877
10F	Inactive blend & pack house 1825/1875, part of scrap yard
10B-E	active or former scrap yards
3F	outdoor spare parts storage
3Q-R	outdoor spare parts storage
1E	4th rolled powder, jeep refueling area
1H,J	4th rolled powder
11A	SWMU 74 [debris], SWMU 28, 52, HWMU16, spring
12A	SWMU 27, 29, 53 [ash/industrial landfills] sedimentation basin

A list of the outfall numbers for each zone, along with pertinent comments, is presented below:

Outfall 004 Zone B – coal pile runoff, and down gradient area. This outfall is located on the northwest side of the Montgomery County side of the facility and drains stormwater from the areas surrounding coal pile area. Stormwater flows is conveyed by a drainage ditch to outfall 004 and ultimately the New River.

Outfall 012 Zone F – Includes Outfall 012, around the TNT/DNT manufacturing area. This zone now also includes drainage areas 8A, 8B and 8C that were previously included in the set of outfalls represented by Outfall 041. This outfall is located on the eastern side of the Montgomery County side of the facility and drains stormwater from the areas surrounding the old TNT production facility. Stormwater flows by sheet flow to various collection points and is conveyed by the stormwater collection system to outfall 012 and ultimately Stroubles Creek.

Outfall 017 Zone A - Propellant Open Burning Ground.

Outfall 031 – Zone G, stormwater outfall "3M", formerly an outfall represented by Outfall 041.

Outfall 032 – Zone G, stormwater outfall "3W", includes the closed acidic wastewater lagoon (SWMU 4) Waste Oil UST (SWMU 75)

Outfall 041 Zone G – All (approximately 120) stormwater outfalls not listed elsewhere. All outfalls within the 041 drainage area are located on the northern side of the Montgomery side of the facility and drain stormwater from the areas surrounding 4th Roll Powder production facilities. Stormwater flows by sheet flow to various collection points and is conveyed by the stormwater collection system to various outfalls prior to discharging to the New River.

powder/propellant areas:

1B 1st rolled powder, locomotive shop yard
1E 4th roll powder
2A 1st rolled powder, NG1, WTP, closed Sanitary Landfill (SWMU 40)
3I propellant finishing, empty drum storage (SWMU F)
3L pack houses with air emissions
5H finishing
5M benite area
6A multibased propellant area, former chromic acid treatment area (SWMUs 57,68,69), power plant 2, coal pile, decommissioned bulk fuel oil storage
7G ballistics testing
15D CASBL

landfills:

12B area near landfills, not associated with current landfill industrial activity
12C area near landfills, not associated with current landfill industrial activity
13A hazardous waste inc., CAMBL, Calcium Sulfate Sludge Drying Bed (SWMU 38), Inert Waste Landfill No. 1 (SWMU 32), closed
15B sanitary landfill (SWMU 43), closed, PCB transformer storage building, propellant test burning
10A spent battery storage (SWMU P), zinc and copper canister have been removed decontamination area

acid/base operations:

3D decommissioned oleum plant
3S lime addition for acid treatment for 007

solvent storage:

3T bulk solvent storage
3V bulk solvent storage

5P-T warehouses, steam condensate from steam heat may be discharged in winter months

Outfall 044 Zone E - 2 outfalls 5Z, ballistics and rocket testing and 15C, ballistics testing Outfall 044 discharge sampling is moved from representative drainage area 5Z to drainage area 15C. Numerous efforts to sample drainage area 5Z following heavy rain events have failed. Drainage area 15C should result in collectable, representative samples. All outfalls within the 044 drainage area are located on the northeastern side of the Montgomery side of the facility and drain stormwater from the areas surrounding powder finishing facilities. Stormwater flows by sheet flow to various collection points and is conveyed by the stormwater collection system to various outfalls prior to discharging to the New River.

Outfall 050 All outfalls within the 050 drainage area are located on the eastern side of the Pulaski County side of the facility and drain stormwater from the areas surrounding the magazine storage facilities. Stormwater flows by sheet flow to various collection points and is conveyed by the stormwater collection system to various outfalls prior to discharging to the New River.

Zone D - 2 outfalls, previously Zone 11, Outfall 11A 12A
Closed Hazardous Waste Landfill (HWMU 16)
Inert Landfill No. 3 (SWMU 52), active
Activated Carbon disposal area (SWMU 28)
(sampling point at trib. before the disposal area for ash from burning propellants (SWMU 54),)
12A: (Formerly outfall 051)
Calcium Sulfate Sludge Landfill (SWMU 27)
Fly Ash Landfill No. 2 (SWMU 29), active
Activated Carbon Disposal Area (SWMU 53)

Outfall 054 All outfalls within the 054 drainage area are located on the northwestern side of the Montgomery side of the facility and drain stormwater from the areas surrounding C-Line Powder production facilities. Stormwater flows by sheet flow to various collection points and is conveyed by the stormwater collection system to various outfalls prior to discharging to the New River.

Zone C - 1 outfall, previously Zone 16, Outfall 16A
propellant area, zinc canister storage
Closed Acidic Wastewater Lagoon (HWMU 7)

Stormwater outfalls 9AA through 9GG are located away from the manufacturing site and are not considered to be associated with industrial activity and are not part of this permit.

10. **Sewage Sludge Use or Disposal:**

Sanitary sewage sludge is placed on drying beds until dry. The dried sewage sludge is hauled to an approved RCRA-D landfill.

11. **Discharge(s) Location Description:**

A USGS Topographic map is provided as **Attachment A** which indicates the discharge location, significant discharges to the receiving stream, water intakes, and other items of interest.

Name of Topo: **RADFORD NORTH QUAD**

Lat/Long: 36° 11' 6" / 80° 33' 25"

12. **Material Storage**: Materials are generally stored inside buildings, tanks, sealed containers, or otherwise covered. Coal is stored outside within a diked area.

13. Ambient Water Quality Information:

A copy of the flow frequency determination memo for the discharge is included in **Attachment B**. Low flow calculations for the facility are affected by the plant's intake as well as upstream withdrawals. Water Withdrawal Reports are included in **Attachment B**.

Section 2a of the New River is designated as special condition "v", the maximum temperature of the New River and it's tributaries from the Montgomery-Giles County line upstream to the Virginia-North Carolina State line is 29 C (84 F). Also, Section 2a of the New River is designated as "PWS" due to RFAAP's previous (drinking) water intake #2. Water intake #2 was dismantled in 2011.

The contents of 9 VAC 25-720-130, based on the 1980 SWCB Water Quality Management Plan, indicates that water quality based permit limitations are not needed in this section of the New River to protect the dissolved oxygen standard. According to the WCRO 2012 Water Quality Assessment 305(b) and Impaired Waters 303(d) Reports, RFAAP discharges are located in a segment of the New River that is included on the Part 1 of the 303(d) list of impaired and threatened waters. The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VA / WVA state line. The causes of impairment are PCBs in fish tissue. The PCBs in fish tissue have resulted in fish consumption advisories. Currently, the source of PCBs is unknown.

BACKGROUND DATA

A review of data in the STORET database at river mile 81.72 reveals that there are detectable background concentrations of parameters with an associated water quality standard. A summary of the STORET data for these parameters is included in **Attachment D**.

The 1980 SWCB Water Quality Management Plan indicates that water quality based permit limitations are not needed in this section of the New River to protect the dissolved oxygen standard.

14. **Antidegradation Review & Comments**:

Tier: 1. _____ 2. __XX__ 3. _____

The State Water Control Board's Water Quality Standards (WQS) (9 VAC 25-260-30) provide all state surface waters one of three levels of antidegradation protection. For Tier I, existing uses of the water body and the water quality must be maintained. A Tier II water body has water quality that is better than the narrative and numeric water quality criteria. Significant lowering of the water quality of a Tier II water is not allowed without an evaluation of the economic and social impacts, as required by Water Quality Standards, 9 VAC 25-260-30. A Tier III water body is an exceptional water body that is designated by regulation. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with the Tier determination. This segment of the New River is listed on Part 1 of the 303(d) list for Fish Consumption Use. The Virginia Department of Health (VDH) has issued a fish consumption advisory for polychloriniated byphenyls (PCBs) for this portion of the New River based on fish tissue collections. However, current guidance indicates that fish consumption advisories do not trigger a Tier 1 designation. In this segment of the New River there are no other impairments and the segment is considered Tier 2 and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated.

The antidegradation baseline for aquatic life and human health are calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed
"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

When applied, the antidegradation baselines become the new water quality criteria to prevent significant degradation of the receiving stream. Effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant. Prior to expansion the antidegradation baselines will be calculated for this facility as described above, in accordance with Guidance Memorandum (GM) 00-2011. Permit limits are in compliance with antidegradation requirements set forth in the 9 VAC 25-260-30.

15. Site Inspection Dates: 10/12/12; 12/20/12; 3/8/13; 8/30/13
Performed by: Gerald Duff and Ryan Hendrix
Site inspection report summaries are included in **Attachment C**.

16. Effluent Screening and Limitation Development

DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). **Attachment D** contains data from STORET Station 9-NEW081.72 located on the New River at Radford, VA. Water quality standards monitoring

data, TMP data, daily temperature and pH data, and data from submitted Discharge Monitoring Reports (DMRs) are contained in **Attachment E** along with the antidegradation wasteload allocation spreadsheet and effluent limit calculations. See **Table III** for outfall limitations.

Critical flows used in calculating water quality standards, waste load allocations and permit limits are included in **Attachment B**. The MIX.EXE program was run to determine the percentage of the receiving stream flow that could be used in the wasteload allocation calculations. Copies of the print outs from the MIX.EXE run are included in **Attachment E**.

The WLA spreadsheet was run for each process wastewater outfall. Once calculated, the acute and chronic WLAs are input into the agency STATS program together with a datum value or analytical results. The STATS program is used to determine whether a limit is needed for the parameter. **Attachment E** contains the spreadsheet used to calculate the stream standards and wasteload allocations and the results of the reasonable potential determination (STATS program) for each parameter.

Reduced Monitoring:
All permit applications are to be considered for reduction in the frequency of effluent monitoring. Only facilities having exemplary operations that consistently meet permit requirements should be considered for reduced monitoring. To qualify for consideration, the facility should not have been issued any letter of noncompliance (LON), notice of violation (NOV), or unsatisfactory laboratory determinations, or be under any Consent Orders, Consent decrees, Executive Compliance Agreements, or related enforcement documents during the past three years. This facility is not eligible for reduced due to the following Warning Letters: W2014-04-W-1001, W2013-02-W-1001, and W2011-11-W-1001; and Notices of Violation: W2014-08-W-0001, W2012-12-W-0001, and W2011-11-W-1001.

NOTE: Outfalls are not numbered sequentially. Outfalls have been taken out of service over the years. In order to avoid confusion, outfalls have not been renumbered.

Data for toxic parameters is evaluated for all outfalls using guidance memo 00-2011, et seq. According to this guidance, only dissolved metals data can be used to establish metals limitations. However, in the absence of dissolved metals data, total recoverable metals data is used in the reasonable potential analysis to determine whether monitoring for the dissolved is required.

CONTINUOUS OUTFALLS: 402, 005, 006, 007, 014, 024, 026, 028, 029, 030

A discussion of permit limitations and monitoring requirements for outfalls 004 and 017 is found in the stormwater outfall section of this fact sheet.

Outfalls 007, 026 and 029 discharge within close proximity of each other. Historically this area has been called the "combined outfall area" since the discharges hugged the river bank as they commingled in the river. Effluent from outfall 007 has been discharged through a multiport diffuser into the faster flowing portion of the River thereby preventing commingling.

Outfall 402:
Outfall 402 is an internal outfall comprised of the non-stormwater flow to Outfall 004. The source of the non-stormwater flow is being investigated. The former treatment works, which consisted of

settling in the main ditch, was cleaned out in 1995. Cooling water was removed from this outfall at the same time. Monthly monitoring of the non-stormwater flow is to continue. Parameters to be monitored include all those monitored during storm events at Outfall 004, with the same sample type. Oxidized nitrogen is monitored for purposes of determining compliance with the plant-wide limit at Outfall 999. Due to the possibility that the non-stormwater flow is cooling water, temperature will also be monitored monthly with no limit. Monthly monitoring using grab samples is required for all parameters at this outfall.

Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards.

Outfall 005:

Effluent guidelines for Organic Chemicals, Plastics and Synthetic Fibers [OCPSF] in 40 CFR 414 were formerly applied to this outfall since wastewater from nitrocellulose [NC] manufacture was routed to this outfall. In 1994, pump capacity was increased to prevent the overflow of NC acidic wastewater to the C-line treatment works. According to the January 26, 1999, letter from the permittee, stormwater from the nitroglycerin [NG] area 1 chemical storage tank dike drains were removed from outfall 005 and routed to the bioplant in March 1999. Due to this, OCPSF limits and the whole effluent toxicity [WET] limit were removed from the outfall in the 1999 permit reissuance.

Cooling water, stormwater, and wastewater from oleum manufacturing if oleum manufacturing is begun will be discharged to this outfall. Oleum is a form of sulfuric acid. Federal effluent guidelines for sulfuric acid manufacture are found in 40 CFR 415 Subpart U which is reserved.

Best professional judgement/technology-based limitations for sulfate are needed since the permit authorizes discharges from the oleum plant. Sulfate limitations in the current permit are based on two different rationale. Concentration limits were BPJ technology based according to calcium sulfate solubility and mass limits were water quality based to protect human health at the RFAAP No. 2 intake at the one day low river flow in the period of record. Mass limitations for sulfate are carried forward from prior permits. The permittee submitted new information on sulfate solubility with the 2000 permit application, letter of June 26, 1999, that indicates that sulfate solubility is higher than was assumed in previous permitting actions. The maximum solubility of calcium sulfate in water listed in common reference materials is 2980 ppm or 2103 ppm sulfate. Because soda ash is also sometimes used to neutralize waste acid, sodium sulfate may also be present in this discharge. The solubility of sodium sulfate is 50,000 to 488,000 ppm or 33,800 to 330,000 ppm sulfate. Depending on how much caustic is used the sulfate concentration could be much higher than the maximum solubility of calcium sulfate. It is reasonable that the presence of sodium sulfate could cause the discharge to increase in sulfate concentration from 2100 ppm to 3000 ppm. Due to this sulfate concentration limits were increased in the 2000 permit reissuance.

Sulfate loading limits are distributed between outfalls 005 and 007 so that all of the WQS based mass limit for the entire facility cannot be discharged by one outfall.

Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

A thermal mixing zone was established in the 1980s based on temperature studies performed in the

New River in 1985 and 1986 and is continued with this permit.

The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual.

OUTFALL 006:

Non-contact cooling water from operations, power house wash down water, stormwater, and raw water overflow are discharged to this outfall. The current permit allows for a mixing zone for temperature below outfall 006. This mixing zone is continued in this permit.

Floor drains in the power house may contribute oil from equipment leaks. Coal is spilled from the conveyor onto the power plant roof. During a previous site visit, coal was not being removed and there was evidence that coal was being washed into the roof drains by stormwater. Improved best management practices (BMPs) should continue to be employed to assure that oil and coal discharged is kept to a minimum.

Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

Whole effluent toxicity data is discussed in **Attachment G**. During the previous permit term acute and chronic toxicity data was collected. The facility has an acute toxicity limit of a TUa=1 for Ceriodaphnia dubia. Chronic data collected was analyzed using the WETLIM10 spreadsheet and STATS. Using the chronic data, an acute toxicity limit greater than the current limit of 1.0 TUa is needed but that no chronic toxicity limit is needed.

The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual.

Outfall 007:

Effluent guidelines for Organic Chemicals, Plastics and Synthetic Fibers **40 CFR 414** serves as the basis for setting limits for BOD and TSS. Specifically, cellulose nitrate manufacturing fits into the Thermoplastic Resin subcategory (section 414.40). BAT effluent limitations promulgated in 40 CFR 414 allow for either biological or physical/chemical treatment to be used. Physical/chemical treatment is used by the facility for this outfall.

Flow data and manufacturing information reported by the permittee in the 2003 request for modification was used to establish a long term average flow of 2.562 MGD on which to compute the limits. According to the regulation, this value must exclude cooling water and utility wastewaters. The volume of the flow that is process wastewater should be verified by actual measurements. Effluent limits are calculated as follows:

BOD5

Daily Max limit = 64 mg/l x 2.562 MGD x 3.785 = 621 kg/d

Monthly Ave limit = 24 mg/l x 2.562 MGD x 3.785 = 233 kg/d

TSS

Daily Max limit = 130 mg/l x 2.562 MGD x 3.785 = 1261 kg/d

Monthly Ave limit = 40 mg/l x 2.562 MGD x 3.785 = 388 kg/d

Daily maximum TSS concentration limits from the current permit, outfall 007, are more restrictive than the BAT limits and will be carried forward into the new permit.

Also applicable to this guideline are the toxic limits in section 414.101. Loading limitations for these toxics are calculated in the same manner as BOD and TSS above. Effluent guideline limitations for metals are expressed as total metals. The concentration values in 40 CFR 414.101 are not concentration limits but are reference data to be used in calculating the minimum effluent guideline loading limits and are to be reported on the DMR.

The pre-expansion chrysene, vinyl chloride, benzo(a)pyrene, benzo(a)anthracene, benzo(k)fluoranthene loadings exceeded the human health water quality standards. These pollutants previously had BPJ limits at Outfalls 007 and 029. In order to meet the more stringent water quality based limits, these parameters are limited at the overall Outfall 999 with no limits at the individual outfalls. Nitrobenzene and acrylonitrile loadings were limited to 10% of the assimilative capacity of the stream to maintain compliance with antidegradation requirements set forth in the Water Quality Standard Regulation, 9 VAC 25-260-30. The antidegradation spreadsheet is in **Attachment E**. Monitoring for COD, N-nitroso-diphenylamine and 2,4-dinitrotoluene is continued since these compounds have been seen in the past.

The basis for sulfate limitations is discussed under outfall 005. The same rationale applies to outfall 007 and the concentration limits are increased in the same amount.

Toxicity of sulfates is a concern since a toxicity reduction evaluation (TRE) for this discharge implicated calcium sulfate as one cause of toxicity. The EPA AQUIRE database was searched for toxicity test data from calcium and sodium sulfate. Of the data for *Ceriodaphnia dubia,* the lowest LC50 for these salts was reported to 1910 ppm or 1347 ppm sulfate. With the dilution factor for the outfall 007 diffuser at 8:1, discharges at 3000 ppm would be about 375 ppm, much lower than the LC50 concentration after dilution. It does not appear that increasing the sulfate permit limit to 3000 ppm will result in a toxic discharge. In fact, since sodium sulfate is slightly less toxic to *C. dubia* than calcium sulfate, increasing the sulfate limit may encourage the use of more sodium hydroxide for neutralization while decreasing the toxicity of the discharge.

Oxidized nitrogen limitations were established in the 1980's based on human health criteria for public water supplies. The mass limit for outfall 007 is equal to the mass limit for the entire plant at outfall 999 and are carried forward to this permit.

It is recommended that noncontact cooling water, uncontaminated stormwater and ground water not be routed to outfall 007. Increased flows may hydraulically overload the treatment works resulting in poor treatment and making it difficult for the permittee to meet technology based mass limits.

RFAAP has instituted pollution prevention (P2) measures to reduce ammonia discharged to outfall 007. Ammonia is no longer drained to outfall 007 after temporary process shutdowns of the ammonia oxidation plant (AOP). This chemical is piped to the bioplant to be used as a nutrient.

Washdowns of the area around the AOP still occur due to the fact that the plant is not enclosed, but are not expected to result in a discharge of significant concentrations of pollutants to the AB-line treatment works. Ammonia remaining in transfer lines when tank cars are unloaded is recovered and not discharged. Ammonia should be monitored periodically to provide assurance that these P2 measures continue to be effective.

Total recoverable metals data was reported for copper and cyanide. The reasonable potential analysis in **Attachment E** for each of these parameters indicates that no potential to exceed the water quality standards even if all of the metals were in dissolved form. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual.

Outfall 014:

Cooling water was removed from this outfall in February 1992 when manufacture of inert gas by pressure-swing absorption began. Currently only spring water and stormwater discharge to this outfall. A contaminated spring originates from the base of a hill where a large oil spill/leak occurred in the early 1970s. During a site visit in the spring of 1999, petroleum odors were detected in the spring area. Even though the one sample tested for the permit application did not contain benzene, toluene or ethylbenzene, weathered fuel oil would not be expected to contain these volatile compounds. Due to this diesel range organics including naphthalene should be measured periodically. Water from the spring passes near the former waste acid equalization pond (HWMU 4) prior to entering Strouble's Creek.

High sulfates (196 mg/l) was reported on the June 2009 DMR. The spring has exhibited chronic toxicity at times as well. Routine monitoring for these parameters should be performed. Recurring high values should trigger an investigation by the permittee into the contaminant source leading to implementation of best management practices to control pollutant discharges.

In January, 2000, RAAP discovered a collapsed pipe line that was allowing large flows of the contaminated spring to enter outfall 014. Once this was repaired, only minor infiltration of contaminated spring water should enter the pipeline and outfall. The contaminated spring now soaks into the ground forming a small wet area near the inert gas plant. Effluent from this outfall should only be uncontaminated water from a spring upgradient of petroleum storage tanks. However, monthly monitoring is needed to determine if contamination enters the outfall and reaches state waters.

Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

Outfall 026:

Limits for BOD, TSS and pH from the current permit were based on the secondary treatment regulation and are carried forward. The permittee previously requested that daily maximum limitations be used rather than weekly averages for ease of automated computations.

There have been documented pH problems in the STP influent which have resulted in 9 pH violations, all less than 6.0, from 1/89 through 12/90. More recently, influent pH was below 6 at times in April through July 1998. According to the permittee, leaking acid sewers that caused the problem in the early 90s have been repaired. Influent pH monitoring is required to verify that the problem does not recur.

Ammonia: A reasonable potential analysis **(Attachment E)** using a single datum of 9 mg/l of ammonia indicates no limit is required. However, the existing ammonia limit is retained in the to prevent backsliding.

Chlorine: A reasonable potential analysis **(Attachment E)** using 4 mg/l effluent TRC was performed. Stats.exe indicated an acute limit of 110 ug/l was required. The current TRC limits are more stringent and are brought forward since they cannot be reduced due to antibacksliding provisions. Standard chlorine limits to verify adequate disinfection for discharges in a public water supply area of 1.5 mg/l are also used.

Sulfate and Oxidized Nitrogen (Nitrate/Nitrite): Concentrations of nitrate/nitrite and sulfate are substantially lower than their WLAs. Although no limit is required at this outfall, monitoring is required for these since their discharge from this outfall will be included in summary outfall 999.

Other Toxics: Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual.

Outfall 028:

The Imhoff tank treatment system is not currently an active facility, as septic tanks are now being used to collect sanitary wastewater. There has not been a reported flow at this outfall since January, 2001. The facility can be reactivated if necessary. To monitor compliance with the WQS for nitrate, oxidized nitrogen is monitored at this outfall and limited at outfall 999.

A non-detectable final total residual chlorine (TRC) limit was previously placed on this outfall as a result of failing TMP tests on effluent that was not dechlorinated. In addition, TRC could be discharged from outfall 026, and the Pepper's Ferry and Blacksburg/VPI STPs. Numeric limitations instead of a nondetectable limit were then placed on the discharge during the last permit reissuance to conform to the recommended agency guidance. The current limit is more restrictive than the limit of 720 ug/l calculated using STATS for a reasonable potential analysis (**Attachment E**) spreadsheet and STATS and cannot be reduced due to antibacksliding provisions of the Clean Water Act. Standard chlorine limits to verify adequate disinfection for discharges in a public water supply area of 1.5 mg/l are also used.

Historical data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No historical data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

Outfall 029:

Process wastewater from several different industrial processes is conveyed to the bioplant for treatment. To properly determine effluent limitations for outfall 029 it is necessary to define each flow contribution and apply appropriate limitations to each different type of wastewater. Wastewater from the following operations flows to the bioplant and outfall 029:

A. Nitroglycerin (NG)(2 plants) and diethylene glycol dinitrate (DEGDN) manufacture (0.061 MGD)
B. Propellant manufacture, includes triethylene glycol (TEG) transport water (0.856 MGD)
C. Solvent recovery, still bottoms, building and equipment washdown (0.11 MGD)
D. Miscellaneous operations:
   1) cooling tower blowdown from alcohol reclamation and single base solvent propellant
   2) cooling water from NG2 and single base solvent propellants (if needed)
   3) steam condensate from NG2, single base solvent propellants, solventless propellants and New River Energetics (0.001 MGD)
   4) ammonia from AOP, used as a nutrient
   5) incinerator scrubber water and cooling water sump could be drained to the bioplant if needed, but are not proposed to be discharged in the permit application.
   6) Lab wastes, commercially available bioaugmentation product, etc. used as nutrients (0.001 MGD)
   7) NC degradation decant added (0.002 MGD)

A. NG and DEGDN production:

Effluent guidelines in **40 CFR 457** are applicable to nitroglycerin manufacture which contributes wastewater to the bioplant. Limits are based on production. The permittee has stated in the application that 9,000 lbs/day of nitroglycerin is an actual measurement of production. Limits are calculated as follows:

COD

$$\text{Daily Maximum} = 7.77 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 31.80\text{ kg/d}$$

$$\text{30 Day Average} = 2.59 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 10.60\text{ kg/d}$$

BOD5

$$\text{Daily Maximum} = 0.72 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 2.95\text{ kg/d}$$

$$\text{30 Day Average} = 0.24 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 0.98\text{ kg/d}$$

TSS

$$\text{Daily Maximum} = 0.25 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 1.02\text{ kg/d}$$

$$\text{30 Day Average} = 0.084 \frac{\text{lb}}{1000\text{ lb}} \times 9.0 \left(\frac{1000\text{lb}}{\text{day}}\right) \times \frac{1\text{ kg}}{2.2\text{ lb}} = 0.34\text{ kg/d}$$

B. Solvent recovery:

Still bottoms from ethanol and ether distillation are conveyed to the bioplant. Ethanol production specifically falls under the Commodity Organic Chemicals subgroup of the Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) guidelines in **40 CFR 414 Subpart F**. Distillation is considered by EPA as one of the major generalized chemical reactions and processes of the OCPSF industry. Therefore wastewater from the recovery of ethanol is considered to be applicable to these same limitations. Long term average flows have been carried forward from the previous permit. OCPSF flows were reported for 3 years during the present permit and will be reported with the next application for permit reissuance.

Effluent limitations are calculated as follows:

Commodity Organic Chemicals: (Solvent recovery)

BOD5

Daily Maximum limit = 80 mg/l x 0.11 MGD x 3.785 = 33.3 kg/d

Monthly Average limit = 30 mg/l x 0.11 MGD x 3.785 = 12.49 kg/d

TSS

Daily Maximum limit = 149 mg/l x 0.11 MGD x 3.785 = 62.03 kg/d

Monthly Average limit = 46 mg/l x 0.11 MGD x 3.785 = 19.15 kg/d

C. Propellant manufacture:

Specific effluent guidelines for propellants manufacture have been reserved by EPA in **40 CFR 457, subpart B**. All propellants manufactured at RAAP contain nitrocellulose.

BPJ concentration and mass limits were developed for the bioplant in March 1986, based on 80% removal of COD and BOD by the bioplant. The BPJ concentration limits are carried forward to this permit and should be easily achieved.

The OCPSF development document places propellant manufacture in the same subcategory as nitrocellulose manufacture (separate from nitroglycerin and TNT). Propellants made at RAAP contain plasticizers, are formed and extruded as plastics and thus may be considered plastics. Propellant manufacture uses ethanol in processing so that the wastewater is similar to that from ethanol manufacturing. Effluent guidelines for the thermoplastic resins subgroup of the OCPSF guidelines, specifically cellulose nitrate, appear to be the most appropriate basis for developing limitations for propellant manufacturing wastewaters. In the OCPSF development document, page III-25, EPA makes the following statement:

"The Agency does note, however, that the OCPSF manufacturing processes are essentially identical regardless of how manufacturing facilities may report OCPSF production to the Bureau of the Census. Therefore, the OCPSF technical data base and effluent limitations and

standards provide permit issuing authorities with technical guidance for establishing 'Best Professional Judgement ' (BPJ) permits for OCPSF production activities to which this regulation does not apply."

Discharges from the loading, assembly and packaging (LAP) of propellants for military charges are similar to those from propellant manufacturing. Flow from these operations is small (< 0.001 MGD) and is limited to washdown and fire sprinkler operation. Wastewater from these operations is estimated to make up less than 0.1% of the influent flow to the bioplant. Limitations from the OCPSF regulations are applied to these discharges.

Effluent guidelines for explosives (in A. above) limit only COD, whereas, OCPSF regulations limit BOD only. To account for these differences, the BOD/COD ratio for effluent from this outfall is used to establish COD limits for OCPSF discharges and BOD limits for explosive discharges.

NG wastewater flow (0.061 MGD), still bottoms flow (0.11 MGD) need to subtracted from the long term average flow (LTAF), to calculate loadings subject to the thermoplastic subcategory since separate calculations have been made to determine loadings from these sources and no allocation is made for cooling water and steam condensate estimated at 0.001MGD.

Subtractions from LTAF = 0.061 +0.11 + 0.001 = 0.172 MGD

Adjusted LTAF = 1.028 - 0.172 = <u>0.856 MGD</u>
To be used for thermoplastic subcategory

LTAF for toxic pollutants in **40 CFR 414.91** = 1.028 – 0.061 – 0.001 = <u>0.966 MGD</u>

<u>Thermoplastic Resin (nitrocellulose [NC] and NC propellants)</u>:

<u>BOD5</u>

Daily Max limit = 64 mg/l x 0.856 MGD x 3.785 = 207.35 kg/d

Monthly Ave. limit = 24 mg/l x 0.856 MGD x 3.785 = 77.76 kg/d

<u>TSS</u>

Daily Max limit = 130 mg/l x 0.856 MGD x 3.785 = 421.19 kg/d

Monthly Ave limit = 40 mg/l x 0.856 MGD x 3.785 = 129.59 kg/d

D. Other flows:

Cooling water and cooling tower blowdown noted in items 1) through 3) are authorized to be discharged to the bioplant, but are not considered process wastewater. These flows were subtracted from the effluent flow to determine the long term average flow for calculation of OPCSF limitations for propellants.

Ammonia is used as a nutrient by microorganisms in the bioplant to degrade organic pollutants. One source of ammonia is directed to the bioplant from the ammonia oxidation plant (AOP) when ammonia lines are drained as the result of a temporary process shutdown (item 2). This is a good use for ammonia that would otherwise be wasted and is authorized by the permit. Additional sources of nutrients may be used in the bioplant.

LOADING LIMITATION SUMMARY = NG + Solvent recovery + Propellant

Technology based BOD Daily maximum limit = 2.95 + 33.3 + 207.35 = 243.6 kg/d
Technology based BOD Monthly average limit = 0.98 + 12.49 + 77.76 = 91.23 kg/d

Technology based COD Daily maximum limit = 31.80 + NA + NA = 31.80 kg/d
Technology based COD Monthly average limit = 10.60 + NA + NA = 10.60 kg/d

Technology based TSS Daily maximum limit = 1.02 + 62.03 + 421.19 = 484.24 kg/d
Technology based TSS Monthly average limit = 0.34 + 19.15 + 129.59 = 149.08 kg/d

To account for the fact that the OCPSF guidelines do not limit COD, the COD limit is recalculated from the BOD limit above and an historic effluent COD/BOD ratio of 3.50 that was used for limit development in the previous permit. This number was calculated by the permittee using about 170 paired data sets. This compares very well with the ratio calculated from average data reported on DMRs.

Calculated BPJ COD Daily Maximum limit = 243.1 x 3.50 = 852.6 kg/d

Calculated BPJ COD Monthly Average limit = 91.06 x 3.50 = 319.3 kg/d

Toxics limitations from the OCPSF guidelines are included on outfall 029, as required by 40 CFR 414. Data from past monitoring indicates that most of the toxics are less than the detection limit. Monitoring for these compounds remains at the same frequency as in the prior permit. N-nitrosodiphenylamine monitoring is continued in this permit since it has been previously detected in effluent.

Thermal limitations, as BTU/day, which replaced the temperature limit at outfall 029, have been carried forward. Mixing zone studies performed in 1995 showed that temperature quickly dissipated with almost no area of the river exceeding the temperature WQS. The limit is equal to the highest thermal load discharged since the new covered equalization basins were completed in November 1995. Data prior to this is not considered representative of thermal load since covering the basins reduced solar heating of the wastewater.

The explosives development document recommends pretreatment for discharges high in sulfate, TNT or NC fines. The facility previously pretreated NG wastewater but does not currently because NG concentrations are manageable in the Bioplant complex. However, capabilities and readiness to pretreat NG wastewater in the event of a process upset or unusual circumstances still exists.

Influent monitoring is recommended for BOD, COD, and TSS since the treatment works has been subject to overloading in the past and the treatment efficiency is dependant upon varying propellant formulations and operation of the equalization basins. This will also help in

establishing operational controls for the plant.

The pre-Outfall 007 expansion chrysene, vinyl chloride, benzo(a)pyrene, benzo(a)anthracene, benzo(k)fluoranthene loadings exceed the human health water quality standards. These pollutants previously had BPJ limits at Outfalls 007 and 029. In order to meet the more stringent water quality based limits, these parameters are limited at the overall Outfall 999 with no limits at the individual outfalls.

WQS Pollutants:

Detectable Copper (Total) data was reported on Form 2C. The reasonable potential analysis in **Attachment E** indicates that no limits were needed. A reasonable potential analysis for acute Whole Effluent Toxicity using P. promelas indicated no limit was needed. Detectable concentrations of zinc and lead were reported on Form 2C. However, these concentrations were significantly below the aWLA.

Propellant formulations can include the following compounds:

Pollutant	CAS no.	toxicity information available
copper compounds		
cyrolite	1509-65-23	ACQUIRE
ethylcellulose	9004-57-3	
ethyl centralite	85-98-3	
(N,N=-diethyl-N,N=-diphenylurea)		ACQUIRE
dibutyl phthalate*	84-74-2	WQS
diethyl phthalate*	84-66-2	WQS
diethylene glycol	111-46-6	ACQUIRE
diethylene glycol dinitrate (DEGDN)	639-21-0	ACQUIRE
di-normal-propyladipate	106-19-4	
2,4-dinitrotoluene* (DNT)	121-14-2	WQS
diphenylamine (DPA)	122-39-4	ACQUIRE
glyceryl triacetate (triacetin)	102-76-1	ACQUIRE
lead compounds		
methyl centralite	611-92-7	
2-nitrodiphenylamine (2NDPA)	119-75-5	
nitroglycerin (NG)	55-63-0	ACQUIRE, US Army
nitroguanidine (NQ)	556-88-7	US Army

OCPSF regulations establish limits for diethyl phthalate, dibutyl phthalate and 2,4-dinitrotoluene (noted with a * above).

No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute WLA.

The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual.

Outfall 291 (internal to outfall 029):

Most of the wastewater expected to be generated from TNT manufacturing operations is expected to be neutral pH (6.0 – 9.0). This wastewater will be discharged to the TNT Wastewater Pre-Treatment facility. In the event acidic wastewater is generated from the area, the wastewater will be neutralized prior to final treatment at the Bioplant. Process wastewater from the manufacture of TNT or DNT is expected to result in the discharge of trace amounts of 2,4-dinitrotoluene (DNT), however, the wastewater will be processed through diatomaceous earth filters and columns packed with granular activated carbon (GAC).

Process wastewater from TNT manufacture was once discharged to an internal outfall 121 that was eliminated from the permit once TNT/DNT wastewater began to be routed to the bioplant. Due to this the BPJ limit for TNT nitrobodies was moved to new outfall 291. The BPJ limit for TNT nitrobodies is applied to this outfall whenever TNT or DNT is manufactured. The limit, incorporated into the facility's VPDES permit in 1979, is based on 85% removal efficiency of the carbon columns while operating at full capacity. The flow used to convert limits from concentration to mass was 0.46 MGD. Copies of pages of the 1979 fact sheet which refer to this are in the **Attachment F**. The discharge is expected to be intermittent and the flow is to be estimated once per discharge week.

TNT nitrobodies may be analyzed by method SW-846 8330 or other EPA or DEQ-approved method. The following is a list of potential components of the TNT nitrobodies: 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, 2-4-6-trinitrotolune, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 2-nitrotoluene, 3-nitrotoluene, 4-amino-2,6-dinitrotoluene, 4-nitrotoluene, HMX, RDX, nitrobenzene, and tetryl. TNT nitrobodies are to be monitored once per discharge week using a grab sample.

Pursuant to backsliding provisions of the Clean Water Act, permit limits for TNT nitrobodies from the current permit are carried forward into the new permit.

Outfall 030:

Intermittent non-contact cooling water from operations, stormwater, and water line breaks are discharged to this outfall.

Data submitted on Form 2C did not indicate a reasonable potential to exceed any water quality standards. No data submitted on Form 2F was greater than the stormwater comparative value of twice the acute standard.

BOD5, COD, oxidized nitrogen, and sulfate will be monitored at this process outfall for use in the calculation of loadings at Outfall 999. Whole effluent data is discussed in **Attachment G**. WET test data indicate limits at Outfall 006, the effluent of which includes non-contact cooling water, are needed at 006 due to acute toxicity to P. promelas. Similarly, toxicity will be evaluated at 030 using annual acute and chronic WET tests shall be performed using P. promelas.

Outfall 999:

Several parameters discharged are regulated to protect human health from toxic effects in Public Water Supply (PWS) designated stream segments. The segment of the New River at RAAP is designated PWS based on the prior operation of a drinking water intake (Intake #2) on the New River located at the downstream end of the plant site. Although the water intake is no longer operational and the intake building dismantled, the PWS status has not yet changed. Therefore, the

total mass discharged of the following parameters continues to be limited as follows:

BOD, TSS, and COD - The current permit limits these parameters. The limits are carried forward. The sample type and frequency at each outfall is given on the respective outfall EL page.

Oxidized Nitrogen -The current permit limits this parameter. The instream drinking water standard of 10 mg/l of Nitrate-N must be met at low flow. Nitrate due to other dischargers in the area is possible. This was previously discussed in the fact sheet.

Sulfate - The current permit limits this parameter. The instream PWS human health WQS of 250 mg/l must not be exceeded.

Data from the following outfalls should be used in computing the summaries: 402, 005, 006, 007, 014, 024, 026, 028, 029, and 030.

Chrysene, vinyl chloride, hexachlorobenzene, benzo(a)pyrene, benzo(a)anthracene, and benzo(k)fluoranthene were previously limited by the minimum effluent limit guidelines in 40 CFR 414. However, the combined loadings at Outfalls 007 and 029 exceed the PWS human health water quality standards for these parameters. Therefore, these parameters are now water quality limited at Outfall 999 with monitoring at Outfalls 007 and 029.

Stormwater Outfalls:

RAAP should rotate monitoring between outfalls within a zone to determine whether new zones are necessary. Areas at the Dublin site previously designated as Zone 9 are used for propellant storage. This zone is excluded from stormwater permitting since all propellants are stored in drums in closed bunkers. Fields in this area are used for agricultural purposes, under contract to a local farmer. Fields have been sprayed with herbicide to reduce the amount of thistle. Since this is an agricultural practice, it is not considered an industrial activity.

Stormwater monitoring data is compared to EPA benchmark values from the multisector general permit, the water quality standard (WQS) criteria and the monitoring cut-off concentrations from Virginia's general permit for discharges of stormwater associated with industrial activity, 9 VAC 25-151-10 et seq., hereafter known as the "general permit".

Stormwater data exceeded the chemical and allied products manufacturing benchmark value of 100 mg/l at least once at Outfalls 044, 050, and 054. Outfall 017 did not discharge during the 2010 permit term. Stormwater outfalls 031 and 032 are new outfalls. Use of the DEQ SW permit is justified since the requirements were developed for similar facilities. Data for fecal coliforms in stormwater is considered to be indicative of the presence of wildlife that is abundant at this site.

All areas should be included in the Stormwater Pollution Prevention Plan. Monitoring is required in specific industrial areas based on the industrial activity in that area. Depending on wind conditions, fugitive dust and air emissions from one area may enter adjacent areas. For this reason, all data was compared to the comparative values. Monitoring is not needed on stormwater from landfills that have vegetative cover and are properly closed out. Monitoring for Outfall 017 is limited to only those parameters that have the potential to be present. In addition to monitoring, visual examination of stormwater quality is required for all areas of industrial activity. Should any of the monitoring exceed the benchmark, other comparative values, or the visual examination be

atypical, then the facility SWPPP should be examined to determine whether pollution prevention, maintenance or additional controls are needed to reduce the level of pollutants in stormwater.

When there is more than one outfall in a zone, monitoring should be rotated among the outfalls. Monitoring for stormwater outfalls that drain areas of less than one acre is not considered as important as monitoring larger drainage areas. This is applicable only as long as these small areas are not considered to be directly associated with industrial activity. Areas of the plant that are being used actively should be given priority for monitoring over areas that have been shutdown.

Outfall 004:

Treatment for solids and pH for runoff from the coal pile runoff is present and permitted as outfall 401.

Stormwater monitoring data above the required quantification level [QL] is available for dissolved Chromium VI. The result of 3.0 ug/l is less than twice the acute standard, or 32 ug/l. Monitoring for this parameter is not required during the permit term.

EPA selected the median concentration from the National Urban Runoff Program as the benchmark for total suspended solids (TSS) and nitrate plus nitrite (NO_3/NO_2). EPA believes the median concentration, which is the mid-point concentration represents concentration above which water quality concerns may result and as a level below which there is little potential for water quality concern. Areas of industrial activity are similar to urban areas in their potential for TSS discharge, but are not similar for discharges of NO_3/NO_2 when large coal burning facilities are located on the industrial site. The benchmark for NO_3/NO_2 for this permit is adjusted for atmospheric deposition of NO_3/NO_2 that is formed from NOx in stack emissions. The mean value of NO_3/NO_2 deposited in samples from all of Virginia's deposition monitoring stations for a five year period (of 1.08 mg/l) is added to the value from the urban program (of 0.68 mg/l) to arrive at a site specific NO_3/NO_2 benchmark value of 1.76 mg/l.

Monitoring for nitrate and sulfate, which have historically been found in the discharge, will continue. Limitations for pH are carried forward from prior permits.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 401:

The outfall and treatment works was created to remove solids and provide pH adjustment. TSS and pH limits are similar to those listed in steam electric effluent guidelines, 40 CFR 423 and are applied to this outfall.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 012:

This outfall receives stormwater from TNT manufacturing areas. Stormwater monitoring data above the required quantification level [QL] is available for dissolved Chromium VI. The result of 2.0 ug/l is less than twice the acute standard, or 32 ug/l. Monitoring for this parameter is not required during the permit term.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 017:

Stormwater from part of the open burning ground flows through a small detention pond prior to discharge to the New River. Stormwater will also infiltrate into ground water and migrate into the New River through the ground.

Monitoring for TSS, dissolved lead and copper is needed to minimize discharge of these pollutants to the River. These metals are selected since they are ingredients in propellants manufactured at RFAAP. The need for additional BMPs must be evaluated whenever the EPA benchmarks or two times the acute WLA or the benchmark values are exceeded. The comparative value to be used in determining whether the BMPs must be re-evaluated or amended are as follows: 18 ug/l for copper, 120 ug/l for lead, 120 ug/l for zinc, and 100 mg/l TSS.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 031:

This is a new outfall. TSS and oil&grease monitoring is to be performed semi-annually using grab samples. Flow is to be estimated.

Outfall 032:

This is a new outfall. TSS and oil&grease monitoring is to be performed semi-annually using grab samples. Flow is to be estimated.

Outfall 041:

Stormwater monitoring data above the required quantification level [QL] is available for dissolved Chromium VI. The result of 3.0 ug/l is less than twice the acute standard, or 32 ug/l. Monitoring for this parameter is not required during the permit term. Monitoring for TSS and Oil & Grease is continued. One result for TSS of 300 mg/l was reported on the DMR for December, 2009. TSS and oil & grease are included in the annual stormwater management evaluation.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 044

Monitoring for TSS and Oil & Grease is continued. One result for TSS of 421 mg/l was reported on the DMR for June, 2006. TSS and oil & grease is included in the annual stormwater

management evaluation.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 050

A spring originating near the closed HWMU 16 discharges to the New River at this outfall location. Stormwater data commingled with the spring has been reported as outfall 050 on DMRs. Although all semi-annual data for lead collected during the 2010 permit was below QL, lead was previously detected at the concentration of 31.2 ug/l at Outfall 050 on the December, 2003 DMR. Semi-annual monitoring for all parameters will continue.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Outfall 054:

Stormwater monitoring data for zinc included only one data point (11 ug/l) above QL and significantly below the WLA. The monitoring frequency for all parameters is continued at once per year for all parameters. The frequency is less than the stormwater industrial general permit (once per six months) due to good data historically, with the exception of a single value of TSS of 107 mg/l during the 2010 permit term.

The stormwater footnote on the effluent limitations page is changed to define a measurable storm event and require information regarding the storm event during which monitoring occurred.

Stormwater Management Requirements

Included in the permit are General Stormwater Management and General Stormwater Pollution Prevention Plan (SWPPP) requirements. Additionally, there are Site Specific SWPPP Requirements that address certain categories of industrial activities: Chemical Manufacturing Areas; Land Application Sites and Open Dumps; Steam Electric Power Generating Facilities, Including Coal Handling Areas; Treatment Works; and Transportation Facilities.

17. **Antibacksliding Statement**:

All limits are at least as stringent as in the previous permit.

18. **Compliance Schedules**:

No compliance schedule is included in the permit.

19. Special Conditions: A brief rationale is given for each special condition contained in the permit.

a. **Additional TRC Limitations and Monitoring Requirements at Outfall 026 and Outfall 028 (Part I.B.1)**
Rationale: Required by Sewage Collection and Treatment Regulations 9VAC25-790 and

Water Quality Standards 9VAC25-260-170, Bacteria; Recreational Waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

b. **Notification Levels (Special Condition I.B.2)**
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 A for all manufacturing, commercial, mining, and silvicultural dischargers.

c. **Compliance Reporting under Part I.A (Part I.B.3)**
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 limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

d. **EPA Industrial Reopener (Part I.B.4)**
Rationale: Required to implement 9 VAC 25-31-220 C, 40 CFR 122.44 requires all permits for primary industrial categories to include the requirements of Section 307 (a) (2) of the Clean Water Act.

e. **Stormwater Reopener – (Part I.B.5)**
Rationale: Section 402 of the Clean Water Act limits the discharge of industrial stormwater pollution and establishes a framework for developing permits over time based on a 4 tier set of priorities. Allows modification of the permit to reflect future stormwater regulations.

f. **Sewage Sludge Reopener (Special Condition I.B.6)**
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-220 C for all permits issued to treatment works treating domestic sewage.

g. **Nutrient Enriched Waters Reopener (Special Condition I.B.7)**
Rationale: Policy for Nutrient Enriched Waters, 9VAC25-40 allows reopening of permits for discharges into waters designated as nutrient enriched if total phosphorus and total nitrogen in a discharge potentially exceed specified concentrations. The policy anticipates that future total phosphorus and total nitrogen limits may be needed.

h. **Water Quality Criteria Reopener (Special Condition I.B.8.)**
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.

i. **Total Maximum Daily Load (TMDL) Reopener (Special Condition I.B.9)**
Rationale: 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.

j. **95% Capacity Reopener (Special Condition I.B.10.a)**

Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B 4 for all POTW and PVOTW permits.

k. **Indirect Dischargers (Special Condition I.B.10.b)**
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B 1 and B 2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

l. **CTO, CTC Requirement (Special Condition I.B.10.c)**
Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

m. **O&M Manual Requirement (Special Condition I.B.10.d)**
Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9VAC25-31-190 E.

n. **Reliability Class (Special Condition I.B.10.e)**
Rationale: Required by Sewage Collection and Treatment Regulations, 9VAC25-790 for all municipal facilities.

o. **Materials Handling/Storage (Special Condition I.B.11)**
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.

p. **Excursion time for pH (Special Condition I.B.12)**
Rationale: This Pursuant to 40 CFR 401.17(b), excursion times can be allowed for continuous monitoring of technology based pH limitations. These excursions are applicable only to outfalls with well maintained treatment systems which monitor pH continuously. Limitations for pH at outfalls 007 and 029 are based on federal effluent guidelines. Outfall 005 and Outfall 006 are given excursion time even though this is a water quality based limit. Excursion time is allowed to account for those times when continuous pH monitoring equipment may malfunction. Instream water quality standards for pH should be met once discharges mix with the receiving stream. If individual excursion time exceeds the time limit then the receiving stream should be observed to see if environmental damage is visible. Environmental damage assessment should be reported with the violation notification.

q. **Concept Engineering Report (CER) (Special Condition I.B.13)**
Rationale: Modifications to Outfall 017, potentially including the drainage area, settling basin, and spillway have previously been considered by the permittee. A CER should be submitted to justify the size of the basin. Modifications to the flow patterns or basin size, if necessary, should conform to specifications in the Virginia Erosion and Sediment Control Handbook. Section 62.1-44.21 of the State Water Control Law requires owners to submit information as necessary to allow the staff to determine the effect of the discharge on the quality of state waters.

r. **Best Management Practices Plan (Special Condition I.B.14)**
Rationale: VPDES Permit Regulation, 9VAC25-31-220 K, requires 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 effluent limit or to carry out the purpose and intent of the Clean Water Act and State Water Control Law.

s. **Operations and Maintenance (O&M) Manuals (Special Condition I.B.15)**
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 approved O&M manual ensures this.

t. **Sludge Use and Disposal (Special Condition I.B.16)**
Rationale: VPDES Permit Regulation, 9VAC25-31-100 P; 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

u. **Licensed operator (Special Condition I.B.17)**
Rationale: The VPDES Permit Regulation, 9VAC25-31-200 C and the Code of Virginia § 54.1-2300 et seq, Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.), require licensure of operators.

v. **Cooling Water and Boiler Additives (Special Condition I.B.18)**
Rationale: This condition is similar to that specified for steam electric power plants and is present in the current permit. Since this facility generates electricity this condition remains in the permit. Organic additives may substantially increase the biochemical oxygen demand of cooling tower blowdown. The facility should consider routing this wastewater to a biological treatment system. Chemical additives may be toxic or otherwise violate the receiving stream water quality standards. Upon notification, the Regional Office can determine if this activity will warrant a modification to the permit.

w. **Daily inspections (Special Condition I.B.19)**
Rationale: A person familiar with Federal and State Water Control Law should physically observe treatment units and pump stations on a routine basis. Bypasses or overflows are required by 9 VAC 25-31-50 B to be reported within 24 hours of their occurrence.

x. **Thermal Mixing Zone (Special Condition I.B.20)**
Rationale: Past thermal mixing zone studies set the basis for thermal mixing zones and heat rejected limitations. The permit application for reissuance should state whether plant conditions used as a basis for thermal mixing zones have changed.

y. **OCPSF Flows (Special Condition I.B.21)**
Rationale: Current limits at outfalls 007 and 029 are based on long term average flow of process wastewater. Measurement of non-OCPSF flows are needed so that accurate flow numbers can be used in permit developing. Flow measurements should be performed periodically over the life of the permit.

z. **New River PCB TMDL Requirements (Special Condition I.B.22)**
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 and Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. Development of a PCB Total Maximum Daily Load (TMDL) requires consideration of the Virginia water quality criterion for Total PCBs (9 VAC 25-260-140) to protect the "fishable" designated use (9 VAC 25-260-10). A PCB TMDL for the New River is scheduled for completion in 2016. This special condition allows for the requirement to develop a Pollutant Minimization Plan should a reduction in PCBs be necessary to bring the discharge into compliance with an approved TMDL.

This special condition also requires the permittee to conduct follow-up monitoring. These requirements are consistent with 9 VAC 25-260-280 and Guidance Memo 09-2001 procedures. The results from this monitoring will be used to implement the PCB TMDL that is being developed for the New River.

aa. **Closure Plan (Special Condition I.B.23)**

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 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 purpose of the State Water Control Law.

ab. **Sludge Reopener (Special Condition I.B.24)**
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-220 C for all permits issued to treatment works treating domestic sewage.

ac. **Section 316 Cooling Water Intake Structure Requirements (Special Condition Part I.B.25)**
Rationale: In accordance with Section 316 of the Clean Water Act and 40 CFR §122.21(r), permittees that have a water intake with a cooling water discharge of more than 2 MGD are required to provide information in the application about intake structures. The permittee has been given a schedule to submit this information with the reissuance application of the next permit. In accordance with 40 CFR§125.94(h), permittees are required to implement interim Best Technology Available measures. In accordance with 40 CFR§ 1215.98(b)(1), this permit does not authorize take for the purposes of a facility's compliance with the endangered species.

ad. **Permit Application Requirement (Part I.C.26)**
Rationale: The VPDES Permit Regulation (9 VAC 25-31-100 D) and 40 CFR 122.21(d)(1) require submission of a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation (9 VAC 25-31-100 E.1) and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before receiving a complete application.

ae. **Whole Effluent Toxicity Limitations (Special Conditions I.C)**
Rationale: Required by 9 VAC 25-31-220 D 1 d. See memo, included in **Attachment G** for specific rationale.

af. **Toxics Monitoring Program (Special Conditions I.D.)**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 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. A TMP Justification Memo is included in **Attachment G.**

ag. **Stormwater Management and Pollution Prevention Plan (Part I.E)**
Rationale: VPDES Permit Regulation, 9VAC25-31-10 defines discharges of stormwater from industrial activity in 9 industrial categories. 9VAC25-31-120 requires a permit for these discharges. The Stormwater Pollution Prevention Plan requirements of the permit are derived from the VPDES general permit for discharges of stormwater associated with industrial activity, 9VAC25-151-10 et seq. VPDES Permit Regulation, 9VAC25-31-220 K, requires 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 effluent limit or to carry out the purpose and intent of the Clean Water Act and State Water Control Law.

ah. **Part II, Conditions Applicable to All Permits**
Rationale: VPDES Permit Regulation, 9VAC25-31-190 requires all VPDES permits to contain

or specifically cite the conditions listed.

20. **NPDES Permit Rating Worksheet:**
Total Score 140
In accordance with Guidance Memo 92-004 and the VPDES Permit Manual, the NPDES Permit Rating Worksheet has been completed, and this facility has been classified as an industrial major. The completed worksheet is found in a copy is in **Attachment H**.

21. **Changes to Permit:**

Permit language has been updated to reflect the recommendations in the 2014 VPDES Permit Manual.

A. Outfall 024 has been deleted from the permit due to the dismantling of water intake #2.
B. Outfall 030 added as a permitted outfall. Previously was outfall 3E. It is listed on the application as receiving intermittent non-contact cooling water flows, water breaks, and stormwater.
C. Outfall 031 added as a permitted outfall. Previously was stormwater outfall '3M' for which Outfall 041 was a representative outfall. In addition to stormwater, it is listed on the application as having dry weather flows from spring water and water line breaks.
D. Outfall 032 added as a permitted outfall. Previously was stormwater outfall '3W" for which Outfall 041 was a representative outfall. In addition to stormwater, it is listed on the application as having dry weather flows from spring water and water line breaks.
E. Outfall 044 (SW outfall '15C') is listed on the application as having dry weather flows from spring water and water line breaks.
F. The stormwater management evaluation special condition is now grouped with the General Stormwater Management requirements as Part I.E.1. The list of parameters and outfalls has been updated based on DMR and application data.
G. The PCB monitoring special condition is replaced by Part I.B.22, New River PCB TMDL Requirements that, if required by the TMDL, requires the development and implementation of a Pollutant Minimization Plan, annual report, and monitoring data.
H. Section 316(b) Cooling Water Intake Structure Requirements, Special Condition Part 1.B.25, is added.
I. A Permit Application Requirement special condition, Part I.B.26, is added.
J. The general stormwater management and the site specific stormwater pollution prevention plan requirements have been updated to reflect the content in the 2014 General Permit for Stormwater Discharges Associated with Industrial Activities (VAR05).
K. The sample type 'Recorded' is changed to 'TIRE' (Totalizing, Indicating, Recording Equipment) for Flow as recommended in the 2014 VPDES Permit Manual. This change affects the sample type for Flow at Outfalls 005, 006, 007, 026, 029.
L. Changed stormwater footnote defining measurable storm event. This impacts Outfalls 004, 401, 012, 017, 031, 032, 041, 044, 050, and 054.
M. The quantification level for BOD5 is changed from 5.0 mg/l to 2 mg/l (note both value and significant digits change) in Part I.B.3.a in accordance with the recommended value in the 2014 VPDES Permit Manual.
N. Added existing pH excursion time limits given in Part I.B.12 to the Part I.A effluent limitation pages for Outfalls 005, 006, 007, and 029. Changed pH excursion type from 'CALC' to 'REC' for Outfalls 005 and 006.

22. **Variances/Alternate Limits or Conditions:**
None.

23. **Regulation of Users:** There are no industrial users contributing to the municipal WWTP.

24. **Public Notice Information required by 9VAC25-31-280 B:**
All pertinent information is on file and may be inspected, and copied by contacting Kevin A. Harlow at: **Virginia DEQ Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019, Telephone No: (540) 562-6700; Email Address: Kevin.Harlow@deq.virginia.gov**

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 Blue Ridge Regional Office by appointment.

25. **Additional Comments:**

Previous Board Action: None
Staff Comments: None
Public Comment: Public comment period ended with no comments.

26. **303(d) Listed Segments (TMDL):** The facility discharges to segments VAW-N22R_NEW03A00 and VAW-N22R_NEW03A00 that are listed on Part I.A of the approved 303(d) list for non-attainment due to PCB concentrations in fish tissue. The Virginia Department of Health has issued a Fish Consumption Advisory for an unknown source. A TMDL has not been prepared or approved for this stream segment. The permit contains a TMDL reopener clause which will allow the permit to be modified, in compliance with Section 303(d)(4) of the Act once a TMDL is approved. The permit also contains a New River PCB TMDL Requirements special condition (Part I.B.22) to require a Pollutant Minimization Plan if required by a TMDL.

TABLE III

INDUSTRIAL EFFLUENT LIMITATIONS

(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

OUTFALL 402 – Non-Stormwater Flows

SIC CODES 2892, 4911

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Judgement	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NL	NA	NL	1/Month	Est
pH, SU		1	NA.	6.0	9.0	1/Month	Grab
Oxidized Nitrogen (mg/l)			NL	NA	NL	1/Month	Grab
Sulfate (mg/l)			NL	NA	NL	1/Month	Grab
Temperature (C)			NL	NA	NL	1/Month	Grab

Key
1. SWCB Water Quality Standards

TABLE III

INDUSTRIAL EFFLUENT LIMITATIONS

(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

OUTFALL 004 - coal pile area

SIC CODES 2892, 4911

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Judgement	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NL	NA	NL	1/6M	Est
pH, SU		1	NA.	6.0	9.0	1/6M	Grab
Nitrate/nitrite (mg/l)			NA	NA	NL	1/6M	Grab
Sulfate (mg/l)			NA	NA	NL	1/6M	Grab

Key
1. SWCB Water Quality Standards

TABLE III

INDUSTRIAL EFFLUENT LIMITATIONS

(X) Final Limitations
( ) Interim Limitations

OUTFALL 401 - coal pile

Dates: From eff date
To exp date

SIC CODES 2892, 4911

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Judgement	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NL	NA	NL	1/6M	Est
pH, SU		1	NA	6.0	9.0	1/6M	Grab
Total suspended solids, mg/l	3		NA	NA	50	1/6M	Grab

Key
1. SWCB Water Quality Standards
3. Best Engineering Judgement limits similar to 40 CFR 423 and 9 VAC 25-151-10 et seq

Any untreated overflow from facilities designed, constructed and operated to treat the volume of coal pile runoff that is associated with a 10-year, 24-hour rainfall event shall not be subject to the 50 mg/l limitation for total suspended solids.

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 005
cooling water, Oleum plant and stormwater

Dates: From eff date
To exp date

SIC CODES 2892,2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	NA	NL	Cont	TIRE
pH, SU		1	NA	6.0	9.0	Cont	REC
pH excursion time, total	2		NA	NA	446 min	Cont	REC
pH excursion time, individual	2		NA	NA	60 min	Cont	REC
BOD(5) (mg/l)			NA	NA	NL	1/W	24HC
Chemical Oxygen Demand (mg/l)			NA	NA	NL	1/W	24HC
Temperature (C), intake	1		NA	NA	NL	Cont	REC
Temperature (C)		1	NA	NA	NL	Cont	REC
Heat rejected, BTU/day		1	NA	NA	518×10^6	1/Day	Calculated
Oxidized nitrogen (mg/l)		1	NA	NA	NL	1/W	24HC
Total Suspended Solids (mg/l)		1	NA	NA	NL	1/M	24HC
Sulfate (mg/l) (kg/d)	7		2100 19000	NA	3000 21000	1/W	24HC

Key
1. SWCB Water Quality Standards
2. 40 CFR 401.17
7. BEJ limit, maximum solubility of calcium sulfate

TABLE III
(X) Final Limitations
() Interim Limitations

Dates: From effective date
To exp date

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 006

cooling water, and stormwater

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	NA	NL	Cont	TIRE
pH, SU		1	NA	6.0	9.0	Cont	REC
pH excursion time, total	2		NA	NA	446 min	Cont	REC
pH excursion time, individual	2		NA	NA	60 min	Cont	REC
BOD(5) (mg/l)	7		NA	NA	NL	1/M	24HC
Chemical Oxygen Demand (mg/l)			NA	NA	NL	1/M	24HC
Temperature (C)		1	NA	NA	NL	Cont	REC
Heat rejected, BTU/day		1	NA	NA	5208×10^6	1/Day	Calculated
Oxidized nitrogen (mg/l)		1	NA	NA	NL	1/M	24HC
Sulfate (mg/l)	7		NA	NA	NL	1/M	24HC
Acute Whole Effluent Toxicity		1	NA	NA	1.0 TUa	1/3 Months	24HC

Key
1. SWCB Water Quality Standards
7. Limit applied to outfall 999, sum of all discharges

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From effective date
To exp date

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 007

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	--	NL	Cont	TIRE
pH, SU		1	NA	6.0	9.0	Cont	REC
pH excursion time, total	2		NA	NA	446 min	Cont	REC
pH excursion time, individual	2		NA	NA	60 min	Cont	REC
BOD(5) (mg/l)			24	NA	64	1/W	24HC
(kg/d)			164		437		
Total Suspended Solids (mg/l)			40	NA	80	1/W	24HC
(kg/d)			273		888		
Sulfate (mg/l)		10	2100	NA	3000	1/W	24HC
(kg/d)		1	50000		59000		
Temperature (C)		1	NA	NA	35	Cont	REC
Chemical Oxygen Demand (mg/l)			NA	NA	NL	1/W	24HC
Oxidized nitrogen (mg/l)			NL mg/l	NA	NL mg/l	1/W	24HC
(kg/d)		1	6000 kg/d		10000 kg/d		
Whole Effluent Toxicity, WET (TUa)		1	NA	NA	6.6	1/3M	24HC
Ammonia (mg/l)		1	NA	NA	NL	1/M	24HC
2,4-dinitrotoluene			NA	NA	NL	1/M	24HC
N-nitroso-diphenylamine			NA	NA	NL	1/Year	24HC
Total Chromium	11	NA ug/l	10.76 kg/d	NA	NA ug/l	26.86 kg/d	1/3M	24 HC
Total Copper	11	NA ug/l	14.06 kg/d	NA	NA ug/l	32.78 kg/d	1/3M	24 HC
Total Lead	11	NA ug/l	3.10 kg/d	NA	NA ug/l	6.69 kg/d	1/3M	24 HC
Total Nickel	11	NA ug/l	16.39 kg/d	NA	NA ug/l	38.60 kg/d	1/3M	24 HC
Total Zinc	11	NA ug/l	10.18 kg/d	NA	NA ug/l	25.31 kg/d	1/3M	24 HC

(X) Final Limitations

OUTFALL 007 continued

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average				EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum				MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Acenaphthene	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
Acenaphthylene	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
Acrylonitrile	1		NA	ug/l	0.91	kg/d	NA	NA	ug/l	1.72	kg/d	1/Year	Grab
Anthracene	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
Benzene	11		NA	ug/l	0.55	kg/d	NA	NA	ug/l	1.30	kg/d	1/Year	Grab
Benzo(a)anthracene	7		NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d	1/Year	Grab
3,4-Benzofluoranthene	11		NA	ug/l	0.19	kg/d	NA	NA	ug/l	0.47	kg/d	1/Year	Grab
Benzo(k)fluoranthene	7		NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d	1/Year	Grab
Benzo(a)pyrene	7		NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d	1/Year	Grab
Bis(2-ethylhexyl)phthalate	11		NA	ug/l	0.92	kg/d	NA	NA	ug/l	2.50	kg/d	1/Year	Grab
Carbon tetrachloride	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
Chlorobenzene	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
Chloroethane	11		NA	ug/l	1.07	kg/d	NA	NA	ug/l	2.86	kg/d	1/Year	Grab
Chloroform	11		NA	ug/l	1.08	kg/d	NA	NA	ug/l	3.15	kg/d	1/Year	Grab
Chrysene	7		NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d	1/Year	Grab
Di-n-butyl phthalate	11		NA	ug/l	0.19	kg/d	NA	NA	ug/l	0.42	kg/d	1/Year	Grab
1,2-Dichlorobenzene	11		NA	ug/l	1.90	kg/d	NA	NA	ug/l	7.70	kg/d	1/Year	Grab
1,3-Dichlorobenzene	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
1,4-Dichlorobenzene	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
1,1-Dichloroethane	11		NA	ug/l	0.21	kg/d	NA	NA	ug/l	0.57	kg/d	1/Year	Grab
1,2-Dichloroethane	11		NA	ug/l	1.75	kg/d	NA	NA	ug/l	5.57	kg/d	1/Year	Grab
1,1-Dichloroethylene	11		NA	ug/l	0.21	kg/d	NA	NA	ug/l	0.58	kg/d	1/Year	Grab
1,2-trans-Dichloroethylene	11		NA	ug/l	0.24	kg/d	NA	NA	ug/l	0.64	kg/d	1/Year	Grab
1,2-Dichloropropane	11		NA	ug/l	1.90	kg/d	NA	NA	ug/l	7.70	kg/d	1/Year	Grab
1,3-Dichloropropylene	11		NA	ug/l	1.90	kg/d	NA	NA	ug/l	7.70	kg/d	1/Year	Grab
Diethyl phthalate	11		NA	ug/l	0.45	kg/d	NA	NA	ug/l	1.10	kg/d	1/Year	Grab
2,4-Dimethylphenol	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
Dimethyl phthalate	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
4,6-Dinitro-o-cresol	11		NA	ug/l	0.76	kg/d	NA	NA	ug/l	2.69	kg/d	1/Year	Grab
2,4-Dinitrophenol	11		NA	ug/l	11.71	kg/d	NA	NA	ug/l	41.61	kg/d	1/Year	Grab
Ethylbenzene	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
Fluoranthene	11		NA	ug/l	0.21	kg/d	NA	NA	ug/l	0.52	kg/d	1/Year	Grab
Fluorene	11		NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d	1/Year	Grab
Hexachlorobenzene	7		NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d	1/Year	Grab
Hexachlorobutadiene	11		NA	ug/l	1.38	kg/d	NA	NA	ug/l	3.69	kg/d	1/Year	Grab
Hexachloroethane	11		NA	ug/l	1.90	kg/d	NA	NA	ug/l	7.70	kg/d	1/Year	Grab

(X) Final Limitations

OUTFALL 007 continued

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Water Quality	EFFLUENT LIMITS: Monthly Average				Minimum		Maximum				MONITORING REQUIREMENTS: Frequency	Sample Type
Methyl Chloride	11	NA	ug/l	1.07	kg/d	NA	NA	ug/l	2.86	kg/d		1/Year	Grab
Methylene Chloride	11	NA	ug/l	0.35	kg/d	NA	NA	ug/l	1.65	kg/d		1/Year	Grab
Naphthalene	11	NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d		1/Year	Grab
Nitrobenzene	1	NA	ug/l	21.69	kg/d	NA	NA	ug/l	45.18	kg/d		1/Year	Grab
2-Nitrophenol	11	NA	ug/l	0.63	kg/d	NA	NA	ug/l	2.24	kg/d		1/Year	Grab
4-Nitrophenol	11	NA	ug/l	1.57	kg/d	NA	NA	ug/l	5.59	kg/d		1/Year	Grab
Phenanthrene	11	NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d		1/Year	Grab
Phenol	11	NA	ug/l	0.18	kg/d	NA	NA	ug/l	0.46	kg/d		1/Year	Grab
Pyrene	11	NA	ug/l	0.19	kg/d	NA	NA	ug/l	0.47	kg/d		1/Year	Grab
Tetrachloroethylene	11	NA	ug/l	0.50	kg/d	NA	NA	ug/l	1.59	kg/d		1/Year	Grab
Toluene	11	NA	ug/l	0.27	kg/d	NA	NA	ug/l	0.72	kg/d		1/Year	Grab
Total Cyanide	11	NA	ug/l	4.07	kg/d	NA	NA	ug/l	11.64	kg/d		1/Year	Grab
1,2,4-Trichlorobenzene	11	NA	ug/l	1.90	kg/d	NA	NA	ug/l	7.70	kg/d		1/Year	Grab
1,1,1-Trichloroethane	11	NA	ug/l	0.21	kg/d	NA	NA	ug/l	0.57	kg/d		1/Year	Grab
1,1,2-Trichloroethane	11	NA	ug/l	0.31	kg/d	NA	NA	ug/l	1.23	kg/d		1/Year	Grab
Trichloroethylene	11	NA	ug/l	0.25	kg/d	NA	NA	ug/l	0.67	kg/d		1/Year	Grab
Vinyl Chloride	7	NA	ug/l	NL	kg/d	NA	NA	ug/l	NL	kg/d		1/Year	Grab

Key
1. SWCB Water Quality Standards
7. Limit applied to outfall 999, sum of all discharges
10. BPJ limit
11. OCPSF Effluent Guidelines at 40 CFR 414, long term average flow = 2.562 MGD

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 012 - Stormwater

Dates: From eff date
To exp date

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	--	NL	1/6 Months	Est
pH, SU		1	NA	6.0	9.0	1/6 Months	Grab
Sulfate (mg/l)			NA	NA	NL	1/6 Months	Grab

Key:
1. SWCB Water Quality Standards

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 014
Contaminated spring and stormwater

Dates: From eff date
To exp date

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	--	NL	1/M	Measure
pH, SU		1	NA	6.0	9.0	1/M	Grab
BOD(5) (mg/l)	6		NA	NA	NL	1/M	24HC
COD (mg/l)	6		NA	NA	NL	1/M	24HC
Oxidized Nitrogen (mg/l)			NA	NA	NL	1/M	24HC
Sulfate (mg/l)			NA	NA	NL	1/M	24HC

Key
1. SWCB Water Quality Standards
6. BMP required if BOD exceeds a target value 30 mg/l or if COD exceeds a target value of 120 mg/l, 40 CFR 414

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 017
stormwater from the opening burning ground

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NL	NA	NL	1/YR	Est
pH, SU		1	NA	NL	NL	1/YR	Grab
Total Suspended Solids (mg/l)			NA	NA	NL	1/YR	Grab
Copper (dissolved) (ug/l)		1	NA	NA	NL	1/YR	Grab
Lead (dissolved) (ug/l)		1	NA	NA	NL	1/YR	Grab
Zinc (dissolved) (ug/l)		1	NA	NA	NL	1/YR	Grab

Key
1. SWCB Water Quality Standards

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 024
Water Plant

OUTFALL DELETED. WATER PLANT NO LONGER ACTIVE AND BUILDING DISMANTLED. NO DISCHARGE TO PREVIOUS OUTFALL

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 026
Trickling Filter STP

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum (*)	MONITORING REQUIREMENTS: Sample Frequency	MONITORING REQUIREMENTS: Type
Flow, MGD			NL	--	NL	Cont	TIRE
pH, SU		1	NA	6.0	9.0	1/Day	Grab
pH, influent, SU		4		NL	NL	Cont	REC
BOD(5) (mg/l) (kg/d)		2	30 114	NA	45 170	3D/W	8HC
Total Suspended Solids (mg/l) (kg/d)		2	30 114	NA	45 170	3D/W	8HC
Ammonia (mg/l)		1	10.6	NA	13.4	1/W	24HC
Oxidized Nitrogen (mg/l)		1	NA	NA	NL	1/M	8HC
Sulfate (mg/l)		1	NA	NA	NL	1/M	8HC
Total Residual Chlorine, TRC contact (mg/l)		1	NA	1.5	NA	3/D	Grab
Chemical Oxygen Demand (mg/l)			NA	NA	NL	1/M	8HC
Total Residual Chlorine, TRC final (mg/l)		1	0.087	NA	0.10	1/D	Grab

Key
1. SWCB Water Quality Standards
2. Secondary Treatment Regulation, 40 CFR 133
* since the facility is not a POTW, BOD, TSS, Ammonia and TRC, final maximum limits are daily maxima
4. To protect biomass from infiltration of acid wastewater

NOTE: The permittee may use a 24 hour composite sample as a substitute for an 8 hour composite sample.
The design flow of this facility is 1.0 MGD

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 028
Imhoff STP

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum (*)	MONITORING REQUIREMENTS: Sample Frequency	MONITORING REQUIREMENTS: Type
Flow, MGD			NL	--	NL	3/D	Est
pH, SU		4	NA	6.0	9.0	1/Day	Grab
BOD(5) (mg/l)		2	30	NA	45	1/M	4HC
(kg/d)			7.9		11.9		
Total Suspended Solids (mg/l)		2	30	NA	45	1/M	4HC
(kg/d)			7.9		11.9		
Oxidized Nitrogen (mg/l)		1	NA	NA	NL	1/M	4HC
Sulfate (mg/l)		1	NA	NA	NL	1/M	4HC
COD (mg/l)			NA	NA	NL	1/M	4HC
Total Residual Chlorine, TRC contact (mg/l)		1	NA	1.5	NA	3/D	Grab
Total Residual Chlorine, TRC final (mg/l)		1	0.10	NA	0.10	1/D	Grab

*Key
1. SWCB Water Quality Standards
2. Secondary Treatment Regulation, 40 CFR 133

* since the facility is not a POTW, BOD, TSS and TRC, final maximum limits are daily maxima

NOTE: The permittee may use a 24 hour composite sample as a substitute for a 4 hour composite sample.
The design flow of this facility is 0.07 MGD

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 029
Biological Treatment Plant (bioplant)

Dates: From eff date
To exp date

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum (*)	MONITORING REQUIREMENTS: Sample Frequency	MONITORING REQUIREMENTS: Type
Flow, MGD			NL	--	NL	Cont	TIRE
pH, SU		1		6.0	9.0	Cont	REC
pH excursion time, total	2		NA	NA	446 min	Cont	REC
pH excursion time, individual	2		NA	NA	60 min	Cont	REC
BOD(5) (mg/l)		11	60	NA	120	1/W	24HC
(kg/d)			91		243		
Total Suspended Solids (mg/l)		11	NL	NA	NL	1/W	24HC
(kg/d)			149		484		
Chemical Oxygen Demand (mg/l)		10,11	200	NA	290	1/W	24HC
(kg/d)			318	NA	850		
Temperature (C)		1	NA	NA	NL	Cont	REC
Heat Rejected, million BTU/day		1	NA	NA	291	1/Day	Calculated
Oxidized Nitrogen (mg/l & kg/d)		1	NA	NA	NL	1/W	24HC
Sulfate (mg/l)		1	NL	NA	NL	1/M	24HC
(kg/d)			3000		6000		
Whole Effluent Toxicity, WET (TUa)		1	NA	NA	1	1/3M	24HC
N-nitroso-diphenylamine		5	NA	NA	NL	1/Yr	24HC
BOD, influent (mg/l)			NL	NA	NL	1/M	24HC
COD, influent (mg/l)			NL	NA	NL	1/M	24HC
TSS, influent (mg/l)			NL	NA	NL	1/M	24HC

(X) Final Limitations

OUTFALL 029 continued

Parameter	BASIS FOR LIMITS: Effluent Guidelines/Water Quality	EFFLUENT LIMITS: Monthly Average		Minimum	Maximum (*)		MONITORING REQUIREMENTS: Frequency	Sample Type
Acenaphthene	11	22 ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab
Acrylonitrile	11	96 ug/l	0.35 kg/d	NA	NA ug/l	0.88 kg/d	1/Year	Grab
Benzene	11	37 ug/l	0.13 kg/d	NA	NA ug/l	0.49 kg/d	1/Year	Grab
Carbon tetrachloride	11	18 ug/l	0.066 kg/d	NA	NA ug/l	0.13 kg/d	1/Year	Grab
Chlorobenzene	11	NA ug/l	0.055 kg/d	NA	NA ug/l	0.10 kg/d	1/Year	Grab
1,2,4-Trichlorobenzene	11	NA ug/l	0.24 kg/d	NA	NA ug/l	0.51 kg/d	1/Year	Grab
Hexachlorobenzene	7	NA ug/l	NL kg/d	NA	NA ug/l	NL kg/d	1/Year	Grab
1,2-Dichloroethane	11	NA ug/l	0.24 kg/d	NA	NA ug/l	0.77 kg/d	1/Year	Grab
1,1,1-Trichloroethane	11	NA ug/l	0.077 kg/d	NA	NA ug/l	0.19 kg/d	1/Year	Grab
Hexachloroethane	11	NA ug/l	0.077 kg/d	NA	NA ug/l	0.19 kg/d	1/Year	Grab
1,1-Dichloroethane	11	NA ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab
1,1,2-Trichloroethane	11	NA ug/l	0.077 kg/d	NA	NA ug/l	0.19 kg/d	1/Year	Grab
Chloroethane	11	NA ug/l	0.38 kg/d	NA	NA ug/l	0.98 kg/d	1/Year	Grab
Chloroform	11	NA ug/l	0.077 kg/d	NA	NA ug/l	0.16 kg/d	1/Year	Grab
2-Chlorophenol	11	NA ug/l	0.11 kg/d	NA	NA ug/l	0.35 kg/d	1/Year	Grab
1,2-Dichlorobenzene	11	NA ug/l	0.28 kg/d	NA	NA ug/l	0.59 kg/d	1/Year	Grab
1,3-Dichlorobenzene	11	NA ug/l	0.11 kg/d	NA	NA ug/l	0.16 kg/d	1/Year	Grab
1,4-Dichlorobenzene	11	NA ug/l	0.055 kg/d	NA	NA ug/l	0.10 kg/d	1/Year	Grab
1,1-Dichloroethylene	11	NA ug/l	0.059 kg/d	NA	NA ug/l	0.09 kg/d	1/Year	Grab
1,2-trans-Dichloroethylene	11	NA ug/l	0.077 kg/d	NA	NA ug/l	0.19 kg/d	1/Year	Grab
2,4-Dichlorophenol	11	NA ug/l	0.14 kg/d	NA	NA ug/l	0.41 kg/d	1/Year	Grab
1,2-Dichloropropane	11	NA ug/l	0.55 kg/d	NA	NA ug/l	0.84 kg/d	1/Year	Grab
1,3-Dichloropropylene	11	NA ug/l	0.10 kg/d	NA	NA ug/l	0.16 kg/d	1/Year	Grab
2,4-Dimethylphenol	11	NA ug/l	0.06 kg/d	NA	NA ug/l	0.13 kg/d	1/Year	Grab
2,4-Dinitrotoluene	11	NA ug/l	0.41 kg/d	NA	NA ug/l	1.04 kg/d	1/Week	Grab

(X) Final Limitations

OUTFALL 029 continued

Parameter	BASIS FOR LIMITS: Effluent Guidelines/Water Quality	EFFLUENT LIMITS: Monthly Average		Minimum	Maximum (*)		MONITORING REQUIREMENTS: Frequency	Sample Type
2,6-Dinitrotoluene	11	NA ug/l	0.93 kg/d	NA	NA ug/l	2.34 kg/d	1/Year	Grab
Ethylbenzene	11	NA ug/l	0.11 kg/d	NA	NA ug/l	0.39 kg/d	1/Year	Grab
Fluoranthene	11	NA ug/l	0.091 kg/d	NA	NA ug/l	0.24 kg/d	1/Year	Grab
Methylene Chloride	11	NA ug/l	0.14 kg/d	NA	NA ug/l	0.32 kg/d	1/Year	Grab
Methyl Chloride	11	NA ug/l	0.31 kg/d	NA	NA ug/l	0.69 kg/d	1/Year	Grab
Hexachlorobutadiene	11	NA ug/l	0.073 kg/d	NA	NA ug/l	0.17 kg/d	1/Year	Grab
Naphthalene	11	NA ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab
Nitrobenzene	11	NA ug/l	0.099 kg/d	NA	NA ug/l	0.24 kg/d	1/Year	Grab
2-Nitrophenol	11	NA ug/l	0.15 kg/d	NA	NA ug/l	0.25 kg/d	1/Year	Grab
4-Nitrophenol	11	NA ug/l	0.26 kg/d	NA	NA ug/l	0.45 kg/d	1/Year	Grab
2,4-Dinitrophenol	11	NA ug/l	0.26 kg/d	NA	NA ug/l	0.45 kg/d	1/Year	Grab
4,6-Dinitro-o-cresol	11	NA ug/l	0.28 kg/d	NA	NA ug/l	1.01 kg/d	1/Year	Grab
Phenol	11	NA ug/l	0.055 kg/d	NA	NA ug/l	0.09 kg/d	1/Year	Grab
Bis(2-ethylhexyl)phthalate	11	NA ug/l	0.37 kg/d	NA	NA ug/l	1.02 kg/d	1/Year	Grab
Di-n-butyl phthalate	11	NA ug/l	0.099 kg/d	NA	NA ug/l	0.20 kg/d	1/3 Months	Grab
Diethyl phthalate	11	NA ug/l	0.29 kg/d	NA	NA ug/l	0.74 kg/d	1/Year	Grab
Dimethyl phthalate	11	NA ug/l	0.069 kg/d	NA	NA ug/l	0.17 kg/d	1/Year	Grab
Benzo(a)anthracene	7	NA ug/l	NL kg/d	NA	NA ug/l	NL kg/d	1/Year	Grab
Benzo(a)pyrene	7	NA ug/l	NL kg/d	NA	NA ug/l	NL kg/d	1/Year	Grab
3,4-Benzofluoranthene	11	NA ug/l	0.084 kg/d	NA	NA ug/l	0.22 kg/d	1/Year	Grab
Benzo(k)fluoranthene	7	NA ug/l	NL kg/d	NA	NA ug/l	NL kg/d	1/Year	Grab
Chrysene	7	NA ug/l	NL kg/d	NA	NA ug/l	NL kg/d	1/Year	Grab
Acenaphthylene	11	NA ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab
Anthracene	11	NA ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab
Fluorene	11	NA ug/l	0.080 kg/d	NA	NA ug/l	0.21 kg/d	1/Year	Grab

(X) Final Limitations

OUTFALL 029 continued

Parameter	BASIS FOR LIMITS: Effluent Guidelines/Water Quality	EFFLUENT LIMITS: Monthly Average			Minimum	Maximum (*)			MONITORING REQUIREMENTS: Frequency	Sample Type
Phenanthrene	11	NA	ug/l	0.080	kg/d	NA	NA	ug/l	0.21	kg/d	1/Year	Grab
Pyrene	11	NA	ug/l	0.091	kg/d	NA	NA	ug/l	0.24	kg/d	1/Year	Grab
Tetrachloroethylene	11	NA	ug/l	0.080	kg/d	NA	NA	ug/l	0.20	kg/d	1/Year	Grab
Toluene	11	NA	ug/l	0.095	kg/d	NA	NA	ug/l	0.29	kg/d	1/Year	Grab
Trichloroethylene	11	NA	ug/l	0.077	kg/d	NA	NA	ug/l	0.19	kg/d	1/Year	Grab
Vinyl Chloride	11	NA	ug/l	0.38	kg/d	NA	NA	ug/l	0.98	kg/d	1/Year	Grab
Total Chromium	11	NA	ug/l	4.05	kg/d	NA	NA	ug/l	10.12	kg/d	1/3 Months	24 HC
Total Copper	11	NA	ug/l	5.30	kg/d	NA	NA	ug/l	12.35	kg/d	1/3 Months	24HC
Total Cyanide	11	NA	ug/l	1.53	kg/d	NA	NA	ug/l	4.38	kg/d	1/Year	Grab
Total Lead	11	NA	ug/l	1.17	kg/d	NA	NA	ug/l	2.52	kg/d	1/3 Months	24 HC
Total Nickel	11	NA	ug/l	6.17	kg/d	NA	NA	ug/l	14.5	kg/d	1/3 Months	24 HC
Total Zinc	11	NA	ug/l	3.83	kg/d	NA	NA	ug/l	9.54	kg/d	1/3 Months	24 HC

Key:
1. SWCB Water Quality Standards
5. BPJ from EPA Gold Book
7. Limit applied to outfall 999, sum of all discharges
10. BPJ
11. From 40 CFR 414, outfall 029 long term average process flow = 0.966 MGD

TABLE III

(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 291
Internal outfall from TNT/DNT area(when active)

Dates: From eff date
To exp date

SIC CODES 2892

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Sample Frequency	MONITORING REQUIREMENTS: Type
Flow, MGD			NL	NA	NL	1/D-Week	measure
TNT Nitrobodies (kg/d)	13		0.9	NA	1.3	1/D-Week	grab

*Key
13 Best professional judgement based on removal efficiency of activated carbon.

TABLE III

(X) Final Limitations
() Interim Limitations

Dates: From effective date
To exp date

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 030

cooling water, and stormwater

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MGD			NL	NA	NL	1/M	Grab
pH, SU		1	NA	6.0	9.0	1/M	Grab
BOD(5) (mg/l)	7		NA	NA	NL	1/M	Grab
Chemical Oxygen Demand (mg/l)	7		NA	NA	NL	1/M	Grab
Temperature (C)		1	NA	NA	NL	1/M	Grab
Oxidized nitrogen (mg/l)	7		NA	NA	NL	1/M	Grab
Sulfate (mg/l)	7		NA	NA	NL	1/M	Grab

Key
1. SWCB Water Quality Standards
7. Limit applied to outfall 999, sum of all discharges

TABLE III
(X) Final Limitations
( ) Interim Limitations

INDUSTRIAL EFFLUENT LIMITATIONS
OUTFALL 999
Summary of all continuous outfalls

Dates: From eff date
To exp date

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum (*)	MONITORING REQUIREMENTS: Sample Frequency	MONITORING REQUIREMENTS: Type
BOD(5) (kg/d)		3	6,700	NA	10,000	1/Month	Calculated
Total Suspended Solids TSS (kg/d)		10	6,200	NA	9,300	1/Month	Calculated
Chemical Oxygen Demand COD (kg/d)		10	14,500	NA	22,000	1/Month	Calculated
Oxidized nitrogen (kg/d)		1	6,600	NA	10,000	1/Month	Calculated
Sulfates (kg/d)		1	50,000	NA	75,000	1/Month	Calculated
Vinyl Chloride (kg/day)		1	0.90	NA	1.36	1/Year	Calculated
Chrysene (kg/day)		1	0.18	NA	0.26	1/Year	Calculated
Benzo(a)anthracene (kg/day)		1	0.18	NA	0.26	1/Year	Calculated
Benzo(a)pyrene (kg/day)		1	0.18	NA	0.26	1/Year	Calculated
Benzo(k)fluoranthene (kg/day)		1	0.18	NA	0.26	1/Year	Calculated
Hexachlorobenzene (kg/day)		1	0.03	NA	0.04	1/Year	Calculated

*Key
1. SWCB Water Quality Standards
3. SWCB Water Quality Management Plan
10. BPJ

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 031
stormwater from 3M

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Water Quality	EFFLUENT LIMITS: Monthly Average	Minimum	Maximum	MONITORING REQUIREMENTS: Frequency	Sample Type
Flow, MG		NA	NA	NL	1/3M	Est
Oil and Grease (mg/l)		NA	NA	NL	1/3M	Grab
Total Suspended Solids (mg/l)		NA	NA	NL	1/3M	Grab

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 032
stormwater from zone 3W

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NA	NA	NL	1/3M	Est
Oil and Grease (mg/l)			NA	NA	NL	1/3M	Grab
Total Suspended Solids (mg/l)			NA	NA	NL	1/3M	Grab

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 041
stormwater from zone G

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NA	NA	NL	1/3M	Est
Oil and Grease (mg/l)			NA	NA	NL	1/3M	Grab
Total Suspended Solids (mg/l)			NA	NA	NL	1/3M	Grab

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 044
stormwater from zone E

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/ Water Quality	EFFLUENT LIMITS: Monthly Average	Minimum	Maximum	MONITORING REQUIREMENTS: Frequency	Sample Type
Flow, MG		NA	NA	NL	1/6M	Est
Oil and Grease (mg/l)		NA	NA	NL	1/6M	Grab
Total Suspended Solids (mg/l)		NA	NA	NL	1/6M	Grab

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 050
stormwater from zone D

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NA	NA	NL	1/6M	Est
Oil and Grease (mg/l)			NA	NA	NL	1/6M	Grab
Total Suspended Solids (mg/l)			NA	NA	NL	1/6M	Grab
Nitrate plus nitrite (mg/l)			NA	NA	NL	1/6M	Grab
Dissolved lead (ug/l)			NA	NA	NL	1/6M	Grab
Dissolved zinc (ug/l)			NA	NA	NL	1/6M	Grab

Monitoring shall be rotated between outfalls 11A and 12A so that each is sampled once per year, if possible.

TABLE III
(X) Final Limitations
( ) Interim Limitations

Dates: From eff date
To exp date

STORMWATER MONITORING
OUTFALL 054
stormwater from zone C

SIC CODES 2892, 2873

Parameter	BASIS FOR LIMITS: Effluent Guidelines/	BASIS FOR LIMITS: Water Quality	EFFLUENT LIMITS: Monthly Average	EFFLUENT LIMITS: Minimum	EFFLUENT LIMITS: Maximum	MONITORING REQUIREMENTS: Frequency	MONITORING REQUIREMENTS: Sample Type
Flow, MG			NA	NA	NL	1/Year	Est
Total Suspended Solids (mg/l)			NA	NA	NL	1/Year	Grab
Dissolved Zinc (ug/l)			NA	NA	NL	1/Year	Grab

Attachments

A. USGS Topographic Map
B. Flow Frequency Memorandum
C. Site Visit Report
D. Ambient Water Quality Information
   - 2012 305b Watershed Summary Report
   - STORET Data (Station 9-NEW081.72)
E. Wasteload and Limit Calculations
   - Mixing Zone Calculations
   - Wasteload Allocation Spreadsheet
   - STATS Program Results
   - DO Model Results
F. Historical Limit Development
G. TMP Justification Memorandum
H. NPDES Permit Rating Worksheet

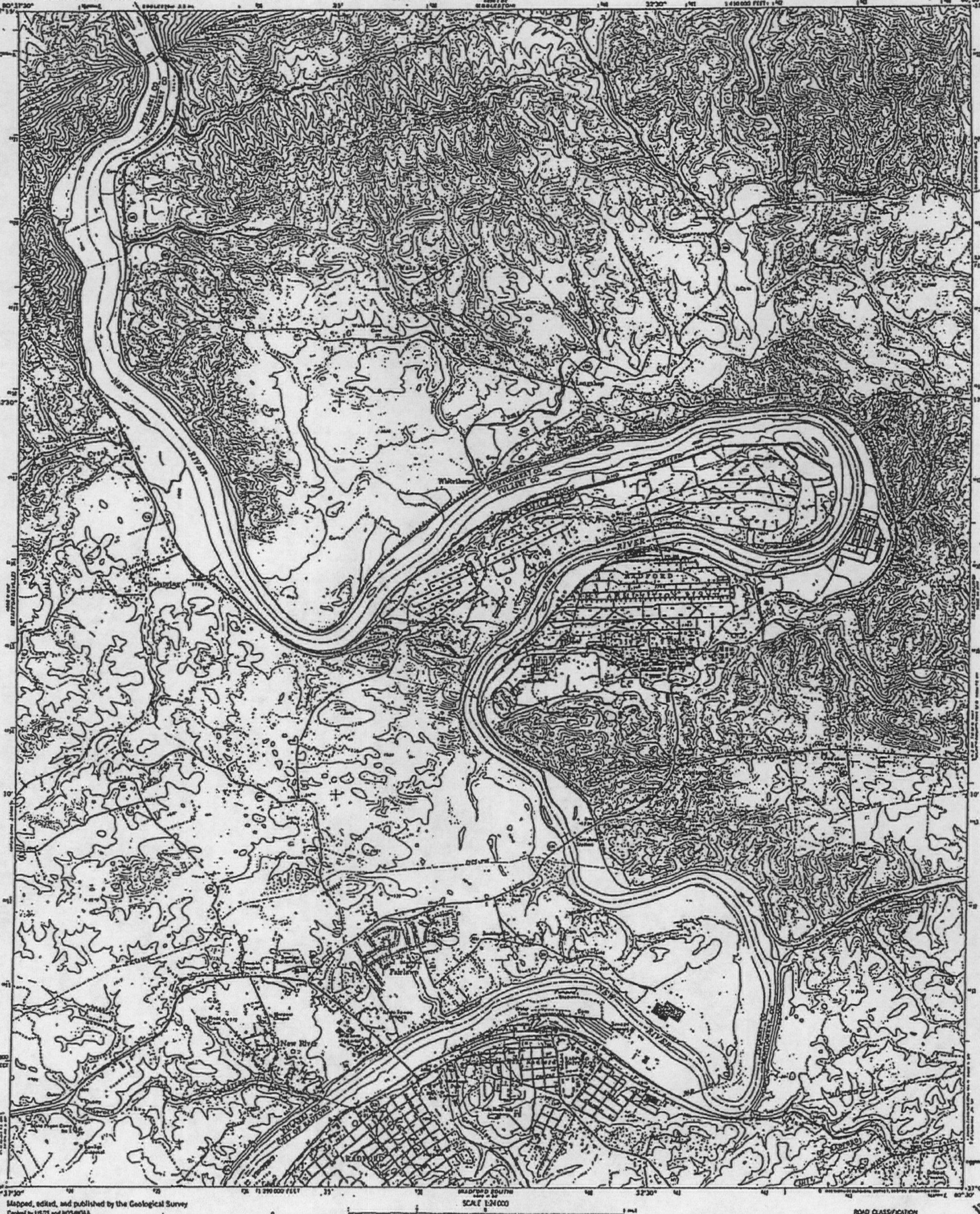
Attachment A

USGS Topographical Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COMMONWEALTH OF VIRGINIA
DIVISION OF MINERAL RESOURCES

RADFORD NORTH QUADRANGLE
VIRGINIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1965
Polyconic projection. 10,000-foot grid ticks based on Virginia coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue
1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 9 meters south and 37 meters west as shown by dashed corner ticks
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Red tint indicates areas in which only landmark buildings are shown
There may be private inholdings within the boundaries of the National or State reservations shown on this map

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

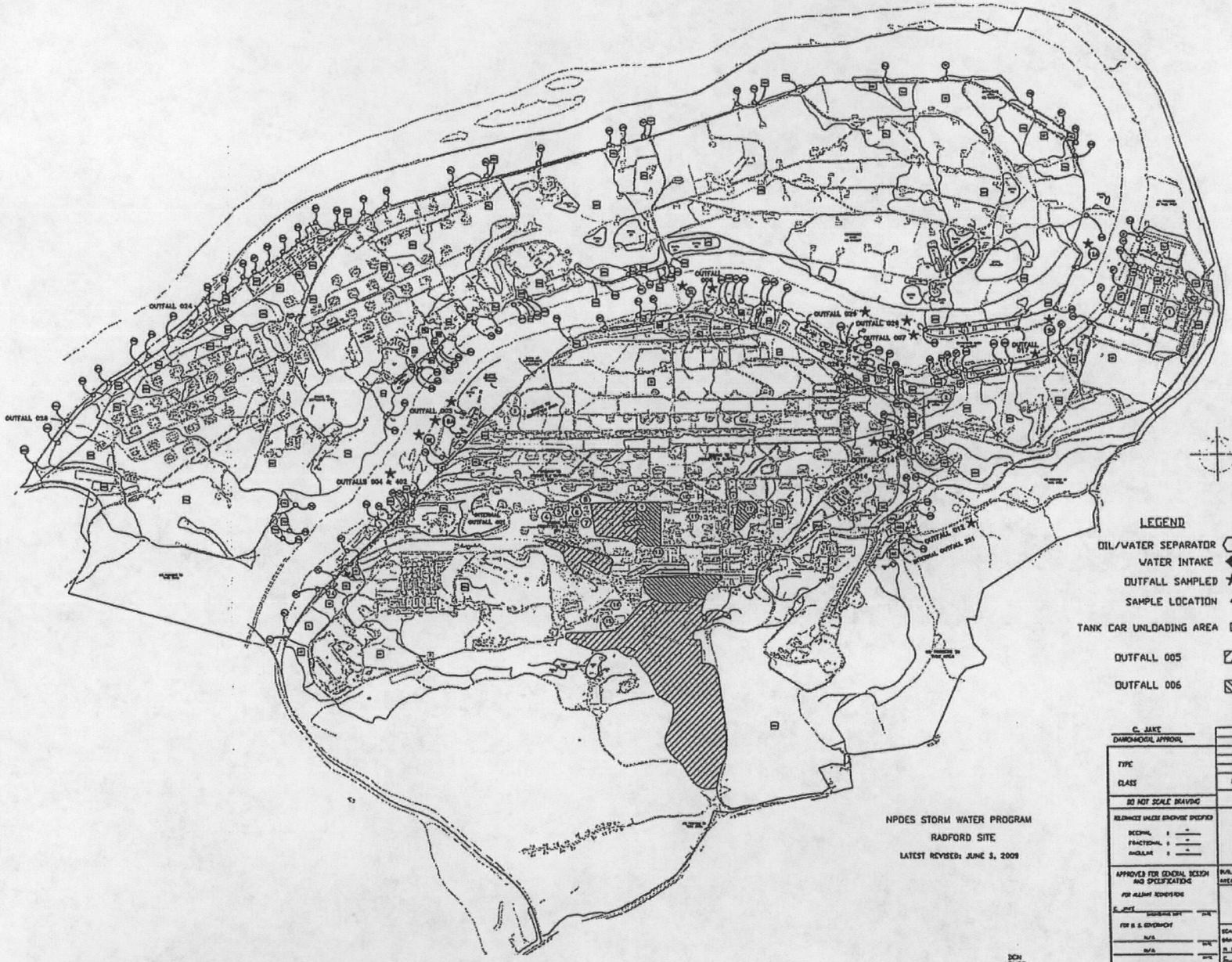
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND VIRGINIA DIVISION OF MINERAL RESOURCES, CHARLOTTESVILLE, VIRGINIA 22903
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U.S. Route
State Route

RADFORD NORTH, VA.
37080-B5-TF-024
1965
PHOTOREVISED 1984

21195

REVISIONS				
DESCRIPTION	DRAFTING		APPROVAL	
	DRAWN	DATE CHECKED	CHK	DATE SAFETY
REVISED FOR PERMIT				



LEGEND

- OIL/WATER SEPARATOR
- WATER INTAKE
- OUTFALL SAMPLED
- SAMPLE LOCATION
- TANK CAR UNLOADING AREA
- OUTFALL 005
- OUTFALL 006

NPDES STORM WATER PROGRAM

RADFORD SITE

LATEST REVISED: JUNE 3, 2009

DCN ENGR.

C. JAKE
DAMONMODEL APPROVAL

TYPE / CLASS	NO.	TITLE

DO NOT SCALE DRAWING

REFERENCE DRAWINGS

RELEVANCE UNLESS OTHERWISE SPECIFIED
DECIMAL ± ___
FRACTIONAL ± ___
ANGULAR ± ___

RADFORD ARMY AMMUNITION PLANT
U. S. ARMY
RADFORD, VIRGINIA

ALLIANT TECHSYSTEMS

APPROVED FOR GENERAL DESIGN AND SPECIFICATIONS
FOR ALLIANT TECHSYSTEMS
C. JAKE — SIGNATURE — DATE
FOR U. S. GOVERNMENT
N/A — SIGNATURE — DATE
N/A — SIGNATURE — DATE

BUILDING ____ NO. ____
AREA 020 DEPT. ENVIRONMENTAL

TITLE
NPDES STORM WATER

SCALE 1"=60' DATE 8/26/1996
DRAWN BY MGA CHECKED BY S. FIELDS
APPROVALS
S. FIELDS — SIGNATURE — DATE
S. WILLIAMS
C. JAKE — SIGNATURE — DATE
S. HALL — SIGNATURE — DATE

THIS DRAWING SHALL NOT BE USED OR REPRODUCED EITHER WHOLLY OR IN PART EXCEPT WHERE AUTHORIZED IN CONNECTION WITH PROCUREMENT FOR THE UNITED STATES GOVERNMENT

MPGJ — CONTRACT NO. DAAA09-96-C-0003

ACCOUNT NO.	TOTAL NO.	CLASS CODE	REV
000000	561112F	3200	L

Attachment B

Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
West Central Regional Office
3019 Peters Creek Road Roanoke, Virginia 24019

SUBJECT: Flow Frequency Determination
Radford Army Ammunition Plant - VA0000248

FROM: Kevin Harlow, WCRO

DATE: March 20, 2015

This memo is an update of the previous flow frequency determination memo dated February 22, 2010 concerning the subject VPDES permit. The Radford Army Ammunition Plant (RAAP) discharges via several outfalls on the New River and four outfalls on the Stroubles Creek. All of these outfalls are located near Radford, VA. Stream flow frequencies are required for several outfalls for use by the permit writer in developing effluent limitations for the VPDES permit.

The USGS has operated a continuous record gage on the New River at Radford, VA (#0317100) since 1940. The gage is approximately 6.0 miles upstream of the RAAP intake #1. The flow frequencies for the gage and discharge point are presented below. The values at the discharge points were calculated using drainage area proportions and account for the known withdrawals located between the gage and the outfalls. This analysis does not address any other withdrawals, discharges, or springs which may influence the flow in the New River between the gage and the downstream-most outfall (028) for RAAP.

New River at Radford, VA (#03171000):

Drainage Area = 2,748 mi^2

1Q10 = 465 MGD	High Flow 1Q10 = 543 MGD
7Q10 = 573 MGD	High Flow 7Q10 = 782 MGD
30Q5 = 737 MGD	HM = 1519 MGD
30Q10 = 659 MGD	High Flow 30Q10 = 1073 MGD
ANN AVG = 2453MGD	

The high flow months are January through May.

Using drainage area proportions, the river flows were projected to just above outfall 004. The withdrawals by the Radford Army Ammunition Plant (RAAP) intake #1 (Bldg. 408) and the Blacksburg, Christiansburg, VPI Water Authority (BCVPIWA) and the discharges from the Peppers Ferry STP and Christiansburg STP were incorporated into the analysis. The average discharged by the Peppers Ferry STP was 4.4 MGD. The average discharged by Christiansburg STP was 2.4 MGD. The withdrawal data for RAAP and the BCVPIWA were taken from the Virginia Water Use Data System for the period 2012-2014. The maximum daily withdrawal for RAAP #1 was 29.4 MGD while the BCVPIWA maximum daily withdrawal was 9.5 MGD.

New River above RAAP Outfall 004

Drainage Area = 2,791.27 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	519 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	762 MGD
30Q5	= 717 MGD	HM =	1511 MGD
30Q10	= 637 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2460 MGD			

Projecting 004 flows to 005 and 030,

New River above RAAP Outfall 005 and 030:

Drainage Area = 2,791.54 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	520 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	762 MGD
30Q5	= 717 MGD	HM =	1511 MGD
30Q10	= 637 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2460 MGD			

Projecting 005 flows to 006,

New River above RAAP Outfall 006:

Drainage Area = 2,792.33 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	520 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	763 MGD
30Q5	= 717 MGD	HM =	1511 MGD
30Q10	= 638 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2460 MGD			

Projecting 006 flows to 029,

New River above RAAP Outfall 029:

Drainage Area = 2,792.56 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	520 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	763 MGD
30Q5	= 717 MGD	HM =	1512 MGD
30Q10	= 638 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2461 MGD			

Projecting 029 flows to 026,

New River above RAAP Outfall 026:

Drainage Area = 2,792.712 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	520 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	763 MGD
30Q5	= 717 MGD	HM =	1512 MGD
30Q10	= 638 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2461 MGD			

Projecting 026 flows to 007,

New River above RAAP Outfall 007:

Drainage Area = 2,792.726 mi^2

1Q10	= 440 MGD	High Flow 1Q10 =	520 MGD
7Q10	= 550 MGD	High Flow 7Q10 =	763 MGD
30Q5	= 717 MGD	HM =	1512 MGD
30Q10	= 638 MGD	High Flow 30Q10 =	1058 MGD
ANN AVG = 2461 MGD			

Downstream of Outfall 007, Stroubles Creek enters the New River. RAAP operates two outfalls on the Stroubles Creek which require flow frequencies. The flows in Stroubles Creek were determined using the USGS continuous record gage on the Walker Creek at Bane, VA (#03173000) and drainage area proportions. This analysis does not address any withdrawals, discharges, or springs which may influence the flows in Stroubles Creek upstream of the discharge points.

Walker Creek at Bane, VA (#03173000):

Drainage Area = 305 mi^2

1Q10	= 19 MGD	High Flow 1Q10 =	29 MGD
7Q10	= 21 MGD	High Flow 7Q10 =	37 MGD
30Q5	= 26 MGD	HM =	72 MGD
30Q10	= 24 MGD	High Flow 30Q10 =	56 MGD
ANN AVG = 207 MGD			

Stroubles Creek at Outfall 012:

Drainage Area = 23.47 mi^2

1Q10	= 1.5 MGD	High Flow 1Q10 =	2.2 MGD
7Q10	= 1.6 MGD	High Flow 7Q10 =	2.8 MGD
30Q5	= 2.0 MGD	HM =	5.5 MGD
30Q10	= 1.8 MGD	High Flow 30Q10 =	4.3 MGD
ANN AVG = 16 MGD			

Projecting 012 flows to 014, 031, and 032,

Stroubles Creek at Outfall 014, 031, and 032:

Drainage Area = 24.19 mi^2

1Q10 = 1.5 MGD	High Flow 1Q10 = 2.3 MGD
7Q10 = 1.7 MGD	High Flow 7Q10 = 2.9 MGD
30Q5 = 2.1 MGD	HM = 5.7 MGD
30Q10 = 1.9 MGD	High Flow 30Q10 = 4.4 MGD
ANN AVG = 16 MGD	

Adding the Stroubles Creek flow and drainage area to 007:

New River below Stroubles Creek:

Drainage Area = 2816.97 mi^2

1Q10 = 442 MGD	High Flow 1Q10 = 522 MGD
7Q10 = 552 MGD	High Flow 7Q10 = 766 MGD
30Q5 = 719 MGD	HM = 1517 MGD
30Q10 = 640 MGD	High Flow 30Q10 = 1063 MGD
ANN AVG = 2477 MGD	

Lower Stroubles WWTP discharges into the New River between the New River below Stroubles Creek and Outfall 024. The average discharge from Lower Stroubles from 2012-2014 was 5.3 MGD.

New River above RAAP Outfall 024:

Drainage Area = 2,862.93 mi^2

1Q10 = 458 MGD	High Flow 1Q10 = 539 MGD
7Q10 = 570 MGD	High Flow 7Q10 = 788 MGD
30Q5 = 741 MGD	HM = 1556 MGD
30Q10 = 660 MGD	High Flow 30Q10 = 1091 MGD
ANN AVG = 2529 MGD	

Projecting 024 flows to 028,

New River above RAAP Outfall 028:

Drainage Area = 2,862.95 mi^2

1Q10 = 458 MGD	High Flow 1Q10 = 539 MGD
7Q10 = 570 MGD	High Flow 7Q10 = 788 MGD
30Q5 = 741 MGD	HM = 1556 MGD
30Q10 = 660 MGD	High Flow 30Q10 = 1091 MGD
ANN AVG = 2529 MGD	

Attachment C

Site Visit Report

DEPARTMENT OF ENVIRONMENTAL QUALITY – BLUE RIDGE REGIONAL OFFICE
VPDES STORM WATER FACILITY INSPECTION REPORT

FACILITY NAME:	**Radford Army Ammunition Plant (RAAP)**			PERMIT NO.:	**VA0000248**
FACILITY ADDRESS:	**State Route 114 - Radford, VA 24143**				
MAILING ADDRESS:	**P.O. Box 1 - Radford, VA 24143**				
FACILITY REPRESENTATIVES:	**Brad Jennings - U.S. Army** **Mary Ann Bogucki & Gregg Hatfield - BAE Systems**			CONTACT INFORMATION:	**(540) 639-8658**
INDUSTRIAL SECTORS:	**Sector C – Chemical and Allied Products** **Sector L – Landfills, Land Application Sites and Open Dumps** **Sector O – Steam Electric Power Generating Facilities, Including Coal Handling Areas** **Sector P – Transportation Facilities** **Sector TW – Treatment Works**				
SIC CODE(S):	**2821, 2869, 2873, 2892, 2899, 4911, 4952, 4953**				
INSPECTOR:	**Ryan L. Hendrix**	INSPECTION DATE:	**08/30/2013**	ANNOUNCED? (Y or N)	**Y**

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Does the facility have a SWPPP on site (Y or N)?	Y	Is the SWPPP being implemented (Y or N)?	Y

SWPPP REVIEW

ELEMENT ADDRESSED IN SWPPP?	(Y or N)	NOTES
Site location and drainage map	Y	
Outfalls and receiving waters	Y	
SWPPP implementation team	Y*	**The SWPPP implementation team needs to be updated.**
Material storage and inventory	Y	**The facility's spill prevention, control, and countermeasure (SPCC) plan also addresses material storage and inventory.**
Maintenance, loading, disposal, etc.	Y	
Pollutant sources	Y	
Title III Section 313 chemicals	Y	
Non-storm water discharges	Y	
Best Management Practices (BMP)	Y	
Good housekeeping	Y	
Storm water inspection reports	Y	
Spill/leak prevention and response	Y	**The facility's SPCC plan also addresses spill prevention and response.**
Sediment erosion control and runoff	Y	
Employee training	Y	
Certification statement	Y*	**The certification statement needs to be updated.**
Comment (s): **See the requests for corrective action section for additional details.**		

OUTFALL OBSERVATIONS

Outfall #	Condition of Effluent	Condition of Receiving Stream	Samples Collected (Y or N)
004	No discharge	Slightly Turbid	N
012	No discharge	Slightly Turbid	N
041 (3L)	No discharge	Slightly Turbid	N
041 (1H)	No discharge	Slightly Turbid	N
044 (15Z)	No discharge	Slightly Turbid	N
050 (11A)	No discharge	Slightly Turbid	N
050 (12A)	No discharge	Slightly Turbid	N
054 (16A)	No discharge	Slightly Turbid	N

OUTFALL DISCUSSION:

Outfall 004: This outfall is located on the northwest side of the Montgomery County side of the facility and drains storm water from the areas surrounding the acid tank battery, above ground storage tanks (AST), and coal pile area. Storm water flows by sheet flow to various collection points and is conveyed by a drainage ditch to outfall 004 and ultimately the New River.

Outfall 012: This outfall is located on the eastern side of the Montgomery County side of the facility and drains storm water from the areas surrounding the old TNT production facility. Storm water flows by sheet flow to various collection points and is conveyed by the storm water collection system to outfall 012 and ultimately Stroubles Creek.

Outfall 041: All outfalls within the 041 drainage area are located on the northern side of the Montgomery side of the facility and drain storm water from the areas surrounding 4th Roll Powder production facilities. Storm water flows by sheet flow to various collection points and is conveyed by the storm water collection system to various outfalls prior to discharging to the New River.

Outfall 044: All outfalls within the 044 drainage area are located on the northeastern side of the Montgomery side of the facility and drain storm water from the areas surrounding powder finishing facilities. Storm water flows by sheet flow to various collection points and is conveyed by the storm water collection system to various outfalls prior to discharging to the New River.

Outfall 050: All outfalls within the 050 drainage area are located on the eastern side of the Pulaski County side of the facility and drain storm water from the areas surrounding the magazine storage facilities. Storm water flows by sheet flow to various collection points and is conveyed by the storm water collection system to various outfalls prior to discharging to the New River.

Outfall 054: All outfalls within the 054 drainage area are located on the northwestern side of the Montgomery side of the facility and drain storm water from the areas surrounding C-Line Powder production facilities. Storm water flows by sheet flow to various collection points and is conveyed by the storm water collection system to various outfalls prior to discharging to the New River.

DESCRIPTION AND EFFECTIVENESS OF BMPs/CONTROLS USED ON SITE:

RAAP is a government owned, contractor operated industrial facility responsible for the manufacturing of propellants, explosives, and chemical materials for the U.S. Army. As such the facility is covered by multiple industrial sectors and implements a variety of sector specific control measures to address pollutants concern. However, the primary BMPs for the entire facility are limiting the exposure of pollutants, containment, and good housekeeping. No chemicals are exposed to storm water and all chemicals received are stored under roof and/or within containment areas. All storm water from containment areas is inspected/tested prior to being released and in most cases is released to the chemical sewer system.

The facility also tries to utilize vegetative buffers and swales as much as possible to minimize the amount of storm water that can flow into the industrial areas. Additionally, certain drainage areas have storm water retention and/or retention basins to control discharges and increase the capture of particulate matter from the industrial facilities. Good housekeeping practices appear to be in use and the site appeared well maintained and all pavement areas appeared free of particulates, spills, etc.

DEPARTMENT OF ENVIRONMENTAL QUALITY / BLUE RIDGE REGIONAL OFFICE
WASTEWATER FACILITY – INSPECTION REPORT
PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0000248	**06/10/2010**		**06/09/2015**

Facility Name	Address	Telephone Number
Radford Army Ammunition Plant	**Route 114 Radford, VA**	**(540) 639-7631**
Owner Name	**Address**	**Telephone Number**
U.S. Army and BAE Systems	**P.O. Box 1 Radford, VA 24143**	**(540) 639-7631**
Responsible Official	**Title**	**Telephone Number**
Lt. Col. Byron Penland Jay Stewart	**Commanding Officer – US Army Environmental Manager – BAE**	**(540) 639-7631 (540) 639-8658**
Responsible Operator	**Operator Cert. Class/number**	**Telephone Number**
Mr. Gregg Hatfield	**Class I – 1965000**	**(804) 847-7678 (Bioplant) (804) 639-7417 (Office)**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major		Major	X	Primary	
Non-federal		Minor		Minor		Secondary	X

INFLUENT CHARACTERISTICS:		DESIGN:
	Flow	
	Population Served	
	Connections Served	
	BOD_5	
	TSS	

EFFLUENT LIMITS: SPECIFY UNITS

Parameter	Minimum	Average	Maximum	Parameter	Minimum	Average	Maximum

PLEASE SEE ATTACHED EFFLUENT LIMITATIONS PAGE

	Receiving Stream	**New River and Stroubles Creek**	
	Basin	**New River**	
	Discharge Point (LONG)	**Multiple outfalls**	
	Discharge Point (LAT)		

Problems identified at last inspection: Corrected Not Corrected

There were no problems identified during the previous inspection.

SUMMARY

Requests for Corrective Action:

1. **RBC No. 4 - 2 was out of service at the time of inspection due to a motor and gearbox failure. The necessary replacement parts have been ordered and the new motor has already been received and is onsite. Please notify this office once all repairs have been made and the RBC is fully functional.**
2. **RBC No. 118 was out of service at the time of inspection due to a bearing failure. The necessary replacement parts had already been ordered and were onsite at the time of inspection. Please notify this office once all repairs have been made and the RBC is fully functional.**
   - **This request was addressed on November 01, 2012, when the facility forwarded correspondence showing that RBC No. 118 had been repaired and was placed back in service. No further action is required at this point in time.**
3. **The seal between the effluent weirs and the clarifier launders, for both secondary clarifiers, has completely come loose in places and is allowing wastewater to short circuit and flow under the effluent weirs. Additionally, there are sections of loose seal material in the effluent launders which are acting to block effluent flow and provide an area for solids to accumulate. Please submit a plan of action detailing how the facility intends to address this item.**

Comments:

There are no additional comments at this point in time.

DEPARTMENT OF ENVIRONMENTAL QUALITY – BLUE RIDGE REGIONAL OFFICE, ROANOKE
WASTEWATER FACILITY
INSPECTION REPORT
PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0000248	**06/10/2010**	**07/01/2013**	**06/9/2015**

Facility Name	Address	Telephone Number
Radford Army Ammunition Plant	**114 Pepper's Ferry Road (SR 114) Radford, VA**	**(540) 639-7631**
Owner Name	Address	Telephone Number
U.S. Army and BAE Systems Ordnance Systems, Inc.	**P.O. Box 1 Radford, VA 24143**	**(540) 639-7631**
Responsible Official	Title	Telephone Number
LTC Wm Byron Penland Jay Stewart	**Commanding Officer Environmental Manager**	**(540) 639-7631**
Responsible Operator	Operator Cert. Class/Number	Telephone Number
Greg Hatfield	**Class II - 1965006036**	**(540) 639-8320**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal	X	Major		Major	X	Primary	
Non-federal		Minor		Minor		Secondary	

INFLUENT CHARACTERISTICS:		DESIGN:
	Flow	**PS026 – 1.0 MGD PS028 – 0.7 MGD**
	Population Served	**~1500**
	Connections Served	**Unknown**
	BOD_5	
	TSS	

EFFLUENT LIMITS: SPECIFY UNITS

Parameter	Minimum	Average	Maximum	Parameter	Minimum	Average	Maximum

PLEASE SEE ATTACHED EFFLUENT LIMITATIONS PAGES

	Receiving Stream	**New River**
	Basin	**New River**
	Discharge Points (LAT)*	**PS026 - 37° 11' 29.85" N PS028 - 37° 11' 13.24" N‡**
	Discharge Points (LONG)*	**PS026 - 80° 31' 53.23" W PS028 - 80° 34' 28.60" W‡**

*** Latitude and longitude coordinates were verified with DEQ's GPS Data Reviewer. ‡ Taken at dechlorination unit.**

VPDES NO. **VA0000248**

Problems identified at last inspection:	Corrected	Not Corrected
1. Submit a schedule to remove the plants from the sludge drying beds.	[X]	[ ]
2. Submit a schedule to repair the P.S. 026 trickling filter spray ports.	[X]	[ ]
3. Remove the grass from the P.S. 026 chlorine contact tank.	[X]	[ ].

SUMMARY

Requests for action:

1. **Repair and/or replace the broken flow deflectors on the rotating distribution arms of the 026 trickling filter.**

2. **The 026 chlorine room fan and lights must activate automatically when the chlorine building's door is opened. In accordance with the regulation cited below, an addition outdoor switch must be provided to activate the lights before entering the 026 chlorine building.**

   From the State Water Control Board, Sewage Collection and Treatment Regulations (February 12, 2004), 9VAC 25-790-750 F.6. "The controls for the fans and lights shall be such that they can automatically operate when the door is opened if a remote disconnect or override switch is provided in an identifiable, safe, remote location and they can also be manually operated from the outside without opening the door."

3. **The temperature of the 026 digester is not maintained at an adequate temperature for microorganism activity (38 °F at time of inspection). Most digestion processes cease below 50 °F and as such, this tank's only current function is for sludge holding. The digester must be heated gradually (approximately 1 °F per day) toward an ideal range of 90 to 100 °F. If this course is taken, process control testing will be necessary to adequately monitor the digestion process. An alternative, is to maintain the digester's current status and consider routine pumping and hauling of the sludge contents to another facility for further sludge processing as noted in the Inspector's Comments below. This option will require a modification of the facility's current O&M manual.**

4. **Clean and refurbish the 026 sludge drying beds and return to service (see inspector's comments below). Routine maintenance should be scheduled and provided if the beds are restored to operational conditions.**

Inspector's Comments: *According to the RAAP Environmental Staff, sludge is only pumped from the 026 digester to the sand drying beds approximately once per year. As such, the facility may wish to obtain cost comparisons between annual pumping and hauling from the digester and refurbishing and maintaining the sand drying beds. The cost of pumping and hauling might be significantly cheaper. If pumping and hauling becomes the preferred method of sludge disposal, the current O&M manual would require modification to reflect this operational change.*

Attachment D

Ambient Water Quality Information

- STORET Data (Station 4ASRE022.71)
- 2012 305b Watershed Summary Report (Excerpt)

Store Data for Station 9-NEW081.72: Physical Parameters

Dry Season

Date	Temp (C)	Ph	Hardness
6/22/1999	18.5	7.92	78.0
7/26/1999	22.5	7.9	77.0
8/17/1999	23	7.71	69.6
9/21/1999	19.1	7.9	59.3
10/13/1999	16.9	7.84	75.2
11/16/1999	9	7.51	69.6
12/14/1999			54.2
6/26/2000	20.9	7.68	62.0
7/26/2000	20.6	7.55	72.6
8/16/2000	23.7	7.63	72.4
9/19/2000	19.1	7.49	75.9
10/18/2000	16.2	7.71	83.4
11/29/2000	8.5	8.01	63.3
12/27/2000	6.5	8.3	65.4
6/25/2001	17.3	7.27	114.0
7/17/2001	21.8	8.1	52.1
8/15/2001	22.1	7.61	68.9
9/11/2001	21.4	7.72	57.6
10/25/2001	17.5	8.33	40.1
11/27/2001			147.8
12/18/2001	10.6	8.48	44.5
6/25/2002	19.79	7.28	79.2
7/30/2002	23.08	7.23	74.5
8/20/2002	22.9	7.23	62.1
9/19/2002	21.75	7.61	101.0
10/31/2002	13.2	7.13	68.7
11/20/2002	10.55	7.6	106.0
12/12/2002	7.02	7.64	69.1
6/12/2003	17.26	7.79	103.0
8/19/2003	22.46	7.37	
10/27/2003	14.41	7.72	
12/22/2003	8.2	7.6	
6/22/2004	20.9	7.47	
8/25/2004	23.3	7.63	
10/27/2004	14.3	7.1	
12/1/2004	11.11	7.45	
6/7/2005	17.7	7.8	
8/10/2005	24	7.2	
10/27/2005	13.1	7.8	
12/19/2005	5.4	7.5	
6/8/2006	17.6	7	
8/14/2006	23.2	7.6	
10/5/2006	18.9	7.2	
12/14/2006	6.2	8.2	
7/17/2007	23.1	7.7	
9/27/2007	22.2	8.2	
11/29/2007	9.7	8.1	
7/2/2008	21.1	7.5	
9/10/2008	21.5	8.2	
11/19/2008	9.6	8.3	
7/21/2009	21.6	8.5	
9/21/2009	20.8	8.2	
11/17/2009	11.6	8.1	
7/20/2010	24.6	8	
9/2/2010	26.1	8	
10/25/2010	16.2	7.3	
11/18/2010	12	8.2	

Date	Temp (C)	Ph
7/19/2011	23.4	7.8
9/15/2011	20.5	8.5
11/29/2011	10.2	8.2
6/19/2012	21	7.8
8/22/2012	21.9	7.9
10/17/2012	14.3	8.3
12/12/2012	6.6	7.3
7/11/2013	21.19	7.37
7/30/2013	21.5	7.5
9/18/2013	20.1	7.7
11/18/2013	12.4	7.9
12/2/2013	7.4	7.5
6/9/2014	20	7.8
8/12/2014	20.43	7.47
10/2/2014	18.75	7.33
12/17/2014	7.66	8.21

Statistic	pH	Temp (C)	Hardness
Average			80.3
10th %'ile	7.3		
90th %'ile	8.3		
90% (Wet)		16.3	
90% (Ann)		22.3	

Wet Season (High Flow Months)

Date	Temp (C)	Ph	Hardness
1/28/1999	6.4	7.89	154.0
2/10/1999	6.3	8.16	76.0
3/30/1999	8.1	8.51	60.0
4/26/1999	12.5	8.18	126.0
5/10/1999	13.8	8.2	62.0
1/26/2000	1.9	7.52	65.1
2/14/2000	4.3	7.61	60.9
3/29/2000	11.4	7.94	61.0
4/6/2000	10.6	7.99	59.0
5/24/2000	16.3	7.9	92.0
5/24/2000	16.3	7.9	
1/17/2001	3.3	8.21	75.3
2/6/2001	8.2	8.4	155.0
3/8/2001	6.1	8.49	28.1
4/10/2001	13.1	7.89	73.4
5/17/2001	13.5	8.09	112.0
1/23/2002	6	8.01	67.8
2/25/2002	8.1	8.24	47.0
3/18/2002	8.5	8.09	109.0
4/30/2002	13.59	7.72	81.2
5/30/2002	16.98	7.58	89.3
1/22/2003	4.93	8.05	93.8
2/11/2003	3.1	8.23	73.4
3/10/2003	8.27	7.93	91.4
4/10/2003	10.56	8.12	178.0
2/18/2004	5.14	7.75	
4/21/2004	13.73	7.59	
2/17/2005	4.63	8.06	
4/19/2005	12.08	8.11	
2/21/2006	5.1	7.8	
4/6/2006	9.2	6.8	
1/17/2007	7.1	8	
3/20/2007	8.8	8.2	
5/9/2007	14.8	8.3	
1/23/2008	5.6	8	
3/5/2008	5.9	8.1	
5/15/2008	16.4		
1/22/2009	5.5	8.2	
3/10/2009	7.1	8.2	
5/12/2009	15.1	6.8	
1/28/2010	8.9	8.2	
3/24/2010	11.2	8.3	
5/18/2010	16.7	7.4	
5/26/2010	20.1	8.3	
1/20/2011	1.7	8.4	
3/24/2011	10	7.9	
5/11/2011	16.7	8.3	
5/18/2011	15.6	7.5	
1/25/2012	5.3	8.2	
4/3/2012	13	8.2	
1/15/2013	6.4	7.3	
3/7/2013	4.7	7.6	
5/23/2013	16.5	7.7	
2/19/2014	5.4	7.6	
4/29/2014	11.7	7.7	
1/20/2015	5.53	7.51	
3/11/2015	5.81	7.99	

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

New River Basin

Fact Sheet prepared for DCR Watershed: N22*

Cause Group Code: **N29R-01-PCB** **New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek**

Location: The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VA/WVA State Line and includes the tributaries Peak Creek and Reed Creek as described below.

City / County: Giles Co. Montgomery Co. Pulaski Co. Radford City

Use(s): Fish Consumption

Cause(s) / VA Category: PCB in Fish Tissue/ 5A

The Virginia Department of Health (VDH) issued a fish consumption advisory on August 6, 2001 for polychlorinated biphenyls (PCBs) for the lower portion of the New River (Rt. 114 Bridge downstream to the VA / WVA State Line - 52.0 miles) based on fish tissue collections from Carp. An Advisory extension to Claytor dam was issued 8/06/2003 (11.47 miles) recommends that no carp be consumed in these waters and no more than two meals per month of flathead and channel catfish. The VDH PCB Fish Consumption Advisory was further extended upstream on the New River (13 miles) to the I-77 Bridge to include the lower portions of Peak Creek (4.02 miles), Reed Creek (16.35 miles) and Claytor Lake (4,287 acres) on 12/02/2004. The VDH advises consumption should not exceed two meals per month for carp and smallmouth bass. The VDH level of concern is 50 parts per billion (ppb) in fish tissue.

There are eight fish tissue collection sites within the 2010 data window reporting exceedances of the WQS based 20 ppb fish tissue value (TV) (VDH 50 ppb). These data are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at http://www.deq.virginia.gov/fishtissue/fishtissue.html. A more detailed presentation of the data can also be found using an interactive mapping application at http://gisweb.deq.state.va.us/. The VDH Advisory information is also available via the web at http://www.vdh.virginia.gov/Epidemiology/PublicHealthToxicology/Advisories/.

9-SNC000.20- 2004 fish tissue finds with application of the new WQS TV for PCB (20 ppb) the addition of 3 species exceeding the new TV criterion. Rock Bass (size 16-20 cm) at 25.21, SM Bass (size 28.6-30.5 cm) at 22.13 and White sucker (1 fish) at 30.08 ppb. Stony Creek is therefore a 2010 addition based on the new WQS PCB tissue value of 20 ppb.

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N22R_NEW01A00 / New River / The New River mainstem from the confluence of Back Creek downstream to the Watershed Boundary at the Montgomery / Giles County Line.	5A	PCB in Fish Tissue		2002	2014	3.47
VAW-N22R_NEW02A00 / New River / New River mainstem from the Radford Army Arsenal Plant downstream intake near Whitethorne downstream to the confluence of Back Creek.	5A	PCB in Fish Tissue		2002	2014	2.88
VAW-N22R_NEW03A00 / New River / New River mainstem from the confluence of Stroubles Creek downstream to the Radford Army Arsenal Plant downstream water intake near Whitethorne.	5A	PCB in Fish Tissue		2002	2014	4.52
VAW-N22R_NEW04A00 / New River / New River mainstem from the Radford Army Arsenal Plant upstream intake/Pepper's Ferry Region POTW outfall downstream to the confluence of Stroubles Creek.	5A	PCB in Fish Tissue		2002	2014	2.35

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

New River Basin

Fact Sheet prepared for DCR Watershed: N22*

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N22R_NEW05A00 / New River / New River mainstem from the Blacksburg /Christiansburg /VPI Authority intake at Rt. 114 downstream to the Radford Army Arsenal Plant upstream intake / Pepper's Ferry Regional POTW outfall.	5A	PCB in Fish Tissue		2002	2014	1.77
VAW-N22R_NEW06A00 / New River / New River mainstem from the Watershed Boundary at the Crab Creek confluence downstream to the Blacksburg /Christiansburg /VPI Authority intake.	5A	PCB in Fish Tissue		2006	2018	1.73

New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek

DCR Watershed: N22*

Fish Consumption	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:			**16.72**

Sources:

Source Unknown

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

Attachment E

Wasteload and Limit Calculations

- Mixing Zone Calculations (MIXER)
- Wasteload Allocation Spreadsheet
- STATS Program Results
- DO Model

Mixing Zone Predictions for RAAP 004

Effluent Flow = 0.04 MGD
Stream 7Q10 = 550 MGD
Stream 30Q10 = 637 MGD
Stream 1Q10 = 440 MGD
Stream slope = .001 ft/ft
Stream width = 550 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.1685 ft
Length = 150743.34 ft
Velocity = .7139 ft/sec
Residence Time = 2.444 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
81.83% of the 7Q10 is used.

Mixing Zone Predictions @ 30Q10

Depth = 2.369 ft
Length = 139970.67 ft
Velocity = .7569 ft/sec
Residence Time = 2.1405 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
93.44% of the 30Q10 is used.

Mixing Zone Predictions @ 1Q10

Depth = 1.8961 ft
Length = 168700.38 ft
Velocity = .6532 ft/sec
Residence Time = 71.7418 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
1.39% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for RAAP 005

Effluent Flow = 0.41 MGD
Stream 7Q10 = 550 MGD
Stream 30Q10 = 637 MGD
Stream 1Q10 = 440 MGD
Stream slope = .001 ft/ft
Stream width = 400 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.6317 ft
Length = 67618.99 ft
Velocity = .8094 ft/sec
Residence Time = .9669 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10

may be used.

Mixing Zone Predictions @ 30Q10

Depth = 2.8753 ft
Length = 62760.18 ft
Velocity = .8579 ft/sec
Residence Time = .8467 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10
may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.3006 ft
Length = 75716.93 ft
Velocity = .7408 ft/sec
Residence Time = 28.3907 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
3.52% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

```
Mixing Zone Predictions for              RAAP 006

Effluent Flow = 11.0 MGD
Stream 7Q10   = 550 MGD
Stream 30Q10 = 638 MGD
Stream 1Q10   = 440 MGD
Stream slope  = .001 ft/ft
Stream width  = 550 ft
Bottom scale  =  3
Channel scale =  1

---------------------------------------------------

Mixing Zone Predictions @ 7Q10

Depth          = 2.1944 ft
Length         = 149249.26 ft
Velocity       = .7195 ft/sec
Residence Time = 2.4008 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
83.31% of the 7Q10 is used.

---------------------------------------------------

Mixing Zone Predictions @ 30Q10

Depth          = 2.3956 ft
Length         = 138661.97 ft
Velocity       = .7625 ft/sec
Residence Time = 2.1048 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
95.02% of the 30Q10 is used.

---------------------------------------------------

Mixing Zone Predictions @ 1Q10

Depth          = 1.9243 ft
Length         = 166620.62 ft
Velocity       = .6596 ft/sec
Residence Time = 70.1664 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
1.43% of the 1Q10 is used.

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Virginia DEQ Mixing Zone Analysis Version 2.1
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Mixing Zone Predictions for RAAP 007

Effluent Flow = 2.62 MGD
Stream 7Q10 = 550 MGD
Stream 30Q10 = 638 MGD
Stream 1Q10 = 440 MGD
Stream slope = .001 ft/ft
Stream width = 600 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.0632 ft
Length = 187123.22 ft
Velocity = .691 ft/sec
Residence Time = 3.1341 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
63.81% of the 7Q10 is used.

Mixing Zone Predictions @ 30Q10

Depth = 2.255 ft
Length = 173688.03 ft
Velocity = .7329 ft/sec
Residence Time = 2.7428 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
72.92% of the 30Q10 is used.

Mixing Zone Predictions @ 1Q10

Depth = 1.8053 ft
Length = 209265.38 ft
Velocity = .6325 ft/sec
Residence Time = 91.8972 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
1.09% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for RAAP 012

Effluent Flow = 0.004 MGD
Stream 7Q10 = 1.6 MGD
Stream 30Q10 = 1.8 MGD
Stream 1Q10 = 1.5 MGD
Stream slope = .001 ft/ft
Stream width = 10 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .763 ft
Length = 108.82 ft
Velocity = .3254 ft/sec
Residence Time = .0039 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10

may be used.

Mixing Zone Predictions @ 30Q10

Depth = .8222 ft
Length = 101.56 ft
Velocity = .3396 ft/sec
Residence Time = .0035 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire
30Q10
may be used.

Mixing Zone Predictions @ 1Q10

Depth = .7326 ft
Length = 112.98 ft
Velocity = .3178 ft/sec
Residence Time = .0988 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10

may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for RAAP 014

Effluent Flow = 0.1 MGD
Stream 7Q10 = 1.7 MGD
Stream 30Q10 = 1.9 MGD
Stream 1Q10 = 1.5 MGD
Stream slope = .001 ft/ft
Stream width = 10 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .821 ft
Length = 101.69 ft
Velocity = .3394 ft/sec
Residence Time = .0035 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .8779 ft
Length = 95.56 ft
Velocity = .3526 ft/sec
Residence Time = .0031 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .7616 ft
Length = 109.03 ft
Velocity = .3251 ft/sec
Residence Time = .0932 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

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Mixing Zone Predictions for             RAAP 024

Effluent Flow = 0.003 MGD
Stream 7Q10   = 570 MGD
Stream 30Q10 = 660 MGD
Stream 1Q10   = 458 MGD
Stream slope  = .001 ft/ft
Stream width  = 650 ft
Bottom scale  =  3
Channel scale =  1

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Mixing Zone Predictions @ 7Q10

Depth          = 2.0028 ft
Length         = 225224.55 ft
Velocity       = .6778 ft/sec
Residence Time = 3.8459 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
52.% of the 7Q10 is used.

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Mixing Zone Predictions @ 30Q10

Depth          = 2.1873 ft
Length         = 209209.89 ft
Velocity       = .7186 ft/sec
Residence Time = 3.3697 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
59.35% of the 30Q10 is used.

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Mixing Zone Predictions @ 1Q10

Depth          = 1.7559 ft
Length         = 251447.93 ft
Velocity       = .6212 ft/sec
Residence Time = 112.4389 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
.89% of the 1Q10 is used.

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Virginia DEQ Mixing Zone Analysis Version 2.1
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Mixing Zone Predictions for RAAP 026

Effluent Flow = 1.0 MGD
Stream 7Q10 = 550 MGD
Stream 30Q10 = 638 MGD
Stream 1Q10 = 440 MGD
Stream slope = .001 ft/ft
Stream width = 600 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.0595 ft
Length = 187405.29 ft
Velocity = .6902 ft/sec
Residence Time = 3.1425 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
63.64% of the 7Q10 is used.

Mixing Zone Predictions @ 30Q10

Depth = 2.2516 ft
Length = 173908.29 ft
Velocity = .7322 ft/sec
Residence Time = 2.749 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
72.75% of the 30Q10 is used.

Mixing Zone Predictions @ 1Q10

Depth = 1.8013 ft
Length = 209651.75 ft
Velocity = .6316 ft/sec
Residence Time = 92.2015 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
1.08% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for RAAP 028

Effluent Flow = 0.07 MGD
Stream 7Q10 = 570 MGD
Stream 30Q10 = 660 MGD
Stream 1Q10 = 458 MGD
Stream slope = .001 ft/ft
Stream width = 760 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.8226 ft
Length = 333373.19 ft
Velocity = .6371 ft/sec
Residence Time = 6.0565 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
33.02% of the 7Q10 is used.

Mixing Zone Predictions @ 30Q10

Depth = 1.9905 ft
Length = 309677.38 ft
Velocity = .6754 ft/sec
Residence Time = 5.3065 days

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
37.69% of the 30Q10 is used.

Mixing Zone Predictions @ 1Q10

Depth = 1.598 ft
Length = 372121.67 ft
Velocity = .5839 ft/sec
Residence Time = 177.0438 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
.56% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

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Mixing Zone Predictions for             RAAP 029

Effluent Flow = 0.795 MGD
Stream 7Q10   = 550 MGD
Stream 30Q10 = 638 MGD
Stream 1Q10   = 440 MGD
Stream slope  = .001 ft/ft
Stream width  = 500 ft
Bottom scale  =  3
Channel scale =  1

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Mixing Zone Predictions @ 7Q10

Depth          = 2.2993 ft
Length         = 118547.63 ft
Velocity       = .7417 ft/sec
Residence Time = 1.85 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10

may be used.

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Mixing Zone Predictions @ 30Q10

Depth          = 2.514 ft
Length         = 109986.05 ft
Velocity       = .7867 ft/sec
Residence Time = 1.6182 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire
30Q10
may be used.

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Mixing Zone Predictions @ 1Q10

Depth          = 2.0106 ft
Length         = 132671.89 ft
Velocity       = .6787 ft/sec
Residence Time = 54.2973 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more
than
1.84% of the 1Q10 is used.

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Virginia DEQ Mixing Zone Analysis Version 2.1
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Mixing Zone Predictions for RAAP - 030

Effluent Flow = 1.552 MGD
Stream 7Q10 = 550 MGD
Stream 30Q10 = 637 MGD
Stream 1Q10 = 440 MGD
Stream slope = 0.001 ft/ft
Stream width = 400 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.635 ft
Length = 67547.96 ft
Velocity = .8101 ft/sec
Residence Time = .9651 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10

may be used.

Mixing Zone Predictions @ 30Q10

Depth = 2.8783 ft
Length = 62703.75 ft
Velocity = .8585 ft/sec
Residence Time = .8453 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10
may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.3042 ft
Length = 75617.61 ft
Velocity = .7416 ft/sec
Residence Time = 28.3243 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than
3.53% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - General Stormwater Outfall Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	637 MGD
1Q10 (Wet season) =	519 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1511 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Discharge Flow =	0 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	5	--	--	na	9.9E+02	--	--	na	#DIV/0!	--	--	na	1.0E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Acrolein	0	--	--	na	9.3E+00	--	--	na	#DIV/0!	--	--	na	9.3E-01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	#DIV/0!	--	--	na	2.5E-01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Aldrin[C]	0	3.0E+00	--	na	5.0E-04	#DIV/0!	--	na	#DIV/0!	7.5E-01	--	na	5.0E-05	#DIV/0!	--	na	#DIV/0!	#DIV/0!	--	na	#DIV/0!
Ammonia-N (mg/l) (Yearly)	0	4.71E+00	9.23E-01	na	--	#DIV/0!	#DIV/0!	na	--	1.18E+00	2.31E-01	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Ammonia-N (mg/l) (High Flow)	0	4.71E+00	1.36E+00	na	--	#DIV/0!	#DIV/0!	na	--	1.18E+00	3.40E-01	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	#DIV/0!	--	--	na	4.0E+03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Antimony	0	--	--	na	6.4E+02	--	--	na	#DIV/0!	--	--	na	6.4E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Arsenic	0	3.4E+02	1.5E+02	na	--	#DIV/0!	#DIV/0!	na	--	8.5E+01	3.8E+01	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Benzene[C]	0	--	--	na	5.1E+02	--	--	na	#DIV/0!	--	--	na	5.1E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	#DIV/0!	--	--	na	2.0E-04	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Benzo (a) anthracene[C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Benzo (b) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Benzo (k) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Benzo (a) pyrene[C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Bis2-Chloroethyl Ether[C]	0	--	--	na	5.3E+00	--	--	na	#DIV/0!	--	--	na	5.3E-01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	#DIV/0!	--	--	na	6.5E+03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	na	2.2E+01	--	--	na	#DIV/0!	--	--	na	2.2E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Bromoform[C]	0	--	--	na	1.4E+03	--	--	na	#DIV/0!	--	--	na	1.4E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	#DIV/0!	--	--	na	1.9E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Cadmium	0	3.1E+00	9.5E-01	na	--	#DIV/0!	#DIV/0!	na	--	7.7E-01	2.4E-01	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Carbon Tetrachloride[C]	0	--	--	na	1.6E+01	--	--	na	#DIV/0!	--	--	na	1.6E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Chlordane[C]	0	2.4E+00	4.3E-03	na	8.1E-03	#DIV/0!	#DIV/0!	na	#DIV/0!	6.0E-01	1.1E-03	na	8.1E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Chloride	0	8.6E+05	2.3E+05	na	--	#DIV/0!	#DIV/0!	na	--	2.2E+05	5.8E+04	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
TRC	0	1.9E+01	1.1E+01	na	--	#DIV/0!	#DIV/0!	na	--	4.8E+00	2.8E+00	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	#DIV/0!	--	--	na	1.6E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	#DIV/0!	--	--	na	1.3E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Chloroform	0	--	--	na	1.1E+04	--	--	na	#DIV/0!	--	--	na	1.1E+03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	#DIV/0!	--	--	na	1.6E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	#DIV/0!	--	--	na	1.5E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	#DIV/0!	#DIV/0!	na	--	2.1E-02	1.0E-02	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Chromium III	0	4.8E+02	6.2E+01	na	--	#DIV/0!	#DIV/0!	na	--	1.2E+02	1.5E+01	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	#DIV/0!	#DIV/0!	na	--	4.0E+00	2.8E+00	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	#DIV/0!	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	1.8E-03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Copper	0	1.1E+01	7.4E+00	na	--	#DIV/0!	#DIV/0!	na	--	2.7E+00	1.9E+00	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	#DIV/0!	#DIV/0!	na	#DIV/0!	5.5E+00	1.3E+00	na	1.6E+03	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
DDD [C]	0	--	--	na	3.1E-03	--	--	na	#DIV/0!	--	--	na	3.1E-04	--	--	na	#DIV/0!	--	--	na	#DIV/0!
DDE [C]	0	--	--	na	2.2E-03	--	--	na	#DIV/0!	--	--	na	2.2E-04	--	--	na	#DIV/0!	--	--	na	#DIV/0!
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	#DIV/0!	#DIV/0!	na	#DIV/0!	2.8E-01	2.5E-04	na	2.2E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Demeton	0	--	1.0E-01	na	--	--	#DIV/0!	na	--	--	2.5E-02	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	#DIV/0!	#DIV/0!	na	--	4.3E-02	4.3E-02	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	#DIV/0!	--	--	na	1.3E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	#DIV/0!	--	--	na	9.6E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	#DIV/0!	--	--	na	1.9E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	#DIV/0!	--	--	na	2.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	#DIV/0!	--	--	na	1.7E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	#DIV/0!	--	--	na	3.7E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	#DIV/0!	--	--	na	7.1E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	#DIV/0!	--	--	na	1.0E+03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	#DIV/0!	--	--	na	2.9E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	#DIV/0!	--	--	na	1.5E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	#DIV/0!	--	--	na	2.1E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	6.0E-02	1.4E-02	na	5.4E-05	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	#DIV/0!	--	--	na	4.4E+03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	#DIV/0!	--	--	na	8.5E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	#DIV/0!	--	--	na	1.1E+05	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	#DIV/0!	--	--	na	4.5E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	#DIV/0!	--	--	na	5.3E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	#DIV/0!	--	--	na	2.8E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	#DIV/0!	--	--	na	3.4E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	#DIV/0!	--	--	na	5.1E-09	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	#DIV/0!	--	--	na	2.0E-01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	#DIV/0!	#DIV/0!	na	#DIV/0!	5.5E-02	1.4E-02	na	8.9E+00	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	#DIV/0!	#DIV/0!	na	#DIV/0!	5.5E-02	1.4E-02	na	8.9E+00	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	#DIV/0!	#DIV/0!	--	--	5.5E-02	1.4E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	#DIV/0!	--	--	na	8.9E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	#DIV/0!	#DIV/0!	na	#DIV/0!	2.2E-02	9.0E-03	na	6.0E-03	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	#DIV/0!	--	--	na	3.0E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	#DIV/0!	--	--	na	2.1E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	#DIV/0!	--	--	na	1.4E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Fluorene	0	--	--	na	5.3E+03	--	--	na	#DIV/0!	--	--	na	5.3E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	#DIV/0!	na	--	--	2.5E-03	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	1.3E-01	9.5E-04	na	7.9E-05	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	1.3E-01	9.5E-04	na	3.9E-05	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	#DIV/0!	--	--	na	2.9E-04	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	#DIV/0!	--	--	na	1.8E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	#DIV/0!	--	--	na	4.9E-03	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	#DIV/0!	--	--	na	1.7E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	#DIV/0!	--	na	#DIV/0!	2.4E-01	--	na	1.8E-01	#DIV/0!	--	na	#DIV/0!	#DIV/0!	--	na	#DIV/0!
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	#DIV/0!	--	--	na	1.1E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	#DIV/0!	--	--	na	3.3E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	#DIV/0!	na	--	--	5.0E-01	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	#DIV/0!	--	--	na	1.8E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	#DIV/0!	--	--	na	9.6E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Kepone	0	--	0.0E+00	na	--	--	#DIV/0!	na	--	--	0.0E+00	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Lead	0	9.0E+01	1.0E+01	na	--	#DIV/0!	#DIV/0!	na	--	2.2E+01	2.6E+00	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
Malathion	0	--	1.0E-01	na	--	--	#DIV/0!	na	--	--	2.5E-02	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.5E-01	1.9E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	#DIV/0!	--	--	na	1.5E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	#DIV/0!	--	--	na	5.9E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Methoxychlor	0	--	3.0E-02	na	--	--	#DIV/0!	na	--	--	7.5E-03	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Mirex	0	--	0.0E+00	na	--	--	#DIV/0!	na	--	--	0.0E+00	na	--	--	#DIV/0!	na	--	--	#DIV/0!	na	--
Nickel	0	1.5E+02	1.7E+01	na	4.6E+03	#DIV/0!	#DIV/0!	na	#DIV/0!	3.8E+01	4.2E+00	na	4.6E+02	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	#DIV/0!	--	--	na	6.9E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	#DIV/0!	--	--	na	3.0E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	#DIV/0!	--	--	na	6.0E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	#DIV/0!	--	--	na	5.1E-01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Nonylphenol	0	2.8E+01	6.6E+00	--	--	#DIV/0!	#DIV/0!	na	--	7.0E+00	1.7E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	#DIV/0!	#DIV/0!	na	--	1.6E-02	3.3E-03	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	#DIV/0!	na	#DIV/0!	--	3.5E-03	na	6.4E-05	--	#DIV/0!	na	#DIV/0!	--	#DIV/0!	na	#DIV/0!
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	na	3.0E+01	#DIV/0!	#DIV/0!	na	#DIV/0!	2.9E+00	2.3E+00	na	3.0E+00	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Phenol	0	--	--	na	8.6E+05	--	--	na	#DIV/0!	--	--	na	8.6E+04	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Pyrene	0	--	--	na	4.0E+03	--	--	na	#DIV/0!	--	--	na	4.0E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	#DIV/0!	#DIV/0!	na	#DIV/0!	5.0E+00	1.3E+00	na	4.2E+02	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Silver	0	2.4E+00	--	na	--	#DIV/0!	--	na	--	5.9E-01	--	na	--	#DIV/0!	--	na	--	#DIV/0!	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	#DIV/0!	--	--	na	4.0E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	#DIV/0!	--	--	na	3.3E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Thallium	0	--	--	na	4.7E-01	--	--	na	#DIV/0!	--	--	na	4.7E-02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Toluene	0	--	--	na	6.0E+03	--	--	na	#DIV/0!	--	--	na	6.0E+02	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	#DIV/0!	#DIV/0!	na	#DIV/0!	1.8E-01	5.0E-05	na	2.8E-04	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!
Tributyltin	0	4.6E-01	7.2E-02	na	--	#DIV/0!	#DIV/0!	na	--	1.2E-01	1.8E-02	na	--	#DIV/0!	#DIV/0!	na	--	#DIV/0!	#DIV/0!	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	#DIV/0!	--	--	na	7.0E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	#DIV/0!	--	--	na	1.6E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	#DIV/0!	--	--	na	3.0E+01	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	#DIV/0!	--	--	na	2.4E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	#DIV/0!	--	--	na	2.4E+00	--	--	na	#DIV/0!	--	--	na	#DIV/0!
Zinc	0	9.7E+01	9.8E+01	na	2.6E+04	#DIV/0!	#DIV/0!	na	#DIV/0!	2.4E+01	2.5E+01	na	2.6E+03	#DIV/0!	#DIV/0!	na	#DIV/0!	#DIV/0!	#DIV/0!	na	#DIV/0!

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	#DIV/0!
Arsenic	#DIV/0!
Barium	na
Cadmium	#DIV/0!
Chromium III	#DIV/0!
Chromium VI	#DIV/0!
Copper	#DIV/0!
Iron	na
Lead	#DIV/0!
Manganese	na
Mercury	#DIV/0!
Nickel	#DIV/0!
Selenium	#DIV/0!
Silver	#DIV/0!
Zinc	#DIV/0!

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 004 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	637 MGD
1Q10 (Wet season) =	519 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1511 MGD

Mixing Information

Annual - 1Q10 Mix =	1.39 %
- 7Q10 Mix =	81.83 %
- 30Q10 Mix =	93.44 %
Wet Season - 1Q10 Mix =	1.39 %
- 30Q10 Mix =	93.44 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	7.4 SU
10% Maximum pH =	6.6 SU
Discharge Flow =	0.04 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	1.2E+07	1.8E+07	--	--	6.7E+01	9.9E+01	--	--	1.2E+06	1.8E+06	--	--	1.2E+06	1.8E+06
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	1.1E+05	1.7E+05	--	--	6.1E-01	9.3E-01	--	--	1.1E+04	1.7E+04	--	--	1.1E+04	1.7E+04
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	1.9E+04	9.4E+04	--	--	5.1E-02	2.5E-01	--	--	1.9E+03	9.4E+03	--	--	1.9E+03	9.4E+03
Aldrin[C]	0	3.0E+00	--	4.9E-04	5.0E-04	4.6E+02	--	1.9E+01	1.9E+01	7.5E-01	--	4.9E-05	5.0E-05	8.3E+03	--	1.9E+00	1.9E+00	4.6E+02	--	1.9E+00	1.9E+00
Ammonia-N (mg/l) (Yearly)	0	4.89E+00	9.23E-01	--	--	7.53E+02	1.37E+04	--	--	1.18E+00	2.31E-01	--	--	1.30E+04	3.68E+03	--	--	7.53E+02	3.68E+03	--	--
Ammonia-N (mg/l) (High Flow)	0	4.87E+00	1.36E+00	--	--	8.83E+02	3.36E+04	--	--	1.18E+00	3.40E-01	--	--	1.53E+04	8.99E+03	--	--	8.83E+02	8.99E+03	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	1.5E+08	7.2E+08	--	--	8.3E+02	4.0E+03	--	--	1.5E+07	7.2E+07	--	--	1.5E+07	7.2E+07
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	1.0E+05	1.1E+07	--	--	5.6E-01	6.4E+01	--	--	1.0E+04	1.1E+06	--	--	1.0E+04	1.1E+06
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	5.2E+04	1.7E+06	1.8E+05	--	8.5E+01	3.8E+01	1.0E+00	--	9.4E+05	5.2E+05	1.8E+04	--	5.2E+04	5.2E+05	1.8E+04	--
Barium	0	--	--	2.0E+03	--	--	--	3.6E+07	--	--	--	2.0E+02	--	--	--	3.6E+06	--	--	--	3.6E+06	--
Benzene[C]	0	--	--	2.2E+01	5.1E+02	--	--	8.3E+05	1.9E+07	--	--	2.2E+00	5.1E+01	--	--	8.3E+04	1.9E+06	--	--	8.3E+04	1.9E+06
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	3.2E+01	7.6E+01	--	--	8.6E-05	2.0E-04	--	--	3.2E+00	7.6E+00	--	--	3.2E+00	7.6E+00
Benzo (a) anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
Benzo (b) fluoranthene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
Benzo (k) fluoranthene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
Benzo (a) pyrene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
Bis2-Chloroethyl Ether[C]	0	--	--	3.0E-01	5.3E+00	--	--	1.1E+04	2.0E+05	--	--	3.0E-02	5.3E-01	--	--	1.1E+03	2.0E+04	--	--	1.1E+03	2.0E+04
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	2.5E+07	1.2E+09	--	--	1.4E+02	6.5E+03	--	--	2.5E+06	1.2E+08	--	--	2.5E+06	1.2E+08
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	1.2E+01	2.2E+01	--	--	4.5E+05	8.3E+05	--	--	1.2E+00	2.2E+00	--	--	4.5E+04	8.3E+04	--	--	4.5E+04	8.3E+04
Bromoform[C]	0	--	--	4.3E+01	1.4E+03	--	--	1.6E+06	5.3E+07	--	--	4.3E+00	1.4E+02	--	--	1.6E+05	5.3E+06	--	--	1.6E+05	5.3E+06
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	2.7E+07	3.4E+07	--	--	1.5E+02	1.9E+02	--	--	2.7E+06	3.4E+06	--	--	2.7E+06	3.4E+06
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	4.7E+02	1.1E+04	9.0E+04	--	7.7E-01	2.4E-01	5.0E-01	--	8.4E+03	3.3E+03	9.0E+03	--	4.7E+02	3.3E+03	9.0E+03	--
Carbon Tetrachloride[C]	0	--	--	2.3E+00	1.6E+01	--	--	8.7E+04	6.0E+05	--	--	2.3E-01	1.6E+00	--	--	8.7E+03	6.0E+04	--	--	8.7E+03	6.0E+04
Chlordane[C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	3.7E+02	4.8E+01	3.0E+02	3.1E+02	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.6E+03	1.5E+01	3.0E+01	3.1E+01	3.7E+02	1.5E+01	3.0E+01	3.1E+01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.3E+08	2.6E+09	4.5E+09	--	2.2E+05	5.8E+04	2.5E+04	--	2.4E+09	7.9E+08	4.5E+08	--	1.3E+08	7.9E+08	4.5E+08	--
TRC	0	1.9E+01	1.1E+01	--	--	2.9E+03	1.2E+05	--	--	4.8E+00	2.8E+00	--	--	5.2E+04	3.8E+04	--	--	2.9E+03	3.8E+04	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	2.3E+06	2.9E+07	--	--	1.3E+01	1.6E+02	--	--	2.3E+05	2.9E+06	--	--	2.3E+05	2.9E+06

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	1.5E+05	4.9E+06	--	--	4.0E-01	1.3E+01	--	--	1.5E+04	4.9E+05	--	--	1.5E+04	4.9E+05
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	6.1E+06	2.0E+08	--	--	3.4E+01	1.1E+03	--	--	6.1E+05	2.0E+07	--	--	6.1E+05	2.0E+07
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.8E+07	2.9E+07	--	--	1.0E+02	1.6E+02	--	--	1.8E+06	2.9E+06	--	--	1.8E+06	2.9E+06
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	1.5E+06	2.7E+06	--	--	8.1E+00	1.5E+01	--	--	1.5E+05	2.7E+05	--	--	1.5E+05	2.7E+05
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.3E+01	4.6E+02	--	--	2.1E-02	1.0E-02	--	--	2.3E+02	1.4E+02	--	--	1.3E+01	1.4E+02	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	7.3E+04	7.0E+05	--	--	1.2E+02	1.5E+01	--	--	1.3E+06	2.1E+05	--	--	7.3E+04	2.1E+05	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.5E+03	1.2E+05	--	--	4.0E+00	2.8E+00	--	--	4.4E+04	3.8E+04	--	--	2.5E+03	3.8E+04	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.8E+06	--	--	--	1.0E+01	--	--	--	1.8E+05	--	--	--	1.8E+05	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	3.8E-04	1.8E-03	--	--	1.4E+01	6.8E+01	--	--	1.4E+01	6.8E+01
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	1.7E+03	8.4E+04	2.3E+07	--	2.7E+00	1.9E+00	1.3E+02	--	3.0E+04	2.6E+04	2.3E+06	--	1.7E+03	2.6E+04	2.3E+06	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	3.4E+03	5.9E+04	2.5E+06	2.9E+08	5.5E+00	1.3E+00	1.4E+01	1.6E+03	6.1E+04	1.8E+04	2.5E+05	2.9E+07	3.4E+03	1.8E+04	2.5E+05	2.9E+07
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	1.2E+02	1.2E+02	--	--	3.1E-04	3.1E-04	--	--	1.2E+01	1.2E+01	--	--	1.2E+01	1.2E+01
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	8.3E+01	8.3E+01	--	--	2.2E-04	2.2E-04	--	--	8.3E+00	8.3E+00	--	--	8.3E+00	8.3E+00
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.7E+02	1.1E+01	8.3E+01	8.3E+01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.0E+03	3.4E+00	8.3E+00	8.3E+00	1.7E+02	3.4E+00	8.3E+00	8.3E+00
Demeton	0	--	1.0E-01	--	--	--	1.1E+03	--	--	--	2.5E-02	--	--	--	3.4E+02	--	--	--	3.4E+02	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	2.6E+01	1.9E+03	--	--	4.3E-02	4.3E-02	--	--	4.7E+02	5.8E+02	--	--	2.6E+01	5.8E+02	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	7.5E+06	2.3E+07	--	--	4.2E+01	1.3E+02	--	--	7.5E+05	2.3E+06	--	--	7.5E+05	2.3E+06
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	5.7E+06	1.7E+07	--	--	3.2E+01	9.6E+01	--	--	5.7E+05	1.7E+06	--	--	5.7E+05	1.7E+06
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	1.1E+06	3.4E+06	--	--	6.3E+00	1.9E+01	--	--	1.1E+05	3.4E+05	--	--	1.1E+05	3.4E+05
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	7.9E+03	1.1E+04	--	--	2.1E-02	2.8E-02	--	--	7.9E+02	1.1E+03	--	--	7.9E+02	1.1E+03
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	2.1E+05	6.4E+06	--	--	5.5E-01	1.7E+01	--	--	2.1E+04	6.4E+05	--	--	2.1E+04	6.4E+05
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	1.4E+05	1.4E+07	--	--	3.8E-01	3.7E+01	--	--	1.4E+04	1.4E+06	--	--	1.4E+04	1.4E+06
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	5.9E+06	1.3E+08	--	--	3.3E+01	7.1E+02	--	--	5.9E+05	1.3E+07	--	--	5.9E+05	1.3E+07
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	2.5E+06	1.8E+08	--	--	1.4E+01	1.0E+03	--	--	2.5E+05	1.8E+07	--	--	2.5E+05	1.8E+07
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	1.4E+06	5.2E+06	--	--	7.7E+00	2.9E+01	--	--	1.4E+05	5.2E+05	--	--	1.4E+05	5.2E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.8E+06	--	--	--	1.0E+01	--	--	--	1.8E+05	--	--	--	1.8E+05	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	1.9E+05	5.7E+06	--	--	5.0E-01	1.5E+01	--	--	1.9E+04	5.7E+05	--	--	1.9E+04	5.7E+05
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	1.3E+05	7.9E+06	--	--	3.4E-01	2.1E+01	--	--	1.3E+04	7.9E+05	--	--	1.3E+04	7.9E+05
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	3.7E+01	6.3E+02	2.0E+01	2.0E+01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.6E+02	1.9E+02	2.0E+00	2.0E+00	3.7E+01	1.9E+02	2.0E+00	2.0E+00
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	3.0E+08	7.9E+08	--	--	1.7E+03	4.4E+03	--	--	3.0E+07	7.9E+07	--	--	3.0E+07	7.9E+07
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	6.8E+06	1.5E+07	--	--	3.8E+01	8.5E+01	--	--	6.8E+05	1.5E+06	--	--	6.8E+05	1.5E+06
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	4.8E+09	2.0E+10	--	--	2.7E+04	1.1E+05	--	--	4.8E+08	2.0E+09	--	--	4.8E+08	2.0E+09
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	3.6E+07	8.1E+07	--	--	2.0E+02	4.5E+02	--	--	3.6E+06	8.1E+06	--	--	3.6E+06	8.1E+06
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	1.2E+06	9.5E+07	--	--	6.9E+00	5.3E+02	--	--	1.2E+05	9.5E+06	--	--	1.2E+05	9.5E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	2.3E+05	5.0E+06	--	--	1.3E+00	2.8E+01	--	--	2.3E+04	5.0E+05	--	--	2.3E+04	5.0E+05
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	4.2E+04	1.3E+06	--	--	1.1E-01	3.4E+00	--	--	4.2E+03	1.3E+05	--	--	4.2E+03	1.3E+05
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	9.0E-04	9.1E-04	--	--	5.0E-09	5.1E-09	--	--	9.0E-05	9.1E-05	--	--	9.0E-05	9.1E-05
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	1.4E+04	7.6E+04	--	--	3.6E-02	2.0E-01	--	--	1.4E+03	7.6E+03	--	--	1.4E+03	7.6E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.4E+01	6.3E+02	1.1E+06	1.6E+06	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.1E+02	1.9E+02	1.1E+05	1.6E+05	3.4E+01	1.9E+02	1.1E+05	1.6E+05
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.4E+01	6.3E+02	1.1E+06	1.6E+06	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.1E+02	1.9E+02	1.1E+05	1.6E+05	3.4E+01	1.9E+02	1.1E+05	1.6E+05
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.4E+01	6.3E+02	--	--	5.5E-02	1.4E-02	--	--	6.1E+02	1.9E+02	--	--	3.4E+01	1.9E+02	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	1.1E+06	1.6E+06	--	--	6.2E+00	8.9E+00	--	--	1.1E+05	1.6E+05	--	--	1.1E+05	1.6E+05
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.3E+01	4.1E+02	1.1E+03	1.1E+03	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.4E+02	1.2E+02	1.1E+02	1.1E+02	1.3E+01	1.2E+02	1.1E+02	1.1E+02
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	5.2E+03	5.4E+03	--	--	2.9E-02	3.0E-02	--	--	5.2E+02	5.4E+02	--	--	5.2E+02	5.4E+02

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	9.5E+06	3.8E+07	--	--	5.3E+01	2.1E+02	--	--	9.5E+05	3.8E+06	--	--	9.5E+05	3.8E+06
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	2.3E+06	2.5E+06	--	--	1.3E+01	1.4E+01	--	--	2.3E+05	2.5E+05	--	--	2.3E+05	2.5E+05
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	2.0E+07	9.5E+07	--	--	1.1E+02	5.3E+02	--	--	2.0E+06	9.5E+06	--	--	2.0E+06	9.5E+06
Foaming Agents	0	--	--	5.0E+02	--	--	--	9.0E+06	--	--	--	5.0E+01	--	--	--	9.0E+05	--	--	--	9.0E+05	--
Guthion	0	--	1.0E-02	--	--	--	1.1E+02	--	--	--	2.5E-03	--	--	--	3.4E+01	--	--	--	3.4E+01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	8.0E+01	4.3E+01	3.0E+01	3.0E+01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.4E+03	1.3E+01	3.0E+00	3.0E+00	8.0E+01	1.3E+01	3.0E+00	3.0E+00
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	8.0E+01	4.3E+01	1.5E+01	1.5E+01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.4E+03	1.3E+01	1.5E+00	1.5E+00	8.0E+01	1.3E+01	1.5E+00	1.5E+00
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.1E+02	1.1E+02	--	--	2.8E-04	2.9E-04	--	--	1.1E+01	1.1E+01	--	--	1.1E+01	1.1E+01
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	1.7E+05	6.8E+06	--	--	4.4E-01	1.8E+01	--	--	1.7E+04	6.8E+05	--	--	1.7E+04	6.8E+05
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	9.8E+02	1.9E+03	--	--	2.6E-03	4.9E-03	--	--	9.8E+01	1.9E+02	--	--	9.8E+01	1.9E+02
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	3.4E+03	6.4E+03	--	--	9.1E-03	1.7E-02	--	--	3.4E+02	6.4E+02	--	--	3.4E+02	6.4E+02
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.5E+02	--	3.7E+04	6.8E+04	2.4E-01	--	9.8E-02	1.8E-01	2.6E+03	--	3.7E+03	6.8E+03	1.5E+02	--	3.7E+03	6.8E+03
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	7.2E+05	2.0E+07	--	--	4.0E+00	1.1E+02	--	--	7.2E+04	2.0E+06	--	--	7.2E+04	2.0E+06
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	5.3E+05	1.2E+06	--	--	1.4E+00	3.3E+00	--	--	5.3E+04	1.2E+05	--	--	5.3E+04	1.2E+05
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.3E+04	--	--	--	5.0E-01	--	--	--	6.9E+03	--	--	--	6.9E+03	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+03	6.8E+03	--	--	3.8E-03	1.8E-02	--	--	1.4E+02	6.8E+02	--	--	1.4E+02	6.8E+02
Iron	0	--	--	3.0E+02	--	--	--	5.4E+06	--	--	--	3.0E+01	--	--	--	5.4E+05	--	--	--	5.4E+05	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	1.3E+07	3.6E+08	--	--	3.5E+01	9.6E+02	--	--	1.3E+06	3.6E+07	--	--	1.3E+06	3.6E+07
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	1.4E+04	1.1E+05	2.7E+05	--	2.2E+01	2.6E+00	1.5E+00	--	2.5E+05	3.5E+04	2.7E+04	--	1.4E+04	3.5E+04	2.7E+04	--
Malathion	0	--	1.0E-01	--	--	--	1.1E+03	--	--	--	2.5E-02	--	--	--	3.4E+02	--	--	--	3.4E+02	--	--
Manganese	0	--	--	5.0E+01	--	--	--	9.0E+05	--	--	--	5.0E+00	--	--	--	9.0E+04	--	--	--	9.0E+04	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.2E+02	8.7E+03	--	--	3.5E-01	1.9E-01	--	--	3.9E+03	2.6E+03	--	--	2.2E+02	2.6E+03	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	8.4E+05	2.7E+07	--	--	4.7E+00	1.5E+02	--	--	8.4E+04	2.7E+06	--	--	8.4E+04	2.7E+06
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	1.7E+06	2.2E+08	--	--	4.6E+00	5.9E+02	--	--	1.7E+05	2.2E+07	--	--	1.7E+05	2.2E+07
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	3.4E+02	1.8E+06	--	--	7.5E-03	1.0E+01	--	--	1.0E+02	1.8E+05	--	--	1.0E+02	1.8E+05	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	2.3E+04	1.9E+05	1.1E+07	8.2E+07	3.8E+01	4.2E+00	6.1E+01	4.6E+02	4.2E+05	5.8E+04	1.1E+06	8.2E+06	2.3E+04	5.8E+04	1.1E+06	8.2E+06
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.8E+08	--	--	--	1.0E+03	--	--	--	1.8E+07	--	--	--	1.8E+07	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	3.0E+05	1.2E+07	--	--	1.7E+00	6.9E+01	--	--	3.0E+04	1.2E+06	--	--	3.0E+04	1.2E+06
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	2.6E+02	1.1E+06	--	--	6.9E-04	3.0E+00	--	--	2.6E+01	1.1E+05	--	--	2.6E+01	1.1E+05
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	1.2E+06	2.3E+06	--	--	3.3E+00	6.0E+00	--	--	1.2E+05	2.3E+05	--	--	1.2E+05	2.3E+05
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	1.9E+03	1.9E+05	--	--	5.0E-03	5.1E-01	--	--	1.9E+02	1.9E+04	--	--	1.9E+02	1.9E+04
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.3E+03	7.4E+04	--	--	7.0E+00	1.7E+00	--	--	7.7E+04	2.3E+04	--	--	4.3E+03	2.3E+04	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.0E+01	1.5E+02	--	--	1.6E-02	3.3E-03	--	--	1.8E+02	4.5E+01	--	--	1.0E+01	4.5E+01	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.6E+02	2.4E+01	2.4E+01	--	3.5E-03	6.4E-05	6.4E-05	--	4.8E+01	2.4E+00	2.4E+00	--	4.8E+01	2.4E+00	2.4E+00
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	1.8E+03	1.0E+05	1.0E+05	1.1E+06	2.9E+00	2.3E+00	2.7E-01	3.0E+00	3.2E+04	3.1E+04	1.0E+04	1.1E+05	1.8E+03	3.1E+04	1.0E+04	1.1E+05
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.8E+08	1.5E+10	--	--	1.0E+03	8.6E+04	--	--	1.8E+07	1.5E+09	--	--	1.8E+07	1.5E+09
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	1.5E+07	7.2E+07	--	--	8.3E+01	4.0E+02	--	--	1.5E+06	7.2E+06	--	--	1.5E+06	7.2E+06
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	2.7E+05	--	--	--	1.5E+00	--	--	--	2.7E+04	--	--	--	2.7E+04	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	7.2E+04	--	--	--	4.0E-01	--	--	--	7.2E+03	--	--	--	7.2E+03	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	9.0E+04	--	--	--	5.0E-01	--	--	--	9.0E+03	--	--	--	9.0E+03	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	5.4E+05	--	--	--	3.0E+00	--	--	--	5.4E+04	--	--	--	5.4E+04	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	3.1E+03	5.6E+04	3.0E+06	7.5E+07	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.5E+04	1.7E+04	3.0E+05	7.5E+06	3.1E+03	1.7E+04	3.0E+05	7.5E+06
Silver	0	2.4E+00	--	--	--	3.6E+02	--	--	--	5.9E-01	--	--	--	6.5E+03	--	--	--	3.6E+02	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	4.5E+09	--	--	--	2.5E+04	--	--	--	4.5E+08	--	--	--	4.5E+08	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	6.4E+04	1.5E+06	--	--	1.7E-01	4.0E+00	--	--	6.4E+03	1.5E+05	--	--	6.4E+03	1.5E+05
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	2.6E+05	1.2E+06	--	--	6.9E-01	3.3E+00	--	--	2.6E+04	1.2E+05	--	--	2.6E+04	1.2E+05
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	4.3E+03	8.4E+03	--	--	2.4E-02	4.7E-02	--	--	4.3E+02	8.4E+02	--	--	4.3E+02	8.4E+02
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	9.1E+06	1.1E+08	--	--	5.1E+01	6.0E+02	--	--	9.1E+05	1.1E+07	--	--	9.1E+05	1.1E+07
Total dissolved solids	0	--	--	5.0E+05	--	--	--	9.0E+09	--	--	--	5.0E+04	--	--	--	9.0E+08	--	--	--	9.0E+08	--
Toxaphene[C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.1E+02	2.3E+00	1.1E+02	1.1E+02	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.0E+03	6.9E-01	1.1E+01	1.1E+01	1.1E+02	6.9E-01	1.1E+01	1.1E+01
Tributyltin	0	4.6E-01	7.2E-02	--	--	7.1E+01	8.1E+02	--	--	1.2E-01	1.8E-02	--	--	1.3E+03	2.5E+02	--	--	7.1E+01	2.5E+02	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	6.3E+05	1.3E+06	--	--	3.5E+00	7.0E+00	--	--	6.3E+04	1.3E+05	--	--	6.3E+04	1.3E+05
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	2.2E+05	6.0E+06	--	--	5.9E-01	1.6E+01	--	--	2.2E+04	6.0E+05	--	--	2.2E+04	6.0E+05
Trichloroethylene[C]	0	--	--	2.5E+01	3.0E+02	--	--	9.4E+05	1.1E+07	--	--	2.5E+00	3.0E+01	--	--	9.4E+04	1.1E+06	--	--	9.4E+04	1.1E+06
2,4,6-Trichlorophenol[C]	0	--	--	1.4E+01	2.4E+01	--	--	5.3E+05	9.1E+05	--	--	1.4E+00	2.4E+00	--	--	5.3E+04	9.1E+04	--	--	5.3E+04	9.1E+04
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	9.0E+05	--	--	--	5.0E+00	--	--	--	9.0E+04	--	--	--	9.0E+04	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	9.4E+03	9.1E+05	--	--	2.5E-02	2.4E+00	--	--	9.4E+02	9.1E+04	--	--	9.4E+02	9.1E+04
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	1.5E+04	1.1E+06	1.3E+08	4.7E+08	2.4E+01	2.5E+01	7.4E+02	2.6E+03	2.7E+05	3.4E+05	1.3E+07	4.7E+07	1.5E+04	3.4E+05	1.3E+07	4.7E+07

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.0E+04
Arsenic	1.8E+04
Barium	3.6E+06
Cadmium	1.9E+02
Chromium III	2.9E+04
Chromium VI	9.8E+02
Copper	6.7E+02
Iron	5.4E+05
Lead	5.5E+03
Manganese	9.0E+04
Mercury	8.6E+01
Nickel	9.3E+03
Selenium	1.2E+03
Silver	1.5E+02
Zinc	6.0E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 005

Permit No.: VA0000248

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	637 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1511 MGD

Mixing Information

Annual - 1Q10 Mix =	3.52 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	3.52 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.4 SU
Discharge Flow =	0.41 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	1.2E+06	1.7E+06	--	--	6.7E+01	9.9E+01	--	--	1.2E+05	1.7E+05	--	--	1.2E+05	1.7E+05
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	1.1E+04	1.6E+04	--	--	6.1E-01	9.3E-01	--	--	1.1E+03	1.6E+03	--	--	1.1E+03	1.6E+03
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	1.9E+03	9.2E+03	--	--	5.1E-02	2.5E-01	--	--	1.9E+02	9.2E+02	--	--	1.9E+02	9.2E+02
Aldrin[C]	0	3.0E+00	--	4.9E-04	5.0E-04	1.2E+02	--	1.8E+00	1.8E+00	7.5E-01	--	4.9E-05	5.0E-05	8.1E+02	--	1.8E-01	1.8E-01	1.2E+02	--	1.8E-01	1.8E-01
Ammonia-N (mg/l) (Yearly)	0	4.71E+00	9.23E-01	--	--	1.83E+02	1.43E+03	--	--	1.18E+00	2.31E-01	--	--	1.27E+03	3.59E+02	--	--	1.83E+02	3.59E+02	--	--
Ammonia-N (mg/l) (High Flow)	0	4.71E+00	1.36E+00	--	--	2.15E+02	3.51E+03	--	--	1.18E+00	3.40E-01	--	--	1.50E+03	8.77E+02	--	--	2.15E+02	8.77E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	1.5E+07	7.0E+07	--	--	8.3E+02	4.0E+03	--	--	1.5E+06	7.0E+06	--	--	1.5E+06	7.0E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	9.8E+03	1.1E+06	--	--	5.6E-01	6.4E+01	--	--	9.8E+02	1.1E+05	--	--	9.8E+02	1.1E+05
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.3E+04	2.0E+05	1.7E+04	--	8.5E+01	3.8E+01	1.0E+00	--	9.1E+04	5.0E+04	1.7E+03	--	1.3E+04	5.0E+04	1.7E+03	--
Barium	0	--	--	2.0E+03	--	--	--	3.5E+06	--	--	--	2.0E+02	--	--	--	3.5E+05	--	--	--	3.5E+05	--
Benzene[C]	0	--	--	2.2E+01	5.1E+02	--	--	8.1E+04	1.9E+06	--	--	2.2E+00	5.1E+01	--	--	8.1E+03	1.9E+05	--	--	8.1E+03	1.9E+05
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	3.2E+00	7.4E+00	--	--	8.6E-05	2.0E-04	--	--	3.2E-01	7.4E-01	--	--	3.2E-01	7.4E-01
Benzo (a) anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
Benzo (b) fluoranthene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
Benzo (k) fluoranthene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
Benzo (a) pyrene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
Bis2-Chloroethyl Ether[C]	0	--	--	3.0E-01	5.3E+00	--	--	1.1E+03	2.0E+04	--	--	3.0E-02	5.3E-01	--	--	1.1E+02	2.0E+03	--	--	1.1E+02	2.0E+03
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	2.4E+06	1.1E+08	--	--	1.4E+02	6.5E+03	--	--	2.4E+05	1.1E+07	--	--	2.4E+05	1.1E+07
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	1.2E+01	2.2E+01	--	--	4.4E+04	8.1E+04	--	--	1.2E+00	2.2E+00	--	--	4.4E+03	8.1E+03	--	--	4.4E+03	8.1E+03
Bromoform[C]	0	--	--	4.3E+01	1.4E+03	--	--	1.6E+05	5.2E+06	--	--	4.3E+00	1.4E+02	--	--	1.6E+04	5.2E+05	--	--	1.6E+04	5.2E+05
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	2.6E+06	3.3E+06	--	--	1.5E+02	1.9E+02	--	--	2.6E+05	3.3E+05	--	--	2.6E+05	3.3E+05
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	1.2E+02	1.3E+03	8.7E+03	--	7.7E-01	2.4E-01	5.0E-01	--	8.2E+02	3.2E+02	8.7E+02	--	1.2E+02	3.2E+02	8.7E+02	--
Carbon Tetrachloride[C]	0	--	--	2.3E+00	1.6E+01	--	--	8.5E+03	5.9E+04	--	--	2.3E-01	1.6E+00	--	--	8.5E+02	5.9E+03	--	--	8.5E+02	5.9E+03
Chlordane[C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	9.3E+01	5.8E+00	2.9E+01	3.0E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.4E+02	1.4E+00	2.9E+00	3.0E+00	9.3E+01	1.4E+00	2.9E+00	3.0E+00
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.3E+07	3.1E+08	4.4E+08	--	2.2E+05	5.8E+04	2.5E+04	--	2.3E+08	7.7E+07	4.4E+07	--	3.3E+07	7.7E+07	4.4E+07	--
TRC	0	1.9E+01	1.1E+01	--	--	7.4E+02	1.5E+04	--	--	4.8E+00	2.8E+00	--	--	5.1E+03	3.7E+03	--	--	7.4E+02	3.7E+03	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	2.3E+05	2.8E+06	--	--	1.3E+01	1.6E+02	--	--	2.3E+04	2.8E+05	--	--	2.3E+04	2.8E+05

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	1.5E+04	4.8E+05	--	--	4.0E-01	1.3E+01	--	--	1.5E+03	4.8E+04	--	--	1.5E+03	4.8E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	5.9E+05	1.9E+07	--	--	3.4E+01	1.1E+03	--	--	5.9E+04	1.9E+06	--	--	5.9E+04	1.9E+06
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.7E+06	2.8E+06	--	--	1.0E+02	1.6E+02	--	--	1.7E+05	2.8E+05	--	--	1.7E+05	2.8E+05
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	1.4E+05	2.6E+05	--	--	8.1E+00	1.5E+01	--	--	1.4E+04	2.6E+04	--	--	1.4E+04	2.6E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	3.2E+00	5.5E+01	--	--	2.1E-02	1.0E-02	--	--	2.2E+01	1.4E+01	--	--	3.2E+00	1.4E+01	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	1.8E+04	8.3E+04	--	--	1.2E+02	1.5E+01	--	--	1.3E+05	2.1E+04	--	--	1.8E+04	2.1E+04	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	6.2E+02	1.5E+04	--	--	4.0E+00	2.8E+00	--	--	4.3E+03	3.7E+03	--	--	6.2E+02	3.7E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.7E+05	--	--	--	1.0E+01	--	--	--	1.7E+04	--	--	--	1.7E+04	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	3.8E-04	1.8E-03	--	--	1.4E+00	6.6E+00	--	--	1.4E+00	6.6E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	4.2E+02	1.0E+04	2.3E+06	--	2.7E+00	1.9E+00	1.3E+02	--	2.9E+03	2.5E+03	2.3E+05	--	4.2E+02	2.5E+03	2.3E+05	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	8.5E+02	7.0E+03	2.4E+05	2.8E+07	5.5E+00	1.3E+00	1.4E+01	1.6E+03	5.9E+03	1.7E+03	2.4E+04	2.8E+06	8.5E+02	1.7E+03	2.4E+04	2.8E+06
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	1.1E+01	1.1E+01	--	--	3.1E-04	3.1E-04	--	--	1.1E+00	1.1E+00	--	--	1.1E+00	1.1E+00
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	8.1E+00	8.1E+00	--	--	2.2E-04	2.2E-04	--	--	8.1E-01	8.1E-01	--	--	8.1E-01	8.1E-01
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	4.3E+01	1.3E+00	8.1E+00	8.1E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.0E+02	3.4E-01	8.1E-01	8.1E-01	4.3E+01	3.4E-01	8.1E-01	8.1E-01
Demeton	0	--	1.0E-01	--	--	--	1.3E+02	--	--	--	2.5E-02	--	--	--	3.4E+01	--	--	--	3.4E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	6.6E+00	2.3E+02	--	--	4.3E-02	4.3E-02	--	--	4.6E+01	5.7E+01	--	--	6.6E+00	5.7E+01	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	7.3E+05	2.3E+06	--	--	4.2E+01	1.3E+02	--	--	7.3E+04	2.3E+05	--	--	7.3E+04	2.3E+05
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	5.6E+05	1.7E+06	--	--	3.2E+01	9.6E+01	--	--	5.6E+04	1.7E+05	--	--	5.6E+04	1.7E+05
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	1.1E+05	3.3E+05	--	--	6.3E+00	1.9E+01	--	--	1.1E+04	3.3E+04	--	--	1.1E+04	3.3E+04
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	7.7E+02	1.0E+03	--	--	2.1E-02	2.8E-02	--	--	7.7E+01	1.0E+02	--	--	7.7E+01	1.0E+02
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	2.0E+04	6.3E+05	--	--	5.5E-01	1.7E+01	--	--	2.0E+03	6.3E+04	--	--	2.0E+03	6.3E+04
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	1.4E+04	1.4E+06	--	--	3.8E-01	3.7E+01	--	--	1.4E+03	1.4E+05	--	--	1.4E+03	1.4E+05
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	5.8E+05	1.2E+07	--	--	3.3E+01	7.1E+02	--	--	5.8E+04	1.2E+06	--	--	5.8E+04	1.2E+06
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	2.4E+05	1.7E+07	--	--	1.4E+01	1.0E+03	--	--	2.4E+04	1.7E+06	--	--	2.4E+04	1.7E+06
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	1.3E+05	5.1E+05	--	--	7.7E+00	2.9E+01	--	--	1.3E+04	5.1E+04	--	--	1.3E+04	5.1E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.7E+05	--	--	--	1.0E+01	--	--	--	1.7E+04	--	--	--	1.7E+04	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	1.8E+04	5.5E+05	--	--	5.0E-01	1.5E+01	--	--	1.8E+03	5.5E+04	--	--	1.8E+03	5.5E+04
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	1.3E+04	7.7E+05	--	--	3.4E-01	2.1E+01	--	--	1.3E+03	7.7E+04	--	--	1.3E+03	7.7E+04
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	9.3E+00	7.5E+01	1.9E+00	2.0E+00	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.4E+01	1.9E+01	1.9E-01	2.0E-01	9.3E+00	1.9E+01	1.9E-01	2.0E-01
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	3.0E+07	7.7E+07	--	--	1.7E+03	4.4E+03	--	--	3.0E+06	7.7E+06	--	--	3.0E+06	7.7E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	6.6E+05	1.5E+06	--	--	3.8E+01	8.5E+01	--	--	6.6E+04	1.5E+05	--	--	6.6E+04	1.5E+05
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	4.7E+08	1.9E+09	--	--	2.7E+04	1.1E+05	--	--	4.7E+07	1.9E+08	--	--	4.7E+07	1.9E+08
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	3.5E+06	7.9E+06	--	--	2.0E+02	4.5E+02	--	--	3.5E+05	7.9E+05	--	--	3.5E+05	7.9E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	1.2E+05	9.3E+06	--	--	6.9E+00	5.3E+02	--	--	1.2E+04	9.3E+05	--	--	1.2E+04	9.3E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	2.3E+04	4.9E+05	--	--	1.3E+00	2.8E+01	--	--	2.3E+03	4.9E+04	--	--	2.3E+03	4.9E+04
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	4.1E+03	1.3E+05	--	--	1.1E-01	3.4E+00	--	--	4.1E+02	1.3E+04	--	--	4.1E+02	1.3E+04
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	8.7E-05	8.9E-05	--	--	5.0E-09	5.1E-09	--	--	8.7E-06	8.9E-06	--	--	8.7E-06	8.9E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	1.3E+03	7.4E+03	--	--	3.6E-02	2.0E-01	--	--	1.3E+02	7.4E+02	--	--	1.3E+02	7.4E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.5E+00	7.5E+01	1.1E+05	1.6E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.9E+01	1.9E+01	1.1E+04	1.6E+04	8.5E+00	1.9E+01	1.1E+04	1.6E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.5E+00	7.5E+01	1.1E+05	1.6E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.9E+01	1.9E+01	1.1E+04	1.6E+04	8.5E+00	1.9E+01	1.1E+04	1.6E+04
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	8.5E+00	7.5E+01	--	--	5.5E-02	1.4E-02	--	--	5.9E+01	1.9E+01	--	--	8.5E+00	1.9E+01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	1.1E+05	1.6E+05	--	--	6.2E+00	8.9E+00	--	--	1.1E+04	1.6E+04	--	--	1.1E+04	1.6E+04
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	3.3E+00	4.8E+01	1.0E+02	1.0E+02	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.3E+01	1.2E+01	1.0E+01	1.0E+01	3.3E+00	1.2E+01	1.0E+01	1.0E+01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	5.1E+02	5.2E+02	--	--	2.9E-02	3.0E-02	--	--	5.1E+01	5.2E+01	--	--	5.1E+01	5.2E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	9.3E+05	3.7E+06	--	--	5.3E+01	2.1E+02	--	--	9.3E+04	3.7E+05	--	--	9.3E+04	3.7E+05
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	2.3E+05	2.4E+05	--	--	1.3E+01	1.4E+01	--	--	2.3E+04	2.4E+04	--	--	2.3E+04	2.4E+04
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.9E+06	9.3E+06	--	--	1.1E+02	5.3E+02	--	--	1.9E+05	9.3E+05	--	--	1.9E+05	9.3E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	8.7E+05	--	--	--	5.0E+01	--	--	--	8.7E+04	--	--	--	8.7E+04	--
Guthion	0	--	1.0E-02	--	--	--	1.3E+01	--	--	--	2.5E-03	--	--	--	3.4E+00	--	--	--	3.4E+00	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	2.0E+01	5.1E+00	2.9E+00	2.9E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.4E+02	1.3E+00	2.9E-01	2.9E-01	2.0E+01	1.3E+00	2.9E-01	2.9E-01
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	2.0E+01	5.1E+00	1.4E+00	1.4E+00	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.4E+02	1.3E+00	1.4E-01	1.4E-01	2.0E+01	1.3E+00	1.4E-01	1.4E-01
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.0E+01	1.1E+01	--	--	2.8E-04	2.9E-04	--	--	1.0E+00	1.1E+00	--	--	1.0E+00	1.1E+00
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	1.6E+04	6.6E+05	--	--	4.4E-01	1.8E+01	--	--	1.6E+03	6.6E+04	--	--	1.6E+03	6.6E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	9.6E+01	1.8E+02	--	--	2.6E-03	4.9E-03	--	--	9.6E+00	1.8E+01	--	--	9.6E+00	1.8E+01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	3.4E+02	6.3E+02	--	--	9.1E-03	1.7E-02	--	--	3.4E+01	6.3E+01	--	--	3.4E+01	6.3E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	3.7E+01	--	3.6E+03	6.6E+03	2.4E-01	--	9.8E-02	1.8E-01	2.6E+02	--	3.6E+02	6.6E+02	3.7E+01	--	3.6E+02	6.6E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	7.0E+04	1.9E+06	--	--	4.0E+00	1.1E+02	--	--	7.0E+03	1.9E+05	--	--	7.0E+03	1.9E+05
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	5.2E+04	1.2E+05	--	--	1.4E+00	3.3E+00	--	--	5.2E+03	1.2E+04	--	--	5.2E+03	1.2E+04
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.7E+03	--	--	--	5.0E-01	--	--	--	6.7E+02	--	--	--	6.7E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.4E+02	6.6E+02	--	--	3.8E-03	1.8E-02	--	--	1.4E+01	6.6E+01	--	--	1.4E+01	6.6E+01
Iron	0	--	--	3.0E+02	--	--	--	5.2E+05	--	--	--	3.0E+01	--	--	--	5.2E+04	--	--	--	5.2E+04	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	1.3E+06	3.5E+07	--	--	3.5E+01	9.6E+02	--	--	1.3E+05	3.5E+06	--	--	1.3E+05	3.5E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	3.5E+03	1.4E+04	2.6E+04	--	2.2E+01	2.6E+00	1.5E+00	--	2.4E+04	3.4E+03	2.6E+03	--	3.5E+03	3.4E+03	2.6E+03	--
Malathion	0	--	1.0E-01	--	--	--	1.3E+02	--	--	--	2.5E-02	--	--	--	3.4E+01	--	--	--	3.4E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	8.7E+04	--	--	--	5.0E+00	--	--	--	8.7E+03	--	--	--	8.7E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	5.4E+01	1.0E+03	--	--	3.5E-01	1.9E-01	--	--	3.8E+02	2.6E+02	--	--	5.4E+01	2.6E+02	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	8.2E+04	2.6E+06	--	--	4.7E+00	1.5E+02	--	--	8.2E+03	2.6E+05	--	--	8.2E+03	2.6E+05
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	1.7E+05	2.2E+07	--	--	4.6E+00	5.9E+02	--	--	1.7E+04	2.2E+06	--	--	1.7E+04	2.2E+06
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	4.0E+01	1.7E+05	--	--	7.5E-03	1.0E+01	--	--	1.0E+01	1.7E+04	--	--	1.0E+01	1.7E+04	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	5.9E+03	2.3E+04	1.1E+06	8.0E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	4.1E+04	5.6E+03	1.1E+05	8.0E+05	5.9E+03	5.6E+03	1.1E+05	8.0E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.7E+07	--	--	--	1.0E+03	--	--	--	1.7E+06	--	--	--	1.7E+06	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	3.0E+04	1.2E+06	--	--	1.7E+00	6.9E+01	--	--	3.0E+03	1.2E+05	--	--	3.0E+03	1.2E+05
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	2.5E+01	1.1E+05	--	--	6.9E-04	3.0E+00	--	--	2.5E+00	1.1E+04	--	--	2.5E+00	1.1E+04
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	1.2E+05	2.2E+05	--	--	3.3E+00	6.0E+00	--	--	1.2E+04	2.2E+04	--	--	1.2E+04	2.2E+04
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	1.8E+02	1.9E+04	--	--	5.0E-03	5.1E-01	--	--	1.8E+01	1.9E+03	--	--	1.8E+01	1.9E+03
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.1E+03	8.9E+03	--	--	7.0E+00	1.7E+00	--	--	7.5E+03	2.2E+03	--	--	1.1E+03	2.2E+03	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	2.5E+00	1.7E+01	--	--	1.6E-02	3.3E-03	--	--	1.7E+01	4.4E+00	--	--	2.5E+00	4.4E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.9E+01	2.4E+00	2.4E+00	--	3.5E-03	6.4E-05	6.4E-05	--	4.7E+00	2.4E-01	2.4E-01	--	4.7E+00	2.4E-01	2.4E-01
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	4.6E+02	1.2E+04	1.0E+04	1.1E+05	2.9E+00	2.3E+00	2.7E-01	3.0E+00	3.2E+03	3.0E+03	1.0E+03	1.1E+04	4.6E+02	3.0E+03	1.0E+03	1.1E+04
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.7E+07	1.5E+09	--	--	1.0E+03	8.6E+04	--	--	1.7E+06	1.5E+08	--	--	1.7E+06	1.5E+08
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	1.5E+06	7.0E+06	--	--	8.3E+01	4.0E+02	--	--	1.5E+05	7.0E+05	--	--	1.5E+05	7.0E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	2.6E+04	--	--	--	1.5E+00	--	--	--	2.6E+03	--	--	--	2.6E+03	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	7.0E+03	--	--	--	4.0E-01	--	--	--	7.0E+02	--	--	--	7.0E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	8.7E+03	--	--	--	5.0E-01	--	--	--	8.7E+02	--	--	--	8.7E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	5.2E+04	--	--	--	3.0E+00	--	--	--	5.2E+03	--	--	--	5.2E+03	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	7.8E+02	6.7E+03	3.0E+05	7.3E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.4E+03	1.7E+03	3.0E+04	7.3E+05	7.8E+02	1.7E+03	3.0E+04	7.3E+05
Silver	0	2.4E+00	--	--	--	9.2E+01	--	--	--	5.9E-01	--	--	--	6.4E+02	--	--	--	9.2E+01	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	4.4E+08	--	--	--	2.5E+04	--	--	--	4.4E+07	--	--	--	4.4E+07	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	6.3E+03	1.5E+05	--	--	1.7E-01	4.0E+00	--	--	6.3E+02	1.5E+04	--	--	6.3E+02	1.5E+04
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	2.5E+04	1.2E+05	--	--	6.9E-01	3.3E+00	--	--	2.5E+03	1.2E+04	--	--	2.5E+03	1.2E+04
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	4.2E+02	8.2E+02	--	--	2.4E-02	4.7E-02	--	--	4.2E+01	8.2E+01	--	--	4.2E+01	8.2E+01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	8.9E+05	1.0E+07	--	--	5.1E+01	6.0E+02	--	--	8.9E+04	1.0E+06	--	--	8.9E+04	1.0E+06
Total dissolved solids	0	--	--	5.0E+05	--	--	--	8.7E+08	--	--	--	5.0E+04	--	--	--	8.7E+07	--	--	--	8.7E+07	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.8E+01	2.7E-01	1.0E+01	1.0E+01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.0E+02	6.7E-02	1.0E+00	1.0E+00	2.8E+01	6.7E-02	1.0E+00	1.0E+00
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.8E+01	9.7E+01	--	--	1.2E-01	1.8E-02	--	--	1.2E+02	2.4E+01	--	--	1.8E+01	2.4E+01	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	6.1E+04	1.2E+05	--	--	3.5E+00	7.0E+00	--	--	6.1E+03	1.2E+04	--	--	6.1E+03	1.2E+04
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	2.2E+04	5.9E+05	--	--	5.9E-01	1.6E+01	--	--	2.2E+03	5.9E+04	--	--	2.2E+03	5.9E+04
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	9.2E+04	1.1E+06	--	--	2.5E+00	3.0E+01	--	--	9.2E+03	1.1E+05	--	--	9.2E+03	1.1E+05
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	5.2E+04	8.8E+04	--	--	1.4E+00	2.4E+00	--	--	5.2E+03	8.8E+03	--	--	5.2E+03	8.8E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	8.7E+04	--	--	--	5.0E+00	--	--	--	8.7E+03	--	--	--	8.7E+03	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	9.2E+02	8.8E+04	--	--	2.5E-02	2.4E+00	--	--	9.2E+01	8.8E+03	--	--	9.2E+01	8.8E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	3.8E+03	1.3E+05	1.3E+07	4.5E+07	2.4E+01	2.5E+01	7.4E+02	2.6E+03	2.6E+04	3.3E+04	1.3E+06	4.5E+06	3.8E+03	3.3E+04	1.3E+06	4.5E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	9.8E+02
Arsenic	1.7E+03
Barium	3.5E+05
Cadmium	4.7E+01
Chromium III	7.4E+03
Chromium VI	2.5E+02
Copper	1.7E+02
Iron	5.2E+04
Lead	1.4E+03
Manganese	8.7E+03
Mercury	2.2E+01
Nickel	2.3E+03
Selenium	3.1E+02
Silver	3.7E+01
Zinc	1.5E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 006 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	638 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1511 MGD

Mixing Information

Annual - 1Q10 Mix =	1.43 %
- 7Q10 Mix =	83.31 %
- 30Q10 Mix =	95.02 %
Wet Season - 1Q10 Mix =	1.43 %
- 30Q10 Mix =	95.02 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8 SU
10% Maximum pH =	7.3 SU
Discharge Flow =	11 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	4.4E+04	6.6E+04	--	--	6.7E+01	9.9E+01	--	--	4.4E+03	6.6E+03	--	--	4.4E+03	6.6E+03
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	4.0E+02	6.2E+02	--	--	6.1E-01	9.3E-01	--	--	4.0E+01	6.2E+01	--	--	4.0E+01	6.2E+01
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	7.1E+01	3.5E+02	--	--	5.1E-02	2.5E-01	--	--	7.1E+00	3.5E+01	--	--	7.1E+00	3.5E+01
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	4.7E+00	--	6.8E-02	6.9E-02	7.5E-01	--	4.9E-05	5.0E-05	3.1E+01	--	6.8E-03	6.9E-03	4.7E+00	--	6.8E-03	6.9E-03
Ammonia-N (mg/l) (Yearly)	0	4.76E+00	9.34E-01	--	--	7.48E+00	5.24E+01	--	--	8.03E-01	2.33E-01	--	--	3.29E+01	1.38E+01	--	--	7.48E+00	1.38E+01	--	--
Ammonia-N (mg/l) (High Flow)	0	4.66E+00	1.37E+00	--	--	7.81E+00	1.26E+02	--	--	8.01E-01	3.42E-01	--	--	3.87E+01	3.33E+01	--	--	7.81E+00	3.33E+01	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	5.5E+05	2.6E+06	--	--	8.3E+02	4.0E+03	--	--	5.5E+04	2.6E+05	--	--	5.5E+04	2.6E+05
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	3.7E+02	4.2E+04	--	--	5.6E-01	6.4E+01	--	--	3.7E+01	4.2E+03	--	--	3.7E+01	4.2E+03
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	5.3E+02	6.4E+03	6.6E+02	--	8.5E+01	3.8E+01	1.0E+00	--	3.5E+03	1.9E+03	6.6E+01	--	5.3E+02	1.9E+03	6.6E+01	--
Barium	0	--	--	2.0E+03	--	--	--	1.3E+05	--	--	--	2.0E+02	--	--	--	1.3E+04	--	--	--	1.3E+04	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	3.0E+03	7.1E+04	--	--	2.2E+00	5.1E+01	--	--	3.0E+02	7.1E+03	--	--	3.0E+02	7.1E+03
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.2E-01	2.8E-01	--	--	8.6E-05	2.0E-04	--	--	1.2E-02	2.8E-02	--	--	1.2E-02	2.8E-02
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	4.2E+01	7.3E+02	--	--	3.0E-02	5.3E-01	--	--	4.2E+00	7.3E+01	--	--	4.2E+00	7.3E+01
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	9.3E+04	4.3E+06	--	--	1.4E+02	6.5E+03	--	--	9.3E+03	4.3E+05	--	--	9.3E+03	4.3E+05
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.7E+03	3.0E+03	--	--	1.2E+00	2.2E+00	--	--	1.7E+02	3.0E+02	--	--	1.7E+02	3.0E+02
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	5.9E+03	1.9E+05	--	--	4.3E+00	1.4E+02	--	--	5.9E+02	1.9E+04	--	--	5.9E+02	1.9E+04
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	9.9E+04	1.3E+05	--	--	1.5E+02	1.9E+02	--	--	9.9E+03	1.3E+04	--	--	9.9E+03	1.3E+04
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	4.8E+00	4.1E+01	3.3E+02	--	7.7E-01	2.4E-01	5.0E-01	--	3.1E+01	1.2E+01	3.3E+01	--	4.8E+00	1.2E+01	3.3E+01	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	3.2E+02	2.2E+03	--	--	2.3E-01	1.6E+00	--	--	3.2E+01	2.2E+02	--	--	3.2E+01	2.2E+02
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	3.8E+00	1.8E-01	1.1E+00	1.1E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	2.5E+01	5.5E-02	1.1E-01	1.1E-01	3.8E+00	5.5E-02	1.1E-01	1.1E-01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.4E+06	9.8E+06	1.7E+07	--	2.2E+05	5.8E+04	2.5E+04	--	8.8E+06	2.9E+06	1.7E+06	--	1.4E+06	2.9E+06	1.7E+06	--
TRC	0	1.9E+01	1.1E+01	--	--	3.0E+01	4.7E+02	--	--	4.8E+00	2.8E+00	--	--	1.9E+02	1.4E+02	--	--	3.0E+01	1.4E+02	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	8.6E+03	1.1E+05	--	--	1.3E+01	1.6E+02	--	--	8.6E+02	1.1E+04	--	--	8.6E+02	1.1E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	5.5E+02	1.8E+04	--	--	4.0E-01	1.3E+01	--	--	5.5E+01	1.8E+03	--	--	5.5E+01	1.8E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.3E+04	7.3E+05	--	--	3.4E+01	1.1E+03	--	--	2.3E+03	7.3E+04	--	--	2.3E+03	7.3E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	6.6E+04	1.1E+05	--	--	1.0E+02	1.6E+02	--	--	6.6E+03	1.1E+04	--	--	6.6E+03	1.1E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	5.4E+03	9.9E+03	--	--	8.1E+00	1.5E+01	--	--	5.4E+02	9.9E+02	--	--	5.4E+02	9.9E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.3E-01	1.7E+00	--	--	2.1E-02	1.0E-02	--	--	8.5E-01	5.2E-01	--	--	1.3E-01	5.2E-01	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	7.5E+02	2.6E+03	--	--	1.2E+02	1.5E+01	--	--	4.9E+03	7.9E+02	--	--	7.5E+02	7.9E+02	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.5E+01	4.7E+02	--	--	4.0E+00	2.8E+00	--	--	1.6E+02	1.4E+02	--	--	2.5E+01	1.4E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	6.6E+03	--	--	--	1.0E+01	--	--	--	6.6E+02	--	--	--	6.6E+02	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	3.8E-04	1.8E-03	--	--	5.3E-02	2.5E-01	--	--	5.3E-02	2.5E-01
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	1.7E+01	3.2E+02	8.6E+04	--	2.7E+00	1.9E+00	1.3E+02	--	1.1E+02	9.5E+01	8.6E+03	--	1.7E+01	9.5E+01	8.6E+03	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	3.5E+01	2.2E+02	9.3E+03	1.1E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.3E+02	6.6E+01	9.3E+02	1.1E+05	3.5E+01	6.6E+01	9.3E+02	1.1E+05
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	4.3E-01	4.3E-01	--	--	3.1E-04	3.1E-04	--	--	4.3E-02	4.3E-02	--	--	4.3E-02	4.3E-02
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	3.0E-01	3.0E-01	--	--	2.2E-04	2.2E-04	--	--	3.0E-02	3.0E-02	--	--	3.0E-02	3.0E-02
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.7E+00	4.3E-02	3.0E-01	3.0E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.1E+01	1.3E-02	3.0E-02	3.0E-02	1.7E+00	1.3E-02	3.0E-02	3.0E-02
Demeton	0	--	1.0E-01	--	--	--	4.3E+00	--	--	--	2.5E-02	--	--	--	1.3E+00	--	--	--	1.3E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	2.7E-01	7.3E+00	--	--	4.3E-02	4.3E-02	--	--	1.7E+00	2.2E+00	--	--	2.7E-01	2.2E+00	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	2.8E+04	8.6E+04	--	--	4.2E+01	1.3E+02	--	--	2.8E+03	8.6E+03	--	--	2.8E+03	8.6E+03
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.1E+04	6.4E+04	--	--	3.2E+01	9.6E+01	--	--	2.1E+03	6.4E+03	--	--	2.1E+03	6.4E+03
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	4.2E+03	1.3E+04	--	--	6.3E+00	1.9E+01	--	--	4.2E+02	1.3E+03	--	--	4.2E+02	1.3E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.9E+01	3.9E+01	--	--	2.1E-02	2.8E-02	--	--	2.9E+00	3.9E+00	--	--	2.9E+00	3.9E+00
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	7.6E+02	2.4E+04	--	--	5.5E-01	1.7E+01	--	--	7.6E+01	2.4E+03	--	--	7.6E+01	2.4E+03
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	5.3E+02	5.1E+04	--	--	3.8E-01	3.7E+01	--	--	5.3E+01	5.1E+03	--	--	5.3E+01	5.1E+03
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.2E+04	4.7E+05	--	--	3.3E+01	7.1E+02	--	--	2.2E+03	4.7E+04	--	--	2.2E+03	4.7E+04
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	9.3E+03	6.6E+05	--	--	1.4E+01	1.0E+03	--	--	9.3E+02	6.6E+04	--	--	9.3E+02	6.6E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	5.1E+03	1.9E+04	--	--	7.7E+00	2.9E+01	--	--	5.1E+02	1.9E+03	--	--	5.1E+02	1.9E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	6.6E+03	--	--	--	1.0E+01	--	--	--	6.6E+02	--	--	--	6.6E+02	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	6.9E+02	2.1E+04	--	--	5.0E-01	1.5E+01	--	--	6.9E+01	2.1E+03	--	--	6.9E+01	2.1E+03
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	4.7E+02	2.9E+04	--	--	3.4E-01	2.1E+01	--	--	4.7E+01	2.9E+03	--	--	4.7E+01	2.9E+03
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	3.8E-01	2.4E+00	7.2E-02	7.5E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	2.5E+00	7.1E-01	7.2E-03	7.5E-03	3.8E-01	7.1E-01	7.2E-03	7.5E-03
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.1E+06	2.9E+06	--	--	1.7E+03	4.4E+03	--	--	1.1E+05	2.9E+05	--	--	1.1E+05	2.9E+05
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	2.5E+04	5.6E+04	--	--	3.8E+01	8.5E+01	--	--	2.5E+03	5.6E+03	--	--	2.5E+03	5.6E+03
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.8E+07	7.3E+07	--	--	2.7E+04	1.1E+05	--	--	1.8E+06	7.3E+06	--	--	1.8E+06	7.3E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.3E+05	3.0E+05	--	--	2.0E+02	4.5E+02	--	--	1.3E+04	3.0E+04	--	--	1.3E+04	3.0E+04
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	4.6E+03	3.5E+05	--	--	6.9E+00	5.3E+02	--	--	4.6E+02	3.5E+04	--	--	4.6E+02	3.5E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	8.6E+02	1.9E+04	--	--	1.3E+00	2.8E+01	--	--	8.6E+01	1.9E+03	--	--	8.6E+01	1.9E+03
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	1.5E+02	4.7E+03	--	--	1.1E-01	3.4E+00	--	--	1.5E+01	4.7E+02	--	--	1.5E+01	4.7E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	3.3E-06	3.4E-06	--	--	5.0E-09	5.1E-09	--	--	3.3E-07	3.4E-07	--	--	3.3E-07	3.4E-07
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	5.0E+01	2.8E+02	--	--	3.6E-02	2.0E-01	--	--	5.0E+00	2.8E+01	--	--	5.0E+00	2.8E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.5E-01	2.4E+00	4.1E+03	5.9E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.3E+00	7.1E-01	4.1E+02	5.9E+02	3.5E-01	7.1E-01	4.1E+02	5.9E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.5E-01	2.4E+00	4.1E+03	5.9E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.3E+00	7.1E-01	4.1E+02	5.9E+02	3.5E-01	7.1E-01	4.1E+02	5.9E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.5E-01	2.4E+00	--	--	5.5E-02	1.4E-02	--	--	2.3E+00	7.1E-01	--	--	3.5E-01	7.1E-01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	4.1E+03	5.9E+03	--	--	6.2E+00	8.9E+00	--	--	4.1E+02	5.9E+02	--	--	4.1E+02	5.9E+02
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.4E-01	1.5E+00	3.9E+00	4.0E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	8.8E-01	4.6E-01	3.9E-01	4.0E-01	1.4E-01	4.6E-01	3.9E-01	4.0E-01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.9E+01	2.0E+01	--	--	2.9E-02	3.0E-02	--	--	1.9E+00	2.0E+00	--	--	1.9E+00	2.0E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	3.5E+04	1.4E+05	--	--	5.3E+01	2.1E+02	--	--	3.5E+03	1.4E+04	--	--	3.5E+03	1.4E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	8.6E+03	9.3E+03	--	--	1.3E+01	1.4E+01	--	--	8.6E+02	9.3E+02	--	--	8.6E+02	9.3E+02
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	7.3E+04	3.5E+05	--	--	1.1E+02	5.3E+02	--	--	7.3E+03	3.5E+04	--	--	7.3E+03	3.5E+04
Foaming Agents	0	--	--	5.0E+02	--	--	--	3.3E+04	--	--	--	5.0E+01	--	--	--	3.3E+03	--	--	--	3.3E+03	--
Guthion	0	--	1.0E-02	--	--	--	4.3E-01	--	--	--	2.5E-03	--	--	--	1.3E-01	--	--	--	1.3E-01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	8.2E-01	1.6E-01	1.1E-01	1.1E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	5.3E+00	4.8E-02	1.1E-02	1.1E-02	8.2E-01	4.8E-02	1.1E-02	1.1E-02
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	8.2E-01	1.6E-01	5.4E-02	5.4E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	5.3E+00	4.8E-02	5.4E-03	5.4E-03	8.2E-01	4.8E-02	5.4E-03	5.4E-03
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	3.9E-01	4.0E-01	--	--	2.8E-04	2.9E-04	--	--	3.9E-02	4.0E-02	--	--	3.9E-02	4.0E-02
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	6.1E+02	2.5E+04	--	--	4.4E-01	1.8E+01	--	--	6.1E+01	2.5E+03	--	--	6.1E+01	2.5E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	3.6E+00	6.8E+00	--	--	2.6E-03	4.9E-03	--	--	3.6E-01	6.8E-01	--	--	3.6E-01	6.8E-01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.3E+01	2.4E+01	--	--	9.1E-03	1.7E-02	--	--	1.3E+00	2.4E+00	--	--	1.3E+00	2.4E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.5E+00	--	1.4E+02	2.5E+02	2.4E-01	--	9.8E-02	1.8E-01	9.7E+00	--	1.4E+01	2.5E+01	1.5E+00	--	1.4E+01	2.5E+01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	2.6E+03	7.3E+04	--	--	4.0E+00	1.1E+02	--	--	2.6E+02	7.3E+03	--	--	2.6E+02	7.3E+03
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.9E+03	4.6E+03	--	--	1.4E+00	3.3E+00	--	--	1.9E+02	4.6E+02	--	--	1.9E+02	4.6E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	8.5E+01	--	--	--	5.0E-01	--	--	--	2.6E+01	--	--	--	2.6E+01	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.3E+00	2.5E+01	--	--	3.8E-03	1.8E-02	--	--	5.3E-01	2.5E+00	--	--	5.3E-01	2.5E+00
Iron	0	--	--	3.0E+02	--	--	--	2.0E+04	--	--	--	3.0E+01	--	--	--	2.0E+03	--	--	--	2.0E+03	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	4.8E+04	1.3E+06	--	--	3.5E+01	9.6E+02	--	--	4.8E+03	1.3E+05	--	--	4.8E+03	1.3E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	1.4E+02	4.4E+02	9.9E+02	--	2.2E+01	2.6E+00	1.5E+00	--	9.2E+02	1.3E+02	9.9E+01	--	1.4E+02	1.3E+02	9.9E+01	--
Malathion	0	--	1.0E-01	--	--	--	4.3E+00	--	--	--	2.5E-02	--	--	--	1.3E+00	--	--	--	1.3E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	3.3E+03	--	--	--	5.0E+00	--	--	--	3.3E+02	--	--	--	3.3E+02	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.2E+00	3.3E+01	--	--	3.5E-01	1.9E-01	--	--	1.4E+01	9.8E+00	--	--	2.2E+00	9.8E+00	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.1E+03	9.9E+04	--	--	4.7E+00	1.5E+02	--	--	3.1E+02	9.9E+03	--	--	3.1E+02	9.9E+03
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	6.4E+03	8.2E+05	--	--	4.6E+00	5.9E+02	--	--	6.4E+02	8.2E+04	--	--	6.4E+02	8.2E+04
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.3E+00	6.6E+03	--	--	7.5E-03	1.0E+01	--	--	3.8E-01	6.6E+02	--	--	3.8E-01	6.6E+02	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	2.4E+02	7.2E+02	4.0E+04	3.0E+05	3.8E+01	4.2E+00	6.1E+01	4.6E+02	1.6E+03	2.1E+02	4.0E+03	3.0E+04	2.4E+02	2.1E+02	4.0E+03	3.0E+04
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	6.6E+05	--	--	--	1.0E+03	--	--	--	6.6E+04	--	--	--	6.6E+04	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.1E+03	4.6E+04	--	--	1.7E+00	6.9E+01	--	--	1.1E+02	4.6E+03	--	--	1.1E+02	4.6E+03
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	9.5E-01	4.2E+03	--	--	6.9E-04	3.0E+00	--	--	9.5E-02	4.2E+02	--	--	9.5E-02	4.2E+02
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	4.6E+03	8.3E+03	--	--	3.3E+00	6.0E+00	--	--	4.6E+02	8.3E+02	--	--	4.6E+02	8.3E+02
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	6.9E+00	7.1E+02	--	--	5.0E-03	5.1E-01	--	--	6.9E-01	7.1E+01	--	--	6.9E-01	7.1E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.4E+01	2.8E+02	--	--	7.0E+00	1.7E+00	--	--	2.9E+02	8.4E+01	--	--	4.4E+01	8.4E+01	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.0E-01	5.5E-01	--	--	1.6E-02	3.3E-03	--	--	6.7E-01	1.7E-01	--	--	1.0E-01	1.7E-01	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	6.0E-01	8.9E-02	8.9E-02	--	3.5E-03	6.4E-05	6.4E-05	--	1.8E-01	8.9E-03	8.9E-03	--	1.8E-01	8.9E-03	8.9E-03
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	1.9E+01	3.9E+02	3.7E+02	4.2E+03	2.9E+00	2.3E+00	2.7E-01	3.0E+00	1.2E+02	1.2E+02	3.7E+01	4.2E+02	1.9E+01	1.2E+02	3.7E+01	4.2E+02
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	6.6E+05	5.7E+07	--	--	1.0E+03	8.6E+04	--	--	6.6E+04	5.7E+06	--	--	6.6E+04	5.7E+06
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	5.5E+04	2.6E+05	--	--	8.3E+01	4.0E+02	--	--	5.5E+03	2.6E+04	--	--	5.5E+03	2.6E+04
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	9.9E+02	--	--	--	1.5E+00	--	--	--	9.9E+01	--	--	--	9.9E+01	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	2.6E+02	--	--	--	4.0E-01	--	--	--	2.6E+01	--	--	--	2.6E+01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	3.3E+02	--	--	--	5.0E-01	--	--	--	3.3E+01	--	--	--	3.3E+01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.0E+03	--	--	--	3.0E+00	--	--	--	2.0E+02	--	--	--	2.0E+02	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	3.1E+01	2.1E+02	1.1E+04	2.8E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.1E+02	6.4E+01	1.1E+03	2.8E+04	3.1E+01	6.4E+01	1.1E+03	2.8E+04
Silver	0	2.4E+00	--	--	--	3.7E+00	--	--	--	5.9E-01	--	--	--	2.4E+01	--	--	--	3.7E+00	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	1.7E+07	--	--	--	2.5E+04	--	--	--	1.7E+06	--	--	--	1.7E+06	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.4E+02	5.5E+03	--	--	1.7E-01	4.0E+00	--	--	2.4E+01	5.5E+02	--	--	2.4E+01	5.5E+02
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	9.5E+02	4.6E+03	--	--	6.9E-01	3.3E+00	--	--	9.5E+01	4.6E+02	--	--	9.5E+01	4.6E+02
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.6E+01	3.1E+01	--	--	2.4E-02	4.7E-02	--	--	1.6E+00	3.1E+00	--	--	1.6E+00	3.1E+00
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	3.4E+04	4.0E+05	--	--	5.1E+01	6.0E+02	--	--	3.4E+03	4.0E+04	--	--	3.4E+03	4.0E+04
Total dissolved solids	0	--	--	5.0E+05	--	--	--	3.3E+07	--	--	--	5.0E+04	--	--	--	3.3E+06	--	--	--	3.3E+06	--
Toxaphene[C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.1E+00	8.5E-03	3.9E-01	3.9E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	7.5E+00	2.6E-03	3.9E-02	3.9E-02	1.1E+00	2.6E-03	3.9E-02	3.9E-02
Tributyltin	0	4.6E-01	7.2E-02	--	--	7.2E-01	3.1E+00	--	--	1.2E-01	1.8E-02	--	--	4.7E+00	9.2E-01	--	--	7.2E-01	9.2E-01	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	2.3E+03	4.6E+03	--	--	3.5E+00	7.0E+00	--	--	2.3E+02	4.6E+02	--	--	2.3E+02	4.6E+02
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	8.2E+02	2.2E+04	--	--	5.9E-01	1.6E+01	--	--	8.2E+01	2.2E+03	--	--	8.2E+01	2.2E+03
Trichloroethylene[C]	0	--	--	2.5E+01	3.0E+02	--	--	3.5E+03	4.2E+04	--	--	2.5E+00	3.0E+01	--	--	3.5E+02	4.2E+03	--	--	3.5E+02	4.2E+03
2,4,6-Trichlorophenol[C]	0	--	--	1.4E+01	2.4E+01	--	--	1.9E+03	3.3E+03	--	--	1.4E+00	2.4E+00	--	--	1.9E+02	3.3E+02	--	--	1.9E+02	3.3E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	3.3E+03	--	--	--	5.0E+00	--	--	--	3.3E+02	--	--	--	3.3E+02	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	3.5E+01	3.3E+03	--	--	2.5E-02	2.4E+00	--	--	3.5E+00	3.3E+02	--	--	3.5E+00	3.3E+02
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	1.5E+02	4.2E+03	4.9E+05	1.7E+06	2.4E+01	2.5E+01	7.4E+02	2.6E+03	1.0E+03	1.3E+03	4.9E+04	1.7E+05	1.5E+02	1.3E+03	4.9E+04	1.7E+05

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	3.7E+01
Arsenic	6.6E+01
Barium	1.3E+04
Cadmium	1.9E+00
Chromium III	3.0E+02
Chromium VI	1.0E+01
Copper	6.9E+00
Iron	2.0E+03
Lead	5.7E+01
Manganese	3.3E+02
Mercury	8.8E-01
Nickel	9.5E+01
Selenium	1.3E+01
Silver	1.5E+00
Zinc	6.1E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 007 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	638 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1512 MGD

Mixing Information

Annual - 1Q10 Mix =	1.09 %
- 7Q10 Mix =	63.81 %
- 30Q10 Mix =	72.92 %
Wet Season - 1Q10 Mix =	1.09 %
- 30Q10 Mix =	72.92 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.1 SU
10% Maximum pH =	6.7 SU
Discharge Flow =	2.62 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	1.8E+05	2.7E+05	--	--	6.7E+01	9.9E+01	--	--	1.8E+04	2.7E+04	--	--	1.8E+04	2.7E+04
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	1.7E+03	2.6E+03	--	--	6.1E-01	9.3E-01	--	--	1.7E+02	2.6E+02	--	--	1.7E+02	2.6E+02
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	2.9E+02	1.4E+03	--	--	5.1E-02	2.5E-01	--	--	2.9E+01	1.4E+02	--	--	2.9E+01	1.4E+02
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	8.5E+00	--	2.8E-01	2.9E-01	7.5E-01	--	4.9E-05	5.0E-05	1.3E+02	--	2.8E-02	2.9E-02	8.5E+00	--	2.8E-02	2.9E-02
Ammonia-N (mg/l) (Yearly)	0	3.69E+00	9.25E-01	--	--	1.04E+01	1.65E+02	--	--	7.90E-01	2.31E-01	--	--	1.33E+02	5.65E+01	--	--	1.04E+01	5.65E+01	--	--
Ammonia-N (mg/l) (High Flow)	0	3.63E+00	1.36E+00	--	--	1.15E+01	4.02E+02	--	--	7.89E-01	3.40E-01	--	--	1.57E+02	1.38E+02	--	--	1.15E+01	1.38E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	2.3E+06	1.1E+07	--	--	8.3E+02	4.0E+03	--	--	2.3E+05	1.1E+06	--	--	2.3E+05	1.1E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	1.5E+03	1.8E+05	--	--	5.6E-01	6.4E+01	--	--	1.5E+02	1.8E+04	--	--	1.5E+02	1.8E+04
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	9.6E+02	2.0E+04	2.7E+03	--	8.5E+01	3.8E+01	1.0E+00	--	1.4E+04	7.9E+03	2.7E+02	--	9.6E+02	7.9E+03	2.7E+02	--
Barium	0	--	--	2.0E+03	--	--	--	5.5E+05	--	--	--	2.0E+02	--	--	--	5.5E+04	--	--	--	5.5E+04	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	1.3E+04	2.9E+05	--	--	2.2E+00	5.1E+01	--	--	1.3E+03	2.9E+04	--	--	1.3E+03	2.9E+04
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	5.0E-01	1.2E+00	--	--	8.6E-05	2.0E-04	--	--	5.0E-02	1.2E-01	--	--	5.0E-02	1.2E-01
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
Bis2-Chloroethyl Ether[C]	0	--	--	3.0E-01	5.3E+00	--	--	1.7E+02	3.1E+03	--	--	3.0E-02	5.3E-01	--	--	1.7E+01	3.1E+02	--	--	1.7E+01	3.1E+02
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	3.8E+05	1.8E+07	--	--	1.4E+02	6.5E+03	--	--	3.8E+04	1.8E+06	--	--	3.8E+04	1.8E+06
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	1.2E+01	2.2E+01	--	--	6.9E+03	1.3E+04	--	--	1.2E+00	2.2E+00	--	--	6.9E+02	1.3E+03	--	--	6.9E+02	1.3E+03
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	2.5E+04	8.1E+05	--	--	4.3E+00	1.4E+02	--	--	2.5E+03	8.1E+04	--	--	2.5E+03	8.1E+04
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	4.1E+05	5.2E+05	--	--	1.5E+02	1.9E+02	--	--	4.1E+04	5.2E+04	--	--	4.1E+04	5.2E+04
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	8.7E+00	1.3E+02	1.4E+03	--	7.7E-01	2.4E-01	5.0E-01	--	1.3E+02	5.0E+01	1.4E+02	--	8.7E+00	5.0E+01	1.4E+02	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	1.3E+03	9.2E+03	--	--	2.3E-01	1.6E+00	--	--	1.3E+02	9.2E+02	--	--	1.3E+02	9.2E+02
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	6.8E+00	5.8E-01	4.6E+00	4.7E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	1.0E+02	2.3E-01	4.6E-01	4.7E-01	6.8E+00	2.3E-01	4.6E-01	4.7E-01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	2.4E+06	3.1E+07	6.9E+07	--	2.2E+05	5.8E+04	2.5E+04	--	3.6E+07	1.2E+07	6.9E+06	--	2.4E+06	1.2E+07	6.9E+06	--
TRC	0	1.9E+01	1.1E+01	--	--	5.4E+01	1.5E+03	--	--	4.8E+00	2.8E+00	--	--	8.0E+02	5.8E+02	--	--	5.4E+01	5.8E+02	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	3.6E+04	4.4E+05	--	--	1.3E+01	1.6E+02	--	--	3.6E+03	4.4E+04	--	--	3.6E+03	4.4E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	2.3E+03	7.5E+04	--	--	4.0E-01	1.3E+01	--	--	2.3E+02	7.5E+03	--	--	2.3E+02	7.5E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	9.3E+04	3.0E+06	--	--	3.4E+01	1.1E+03	--	--	9.3E+03	3.0E+05	--	--	9.3E+03	3.0E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	2.7E+05	4.4E+05	--	--	1.0E+02	1.6E+02	--	--	2.7E+04	4.4E+04	--	--	2.7E+04	4.4E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	2.2E+04	4.1E+04	--	--	8.1E+00	1.5E+01	--	--	2.2E+03	4.1E+03	--	--	2.2E+03	4.1E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	2.3E-01	5.5E+00	--	--	2.1E-02	1.0E-02	--	--	3.5E+00	2.2E+00	--	--	2.3E-01	2.2E+00	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	1.3E+03	8.4E+03	--	--	1.2E+02	1.5E+01	--	--	2.0E+04	3.3E+03	--	--	1.3E+03	3.3E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	4.5E+01	1.5E+03	--	--	4.0E+00	2.8E+00	--	--	6.8E+02	5.8E+02	--	--	4.5E+01	5.8E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	2.7E+04	--	--	--	1.0E+01	--	--	--	2.7E+03	--	--	--	2.7E+03	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	3.8E-04	1.8E-03	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	3.1E+01	1.0E+03	3.6E+05	--	2.7E+00	1.9E+00	1.3E+02	--	4.6E+02	3.9E+02	3.6E+04	--	3.1E+01	3.9E+02	3.6E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	6.2E+01	7.0E+02	3.8E+04	4.4E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	9.3E+02	2.7E+02	3.8E+03	4.4E+05	6.2E+01	2.7E+02	3.8E+03	4.4E+05
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	1.8E+00	1.8E+00	--	--	3.1E-04	3.1E-04	--	--	1.8E-01	1.8E-01	--	--	1.8E-01	1.8E-01
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	1.3E+00	1.3E+00	--	--	2.2E-04	2.2E-04	--	--	1.3E-01	1.3E-01	--	--	1.3E-01	1.3E-01
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	3.1E+00	1.3E-01	1.3E+00	1.3E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	4.6E+01	5.3E-02	1.3E-01	1.3E-01	3.1E+00	5.3E-02	1.3E-01	1.3E-01
Demeton	0	--	1.0E-01	--	--	--	1.3E+01	--	--	--	2.5E-02	--	--	--	5.3E+00	--	--	--	5.3E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	4.8E-01	2.3E+01	--	--	4.3E-02	4.3E-02	--	--	7.2E+00	9.0E+00	--	--	4.8E-01	9.0E+00	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.2E+05	3.6E+05	--	--	4.2E+01	1.3E+02	--	--	1.2E+04	3.6E+04	--	--	1.2E+04	3.6E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	8.8E+04	2.6E+05	--	--	3.2E+01	9.6E+01	--	--	8.8E+03	2.6E+04	--	--	8.8E+03	2.6E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	1.7E+04	5.2E+04	--	--	6.3E+00	1.9E+01	--	--	1.7E+03	5.2E+03	--	--	1.7E+03	5.2E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	1.2E+02	1.6E+02	--	--	2.1E-02	2.8E-02	--	--	1.2E+01	1.6E+01	--	--	1.2E+01	1.6E+01
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	3.2E+03	9.8E+04	--	--	5.5E-01	1.7E+01	--	--	3.2E+02	9.8E+03	--	--	3.2E+02	9.8E+03
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	2.2E+03	2.1E+05	--	--	3.8E-01	3.7E+01	--	--	2.2E+02	2.1E+04	--	--	2.2E+02	2.1E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	9.1E+04	2.0E+06	--	--	3.3E+01	7.1E+02	--	--	9.1E+03	2.0E+05	--	--	9.1E+03	2.0E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	3.8E+04	2.7E+06	--	--	1.4E+01	1.0E+03	--	--	3.8E+03	2.7E+05	--	--	3.8E+03	2.7E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	2.1E+04	8.0E+04	--	--	7.7E+00	2.9E+01	--	--	2.1E+03	8.0E+03	--	--	2.1E+03	8.0E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	2.7E+04	--	--	--	1.0E+01	--	--	--	2.7E+03	--	--	--	2.7E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	2.9E+03	8.7E+04	--	--	5.0E-01	1.5E+01	--	--	2.9E+02	8.7E+03	--	--	2.9E+02	8.7E+03
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	2.0E+03	1.2E+05	--	--	3.4E-01	2.1E+01	--	--	2.0E+02	1.2E+04	--	--	2.0E+02	1.2E+04
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	6.8E-01	7.6E+00	3.0E-01	3.1E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	1.0E+01	3.0E+00	3.0E-02	3.1E-02	6.8E-01	3.0E+00	3.0E-02	3.1E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	4.7E+06	1.2E+07	--	--	1.7E+03	4.4E+03	--	--	4.7E+05	1.2E+06	--	--	4.7E+05	1.2E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.0E+05	2.3E+05	--	--	3.8E+01	8.5E+01	--	--	1.0E+04	2.3E+04	--	--	1.0E+04	2.3E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	7.4E+07	3.0E+08	--	--	2.7E+04	1.1E+05	--	--	7.4E+06	3.0E+07	--	--	7.4E+06	3.0E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	5.5E+05	1.2E+06	--	--	2.0E+02	4.5E+02	--	--	5.5E+04	1.2E+05	--	--	5.5E+04	1.2E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	1.9E+04	1.5E+06	--	--	6.9E+00	5.3E+02	--	--	1.9E+03	1.5E+05	--	--	1.9E+03	1.5E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	3.6E+03	7.7E+04	--	--	1.3E+00	2.8E+01	--	--	3.6E+02	7.7E+03	--	--	3.6E+02	7.7E+03
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	6.4E+02	2.0E+04	--	--	1.1E-01	3.4E+00	--	--	6.4E+01	2.0E+03	--	--	6.4E+01	2.0E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	1.4E-05	1.4E-05	--	--	5.0E-09	5.1E-09	--	--	1.4E-06	1.4E-06	--	--	1.4E-06	1.4E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	2.1E+02	1.2E+03	--	--	3.6E-02	2.0E-01	--	--	2.1E+01	1.2E+02	--	--	2.1E+01	1.2E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.2E-01	7.6E+00	1.7E+04	2.4E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	9.3E+00	3.0E+00	1.7E+03	2.4E+03	6.2E-01	3.0E+00	1.7E+03	2.4E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.2E-01	7.6E+00	1.7E+04	2.4E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	9.3E+00	3.0E+00	1.7E+03	2.4E+03	6.2E-01	3.0E+00	1.7E+03	2.4E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	6.2E-01	7.6E+00	--	--	5.5E-02	1.4E-02	--	--	9.3E+00	3.0E+00	--	--	6.2E-01	3.0E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	1.7E+04	2.4E+04	--	--	6.2E+00	8.9E+00	--	--	1.7E+03	2.4E+03	--	--	1.7E+03	2.4E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.4E-01	4.9E+00	1.6E+01	1.6E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	3.6E+00	1.9E+00	1.6E+00	1.6E+00	2.4E-01	1.9E+00	1.6E+00	1.6E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	8.0E+01	8.2E+01	--	--	2.9E-02	3.0E-02	--	--	8.0E+00	8.2E+00	--	--	8.0E+00	8.2E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	1.5E+05	5.8E+05	--	--	5.3E+01	2.1E+02	--	--	1.5E+04	5.8E+04	--	--	1.5E+04	5.8E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	3.6E+04	3.8E+04	--	--	1.3E+01	1.4E+01	--	--	3.6E+03	3.8E+03	--	--	3.6E+03	3.8E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	3.0E+05	1.5E+06	--	--	1.1E+02	5.3E+02	--	--	3.0E+04	1.5E+05	--	--	3.0E+04	1.5E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	1.4E+05	--	--	--	5.0E+01	--	--	--	1.4E+04	--	--	--	1.4E+04	--
Guthion	0	--	1.0E-02	--	--	--	1.3E+00	--	--	--	2.5E-03	--	--	--	5.3E-01	--	--	--	5.3E-01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.5E+00	5.1E-01	4.6E-01	4.6E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	2.2E+01	2.0E-01	4.6E-02	4.6E-02	1.5E+00	2.0E-01	4.6E-02	4.6E-02
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.5E+00	5.1E-01	2.3E-01	2.3E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	2.2E+01	2.0E-01	2.3E-02	2.3E-02	1.5E+00	2.0E-01	2.3E-02	2.3E-02
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.6E+00	1.7E+00	--	--	2.8E-04	2.9E-04	--	--	1.6E-01	1.7E-01	--	--	1.6E-01	1.7E-01
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	2.5E+03	1.0E+05	--	--	4.4E-01	1.8E+01	--	--	2.5E+02	1.0E+04	--	--	2.5E+02	1.0E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	1.5E+01	2.8E+01	--	--	2.6E-03	4.9E-03	--	--	1.5E+00	2.8E+00	--	--	1.5E+00	2.8E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	5.3E+01	9.8E+01	--	--	9.1E-03	1.7E-02	--	--	5.3E+00	9.8E+00	--	--	5.3E+00	9.8E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	2.7E+00	--	5.7E+02	1.0E+03	2.4E-01	--	9.8E-02	1.8E-01	4.0E+01	--	5.7E+01	1.0E+02	2.7E+00	--	5.7E+01	1.0E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.1E+04	3.0E+05	--	--	4.0E+00	1.1E+02	--	--	1.1E+03	3.0E+04	--	--	1.1E+03	3.0E+04
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	8.1E+03	1.9E+04	--	--	1.4E+00	3.3E+00	--	--	8.1E+02	1.9E+03	--	--	8.1E+02	1.9E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.7E+02	--	--	--	5.0E-01	--	--	--	1.1E+02	--	--	--	1.1E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+01	1.0E+02	--	--	3.8E-03	1.8E-02	--	--	2.2E+00	1.0E+01	--	--	2.2E+00	1.0E+01
Iron	0	--	--	3.0E+02	--	--	--	8.2E+04	--	--	--	3.0E+01	--	--	--	8.2E+03	--	--	--	8.2E+03	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	2.0E+05	5.5E+06	--	--	3.5E+01	9.6E+02	--	--	2.0E+04	5.5E+05	--	--	2.0E+04	5.5E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	2.5E+02	1.4E+03	4.1E+03	--	2.2E+01	2.6E+00	1.5E+00	--	3.8E+03	5.4E+02	4.1E+02	--	2.5E+02	5.4E+02	4.1E+02	--
Malathion	0	--	1.0E-01	--	--	--	1.3E+01	--	--	--	2.5E-02	--	--	--	5.3E+00	--	--	--	5.3E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	1.4E+04	--	--	--	5.0E+00	--	--	--	1.4E+03	--	--	--	1.4E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	4.0E+00	1.0E+02	--	--	3.5E-01	1.9E-01	--	--	5.9E+01	4.1E+01	--	--	4.0E+00	4.1E+01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.3E+04	4.1E+05	--	--	4.7E+00	1.5E+02	--	--	1.3E+03	4.1E+04	--	--	1.3E+03	4.1E+04
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	2.7E+04	3.4E+06	--	--	4.6E+00	5.9E+02	--	--	2.7E+03	3.4E+05	--	--	2.7E+03	3.4E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	4.0E+00	2.7E+04	--	--	7.5E-03	1.0E+01	--	--	1.6E+00	2.7E+03	--	--	1.6E+00	2.7E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	4.3E+02	2.3E+03	1.7E+05	1.3E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	6.4E+03	8.9E+02	1.7E+04	1.3E+05	4.3E+02	8.9E+02	1.7E+04	1.3E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	2.7E+06	--	--	--	1.0E+03	--	--	--	2.7E+05	--	--	--	2.7E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	4.7E+03	1.9E+05	--	--	1.7E+00	6.9E+01	--	--	4.7E+02	1.9E+04	--	--	4.7E+02	1.9E+04
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	4.0E+00	1.7E+04	--	--	6.9E-04	3.0E+00	--	--	4.0E-01	1.7E+03	--	--	4.0E-01	1.7E+03
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	1.9E+04	3.5E+04	--	--	3.3E+00	6.0E+00	--	--	1.9E+03	3.5E+03	--	--	1.9E+03	3.5E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	2.9E+01	2.9E+03	--	--	5.0E-03	5.1E-01	--	--	2.9E+00	2.9E+02	--	--	2.9E+00	2.9E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	7.9E+01	8.9E+02	--	--	7.0E+00	1.7E+00	--	--	1.2E+03	3.5E+02	--	--	7.9E+01	3.5E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.8E-01	1.8E+00	--	--	1.6E-02	3.3E-03	--	--	2.7E+00	6.9E-01	--	--	1.8E-01	6.9E-01	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.9E+00	3.7E-01	3.7E-01	--	3.5E-03	6.4E-05	6.4E-05	--	7.4E-01	3.7E-02	3.7E-02	--	7.4E-01	3.7E-02	3.7E-02
Pentachlorophenol [C]	0	8.6E+00	9.0E+00	2.7E+00	3.0E+01	2.4E+01	1.2E+03	1.6E+03	1.7E+04	2.9E+00	2.2E+00	2.7E-01	3.0E+00	4.9E+02	4.7E+02	1.6E+02	1.7E+03	2.4E+01	4.7E+02	1.6E+02	1.7E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	2.7E+06	2.4E+08	--	--	1.0E+03	8.6E+04	--	--	2.7E+05	2.4E+07	--	--	2.7E+05	2.4E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	2.3E+05	1.1E+06	--	--	8.3E+01	4.0E+02	--	--	2.3E+04	1.1E+05	--	--	2.3E+04	1.1E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	4.1E+03	--	--	--	1.5E+00	--	--	--	4.1E+02	--	--	--	4.1E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	1.1E+03	--	--	--	4.0E-01	--	--	--	1.1E+02	--	--	--	1.1E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	1.4E+03	--	--	--	5.0E-01	--	--	--	1.4E+02	--	--	--	1.4E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	8.2E+03	--	--	--	3.0E+00	--	--	--	8.2E+02	--	--	--	8.2E+02	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.7E+01	6.7E+02	4.7E+04	1.2E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	8.4E+02	2.6E+02	4.7E+03	1.2E+05	5.7E+01	2.6E+02	4.7E+03	1.2E+05
Silver	0	2.4E+00	–	–	–	6.7E+00	–	–	–	5.9E-01	–	–	–	1.0E+02	–	–	–	6.7E+00	–	–	–
Sulfate	0	–	–	2.5E+05	–	–	–	6.9E+07	–	–	–	2.5E+04	–	–	–	6.9E+06	–	–	–	6.9E+06	–
1,1,2,2-Tetrachloroethane[C]	0	–	–	1.7E+00	4.0E+01	–	–	9.8E+02	2.3E+04	–	–	1.7E-01	4.0E+00	–	–	9.8E+01	2.3E+03	–	–	9.8E+01	2.3E+03
Tetrachloroethylene[C]	0	–	–	6.9E+00	3.3E+01	–	–	4.0E+03	1.9E+04	–	–	6.9E-01	3.3E+00	–	–	4.0E+02	1.9E+03	–	–	4.0E+02	1.9E+03
Thallium	0	–	–	2.4E-01	4.7E-01	–	–	6.6E+01	1.3E+02	–	–	2.4E-02	4.7E-02	–	–	6.6E+00	1.3E+01	–	–	6.6E+00	1.3E+01
Toluene	0	–	–	5.1E+02	6.0E+03	–	–	1.4E+05	1.6E+06	–	–	5.1E+01	6.0E+02	–	–	1.4E+04	1.6E+05	–	–	1.4E+04	1.6E+05
Total dissolved solids	0	–	–	5.0E+05	–	–	–	1.4E+08	–	–	–	5.0E+04	–	–	–	1.4E+07	–	–	–	1.4E+07	–
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.1E+00	2.7E-02	1.6E+00	1.6E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	3.1E+01	1.1E-02	1.6E-01	1.6E-01	2.1E+00	1.1E-02	1.6E-01	1.6E-01
Tributyltin	0	4.6E-01	7.2E-02	–	–	1.3E+00	9.7E+00	–	–	1.2E-01	1.8E-02	–	–	1.9E+01	3.8E+00	–	–	1.3E+00	3.8E+00	–	–
1,2,4-Trichlorobenzene	0	–	–	3.5E+01	7.0E+01	–	–	9.6E+03	1.9E+04	–	–	3.5E+00	7.0E+00	–	–	9.6E+02	1.9E+03	–	–	9.6E+02	1.9E+03
1,1,2-Trichloroethane[C]	0	–	–	5.9E+00	1.6E+02	–	–	3.4E+03	9.2E+04	–	–	5.9E-01	1.6E+01	–	–	3.4E+02	9.2E+03	–	–	3.4E+02	9.2E+03
Trichloroethylene [C]	0	–	–	2.5E+01	3.0E+02	–	–	1.4E+04	1.7E+05	–	–	2.5E+00	3.0E+01	–	–	1.4E+03	1.7E+04	–	–	1.4E+03	1.7E+04
2,4,6-Trichlorophenol [C]	0	–	–	1.4E+01	2.4E+01	–	–	8.1E+03	1.4E+04	–	–	1.4E+00	2.4E+00	–	–	8.1E+02	1.4E+03	–	–	8.1E+02	1.4E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	–	–	5.0E+01	–	–	–	1.4E+04	–	–	–	5.0E+00	–	–	–	1.4E+03	–	–	–	1.4E+03	–
Vinyl Chloride[C]	0	–	–	2.5E-01	2.4E+01	–	–	1.4E+02	1.4E+04	–	–	2.5E-02	2.4E+00	–	–	1.4E+01	1.4E+03	–	–	1.4E+01	1.4E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	2.8E+02	1.3E+04	2.0E+06	7.1E+06	2.4E+01	2.5E+01	7.4E+02	2.6E+03	4.1E+03	5.2E+03	2.0E+05	7.1E+05	2.8E+02	5.2E+03	2.0E+05	7.1E+05

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.5E+02
Arsenic	2.7E+02
Barium	5.5E+04
Cadmium	3.5E+00
Chromium III	5.4E+02
Chromium VI	1.8E+01
Copper	1.2E+01
Iron	8.2E+03
Lead	1.0E+02
Manganese	1.4E+03
Mercury	1.6E+00
Nickel	1.7E+02
Selenium	2.3E+01
Silver	2.7E+00
Zinc	1.1E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 012 Permit No.: VA0000248

Receiving Stream: Stroubles Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	1.5 MGD
7Q10 (Annual) =	1.6 MGD
30Q10 (Annual) =	1.8 MGD
1Q10 (Wet season) =	2.2 MGD
30Q10 (Wet season)	4.3 MGD
30Q5 =	2 MGD
Harmonic Mean =	5.5 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	83 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.4 SU
10% Maximum pH =	7 SU
Discharge Flow =	0.004 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	3.4E+05	5.0E+05	--	--	6.7E+01	9.9E+01	--	--	3.4E+04	5.0E+04	--	--	3.4E+04	5.0E+04
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	3.1E+03	4.7E+03	--	--	6.1E-01	9.3E-01	--	--	3.1E+02	4.7E+02	--	--	3.1E+02	4.7E+02
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	7.0E+02	3.4E+03	--	--	5.1E-02	2.5E-01	--	--	7.0E+01	3.4E+02	--	--	7.0E+01	3.4E+02
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	1.1E+03	--	6.7E-01	6.9E-01	7.5E-01	--	4.9E-05	5.0E-05	2.8E+02	--	6.7E-02	6.9E-02	2.8E+02	--	6.7E-02	6.9E-02
Ammonia-N (mg/l) (Yearly)	0	3.15E+00	9.22E-01	--	--	1.18E+03	4.16E+02	--	--	7.87E-01	2.31E-01	--	--	2.96E+02	1.04E+02	--	--	2.96E+02	1.04E+02	--	--
Ammonia-N (mg/l) (High Flow)	0	3.15E+00	1.36E+00	--	--	1.73E+03	1.46E+03	--	--	7.87E-01	3.40E-01	--	--	4.34E+02	3.65E+02	--	--	4.34E+02	3.65E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	4.2E+06	2.0E+07	--	--	8.3E+02	4.0E+03	--	--	4.2E+05	2.0E+06	--	--	4.2E+05	2.0E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	2.8E+03	3.2E+05	--	--	5.6E-01	6.4E+01	--	--	2.8E+02	3.2E+04	--	--	2.8E+02	3.2E+04
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.3E+05	6.0E+04	5.0E+03	--	8.5E+01	3.8E+01	1.0E+00	--	3.2E+04	1.5E+04	5.0E+02	--	3.2E+04	1.5E+04	5.0E+02	--
Barium	0	--	--	2.0E+03	--	--	--	1.0E+06	--	--	--	2.0E+02	--	--	--	1.0E+05	--	--	--	1.0E+05	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	3.0E+04	7.0E+05	--	--	2.2E+00	5.1E+01	--	--	3.0E+03	7.0E+04	--	--	3.0E+03	7.0E+04
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.2E+00	2.8E+00	--	--	8.6E-05	2.0E-04	--	--	1.2E-01	2.8E-01	--	--	1.2E-01	2.8E-01
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	4.1E+02	7.3E+03	--	--	3.0E-02	5.3E-01	--	--	4.1E+01	7.3E+02	--	--	4.1E+01	7.3E+02
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	7.0E+05	3.3E+07	--	--	1.4E+02	6.5E+03	--	--	7.0E+04	3.3E+06	--	--	7.0E+04	3.3E+06
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.7E+04	3.0E+04	--	--	1.2E+00	2.2E+00	--	--	1.7E+03	3.0E+03	--	--	1.7E+03	3.0E+03
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	5.9E+04	1.9E+06	--	--	4.3E+00	1.4E+02	--	--	5.9E+03	1.9E+05	--	--	5.9E+03	1.9E+05
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	7.5E+05	9.5E+05	--	--	1.5E+02	1.9E+02	--	--	7.5E+04	9.5E+04	--	--	7.5E+04	9.5E+04
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	1.2E+03	3.8E+02	2.5E+03	--	7.7E-01	2.4E-01	5.0E-01	--	2.9E+02	9.6E+01	2.5E+02	--	2.9E+02	9.6E+01	2.5E+02	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	3.2E+03	2.2E+04	--	--	2.3E-01	1.6E+00	--	--	3.2E+02	2.2E+03	--	--	3.2E+02	2.2E+03
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	9.0E+02	1.7E+00	1.1E+01	1.1E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	2.3E+02	4.3E-01	1.1E+00	1.1E+00	2.3E+02	4.3E-01	1.1E+00	1.1E+00
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.2E+08	9.2E+07	1.3E+08	--	2.2E+05	5.8E+04	2.5E+04	--	8.1E+07	2.3E+07	1.3E+07	--	8.1E+07	2.3E+07	1.3E+07	--
TRC	0	1.9E+01	1.1E+01	--	--	7.1E+03	4.4E+03	--	--	4.8E+00	2.8E+00	--	--	1.8E+03	1.1E+03	--	--	1.8E+03	1.1E+03	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	6.5E+04	8.0E+05	--	--	1.3E+01	1.6E+02	--	--	6.5E+03	8.0E+04	--	--	6.5E+03	8.0E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	5.5E+03	1.8E+05	--	--	4.0E-01	1.3E+01	--	--	5.5E+02	1.8E+04	--	--	5.5E+02	1.8E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.7E+05	5.5E+06	--	--	3.4E+01	1.1E+03	--	--	1.7E+04	5.5E+05	--	--	1.7E+04	5.5E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	5.0E+05	8.0E+05	--	--	1.0E+02	1.6E+02	--	--	5.0E+04	8.0E+04	--	--	5.0E+04	8.0E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	4.1E+04	7.5E+04	--	--	8.1E+00	1.5E+01	--	--	4.1E+03	7.5E+03	--	--	4.1E+03	7.5E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	3.1E+01	1.6E+01	--	--	2.1E-02	1.0E-02	--	--	7.8E+00	4.1E+00	--	--	7.8E+00	4.1E+00	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	1.8E+05	2.5E+04	--	--	1.2E+02	1.5E+01	--	--	4.5E+04	6.2E+03	--	--	4.5E+04	6.2E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	6.0E+03	4.4E+03	--	--	4.0E+00	2.8E+00	--	--	1.5E+03	1.1E+03	--	--	1.5E+03	1.1E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	5.0E+04	--	--	--	1.0E+01	--	--	--	5.0E+03	--	--	--	5.0E+03	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	3.8E-04	1.8E-03	--	--	5.2E-01	2.5E+00	--	--	5.2E-01	2.5E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	4.1E+03	3.0E+03	6.5E+05	--	2.7E+00	1.9E+00	1.3E+02	--	1.0E+03	7.4E+02	6.5E+04	--	1.0E+03	7.4E+02	6.5E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	8.3E+03	2.1E+03	7.0E+04	8.0E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.1E+03	5.2E+02	7.0E+03	8.0E+05	2.1E+03	5.2E+02	7.0E+03	8.0E+05
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	4.3E+00	4.3E+00	--	--	3.1E-04	3.1E-04	--	--	4.3E-01	4.3E-01	--	--	4.3E-01	4.3E-01
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	3.0E+00	3.0E+00	--	--	2.2E-04	2.2E-04	--	--	3.0E-01	3.0E-01	--	--	3.0E-01	3.0E-01
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	4.1E+02	4.0E-01	3.0E+00	3.0E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.0E+02	1.0E-01	3.0E-01	3.0E-01	1.0E+02	1.0E-01	3.0E-01	3.0E-01
Demeton	0	--	1.0E-01	--	--	--	4.0E+01	--	--	--	2.5E-02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	6.4E+01	6.8E+01	--	--	4.3E-02	4.3E-02	--	--	1.6E+01	1.7E+01	--	--	1.6E+01	1.7E+01	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	2.1E+05	6.5E+05	--	--	4.2E+01	1.3E+02	--	--	2.1E+04	6.5E+04	--	--	2.1E+04	6.5E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.6E+05	4.8E+05	--	--	3.2E+01	9.6E+01	--	--	1.6E+04	4.8E+04	--	--	1.6E+04	4.8E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	3.2E+04	9.5E+04	--	--	6.3E+00	1.9E+01	--	--	3.2E+03	9.5E+03	--	--	3.2E+03	9.5E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.9E+02	3.9E+02	--	--	2.1E-02	2.8E-02	--	--	2.9E+01	3.9E+01	--	--	2.9E+01	3.9E+01
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	7.6E+03	2.3E+05	--	--	5.5E-01	1.7E+01	--	--	7.6E+02	2.3E+04	--	--	7.6E+02	2.3E+04
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	5.2E+03	5.1E+05	--	--	3.8E-01	3.7E+01	--	--	5.2E+02	5.1E+04	--	--	5.2E+02	5.1E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.7E+05	3.6E+06	--	--	3.3E+01	7.1E+02	--	--	1.7E+04	3.6E+05	--	--	1.7E+04	3.6E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	7.0E+04	5.0E+06	--	--	1.4E+01	1.0E+03	--	--	7.0E+03	5.0E+05	--	--	7.0E+03	5.0E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	3.9E+04	1.5E+05	--	--	7.7E+00	2.9E+01	--	--	3.9E+03	1.5E+04	--	--	3.9E+03	1.5E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	5.0E+04	--	--	--	1.0E+01	--	--	--	5.0E+03	--	--	--	5.0E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	6.9E+03	2.1E+05	--	--	5.0E-01	1.5E+01	--	--	6.9E+02	2.1E+04	--	--	6.9E+02	2.1E+04
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	4.7E+03	2.9E+05	--	--	3.4E-01	2.1E+01	--	--	4.7E+02	2.9E+04	--	--	4.7E+02	2.9E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	9.0E+01	2.2E+01	7.2E-01	7.4E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	2.3E+01	5.6E+00	7.2E-02	7.4E-02	2.3E+01	5.6E+00	7.2E-02	7.4E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	8.5E+06	2.2E+07	--	--	1.7E+03	4.4E+03	--	--	8.5E+05	2.2E+06	--	--	8.5E+05	2.2E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.9E+05	4.3E+05	--	--	3.8E+01	8.5E+01	--	--	1.9E+04	4.3E+04	--	--	1.9E+04	4.3E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.4E+08	5.5E+08	--	--	2.7E+04	1.1E+05	--	--	1.4E+07	5.5E+07	--	--	1.4E+07	5.5E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.0E+06	2.3E+06	--	--	2.0E+02	4.5E+02	--	--	1.0E+05	2.3E+05	--	--	1.0E+05	2.3E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	3.5E+04	2.7E+06	--	--	6.9E+00	5.3E+02	--	--	3.5E+03	2.7E+05	--	--	3.5E+03	2.7E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	6.5E+03	1.4E+05	--	--	1.3E+00	2.8E+01	--	--	6.5E+02	1.4E+04	--	--	6.5E+02	1.4E+04
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.5E+03	4.7E+04	--	--	1.1E-01	3.4E+00	--	--	1.5E+02	4.7E+03	--	--	1.5E+02	4.7E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	2.5E-05	2.6E-05	--	--	5.0E-09	5.1E-09	--	--	2.5E-06	2.6E-06	--	--	2.5E-06	2.6E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	5.0E+02	2.8E+03	--	--	3.6E-02	2.0E-01	--	--	5.0E+01	2.8E+02	--	--	5.0E+01	2.8E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.3E+01	2.2E+01	3.1E+04	4.5E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.1E+01	5.6E+00	3.1E+03	4.5E+03	2.1E+01	5.6E+00	3.1E+03	4.5E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.3E+01	2.2E+01	3.1E+04	4.5E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.1E+01	5.6E+00	3.1E+03	4.5E+03	2.1E+01	5.6E+00	3.1E+03	4.5E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	8.3E+01	2.2E+01	--	--	5.5E-02	1.4E-02	--	--	2.1E+01	5.6E+00	--	--	2.1E+01	5.6E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	3.1E+04	4.5E+04	--	--	6.2E+00	8.9E+00	--	--	3.1E+03	4.5E+03	--	--	3.1E+03	4.5E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	3.2E+01	1.4E+01	3.0E+01	3.0E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	8.1E+00	3.6E+00	3.0E+00	3.0E+00	8.1E+00	3.6E+00	3.0E+00	3.0E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.5E+02	1.5E+02	--	--	2.9E-02	3.0E-02	--	--	1.5E+01	1.5E+01	--	--	1.5E+01	1.5E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	2.7E+05	1.1E+06	--	--	5.3E+01	2.1E+02	--	--	2.7E+04	1.1E+05	--	--	2.7E+04	1.1E+05
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	6.5E+04	7.0E+04	--	--	1.3E+01	1.4E+01	--	--	6.5E+03	7.0E+03	--	--	6.5E+03	7.0E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	5.5E+05	2.7E+06	--	--	1.1E+02	5.3E+02	--	--	5.5E+04	2.7E+05	--	--	5.5E+04	2.7E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	2.5E+05	--	--	--	5.0E+01	--	--	--	2.5E+04	--	--	--	2.5E+04	--
Guthion	0	--	1.0E-02	--	--	--	4.0E+00	--	--	--	2.5E-03	--	--	--	1.0E+00	--	--	--	1.0E+00	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	2.0E+02	1.5E+00	1.1E+00	1.1E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	4.9E+01	3.8E-01	1.1E-01	1.1E-01	4.9E+01	3.8E-01	1.1E-01	1.1E-01
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	2.0E+02	1.5E+00	5.4E-01	5.4E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	4.9E+01	3.8E-01	5.4E-02	5.4E-02	4.9E+01	3.8E-01	5.4E-02	5.4E-02
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	3.9E+00	4.0E+00	--	--	2.8E-04	2.9E-04	--	--	3.9E-01	4.0E-01	--	--	3.9E-01	4.0E-01
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	6.1E+03	2.5E+05	--	--	4.4E-01	1.8E+01	--	--	6.1E+02	2.5E+04	--	--	6.1E+02	2.5E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	3.6E+01	6.7E+01	--	--	2.6E-03	4.9E-03	--	--	3.6E+00	6.7E+00	--	--	3.6E+00	6.7E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.3E+02	2.3E+02	--	--	9.1E-03	1.7E-02	--	--	1.3E+01	2.3E+01	--	--	1.3E+01	2.3E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	3.6E+02	--	1.3E+03	2.5E+03	2.4E-01	--	9.8E-02	1.8E-01	8.9E+01	--	1.3E+02	2.5E+02	8.9E+01	--	1.3E+02	2.5E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	2.0E+04	5.5E+05	--	--	4.0E+00	1.1E+02	--	--	2.0E+03	5.5E+04	--	--	2.0E+03	5.5E+04
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.9E+04	4.5E+04	--	--	1.4E+00	3.3E+00	--	--	1.9E+03	4.5E+03	--	--	1.9E+03	4.5E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	8.0E+02	--	--	--	5.0E-01	--	--	--	2.0E+02	--	--	--	2.0E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.2E+01	2.5E+02	--	--	3.8E-03	1.8E-02	--	--	5.2E+00	2.5E+01	--	--	5.2E+00	2.5E+01
Iron	0	--	--	3.0E+02	--	--	--	1.5E+05	--	--	--	3.0E+01	--	--	--	1.5E+04	--	--	--	1.5E+04	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	4.8E+05	1.3E+07	--	--	3.5E+01	9.6E+02	--	--	4.8E+04	1.3E+06	--	--	4.8E+04	1.3E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	3.4E+04	4.1E+03	7.5E+03	--	2.2E+01	2.6E+00	1.5E+00	--	8.5E+03	1.0E+03	7.5E+02	--	8.5E+03	1.0E+03	7.5E+02	--
Malathion	0	--	1.0E-01	--	--	--	4.0E+01	--	--	--	2.5E-02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	2.5E+04	--	--	--	5.0E+00	--	--	--	2.5E+03	--	--	--	2.5E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	5.3E+02	3.1E+02	--	--	3.5E-01	1.9E-01	--	--	1.3E+02	7.7E+01	--	--	1.3E+02	7.7E+01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	2.4E+04	7.5E+05	--	--	4.7E+00	1.5E+02	--	--	2.4E+03	7.5E+04	--	--	2.4E+03	7.5E+04
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	6.3E+04	8.1E+06	--	--	4.6E+00	5.9E+02	--	--	6.3E+03	8.1E+05	--	--	6.3E+03	8.1E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.2E+01	5.0E+04	--	--	7.5E-03	1.0E+01	--	--	3.0E+00	5.0E+03	--	--	3.0E+00	5.0E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	5.7E+04	6.8E+03	3.1E+05	2.3E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	1.4E+04	1.7E+03	3.1E+04	2.3E+05	1.4E+04	1.7E+03	3.1E+04	2.3E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	5.0E+06	--	--	--	1.0E+03	--	--	--	5.0E+05	--	--	--	5.0E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	8.5E+03	3.5E+05	--	--	1.7E+00	6.9E+01	--	--	8.5E+02	3.5E+04	--	--	8.5E+02	3.5E+04
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	9.5E+00	4.1E+04	--	--	6.9E-04	3.0E+00	--	--	9.5E-01	4.1E+03	--	--	9.5E-01	4.1E+03
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	4.5E+04	8.3E+04	--	--	3.3E+00	6.0E+00	--	--	4.5E+03	8.3E+03	--	--	4.5E+03	8.3E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	6.9E+01	7.0E+03	--	--	5.0E-03	5.1E-01	--	--	6.9E+00	7.0E+02	--	--	6.9E+00	7.0E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.1E+04	2.6E+03	--	--	7.0E+00	1.7E+00	--	--	2.6E+03	6.6E+02	--	--	2.6E+03	6.6E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	2.4E+01	5.2E+00	--	--	1.6E-02	3.3E-03	--	--	6.1E+00	1.3E+00	--	--	6.1E+00	1.3E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	5.6E+00	8.8E-01	8.8E-01	--	3.5E-03	6.4E-05	6.4E-05	--	1.4E+00	8.8E-02	8.8E-02	--	1.4E+00	8.8E-02	8.8E-02
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	4.4E+03	3.6E+03	3.7E+03	4.1E+04	2.9E+00	2.3E+00	2.7E-01	3.0E+00	1.1E+03	9.1E+02	3.7E+02	4.1E+03	1.1E+03	9.1E+02	3.7E+02	4.1E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	5.0E+06	4.3E+08	--	--	1.0E+03	8.6E+04	--	--	5.0E+05	4.3E+07	--	--	5.0E+05	4.3E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	4.2E+05	2.0E+06	--	--	8.3E+01	4.0E+02	--	--	4.2E+04	2.0E+05	--	--	4.2E+04	2.0E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	7.5E+03	--	--	--	1.5E+00	--	--	--	7.5E+02	--	--	--	7.5E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	2.0E+03	--	--	--	4.0E-01	--	--	--	2.0E+02	--	--	--	2.0E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	2.5E+03	--	--	--	5.0E-01	--	--	--	2.5E+02	--	--	--	2.5E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	1.5E+04	--	--	--	3.0E+00	--	--	--	1.5E+03	--	--	--	1.5E+03	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	7.5E+03	2.0E+03	8.5E+04	2.1E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	1.9E+03	5.0E+02	8.5E+03	2.1E+05	1.9E+03	5.0E+02	8.5E+03	2.1E+05
Silver	0	2.4E+00	--	--	--	8.9E+02	--	--	--	5.9E-01	--	--	--	2.2E+02	--	--	--	2.2E+02	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	1.3E+08	--	--	--	2.5E+04	--	--	--	1.3E+07	--	--	--	1.3E+07	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.3E+03	5.5E+04	--	--	1.7E-01	4.0E+00	--	--	2.3E+02	5.5E+03	--	--	2.3E+02	5.5E+03
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	9.5E+03	4.5E+04	--	--	6.9E-01	3.3E+00	--	--	9.5E+02	4.5E+03	--	--	9.5E+02	4.5E+03
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.2E+02	2.4E+02	--	--	2.4E-02	4.7E-02	--	--	1.2E+01	2.4E+01	--	--	1.2E+01	2.4E+01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	2.6E+05	3.0E+06	--	--	5.1E+01	6.0E+02	--	--	2.6E+04	3.0E+05	--	--	2.6E+04	3.0E+05
Total dissolved solids	0	--	--	5.0E+05	--	--	--	2.5E+08	--	--	--	5.0E+04	--	--	--	2.5E+07	--	--	--	2.5E+07	--
Toxaphene[C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.7E+02	8.0E-02	3.9E+00	3.9E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	6.9E+01	2.0E-02	3.9E-01	3.9E-01	6.9E+01	2.0E-02	3.9E-01	3.9E-01
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.7E+02	2.9E+01	--	--	1.2E-01	1.8E-02	--	--	4.3E+01	7.2E+00	--	--	4.3E+01	7.2E+00	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.8E+04	3.5E+04	--	--	3.5E+00	7.0E+00	--	--	1.8E+03	3.5E+03	--	--	1.8E+03	3.5E+03
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	8.1E+03	2.2E+05	--	--	5.9E-01	1.6E+01	--	--	8.1E+02	2.2E+04	--	--	8.1E+02	2.2E+04
Trichloroethylene[C]	0	--	--	2.5E+01	3.0E+02	--	--	3.4E+04	4.1E+05	--	--	2.5E+00	3.0E+01	--	--	3.4E+03	4.1E+04	--	--	3.4E+03	4.1E+04
2,4,6-Trichlorophenol[C]	0	--	--	1.4E+01	2.4E+01	--	--	1.9E+04	3.3E+04	--	--	1.4E+00	2.4E+00	--	--	1.9E+03	3.3E+03	--	--	1.9E+03	3.3E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	2.5E+04	--	--	--	5.0E+00	--	--	--	2.5E+03	--	--	--	2.5E+03	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	3.4E+02	3.3E+04	--	--	2.5E-02	2.4E+00	--	--	3.4E+01	3.3E+03	--	--	3.4E+01	3.3E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	3.7E+04	3.9E+04	3.7E+06	1.3E+07	2.4E+01	2.5E+01	7.4E+02	2.6E+03	9.1E+03	9.8E+03	3.7E+05	1.3E+06	9.1E+03	9.8E+03	3.7E+05	1.3E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.8E+02
Arsenic	5.0E+02
Barium	1.0E+05
Cadmium	5.7E+01
Chromium III	3.7E+03
Chromium VI	6.0E+02
Copper	4.1E+02
Iron	1.5E+04
Lead	6.1E+02
Manganese	2.5E+03
Mercury	4.6E+01
Nickel	1.0E+03
Selenium	3.0E+02
Silver	8.9E+01
Zinc	3.7E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 014 Permit No.: VA0000248

Receiving Stream: Stroubles Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	1.5 MGD
7Q10 (Annual) =	1.7 MGD
30Q10 (Annual) =	1.9 MGD
1Q10 (Wet season) =	2.3 MGD
30Q10 (Wet season)	4.4 MGD
30Q5 =	2.1 MGD
Harmonic Mean =	5.7 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.1 SU
10% Maximum pH =	6.9 SU
Discharge Flow =	0.1 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	1.5E+04	2.2E+04	--	--	6.7E+01	9.9E+01	--	--	1.5E+03	2.2E+03	--	--	1.5E+03	2.2E+03
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	1.3E+02	2.0E+02	--	--	6.1E-01	9.3E-01	--	--	1.3E+01	2.0E+01	--	--	1.3E+01	2.0E+01
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	3.0E+01	1.5E+02	--	--	5.1E-02	2.5E-01	--	--	3.0E+00	1.5E+01	--	--	3.0E+00	1.5E+01
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	4.8E+01	--	2.8E-02	2.9E-02	7.5E-01	--	4.9E-05	5.0E-05	1.2E+01	--	2.8E-03	2.9E-03	1.2E+01	--	2.8E-03	2.9E-03
Ammonia-N (mg/l) (Yearly)	0	3.25E+00	9.42E-01	--	--	5.19E+01	1.88E+01	--	--	8.12E-01	2.36E-01	--	--	1.30E+01	4.71E+00	--	--	1.30E+01	4.71E+00	--	--
Ammonia-N (mg/l) (High Flow)	0	3.21E+00	1.37E+00	--	--	7.71E+01	6.17E+01	--	--	8.03E-01	3.43E-01	--	--	1.93E+01	1.54E+01	--	--	1.93E+01	1.54E+01	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	1.8E+05	8.8E+05	--	--	8.3E+02	4.0E+03	--	--	1.8E+04	8.8E+04	--	--	1.8E+04	8.8E+04
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	1.2E+02	1.4E+04	--	--	5.6E-01	6.4E+01	--	--	1.2E+01	1.4E+03	--	--	1.2E+01	1.4E+03
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	5.4E+03	2.7E+03	2.2E+02	--	8.5E+01	3.8E+01	1.0E+00	--	1.4E+03	6.8E+02	2.2E+01	--	1.4E+03	6.8E+02	2.2E+01	--
Barium	0	--	--	2.0E+03	--	--	--	4.4E+04	--	--	--	2.0E+02	--	--	--	4.4E+03	--	--	--	4.4E+03	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	1.3E+03	3.0E+04	--	--	2.2E+00	5.1E+01	--	--	1.3E+02	3.0E+03	--	--	1.3E+02	3.0E+03
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	5.0E-02	1.2E-01	--	--	8.6E-05	2.0E-04	--	--	5.0E-03	1.2E-02	--	--	5.0E-03	1.2E-02
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Bis2-Chloroethyl Ether[C]	0	--	--	3.0E-01	5.3E+00	--	--	1.7E+01	3.1E+02	--	--	3.0E-02	5.3E-01	--	--	1.7E+00	3.1E+01	--	--	1.7E+00	3.1E+01
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	3.1E+04	1.4E+06	--	--	1.4E+02	6.5E+03	--	--	3.1E+03	1.4E+05	--	--	3.1E+03	1.4E+05
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	7.0E+02	1.3E+03	--	--	1.2E+00	2.2E+00	--	--	7.0E+01	1.3E+02	--	--	7.0E+01	1.3E+02
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	2.5E+03	8.1E+04	--	--	4.3E+00	1.4E+02	--	--	2.5E+02	8.1E+03	--	--	2.5E+02	8.1E+03
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	3.3E+04	4.2E+04	--	--	1.5E+02	1.9E+02	--	--	3.3E+03	4.2E+03	--	--	3.3E+03	4.2E+03
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	4.9E+01	1.7E+01	1.1E+02	--	7.7E-01	2.4E-01	5.0E-01	--	1.2E+01	4.3E+00	1.1E+01	--	1.2E+01	4.3E+00	1.1E+01	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	1.3E+02	9.3E+02	--	--	2.3E-01	1.6E+00	--	--	1.3E+01	9.3E+01	--	--	1.3E+01	9.3E+01
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	3.8E+01	7.7E-02	4.6E-01	4.7E-01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	9.6E+00	1.9E-02	4.6E-02	4.7E-02	9.6E+00	1.9E-02	4.6E-02	4.7E-02
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.4E+07	4.1E+06	5.5E+06	--	2.2E+05	5.8E+04	2.5E+04	--	3.4E+06	1.0E+06	5.5E+05	--	3.4E+06	1.0E+06	5.5E+05	--
TRC	0	1.9E+01	1.1E+01	--	--	3.0E+02	2.0E+02	--	--	4.8E+00	2.8E+00	--	--	7.6E+01	5.0E+01	--	--	7.6E+01	5.0E+01	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	2.9E+03	3.5E+04	--	--	1.3E+01	1.6E+02	--	--	2.9E+02	3.5E+03	--	--	2.9E+02	3.5E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	2.3E+02	7.5E+03	--	--	4.0E-01	1.3E+01	--	--	2.3E+01	7.5E+02	--	--	2.3E+01	7.5E+02
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	7.5E+03	2.4E+05	--	--	3.4E+01	1.1E+03	--	--	7.5E+02	2.4E+04	--	--	7.5E+02	2.4E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	2.2E+04	3.5E+04	--	--	1.0E+02	1.6E+02	--	--	2.2E+03	3.5E+03	--	--	2.2E+03	3.5E+03
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	1.8E+03	3.3E+03	--	--	8.1E+00	1.5E+01	--	--	1.8E+02	3.3E+02	--	--	1.8E+02	3.3E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.3E+00	7.4E-01	--	--	2.1E-02	1.0E-02	--	--	3.3E-01	1.8E-01	--	--	3.3E-01	1.8E-01	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	7.6E+03	1.1E+03	--	--	1.2E+02	1.5E+01	--	--	1.9E+03	2.8E+02	--	--	1.9E+03	2.8E+02	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.6E+02	2.0E+02	--	--	4.0E+00	2.8E+00	--	--	6.4E+01	5.0E+01	--	--	6.4E+01	5.0E+01	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	2.2E+03	--	--	--	1.0E+01	--	--	--	2.2E+02	--	--	--	2.2E+02	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	3.8E-04	1.8E-03	--	--	2.2E-02	1.0E-01	--	--	2.2E-02	1.0E-01
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	1.7E+02	1.3E+02	2.9E+04	--	2.7E+00	1.9E+00	1.3E+02	--	4.4E+01	3.3E+01	2.9E+03	--	4.4E+01	3.3E+01	2.9E+03	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	3.5E+02	9.4E+01	3.1E+03	3.5E+05	5.5E+00	1.3E+00	1.4E+01	1.6E+03	8.8E+01	2.3E+01	3.1E+02	3.5E+04	8.8E+01	2.3E+01	3.1E+02	3.5E+04
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	1.8E-01	1.8E-01	--	--	3.1E-04	3.1E-04	--	--	1.8E-02	1.8E-02	--	--	1.8E-02	1.8E-02
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	1.3E-01	1.3E-01	--	--	2.2E-04	2.2E-04	--	--	1.3E-02	1.3E-02	--	--	1.3E-02	1.3E-02
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.8E+01	1.8E-02	1.3E-01	1.3E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	4.4E+00	4.5E-03	1.3E-02	1.3E-02	4.4E+00	4.5E-03	1.3E-02	1.3E-02
Demeton	0	--	1.0E-01	--	--	--	1.8E+00	--	--	--	2.5E-02	--	--	--	4.5E-01	--	--	--	4.5E-01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	2.7E+00	3.1E+00	--	--	4.3E-02	4.3E-02	--	--	6.8E-01	7.7E-01	--	--	6.8E-01	7.7E-01	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	9.2E+03	2.9E+04	--	--	4.2E+01	1.3E+02	--	--	9.2E+02	2.9E+03	--	--	9.2E+02	2.9E+03
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	7.0E+03	2.1E+04	--	--	3.2E+01	9.6E+01	--	--	7.0E+02	2.1E+03	--	--	7.0E+02	2.1E+03
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	1.4E+03	4.2E+03	--	--	6.3E+00	1.9E+01	--	--	1.4E+02	4.2E+02	--	--	1.4E+02	4.2E+02
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	1.2E+01	1.6E+01	--	--	2.1E-02	2.8E-02	--	--	1.2E+00	1.6E+00	--	--	1.2E+00	1.6E+00
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	3.2E+02	9.9E+03	--	--	5.5E-01	1.7E+01	--	--	3.2E+01	9.9E+02	--	--	3.2E+01	9.9E+02
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	2.2E+02	2.1E+04	--	--	3.8E-01	3.7E+01	--	--	2.2E+01	2.1E+03	--	--	2.2E+01	2.1E+03
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	7.3E+03	1.6E+05	--	--	3.3E+01	7.1E+02	--	--	7.3E+02	1.6E+04	--	--	7.3E+02	1.6E+04
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	3.1E+03	2.2E+05	--	--	1.4E+01	1.0E+03	--	--	3.1E+02	2.2E+04	--	--	3.1E+02	2.2E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	1.7E+03	6.4E+03	--	--	7.7E+00	2.9E+01	--	--	1.7E+02	6.4E+02	--	--	1.7E+02	6.4E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	2.2E+03	--	--	--	1.0E+01	--	--	--	2.2E+02	--	--	--	2.2E+02	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	2.9E+02	8.7E+03	--	--	5.0E-01	1.5E+01	--	--	2.9E+01	8.7E+02	--	--	2.9E+01	8.7E+02
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	2.0E+02	1.2E+04	--	--	3.4E-01	2.1E+01	--	--	2.0E+01	1.2E+03	--	--	2.0E+01	1.2E+03
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	3.8E+00	1.0E+00	3.0E-02	3.1E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	9.6E-01	2.5E-01	3.0E-03	3.1E-03	9.6E-01	2.5E-01	3.0E-03	3.1E-03
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	3.7E+05	9.7E+05	--	--	1.7E+03	4.4E+03	--	--	3.7E+04	9.7E+04	--	--	3.7E+04	9.7E+04
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	8.4E+03	1.9E+04	--	--	3.8E+01	8.5E+01	--	--	8.4E+02	1.9E+03	--	--	8.4E+02	1.9E+03
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	5.9E+06	2.4E+07	--	--	2.7E+04	1.1E+05	--	--	5.9E+05	2.4E+06	--	--	5.9E+05	2.4E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	4.4E+04	9.9E+04	--	--	2.0E+02	4.5E+02	--	--	4.4E+03	9.9E+03	--	--	4.4E+03	9.9E+03
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	1.5E+03	1.2E+05	--	--	6.9E+00	5.3E+02	--	--	1.5E+02	1.2E+04	--	--	1.5E+02	1.2E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	2.9E+02	6.2E+03	--	--	1.3E+00	2.8E+01	--	--	2.9E+01	6.2E+02	--	--	2.9E+01	6.2E+02
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	6.4E+01	2.0E+03	--	--	1.1E-01	3.4E+00	--	--	6.4E+00	2.0E+02	--	--	6.4E+00	2.0E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	1.1E-06	1.1E-06	--	--	5.0E-09	5.1E-09	--	--	1.1E-07	1.1E-07	--	--	1.1E-07	1.1E-07
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	2.1E+01	1.2E+02	--	--	3.6E-02	2.0E-01	--	--	2.1E+00	1.2E+01	--	--	2.1E+00	1.2E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.5E+00	1.0E+00	1.4E+03	2.0E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	8.8E-01	2.5E-01	1.4E+02	2.0E+02	8.8E-01	2.5E-01	1.4E+02	2.0E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.5E+00	1.0E+00	1.4E+03	2.0E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	8.8E-01	2.5E-01	1.4E+02	2.0E+02	8.8E-01	2.5E-01	1.4E+02	2.0E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.5E+00	1.0E+00	--	--	5.5E-02	1.4E-02	--	--	8.8E-01	2.5E-01	--	--	8.8E-01	2.5E-01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	1.4E+03	2.0E+03	--	--	6.2E+00	8.9E+00	--	--	1.4E+02	2.0E+02	--	--	1.4E+02	2.0E+02
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.4E+00	6.5E-01	1.3E+00	1.3E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	3.4E-01	1.6E-01	1.3E-01	1.3E-01	3.4E-01	1.6E-01	1.3E-01	1.3E-01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	6.4E+00	6.6E+00	--	--	2.9E-02	3.0E-02	--	--	6.4E-01	6.6E-01	--	--	6.4E-01	6.6E-01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	1.2E+04	4.6E+04	--	--	5.3E+01	2.1E+02	--	--	1.2E+03	4.6E+03	--	--	1.2E+03	4.6E+03
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	2.9E+03	3.1E+03	--	--	1.3E+01	1.4E+01	--	--	2.9E+02	3.1E+02	--	--	2.9E+02	3.1E+02
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	2.4E+04	1.2E+05	--	--	1.1E+02	5.3E+02	--	--	2.4E+03	1.2E+04	--	--	2.4E+03	1.2E+04
Foaming Agents	0	--	--	5.0E+02	--	--	--	1.1E+04	--	--	--	5.0E+01	--	--	--	1.1E+03	--	--	--	1.1E+03	--
Guthion	0	--	1.0E-02	--	--	--	1.8E-01	--	--	--	2.5E-03	--	--	--	4.5E-02	--	--	--	4.5E-02	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	8.3E+00	6.8E-02	4.6E-02	4.6E-02	1.3E-01	9.5E-04	7.9E-05	7.9E-05	2.1E+00	1.7E-02	4.6E-03	4.6E-03	2.1E+00	1.7E-02	4.6E-03	4.6E-03
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	8.3E+00	6.8E-02	2.3E-02	2.3E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	2.1E+00	1.7E-02	2.3E-03	2.3E-03	2.1E+00	1.7E-02	2.3E-03	2.3E-03
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.6E-01	1.7E-01	--	--	2.8E-04	2.9E-04	--	--	1.6E-02	1.7E-02	--	--	1.6E-02	1.7E-02
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	2.6E+02	1.0E+04	--	--	4.4E-01	1.8E+01	--	--	2.6E+01	1.0E+03	--	--	2.6E+01	1.0E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	1.5E+00	2.8E+00	--	--	2.6E-03	4.9E-03	--	--	1.5E-01	2.8E-01	--	--	1.5E-01	2.8E-01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	5.3E+00	9.9E+00	--	--	9.1E-03	1.7E-02	--	--	5.3E-01	9.9E-01	--	--	5.3E-01	9.9E-01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.5E+01	--	5.7E+01	1.0E+02	2.4E-01	--	9.8E-02	1.8E-01	3.8E+00	--	5.7E+00	1.0E+01	3.8E+00	--	5.7E+00	1.0E+01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	8.8E+02	2.4E+04	--	--	4.0E+00	1.1E+02	--	--	8.8E+01	2.4E+03	--	--	8.8E+01	2.4E+03
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	8.1E+02	1.9E+03	--	--	1.4E+00	3.3E+00	--	--	8.1E+01	1.9E+02	--	--	8.1E+01	1.9E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	3.6E+01	--	--	--	5.0E-01	--	--	--	9.0E+00	--	--	--	9.0E+00	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.2E+00	1.0E+01	--	--	3.8E-03	1.8E-02	--	--	2.2E-01	1.0E+00	--	--	2.2E-01	1.0E+00
Iron	0	--	--	3.0E+02	--	--	--	6.6E+03	--	--	--	3.0E+01	--	--	--	6.6E+02	--	--	--	6.6E+02	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	2.0E+04	5.6E+05	--	--	3.5E+01	9.6E+02	--	--	2.0E+03	5.6E+04	--	--	2.0E+03	5.6E+04
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	1.4E+03	1.8E+02	3.3E+02	--	2.2E+01	2.6E+00	1.5E+00	--	3.6E+02	4.6E+01	3.3E+01	--	3.6E+02	4.6E+01	3.3E+01	--
Malathion	0	--	1.0E-01	--	--	--	1.8E+00	--	--	--	2.5E-02	--	--	--	4.5E-01	--	--	--	4.5E-01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	1.1E+03	--	--	--	5.0E+00	--	--	--	1.1E+02	--	--	--	1.1E+02	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.2E+01	1.4E+01	--	--	3.5E-01	1.9E-01	--	--	5.6E+00	3.5E+00	--	--	5.6E+00	3.5E+00	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.0E+03	3.3E+04	--	--	4.7E+00	1.5E+02	--	--	1.0E+02	3.3E+03	--	--	1.0E+02	3.3E+03
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	2.7E+03	3.4E+05	--	--	4.6E+00	5.9E+02	--	--	2.7E+02	3.4E+04	--	--	2.7E+02	3.4E+04
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	5.4E-01	2.2E+03	--	--	7.5E-03	1.0E+01	--	--	1.4E-01	2.2E+02	--	--	1.4E-01	2.2E+02	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	2.4E+03	3.0E+02	1.3E+04	1.0E+05	3.8E+01	4.2E+00	6.1E+01	4.6E+02	6.1E+02	7.6E+01	1.3E+03	1.0E+04	6.1E+02	7.6E+01	1.3E+03	1.0E+04
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	2.2E+05	--	--	--	1.0E+03	--	--	--	2.2E+04	--	--	--	2.2E+04	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	3.7E+02	1.5E+04	--	--	1.7E+00	6.9E+01	--	--	3.7E+01	1.5E+03	--	--	3.7E+01	1.5E+03
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	4.0E-01	1.7E+03	--	--	6.9E-04	3.0E+00	--	--	4.0E-02	1.7E+02	--	--	4.0E-02	1.7E+02
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	1.9E+03	3.5E+03	--	--	3.3E+00	6.0E+00	--	--	1.9E+02	3.5E+02	--	--	1.9E+02	3.5E+02
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	2.9E+00	3.0E+02	--	--	5.0E-03	5.1E-01	--	--	2.9E-01	3.0E+01	--	--	2.9E-01	3.0E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.5E+02	1.2E+02	--	--	7.0E+00	1.7E+00	--	--	1.1E+02	3.0E+01	--	--	1.1E+02	3.0E+01	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.0E+00	2.3E-01	--	--	1.6E-02	3.3E-03	--	--	2.6E-01	5.9E-02	--	--	2.6E-01	5.9E-02	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	2.5E-01	3.7E-02	3.7E-02	--	3.5E-03	6.4E-05	6.4E-05	--	6.3E-02	3.7E-03	3.7E-03	--	6.3E-02	3.7E-03	3.7E-03
Pentachlorophenol [C]	0	1.1E+01	8.7E+00	2.7E+00	3.0E+01	1.8E+02	1.6E+02	1.6E+02	1.7E+03	2.8E+00	2.2E+00	2.7E-01	3.0E+00	4.5E+01	3.9E+01	1.6E+01	1.7E+02	4.5E+01	3.9E+01	1.6E+01	1.7E+02
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	2.2E+05	1.9E+07	--	--	1.0E+03	8.6E+04	--	--	2.2E+04	1.9E+06	--	--	2.2E+04	1.9E+06
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	1.8E+04	8.8E+04	--	--	8.3E+01	4.0E+02	--	--	1.8E+03	8.8E+03	--	--	1.8E+03	8.8E+03
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	3.3E+02	--	--	--	1.5E+00	--	--	--	3.3E+01	--	--	--	3.3E+01	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	8.8E+01	--	--	--	4.0E-01	--	--	--	8.8E+00	--	--	--	8.8E+00	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	1.1E+02	--	--	--	5.0E-01	--	--	--	1.1E+01	--	--	--	1.1E+01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	6.6E+02	--	--	--	3.0E+00	--	--	--	6.6E+01	--	--	--	6.6E+01	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	3.2E+02	9.0E+01	3.7E+03	9.2E+04	5.0E+00	1.3E+00	1.7E+01	4.2E+02	8.0E+01	2.3E+01	3.7E+02	9.2E+03	8.0E+01	2.3E+01	3.7E+02	9.2E+03
Silver	0	2.4E+00	--	--	--	3.8E+01	--	--	--	5.9E-01	--	--	--	9.5E+00	--	--	--	9.5E+00	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	5.5E+06	--	--	--	2.5E+04	--	--	--	5.5E+05	--	--	--	5.5E+05	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	9.9E+01	2.3E+03	--	--	1.7E-01	4.0E+00	--	--	9.9E+00	2.3E+02	--	--	9.9E+00	2.3E+02
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	4.0E+02	1.9E+03	--	--	6.9E-01	3.3E+00	--	--	4.0E+01	1.9E+02	--	--	4.0E+01	1.9E+02
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	5.3E+00	1.0E+01	--	--	2.4E-02	4.7E-02	--	--	5.3E-01	1.0E+00	--	--	5.3E-01	1.0E+00
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	1.1E+04	1.3E+05	--	--	5.1E+01	6.0E+02	--	--	1.1E+03	1.3E+04	--	--	1.1E+03	1.3E+04
Total dissolved solids	0	--	--	5.0E+05	--	--	--	1.1E+07	--	--	--	5.0E+04	--	--	--	1.1E+06	--	--	--	1.1E+06	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.2E+01	3.6E-03	1.6E-01	1.6E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.9E+00	9.0E-04	1.6E-02	1.6E-02	2.9E+00	9.0E-04	1.6E-02	1.6E-02
Tributyltin	0	4.6E-01	7.2E-02	--	--	7.4E+00	1.3E+00	--	--	1.2E-01	1.8E-02	--	--	1.8E+00	3.2E-01	--	--	1.8E+00	3.2E-01	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	7.7E+02	1.5E+03	--	--	3.5E+00	7.0E+00	--	--	7.7E+01	1.5E+02	--	--	7.7E+01	1.5E+02
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	3.4E+02	9.3E+03	--	--	5.9E-01	1.6E+01	--	--	3.4E+01	9.3E+02	--	--	3.4E+01	9.3E+02
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	1.5E+03	1.7E+04	--	--	2.5E+00	3.0E+01	--	--	1.5E+02	1.7E+03	--	--	1.5E+02	1.7E+03
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	8.1E+02	1.4E+03	--	--	1.4E+00	2.4E+00	--	--	8.1E+01	1.4E+02	--	--	8.1E+01	1.4E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	1.1E+03	--	--	--	5.0E+00	--	--	--	1.1E+02	--	--	--	1.1E+02	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	1.5E+01	1.4E+03	--	--	2.5E-02	2.4E+00	--	--	1.5E+00	1.4E+02	--	--	1.5E+00	1.4E+02
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	1.6E+03	1.8E+03	1.6E+05	5.7E+05	2.4E+01	2.5E+01	7.4E+02	2.6E+03	3.9E+02	4.4E+02	1.6E+04	5.7E+04	3.9E+02	4.4E+02	1.6E+04	5.7E+04

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.2E+01
Arsenic	2.2E+01
Barium	4.4E+03
Cadmium	2.6E+00
Chromium III	1.7E+02
Chromium VI	2.6E+01
Copper	1.7E+01
Iron	6.6E+02
Lead	2.8E+01
Manganese	1.1E+02
Mercury	2.1E+00
Nickel	4.5E+01
Selenium	1.4E+01
Silver	3.8E+00
Zinc	1.6E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 026 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	638 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1512 MGD

Mixing Information

Annual - 1Q10 Mix =	1.08 %
- 7Q10 Mix =	63.64 %
- 30Q10 Mix =	72.75 %
Wet Season - 1Q10 Mix =	1.08 %
- 30Q10 Mix =	72.75 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	7.3 SU
10% Maximum pH =	6.6 SU
Discharge Flow =	1 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	4.8E+05	7.1E+05	--	--	6.7E+01	9.9E+01	--	--	4.8E+04	7.1E+04	--	--	4.8E+04	7.1E+04
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	4.4E+03	6.7E+03	--	--	6.1E-01	9.3E-01	--	--	4.4E+02	6.7E+02	--	--	4.4E+02	6.7E+02
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	7.7E+02	3.8E+03	--	--	5.1E-02	2.5E-01	--	--	7.7E+01	3.8E+02	--	--	7.7E+01	3.8E+02
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	1.7E+01	--	7.4E-01	7.6E-01	7.5E-01	--	4.9E-05	5.0E-05	3.3E+02	--	7.4E-02	7.6E-02	1.7E+01	--	7.4E-02	7.6E-02
Ammonia-N (mg/l) (Yearly)	0	6.88E+00	9.36E-01	--	--	3.96E+01	4.35E+02	--	--	8.01E-01	2.33E-01	--	--	3.53E+02	1.49E+02	--	--	3.96E+01	1.49E+02	--	--
Ammonia-N (mg/l) (High Flow)	0	6.44E+00	1.37E+00	--	--	4.26E+01	1.06E+03	--	--	7.99E-01	3.42E-01	--	--	4.16E+02	3.62E+02	--	--	4.26E+01	3.62E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	6.0E+06	2.9E+07	--	--	8.3E+02	4.0E+03	--	--	6.0E+05	2.9E+06	--	--	6.0E+05	2.9E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	4.0E+03	4.6E+05	--	--	5.6E-01	6.4E+01	--	--	4.0E+02	4.6E+04	--	--	4.0E+02	4.6E+04
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	2.0E+03	5.3E+04	7.2E+03	--	8.5E+01	3.8E+01	1.0E+00	--	3.7E+04	2.1E+04	7.2E+02	--	2.0E+03	2.1E+04	7.2E+02	--
Barium	0	--	--	2.0E+03	--	--	--	1.4E+06	--	--	--	2.0E+02	--	--	--	1.4E+05	--	--	--	1.4E+05	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	3.3E+04	7.7E+05	--	--	2.2E+00	5.1E+01	--	--	3.3E+03	7.7E+04	--	--	3.3E+03	7.7E+04
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.3E+00	3.0E+00	--	--	8.6E-05	2.0E-04	--	--	1.3E-01	3.0E-01	--	--	1.3E-01	3.0E-01
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	4.5E+02	8.0E+03	--	--	3.0E-02	5.3E-01	--	--	4.5E+01	8.0E+02	--	--	4.5E+01	8.0E+02
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.0E+06	4.7E+07	--	--	1.4E+02	6.5E+03	--	--	1.0E+05	4.7E+06	--	--	1.0E+05	4.7E+06
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.8E+04	3.3E+04	--	--	1.2E+00	2.2E+00	--	--	1.8E+03	3.3E+03	--	--	1.8E+03	3.3E+03
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	6.5E+04	2.1E+06	--	--	4.3E+00	1.4E+02	--	--	6.5E+03	2.1E+05	--	--	6.5E+03	2.1E+05
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.1E+06	1.4E+06	--	--	1.5E+02	1.9E+02	--	--	1.1E+05	1.4E+05	--	--	1.1E+05	1.4E+05
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	1.8E+01	3.4E+02	3.6E+03	--	7.7E-01	2.4E-01	5.0E-01	--	3.4E+02	1.3E+02	3.6E+02	--	1.8E+01	1.3E+02	3.6E+02	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	3.5E+03	2.4E+04	--	--	2.3E-01	1.6E+00	--	--	3.5E+02	2.4E+03	--	--	3.5E+02	2.4E+03
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	1.4E+01	1.5E+00	1.2E+01	1.2E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	2.6E+02	5.9E-01	1.2E+00	1.2E+00	1.4E+01	5.9E-01	1.2E+00	1.2E+00
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	4.9E+06	8.1E+07	1.8E+08	--	2.2E+05	5.8E+04	2.5E+04	--	9.5E+07	3.2E+07	1.8E+07	--	4.9E+06	3.2E+07	1.8E+07	--
TRC	0	1.9E+01	1.1E+01	--	--	1.1E+02	3.9E+03	--	--	4.8E+00	2.8E+00	--	--	2.1E+03	1.5E+03	--	--	1.1E+02	1.5E+03	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	9.3E+04	1.1E+06	--	--	1.3E+01	1.6E+02	--	--	9.3E+03	1.1E+05	--	--	9.3E+03	1.1E+05

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	6.1E+03	2.0E+05	--	--	4.0E-01	1.3E+01	--	--	6.1E+02	2.0E+04	--	--	6.1E+02	2.0E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.4E+05	7.9E+06	--	--	3.4E+01	1.1E+03	--	--	2.4E+04	7.9E+05	--	--	2.4E+04	7.9E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	7.2E+05	1.1E+06	--	--	1.0E+02	1.6E+02	--	--	7.2E+04	1.1E+05	--	--	7.2E+04	1.1E+05
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	5.8E+04	1.1E+05	--	--	8.1E+00	1.5E+01	--	--	5.8E+03	1.1E+04	--	--	5.8E+03	1.1E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	4.8E-01	1.4E+01	--	--	2.1E-02	1.0E-02	--	--	9.2E+00	5.6E+00	--	--	4.8E-01	5.6E+00	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	2.7E+03	2.2E+04	--	--	1.2E+02	1.5E+01	--	--	5.2E+04	8.5E+03	--	--	2.7E+03	8.5E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	9.2E+01	3.9E+03	--	--	4.0E+00	2.8E+00	--	--	1.8E+03	1.5E+03	--	--	9.2E+01	1.5E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	7.2E+04	--	--	--	1.0E+01	--	--	--	7.2E+03	--	--	--	7.2E+03	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	3.8E-04	1.8E-03	--	--	5.7E-01	2.7E+00	--	--	5.7E-01	2.7E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	6.3E+01	2.6E+03	9.3E+05	--	2.7E+00	1.9E+00	1.3E+02	--	1.2E+03	1.0E+03	9.3E+04	--	6.3E+01	1.0E+03	9.3E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	1.3E+02	1.8E+03	1.0E+05	1.1E+07	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.4E+03	7.2E+02	1.0E+04	1.1E+06	1.3E+02	7.2E+02	1.0E+04	1.1E+06
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	4.7E+00	4.7E+00	--	--	3.1E-04	3.1E-04	--	--	4.7E-01	4.7E-01	--	--	4.7E-01	4.7E-01
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	3.3E+00	3.3E+00	--	--	2.2E-04	2.2E-04	--	--	3.3E-01	3.3E-01	--	--	3.3E-01	3.3E-01
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	6.3E+00	3.5E-01	3.3E+00	3.3E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.2E+02	1.4E-01	3.3E-01	3.3E-01	6.3E+00	1.4E-01	3.3E-01	3.3E-01
Demeton	0	--	1.0E-01	--	--	--	3.5E+01	--	--	--	2.5E-02	--	--	--	1.4E+01	--	--	--	1.4E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	9.8E-01	6.0E+01	--	--	4.3E-02	4.3E-02	--	--	1.9E+01	2.3E+01	--	--	9.8E-01	2.3E+01	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.0E+05	9.3E+05	--	--	4.2E+01	1.3E+02	--	--	3.0E+04	9.3E+04	--	--	3.0E+04	9.3E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.3E+05	6.9E+05	--	--	3.2E+01	9.6E+01	--	--	2.3E+04	6.9E+04	--	--	2.3E+04	6.9E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	4.5E+04	1.4E+05	--	--	6.3E+00	1.9E+01	--	--	4.5E+03	1.4E+04	--	--	4.5E+03	1.4E+04
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	3.2E+02	4.2E+02	--	--	2.1E-02	2.8E-02	--	--	3.2E+01	4.2E+01	--	--	3.2E+01	4.2E+01
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	8.3E+03	2.6E+05	--	--	5.5E-01	1.7E+01	--	--	8.3E+02	2.6E+04	--	--	8.3E+02	2.6E+04
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	5.7E+03	5.6E+05	--	--	3.8E-01	3.7E+01	--	--	5.7E+02	5.6E+04	--	--	5.7E+02	5.6E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.4E+05	5.1E+06	--	--	3.3E+01	7.1E+02	--	--	2.4E+04	5.1E+05	--	--	2.4E+04	5.1E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.0E+05	7.2E+06	--	--	1.4E+01	1.0E+03	--	--	1.0E+04	7.2E+05	--	--	1.0E+04	7.2E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	5.5E+04	2.1E+05	--	--	7.7E+00	2.9E+01	--	--	5.5E+03	2.1E+04	--	--	5.5E+03	2.1E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	7.2E+04	--	--	--	1.0E+01	--	--	--	7.2E+03	--	--	--	7.2E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	7.6E+03	2.3E+05	--	--	5.0E-01	1.5E+01	--	--	7.6E+02	2.3E+04	--	--	7.6E+02	2.3E+04
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	5.1E+03	3.2E+05	--	--	3.4E-01	2.1E+01	--	--	5.1E+02	3.2E+04	--	--	5.1E+02	3.2E+04
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	1.4E+00	2.0E+01	7.9E-01	8.2E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	2.6E+01	7.7E+00	7.9E-02	8.2E-02	1.4E+00	7.7E+00	7.9E-02	8.2E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.2E+07	3.2E+07	--	--	1.7E+03	4.4E+03	--	--	1.2E+06	3.2E+06	--	--	1.2E+06	3.2E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	2.7E+05	6.1E+05	--	--	3.8E+01	8.5E+01	--	--	2.7E+04	6.1E+04	--	--	2.7E+04	6.1E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.9E+08	7.9E+08	--	--	2.7E+04	1.1E+05	--	--	1.9E+07	7.9E+07	--	--	1.9E+07	7.9E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.4E+06	3.2E+06	--	--	2.0E+02	4.5E+02	--	--	1.4E+05	3.2E+05	--	--	1.4E+05	3.2E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	5.0E+04	3.8E+06	--	--	6.9E+00	5.3E+02	--	--	5.0E+03	3.8E+05	--	--	5.0E+03	3.8E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	9.3E+03	2.0E+05	--	--	1.3E+00	2.8E+01	--	--	9.3E+02	2.0E+04	--	--	9.3E+02	2.0E+04
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	1.7E+03	5.1E+04	--	--	1.1E-01	3.4E+00	--	--	1.7E+02	5.1E+03	--	--	1.7E+02	5.1E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	3.6E-05	3.7E-05	--	--	5.0E-09	5.1E-09	--	--	3.6E-06	3.7E-06	--	--	3.6E-06	3.7E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	5.4E+02	3.0E+03	--	--	3.6E-02	2.0E-01	--	--	5.4E+01	3.0E+02	--	--	5.4E+01	3.0E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	1.3E+00	2.0E+01	4.5E+04	6.4E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.4E+01	7.7E+00	4.5E+03	6.4E+03	1.3E+00	7.7E+00	4.5E+03	6.4E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	1.3E+00	2.0E+01	4.5E+04	6.4E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.4E+01	7.7E+00	4.5E+03	6.4E+03	1.3E+00	7.7E+00	4.5E+03	6.4E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.3E+00	2.0E+01	--	--	5.5E-02	1.4E-02	--	--	2.4E+01	7.7E+00	--	--	1.3E+00	7.7E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	4.5E+04	6.4E+04	--	--	6.2E+00	8.9E+00	--	--	4.5E+03	6.4E+03	--	--	4.5E+03	6.4E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	4.9E-01	1.3E+01	4.2E+01	4.3E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	9.5E+00	5.0E+00	4.2E+00	4.3E+00	4.9E-01	5.0E+00	4.2E+00	4.3E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.1E+02	2.2E+02	--	--	2.9E-02	3.0E-02	--	--	2.1E+01	2.2E+01	--	--	2.1E+01	2.2E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	3.8E+05	1.5E+06	--	--	5.3E+01	2.1E+02	--	--	3.8E+04	1.5E+05	--	--	3.8E+04	1.5E+05
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	9.3E+04	1.0E+05	--	--	1.3E+01	1.4E+01	--	--	9.3E+03	1.0E+04	--	--	9.3E+03	1.0E+04
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	7.9E+05	3.8E+06	--	--	1.1E+02	5.3E+02	--	--	7.9E+04	3.8E+05	--	--	7.9E+04	3.8E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	3.6E+05	--	--	--	5.0E+01	--	--	--	3.6E+04	--	--	--	3.6E+04	--
Guthion	0	--	1.0E-02	--	--	--	3.5E+00	--	--	--	2.5E-03	--	--	--	1.4E+00	--	--	--	1.4E+00	--	--
Heptachlor [c]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	3.0E+00	1.3E+00	1.2E+00	1.2E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	5.7E+01	5.2E-01	1.2E-01	1.2E-01	3.0E+00	5.2E-01	1.2E-01	1.2E-01
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	3.0E+00	1.3E+00	5.9E-01	5.9E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	5.7E+01	5.2E-01	5.9E-02	5.9E-02	3.0E+00	5.2E-01	5.9E-02	5.9E-02
Hexachlorobenzene[c]	0	--	--	2.8E-03	2.9E-03	--	--	4.2E+00	4.4E+00	--	--	2.8E-04	2.9E-04	--	--	4.2E-01	4.4E-01	--	--	4.2E-01	4.4E-01
Hexachlorobutadiene[c]	0	--	--	4.4E+00	1.8E+02	--	--	6.7E+03	2.7E+05	--	--	4.4E-01	1.8E+01	--	--	6.7E+02	2.7E+04	--	--	6.7E+02	2.7E+04
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	2.6E-02	4.9E-02	--	--	3.9E+01	7.4E+01	--	--	2.6E-03	4.9E-03	--	--	3.9E+00	7.4E+00	--	--	3.9E+00	7.4E+00
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	9.1E-02	1.7E-01	--	--	1.4E+02	2.6E+02	--	--	9.1E-03	1.7E-02	--	--	1.4E+01	2.6E+01	--	--	1.4E+01	2.6E+01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	5.5E+00	--	1.5E+03	2.7E+03	2.4E-01	--	9.8E-02	1.8E-01	1.0E+02	--	1.5E+02	2.7E+02	5.5E+00	--	1.5E+02	2.7E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	2.9E+04	7.9E+05	--	--	4.0E+00	1.1E+02	--	--	2.9E+03	7.9E+04	--	--	2.9E+03	7.9E+04
Hexachloroethane[c]	0	--	--	1.4E+01	3.3E+01	--	--	2.1E+04	5.0E+04	--	--	1.4E+00	3.3E+00	--	--	2.1E+03	5.0E+03	--	--	2.1E+03	5.0E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	7.0E+02	--	--	--	5.0E-01	--	--	--	2.8E+02	--	--	--	2.8E+02	--	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	5.7E+01	2.7E+02	--	--	3.8E-03	1.8E-02	--	--	5.7E+00	2.7E+01	--	--	5.7E+00	2.7E+01
Iron	0	--	--	3.0E+02	--	--	--	2.2E+05	--	--	--	3.0E+01	--	--	--	2.2E+04	--	--	--	2.2E+04	--
Isophorone[c]	0	--	--	3.5E+02	9.6E+03	--	--	5.3E+05	1.5E+07	--	--	3.5E+01	9.6E+02	--	--	5.3E+04	1.5E+06	--	--	5.3E+04	1.5E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	5.2E+02	3.6E+03	1.1E+04	--	2.2E+01	2.6E+00	1.5E+00	--	9.9E+03	1.4E+03	1.1E+03	--	5.2E+02	1.4E+03	1.1E+03	--
Malathion	0	--	1.0E-01	--	--	--	3.5E+01	--	--	--	2.5E-02	--	--	--	1.4E+01	--	--	--	1.4E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	3.6E+04	--	--	--	5.0E+00	--	--	--	3.6E+03	--	--	--	3.6E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	8.1E+00	2.7E+02	--	--	3.5E-01	1.9E-01	--	--	1.5E+02	1.1E+02	--	--	8.1E+00	1.1E+02	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.4E+04	1.1E+06	--	--	4.7E+00	1.5E+02	--	--	3.4E+03	1.1E+05	--	--	3.4E+03	1.1E+05
Methylene Chloride [c]	0	--	--	4.6E+01	5.9E+03	--	--	7.0E+04	8.9E+06	--	--	4.6E+00	5.9E+02	--	--	7.0E+03	8.9E+05	--	--	7.0E+03	8.9E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.1E+01	7.2E+04	--	--	7.5E-03	1.0E+01	--	--	4.1E+00	7.2E+03	--	--	4.1E+00	7.2E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	8.7E+02	5.9E+03	4.4E+05	3.3E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	1.7E+04	2.3E+03	4.4E+04	3.3E+05	8.7E+02	2.3E+03	4.4E+04	3.3E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	7.2E+06	--	--	--	1.0E+03	--	--	--	7.2E+05	--	--	--	7.2E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.2E+04	5.0E+05	--	--	1.7E+00	6.9E+01	--	--	1.2E+03	5.0E+04	--	--	1.2E+03	5.0E+04
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	3.0E+01	--	--	1.0E+01	4.5E+04	--	--	6.9E-04	3.0E+00	--	--	1.0E+00	4.5E+03	--	--	1.0E+00	4.5E+03
N-Nitrosodiphenylamine[c]	0	--	--	3.3E+01	6.0E+01	--	--	5.0E+04	9.1E+04	--	--	3.3E+00	6.0E+00	--	--	5.0E+03	9.1E+03	--	--	5.0E+03	9.1E+03
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	5.1E+00	--	--	7.6E+01	7.7E+03	--	--	5.0E-03	5.1E-01	--	--	7.6E+00	7.7E+02	--	--	7.6E+00	7.7E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.6E+02	2.3E+03	--	--	7.0E+00	1.7E+00	--	--	3.1E+03	9.1E+02	--	--	1.6E+02	9.1E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	3.7E-01	4.6E+00	--	--	1.6E-02	3.3E-03	--	--	7.2E+00	1.8E+00	--	--	3.7E-01	1.8E+00	--	--
PCB Total[c]	0	--	1.4E-02	6.4E-04	6.4E-04	--	4.9E+00	9.7E-01	9.7E-01	--	3.5E-03	6.4E-05	6.4E-05	--	1.9E+00	9.7E-02	9.7E-02	--	1.9E+00	9.7E-02	9.7E-02
Pentachlorophenol [c]	0	9.4E+00	9.0E+00	2.7E+00	3.0E+01	5.4E+01	3.2E+03	4.1E+03	4.5E+04	2.9E+00	2.3E+00	2.7E-01	3.0E+00	1.3E+03	1.2E+03	4.1E+02	4.5E+03	5.4E+01	1.2E+03	4.1E+02	4.5E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	7.2E+06	6.2E+08	--	--	1.0E+03	8.6E+04	--	--	7.2E+05	6.2E+07	--	--	7.2E+05	6.2E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	6.0E+05	2.9E+06	--	--	8.3E+01	4.0E+02	--	--	6.0E+04	2.9E+05	--	--	6.0E+04	2.9E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.1E+04	--	--	--	1.5E+00	--	--	--	1.1E+03	--	--	--	1.1E+03	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	2.9E+03	--	--	--	4.0E-01	--	--	--	2.9E+02	--	--	--	2.9E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	3.6E+03	--	--	--	5.0E-01	--	--	--	3.6E+02	--	--	--	3.6E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.2E+04	--	--	--	3.0E+00	--	--	--	2.2E+03	--	--	--	2.2E+03	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	1.2E+02	1.8E+03	1.2E+05	3.0E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.2E+03	6.9E+02	1.2E+04	3.0E+05	1.2E+02	6.9E+02	1.2E+04	3.0E+05
Silver	0	2.4E+00	--	--	--	1.4E+01	--	--	--	5.9E-01	--	--	--	2.6E+02	--	--	--	1.4E+01	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	1.8E+08	--	--	--	2.5E+04	--	--	--	1.8E+07	--	--	--	1.8E+07	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.6E+03	6.1E+04	--	--	1.7E-01	4.0E+00	--	--	2.6E+02	6.1E+03	--	--	2.6E+02	6.1E+03
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.0E+04	5.0E+04	--	--	6.9E-01	3.3E+00	--	--	1.0E+03	5.0E+03	--	--	1.0E+03	5.0E+03
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.7E+02	3.4E+02	--	--	2.4E-02	4.7E-02	--	--	1.7E+01	3.4E+01	--	--	1.7E+01	3.4E+01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	3.7E+05	4.3E+06	--	--	5.1E+01	6.0E+02	--	--	3.7E+04	4.3E+05	--	--	3.7E+04	4.3E+05
Total dissolved solids	0	--	--	5.0E+05	--	--	--	3.6E+08	--	--	--	5.0E+04	--	--	--	3.6E+07	--	--	--	3.6E+07	--
Toxaphene[C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	4.2E+00	7.0E-02	4.2E+00	4.2E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	8.0E+01	2.8E-02	4.2E-01	4.2E-01	4.2E+00	2.8E-02	4.2E-01	4.2E-01
Tributyltin	0	4.6E-01	7.2E-02	--	--	2.6E+00	2.5E+01	--	--	1.2E-01	1.8E-02	--	--	5.1E+01	9.9E+00	--	--	2.6E+00	9.9E+00	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	2.5E+04	5.0E+04	--	--	3.5E+00	7.0E+00	--	--	2.5E+03	5.0E+03	--	--	2.5E+03	5.0E+03
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	8.9E+03	2.4E+05	--	--	5.9E-01	1.6E+01	--	--	8.9E+02	2.4E+04	--	--	8.9E+02	2.4E+04
Trichloroethylene[C]	0	--	--	2.5E+01	3.0E+02	--	--	3.8E+04	4.5E+05	--	--	2.5E+00	3.0E+01	--	--	3.8E+03	4.5E+04	--	--	3.8E+03	4.5E+04
2,4,6-Trichlorophenol[C]	0	--	--	1.4E+01	2.4E+01	--	--	2.1E+04	3.6E+04	--	--	1.4E+00	2.4E+00	--	--	2.1E+03	3.6E+03	--	--	2.1E+03	3.6E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	3.6E+04	--	--	--	5.0E+00	--	--	--	3.6E+03	--	--	--	3.6E+03	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	3.8E+02	3.6E+04	--	--	2.5E-02	2.4E+00	--	--	3.8E+01	3.6E+03	--	--	3.8E+01	3.6E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	5.6E+02	3.4E+04	5.3E+06	1.9E+07	2.4E+01	2.5E+01	7.4E+02	2.6E+03	1.1E+04	1.4E+04	5.3E+05	1.9E+06	5.6E+02	1.4E+04	5.3E+05	1.9E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	4.0E+02
Arsenic	7.2E+02
Barium	1.4E+05
Cadmium	7.0E+00
Chromium III	1.1E+03
Chromium VI	3.7E+01
Copper	2.5E+01
Iron	2.2E+04
Lead	2.1E+02
Manganese	3.6E+03
Mercury	3.2E+00
Nickel	3.5E+02
Selenium	4.6E+01
Silver	5.4E+00
Zinc	2.2E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 028 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	458 MGD
7Q10 (Annual) =	570 MGD
30Q10 (Annual) =	660 MGD
1Q10 (Wet season) =	539 MGD
30Q10 (Wet season)	1091 MGD
30Q5 =	741 MGD
Harmonic Mean =	1556 MGD

Mixing Information

Annual - 1Q10 Mix =	0.56 %
- 7Q10 Mix =	33.02 %
- 30Q10 Mix =	37.69 %
Wet Season - 1Q10 Mix =	0.56 %
- 30Q10 Mix =	37.69 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Discharge Flow =	0.07 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	7.1E+06	1.0E+07	--	--	6.7E+01	9.9E+01	--	--	7.1E+05	1.0E+06	--	--	7.1E+05	1.0E+06
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	6.5E+04	9.8E+04	--	--	6.1E-01	9.3E-01	--	--	6.5E+03	9.8E+03	--	--	6.5E+03	9.8E+03
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	1.1E+04	5.6E+04	--	--	5.1E-02	2.5E-01	--	--	1.1E+03	5.6E+03	--	--	1.1E+03	5.6E+03
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	1.1E+02	--	1.1E+01	1.1E+01	7.5E-01	--	4.9E-05	5.0E-05	4.9E+03	--	1.1E+00	1.1E+00	1.1E+02	--	1.1E+00	1.1E+00
Ammonia-N (mg/l) (Yearly)	0	3.15E+00	9.23E-01	--	--	1.19E+02	3.28E+03	--	--	7.87E-01	2.31E-01	--	--	5.15E+03	2.18E+03	--	--	1.19E+02	2.18E+03	--	--
Ammonia-N (mg/l) (High Flow)	0	3.15E+00	1.36E+00	--	--	1.39E+02	7.98E+03	--	--	7.87E-01	3.40E-01	--	--	6.06E+03	5.29E+03	--	--	1.39E+02	5.29E+03	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	8.8E+07	4.2E+08	--	--	8.3E+02	4.0E+03	--	--	8.8E+06	4.2E+07	--	--	8.8E+06	4.2E+07
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.9E+04	6.8E+06	--	--	5.6E-01	6.4E+01	--	--	5.9E+03	6.8E+05	--	--	5.9E+03	6.8E+05
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.3E+04	4.0E+05	1.1E+05	--	8.5E+01	3.8E+01	1.0E+00	--	5.6E+05	3.1E+05	1.1E+04	--	1.3E+04	3.1E+05	1.1E+04	--
Barium	0	--	--	2.0E+03	--	--	--	2.1E+07	--	--	--	2.0E+02	--	--	--	2.1E+06	--	--	--	2.1E+06	--
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	4.9E+05	1.1E+07	--	--	2.2E+00	5.1E+01	--	--	4.9E+04	1.1E+06	--	--	4.9E+04	1.1E+06
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	1.9E+01	4.4E+01	--	--	8.6E-05	2.0E-04	--	--	1.9E+00	4.4E+00	--	--	1.9E+00	4.4E+00
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
Bis2-Chloroethyl Ether [c]	0	--	--	3.0E-01	5.3E+00	--	--	6.7E+03	1.2E+05	--	--	3.0E-02	5.3E-01	--	--	6.7E+02	1.2E+04	--	--	6.7E+02	1.2E+04
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.5E+07	6.9E+08	--	--	1.4E+02	6.5E+03	--	--	1.5E+06	6.9E+07	--	--	1.5E+06	6.9E+07
Bis 2-Ethylhexyl Phthalate [c]	0	--	--	1.2E+01	2.2E+01	--	--	2.7E+05	4.9E+05	--	--	1.2E+00	2.2E+00	--	--	2.7E+04	4.9E+04	--	--	2.7E+04	4.9E+04
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	9.6E+05	3.1E+07	--	--	4.3E+00	1.4E+02	--	--	9.6E+04	3.1E+06	--	--	9.6E+04	3.1E+06
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.6E+07	2.0E+07	--	--	1.5E+02	1.9E+02	--	--	1.6E+06	2.0E+06	--	--	1.6E+06	2.0E+06
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	1.2E+02	2.6E+03	5.3E+04	--	7.7E-01	2.4E-01	5.0E-01	--	5.0E+03	1.9E+03	5.3E+03	--	1.2E+02	1.9E+03	5.3E+03	--
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	5.1E+04	3.6E+05	--	--	2.3E-01	1.6E+00	--	--	5.1E+03	3.6E+04	--	--	5.1E+03	3.6E+04
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	9.0E+01	1.2E+01	1.8E+02	1.8E+02	6.0E-01	1.1E-03	8.0E-04	8.1E-04	3.9E+03	8.8E+00	1.8E+01	1.8E+01	9.0E+01	8.8E+00	1.8E+01	1.8E+01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.2E+07	6.2E+08	2.6E+09	--	2.2E+05	5.8E+04	2.5E+04	--	1.4E+09	4.7E+08	2.6E+08	--	3.2E+07	4.7E+08	2.6E+08	--
TRC	0	1.9E+01	1.1E+01	--	--	7.2E+02	3.0E+04	--	--	4.8E+00	2.8E+00	--	--	3.1E+04	2.2E+04	--	--	7.2E+02	2.2E+04	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.4E+06	1.7E+07	--	--	1.3E+01	1.6E+02	--	--	1.4E+05	1.7E+06	--	--	1.4E+05	1.7E+06

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	8.9E+04	2.9E+06	--	--	4.0E-01	1.3E+01	--	--	8.9E+03	2.9E+05	--	--	8.9E+03	2.9E+05
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.6E+06	1.2E+08	--	--	3.4E+01	1.1E+03	--	--	3.6E+05	1.2E+07	--	--	3.6E+05	1.2E+07
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.1E+07	1.7E+07	--	--	1.0E+02	1.6E+02	--	--	1.1E+06	1.7E+06	--	--	1.1E+06	1.7E+06
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	8.6E+05	1.6E+06	--	--	8.1E+00	1.5E+01	--	--	8.6E+04	1.6E+05	--	--	8.6E+04	1.6E+05
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	3.1E+00	1.1E+02	--	--	2.1E-02	1.0E-02	--	--	1.4E+02	8.3E+01	--	--	3.1E+00	8.3E+01	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	1.8E+04	1.7E+05	--	--	1.2E+02	1.5E+01	--	--	7.8E+05	1.3E+05	--	--	1.8E+04	1.3E+05	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	6.0E+02	3.0E+04	--	--	4.0E+00	2.8E+00	--	--	2.6E+04	2.2E+04	--	--	6.0E+02	2.2E+04	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.1E+06	--	--	--	1.0E+01	--	--	--	1.1E+05	--	--	--	1.1E+05	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	3.8E-04	1.8E-03	--	--	8.4E+00	4.0E+01	--	--	8.4E+00	4.0E+01
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	4.1E+02	2.0E+04	1.4E+07	--	2.7E+00	1.9E+00	1.3E+02	--	1.8E+04	1.5E+04	1.4E+06	--	4.1E+02	1.5E+04	1.4E+06	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	8.3E+02	1.4E+04	1.5E+06	1.7E+08	5.5E+00	1.3E+00	1.4E+01	1.6E+03	3.6E+04	1.1E+04	1.5E+05	1.7E+07	8.3E+02	1.1E+04	1.5E+05	1.7E+07
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	6.9E+01	6.9E+01	--	--	3.1E-04	3.1E-04	--	--	6.9E+00	6.9E+00	--	--	6.9E+00	6.9E+00
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	4.9E+01	4.9E+01	--	--	2.2E-04	2.2E-04	--	--	4.9E+00	4.9E+00	--	--	4.9E+00	4.9E+00
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	4.1E+01	2.7E+00	4.9E+01	4.9E+01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.8E+03	2.0E+00	4.9E+00	4.9E+00	4.1E+01	2.0E+00	4.9E+00	4.9E+00
Demeton	0	--	1.0E-01	--	--	--	2.7E+02	--	--	--	2.5E-02	--	--	--	2.0E+02	--	--	--	2.0E+02	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	6.4E+00	4.6E+02	--	--	4.3E-02	4.3E-02	--	--	2.8E+02	3.5E+02	--	--	6.4E+00	3.5E+02	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	4.4E+06	1.4E+07	--	--	4.2E+01	1.3E+02	--	--	4.4E+05	1.4E+06	--	--	4.4E+05	1.4E+06
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.4E+06	1.0E+07	--	--	3.2E+01	9.6E+01	--	--	3.4E+05	1.0E+06	--	--	3.4E+05	1.0E+06
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	6.7E+05	2.0E+06	--	--	6.3E+00	1.9E+01	--	--	6.7E+04	2.0E+05	--	--	6.7E+04	2.0E+05
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	4.7E+03	6.2E+03	--	--	2.1E-02	2.8E-02	--	--	4.7E+02	6.2E+02	--	--	4.7E+02	6.2E+02
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	1.2E+05	3.8E+06	--	--	5.5E-01	1.7E+01	--	--	1.2E+04	3.8E+05	--	--	1.2E+04	3.8E+05
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	8.4E+04	8.2E+06	--	--	3.8E-01	3.7E+01	--	--	8.4E+03	8.2E+05	--	--	8.4E+03	8.2E+05
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.5E+06	7.5E+07	--	--	3.3E+01	7.1E+02	--	--	3.5E+05	7.5E+06	--	--	3.5E+05	7.5E+06
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.5E+06	1.1E+08	--	--	1.4E+01	1.0E+03	--	--	1.5E+05	1.1E+07	--	--	1.5E+05	1.1E+07
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	8.2E+05	3.1E+06	--	--	7.7E+00	2.9E+01	--	--	8.2E+04	3.1E+05	--	--	8.2E+04	3.1E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.1E+06	--	--	--	1.0E+01	--	--	--	1.1E+05	--	--	--	1.1E+05	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	1.1E+05	3.3E+06	--	--	5.0E-01	1.5E+01	--	--	1.1E+04	3.3E+05	--	--	1.1E+04	3.3E+05
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	7.6E+04	4.7E+06	--	--	3.4E-01	2.1E+01	--	--	7.6E+03	4.7E+05	--	--	7.6E+03	4.7E+05
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	9.0E+00	1.5E+02	1.2E+01	1.2E+01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	3.9E+02	1.1E+02	1.2E+00	1.2E+00	9.0E+00	1.1E+02	1.2E+00	1.2E+00
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.8E+08	4.7E+08	--	--	1.7E+03	4.4E+03	--	--	1.8E+07	4.7E+07	--	--	1.8E+07	4.7E+07
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	4.0E+06	9.0E+06	--	--	3.8E+01	8.5E+01	--	--	4.0E+05	9.0E+05	--	--	4.0E+05	9.0E+05
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.9E+09	1.2E+10	--	--	2.7E+04	1.1E+05	--	--	2.9E+08	1.2E+09	--	--	2.9E+08	1.2E+09
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.1E+07	4.8E+07	--	--	2.0E+02	4.5E+02	--	--	2.1E+06	4.8E+06	--	--	2.1E+06	4.8E+06
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	7.3E+05	5.6E+07	--	--	6.9E+00	5.3E+02	--	--	7.3E+04	5.6E+06	--	--	7.3E+04	5.6E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.4E+05	3.0E+06	--	--	1.3E+00	2.8E+01	--	--	1.4E+04	3.0E+05	--	--	1.4E+04	3.0E+05
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	2.4E+04	7.6E+05	--	--	1.1E-01	3.4E+00	--	--	2.4E+03	7.6E+04	--	--	2.4E+03	7.6E+04
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	5.3E-04	5.4E-04	--	--	5.0E-09	5.1E-09	--	--	5.3E-05	5.4E-05	--	--	5.3E-05	5.4E-05
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	8.0E+03	4.4E+04	--	--	3.6E-02	2.0E-01	--	--	8.0E+02	4.4E+03	--	--	8.0E+02	4.4E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.3E+00	1.5E+02	6.6E+05	9.4E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	3.6E+02	1.1E+02	6.6E+04	9.4E+04	8.3E+00	1.1E+02	6.6E+04	9.4E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.3E+00	1.5E+02	6.6E+05	9.4E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	3.6E+02	1.1E+02	6.6E+04	9.4E+04	8.3E+00	1.1E+02	6.6E+04	9.4E+04
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	8.3E+00	1.5E+02	--	--	5.5E-02	1.4E-02	--	--	3.6E+02	1.1E+02	--	--	8.3E+00	1.1E+02	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	6.6E+05	9.4E+05	--	--	6.2E+00	8.9E+00	--	--	6.6E+04	9.4E+04	--	--	6.6E+04	9.4E+04
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	3.2E+00	9.7E+01	6.2E+02	6.4E+02	2.2E-02	9.0E-03	5.9E-03	6.0E-03	1.4E+02	7.3E+01	6.2E+01	6.4E+01	3.2E+00	7.3E+01	6.2E+01	6.4E+01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	3.1E+03	3.2E+03	--	--	2.9E-02	3.0E-02	--	--	3.1E+02	3.2E+02	--	--	3.1E+02	3.2E+02

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	5.6E+06	2.2E+07	--	--	5.3E+01	2.1E+02	--	--	5.6E+05	2.2E+06	--	--	5.6E+05	2.2E+06
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.4E+06	1.5E+06	--	--	1.3E+01	1.4E+01	--	--	1.4E+05	1.5E+05	--	--	1.4E+05	1.5E+05
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.2E+07	5.6E+07	--	--	1.1E+02	5.3E+02	--	--	1.2E+06	5.6E+06	--	--	1.2E+06	5.6E+06
Foaming Agents	0	--	--	5.0E+02	--	--	--	5.3E+06	--	--	--	5.0E+01	--	--	--	5.3E+05	--	--	--	5.3E+05	--
Guthion	0	--	1.0E-02	--	--	--	2.7E+01	--	--	--	2.5E-03	--	--	--	2.0E+01	--	--	--	2.0E+01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	2.0E+01	1.0E+01	1.8E+01	1.8E+01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	8.5E+02	7.7E+00	1.8E+00	1.8E+00	2.0E+01	7.7E+00	1.8E+00	1.8E+00
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	2.0E+01	1.0E+01	8.7E+00	8.7E+00	1.3E-01	9.5E-04	3.9E-05	3.9E-05	8.5E+02	7.7E+00	8.7E-01	8.7E-01	2.0E+01	7.7E+00	8.7E-01	8.7E-01
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	6.2E+01	6.4E+01	--	--	2.8E-04	2.9E-04	--	--	6.2E+00	6.4E+00	--	--	6.2E+00	6.4E+00
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	9.8E+04	4.0E+06	--	--	4.4E-01	1.8E+01	--	--	9.8E+03	4.0E+05	--	--	9.8E+03	4.0E+05
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	5.8E+02	1.1E+03	--	--	2.6E-03	4.9E-03	--	--	5.8E+01	1.1E+02	--	--	5.8E+01	1.1E+02
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	2.0E+03	3.8E+03	--	--	9.1E-03	1.7E-02	--	--	2.0E+02	3.8E+02	--	--	2.0E+02	3.8E+02
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	3.6E+01	--	2.2E+04	4.0E+04	2.4E-01	--	9.8E-02	1.8E-01	1.6E+03	--	2.2E+03	4.0E+03	3.6E+01	--	2.2E+03	4.0E+03
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	4.2E+05	1.2E+07	--	--	4.0E+00	1.1E+02	--	--	4.2E+04	1.2E+06	--	--	4.2E+04	1.2E+06
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	3.1E+05	7.3E+05	--	--	1.4E+00	3.3E+00	--	--	3.1E+04	7.3E+04	--	--	3.1E+04	7.3E+04
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	5.4E+03	--	--	--	5.0E-01	--	--	--	4.1E+03	--	--	--	4.1E+03	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	8.4E+02	4.0E+03	--	--	3.8E-03	1.8E-02	--	--	8.4E+01	4.0E+02	--	--	8.4E+01	4.0E+02
Iron	0	--	--	3.0E+02	--	--	--	3.2E+06	--	--	--	3.0E+01	--	--	--	3.2E+05	--	--	--	3.2E+05	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	7.8E+06	2.1E+08	--	--	3.5E+01	9.6E+02	--	--	7.8E+05	2.1E+07	--	--	7.8E+05	2.1E+07
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	3.4E+03	2.7E+04	1.6E+05	--	2.2E+01	2.6E+00	1.5E+00	--	1.5E+05	2.1E+04	1.6E+04	--	3.4E+03	2.1E+04	1.6E+04	--
Malathion	0	--	1.0E-01	--	--	--	2.7E+02	--	--	--	2.5E-02	--	--	--	2.0E+02	--	--	--	2.0E+02	--	--
Manganese	0	--	--	5.0E+01	--	--	--	5.3E+05	--	--	--	5.0E+00	--	--	--	5.3E+04	--	--	--	5.3E+04	--
Mercury	0	1.4E+00	7.7E-01	--	--	5.3E+01	2.1E+03	--	--	3.5E-01	1.9E-01	--	--	2.3E+03	1.6E+03	--	--	5.3E+01	1.6E+03	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	5.0E+05	1.6E+07	--	--	4.7E+00	1.5E+02	--	--	5.0E+04	1.6E+06	--	--	5.0E+04	1.6E+06
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	1.0E+06	1.3E+08	--	--	4.6E+00	5.9E+02	--	--	1.0E+05	1.3E+07	--	--	1.0E+05	1.3E+07
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	8.1E+01	1.1E+06	--	--	7.5E-03	1.0E+01	--	--	6.1E+01	1.1E+05	--	--	6.1E+01	1.1E+05	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	5.7E+03	4.5E+04	6.5E+06	4.9E+07	3.8E+01	4.2E+00	6.1E+01	4.6E+02	2.5E+05	3.4E+04	6.5E+05	4.9E+06	5.7E+03	3.4E+04	6.5E+05	4.9E+06
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.1E+08	--	--	--	1.0E+03	--	--	--	1.1E+07	--	--	--	1.1E+07	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.8E+05	7.3E+06	--	--	1.7E+00	6.9E+01	--	--	1.8E+04	7.3E+05	--	--	1.8E+04	7.3E+05
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	1.5E+02	6.7E+05	--	--	6.9E-04	3.0E+00	--	--	1.5E+01	6.7E+04	--	--	1.5E+01	6.7E+04
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	7.3E+05	1.3E+06	--	--	3.3E+00	6.0E+00	--	--	7.3E+04	1.3E+05	--	--	7.3E+04	1.3E+05
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	1.1E+03	1.1E+05	--	--	5.0E-03	5.1E-01	--	--	1.1E+02	1.1E+04	--	--	1.1E+02	1.1E+04
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.1E+03	1.8E+04	--	--	7.0E+00	1.7E+00	--	--	4.6E+04	1.3E+04	--	--	1.1E+03	1.3E+04	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	2.4E+00	3.5E+01	--	--	1.6E-02	3.3E-03	--	--	1.1E+02	2.6E+01	--	--	2.4E+00	2.6E+01	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	3.8E+01	1.4E+01	1.4E+01	--	3.5E-03	6.4E-05	6.4E-05	--	2.9E+01	1.4E+00	1.4E+00	--	2.9E+01	1.4E+00	1.4E+00
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	4.4E+02	2.4E+04	6.0E+04	6.7E+05	2.9E+00	2.3E+00	2.7E-01	3.0E+00	1.9E+04	1.8E+04	6.0E+03	6.7E+04	4.4E+02	1.8E+04	6.0E+03	6.7E+04
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.1E+08	9.1E+09	--	--	1.0E+03	8.6E+04	--	--	1.1E+07	9.1E+08	--	--	1.1E+07	9.1E+08
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	8.8E+06	4.2E+07	--	--	8.3E+01	4.0E+02	--	--	8.8E+05	4.2E+06	--	--	8.8E+05	4.2E+06
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.6E+05	--	--	--	1.5E+00	--	--	--	1.6E+04	--	--	--	1.6E+04	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	4.2E+04	--	--	--	4.0E-01	--	--	--	4.2E+03	--	--	--	4.2E+03	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	5.3E+04	--	--	--	5.0E-01	--	--	--	5.3E+03	--	--	--	5.3E+03	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	3.2E+05	--	--	--	3.0E+00	--	--	--	3.2E+04	--	--	--	3.2E+04	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	7.5E+02	1.3E+04	1.8E+06	4.4E+07	5.0E+00	1.3E+00	1.7E+01	4.2E+02	3.3E+04	1.0E+04	1.8E+05	4.4E+06	7.5E+02	1.0E+04	1.8E+05	4.4E+06
Silver	0	2.4E+00	--	--	--	8.9E+01	--	--	--	5.9E-01	--	--	--	3.9E+03	--	--	--	8.9E+01	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.6E+09	--	--	--	2.5E+04	--	--	--	2.6E+08	--	--	--	2.6E+08	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	3.8E+04	8.9E+05	--	--	1.7E-01	4.0E+00	--	--	3.8E+03	8.9E+04	--	--	3.8E+03	8.9E+04
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.5E+05	7.3E+05	--	--	6.9E-01	3.3E+00	--	--	1.5E+04	7.3E+04	--	--	1.5E+04	7.3E+04
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.5E+03	5.0E+03	--	--	2.4E-02	4.7E-02	--	--	2.5E+02	5.0E+02	--	--	2.5E+02	5.0E+02
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	5.4E+06	6.4E+07	--	--	5.1E+01	6.0E+02	--	--	5.4E+05	6.4E+06	--	--	5.4E+05	6.4E+06
Total dissolved solids	0	--	--	5.0E+05	--	--	--	5.3E+09	--	--	--	5.0E+04	--	--	--	5.3E+08	--	--	--	5.3E+08	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.7E+01	5.4E-01	6.2E+01	6.2E+01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	1.2E+03	4.1E-01	6.2E+00	6.2E+00	2.7E+01	4.1E-01	6.2E+00	6.2E+00
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.7E+01	1.9E+02	--	--	1.2E-01	1.8E-02	--	--	7.5E+02	1.5E+02	--	--	1.7E+01	1.5E+02	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.7E+05	7.4E+05	--	--	3.5E+00	7.0E+00	--	--	3.7E+04	7.4E+04	--	--	3.7E+04	7.4E+04
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	1.3E+05	3.6E+06	--	--	5.9E-01	1.6E+01	--	--	1.3E+04	3.6E+05	--	--	1.3E+04	3.6E+05
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	5.6E+05	6.7E+06	--	--	2.5E+00	3.0E+01	--	--	5.6E+04	6.7E+05	--	--	5.6E+04	6.7E+05
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	3.1E+05	5.3E+05	--	--	1.4E+00	2.4E+00	--	--	3.1E+04	5.3E+04	--	--	3.1E+04	5.3E+04
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	5.3E+05	--	--	--	5.0E+00	--	--	--	5.3E+04	--	--	--	5.3E+04	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	5.6E+03	5.3E+05	--	--	2.5E-02	2.4E+00	--	--	5.6E+02	5.3E+04	--	--	5.6E+02	5.3E+04
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	3.7E+03	2.6E+05	7.8E+07	2.8E+08	2.4E+01	2.5E+01	7.4E+02	2.6E+03	1.6E+05	2.0E+05	7.8E+06	2.8E+07	3.7E+03	2.0E+05	7.8E+06	2.8E+07

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.9E+03
Arsenic	5.1E+03
Barium	2.1E+06
Cadmium	4.6E+01
Chromium III	7.2E+03
Chromium VI	2.4E+02
Copper	1.6E+02
Iron	3.2E+05
Lead	1.4E+03
Manganese	5.3E+04
Mercury	2.1E+01
Nickel	2.3E+03
Selenium	3.0E+02
Silver	3.6E+01
Zinc	1.5E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 029 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	y
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	638 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1512 MGD

Mixing Information

Annual - 1Q10 Mix =	1.84 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	1.84 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.4 SU
10% Maximum pH =	7.9 SU
Discharge Flow =	0.795 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	6.0E+05	8.9E+05	--	--	6.7E+01	9.9E+01	--	--	6.0E+04	8.9E+04	--	--	6.0E+04	8.9E+04
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	5.5E+03	8.4E+03	--	--	6.1E-01	9.3E-01	--	--	5.5E+02	8.4E+02	--	--	5.5E+02	8.4E+02
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	9.7E+02	4.8E+03	--	--	5.1E-02	2.5E-01	--	--	9.7E+01	4.8E+02	--	--	9.7E+01	4.8E+02
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	3.4E+01	--	9.3E-01	9.5E-01	7.5E-01	--	4.9E-05	5.0E-05	4.2E+02	--	9.3E-02	9.5E-02	3.4E+01	--	9.3E-02	9.5E-02
Ammonia-N (mg/l) (Yearly)	0	3.10E+00	9.23E-01	--	--	3.47E+01	7.41E+02	--	--	7.87E-01	2.31E-01	--	--	4.36E+02	1.85E+02	--	--	3.47E+01	1.85E+02	--	--
Ammonia-N (mg/l) (High Flow)	0	3.11E+00	1.36E+00	--	--	4.05E+01	1.81E+03	--	--	7.87E-01	3.40E-01	--	--	5.16E+02	4.52E+02	--	--	4.05E+01	4.52E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	7.5E+06	3.6E+07	--	--	8.3E+02	4.0E+03	--	--	7.5E+05	3.6E+06	--	--	7.5E+05	3.6E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.1E+03	5.8E+05	--	--	5.6E-01	6.4E+01	--	--	5.1E+02	5.8E+04	--	--	5.1E+02	5.8E+04
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.8E+03	1.0E+05	9.0E+03	--	8.5E+01	3.8E+01	1.0E+00	--	4.7E+04	2.6E+04	9.0E+02	--	3.8E+03	2.6E+04	9.0E+02	--
Barium	0	--	--	2.0E+03	--	--	--	1.8E+06	--	--	--	2.0E+02	--	--	--	1.8E+05	--	--	--	1.8E+05	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	4.2E+04	9.7E+05	--	--	2.2E+00	5.1E+01	--	--	4.2E+03	9.7E+04	--	--	4.2E+03	9.7E+04
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.6E+00	3.8E+00	--	--	8.6E-05	2.0E-04	--	--	1.6E-01	3.8E-01	--	--	1.6E-01	3.8E-01
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	5.7E+02	1.0E+04	--	--	3.0E-02	5.3E-01	--	--	5.7E+01	1.0E+03	--	--	5.7E+01	1.0E+03
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.3E+06	5.9E+07	--	--	1.4E+02	6.5E+03	--	--	1.3E+05	5.9E+06	--	--	1.3E+05	5.9E+06
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	2.3E+04	4.2E+04	--	--	1.2E+00	2.2E+00	--	--	2.3E+03	4.2E+03	--	--	2.3E+03	4.2E+03
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	8.2E+04	2.7E+06	--	--	4.3E+00	1.4E+02	--	--	8.2E+03	2.7E+05	--	--	8.2E+03	2.7E+05
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.4E+06	1.7E+06	--	--	1.5E+02	1.9E+02	--	--	1.4E+05	1.7E+05	--	--	1.4E+05	1.7E+05
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	3.4E+01	6.6E+02	4.5E+03	--	7.7E-01	2.4E-01	5.0E-01	--	4.2E+02	1.7E+02	4.5E+02	--	3.4E+01	1.7E+02	4.5E+02	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	4.4E+03	3.0E+04	--	--	2.3E-01	1.6E+00	--	--	4.4E+02	3.0E+03	--	--	4.4E+02	3.0E+03
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.7E+01	3.0E+00	1.5E+01	1.5E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	3.3E+02	7.4E-01	1.5E+00	1.5E+00	2.7E+01	7.4E-01	1.5E+00	1.5E+00
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	9.6E+06	1.6E+08	2.3E+08	--	2.2E+05	5.8E+04	2.5E+04	--	1.2E+08	4.0E+07	2.3E+07	--	9.6E+06	4.0E+07	2.3E+07	--
TRC	0	1.9E+01	1.1E+01	--	--	2.1E+02	7.6E+03	--	--	4.8E+00	2.8E+00	--	--	2.6E+03	1.9E+03	--	--	2.1E+02	1.9E+03	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.2E+05	1.4E+06	--	--	1.3E+01	1.6E+02	--	--	1.2E+04	1.4E+05	--	--	1.2E+04	1.4E+05

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	7.6E+03	2.5E+05	--	--	4.0E-01	1.3E+01	--	--	7.6E+02	2.5E+04	--	--	7.6E+02	2.5E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.1E+05	9.9E+06	--	--	3.4E+01	1.1E+03	--	--	3.1E+04	9.9E+05	--	--	3.1E+04	9.9E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	9.0E+05	1.4E+06	--	--	1.0E+02	1.6E+02	--	--	9.0E+04	1.4E+05	--	--	9.0E+04	1.4E+05
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	7.3E+04	1.4E+05	--	--	8.1E+00	1.5E+01	--	--	7.3E+03	1.4E+04	--	--	7.3E+03	1.4E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	9.3E-01	2.8E+01	--	--	2.1E-02	1.0E-02	--	--	1.2E+01	7.1E+00	--	--	9.3E-01	7.1E+00	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	5.3E+03	4.3E+04	--	--	1.2E+02	1.5E+01	--	--	6.6E+04	1.1E+04	--	--	5.3E+03	1.1E+04	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.8E+02	7.6E+03	--	--	4.0E+00	2.8E+00	--	--	2.2E+03	1.9E+03	--	--	1.8E+02	1.9E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	9.0E+04	--	--	--	1.0E+01	--	--	--	9.0E+03	--	--	--	9.0E+03	--
Chrysene[C]	0	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	3.8E-04	1.8E-03	--	--	7.2E-01	3.4E+00	--	--	7.2E-01	3.4E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	1.2E+02	5.1E+03	1.2E+06	--	2.7E+00	1.9E+00	1.3E+02	--	1.5E+03	1.3E+03	1.2E+05	--	1.2E+02	1.3E+03	1.2E+05	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.5E+02	3.6E+03	1.3E+05	1.4E+07	5.5E+00	1.3E+00	1.4E+01	1.6E+03	3.0E+03	9.0E+02	1.3E+04	1.4E+06	2.5E+02	9.0E+02	1.3E+04	1.4E+06
DDD[C]	0	--	--	3.1E-03	3.1E-03	--	--	5.9E+00	5.9E+00	--	--	3.1E-04	3.1E-04	--	--	5.9E-01	5.9E-01	--	--	5.9E-01	5.9E-01
DDE[C]	0	--	--	2.2E-03	2.2E-03	--	--	4.2E+00	4.2E+00	--	--	2.2E-04	2.2E-04	--	--	4.2E-01	4.2E-01	--	--	4.2E-01	4.2E-01
DDT[C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.2E+01	6.9E-01	4.2E+00	4.2E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.5E+02	1.7E-01	4.2E-01	4.2E-01	1.2E+01	1.7E-01	4.2E-01	4.2E-01
Demeton	0	--	1.0E-01	--	--	--	6.9E+01	--	--	--	2.5E-02	--	--	--	1.7E+01	--	--	--	1.7E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.9E+00	1.2E+02	--	--	4.3E-02	4.3E-02	--	--	2.4E+01	2.9E+01	--	--	1.9E+00	2.9E+01	--	--
Dibenz(a,h)anthracene[C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.8E+05	1.2E+06	--	--	4.2E+01	1.3E+02	--	--	3.8E+04	1.2E+05	--	--	3.8E+04	1.2E+05
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.9E+05	8.7E+05	--	--	3.2E+01	9.6E+01	--	--	2.9E+04	8.7E+04	--	--	2.9E+04	8.7E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	5.7E+04	1.7E+05	--	--	6.3E+00	1.9E+01	--	--	5.7E+03	1.7E+04	--	--	5.7E+03	1.7E+04
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	4.0E+02	5.3E+02	--	--	2.1E-02	2.8E-02	--	--	4.0E+01	5.3E+01	--	--	4.0E+01	5.3E+01
Dichlorobromomethane[C]	0	--	--	5.5E+00	1.7E+02	--	--	1.0E+04	3.2E+05	--	--	5.5E-01	1.7E+01	--	--	1.0E+03	3.2E+04	--	--	1.0E+03	3.2E+04
1,2-Dichloroethane[C]	0	--	--	3.8E+00	3.7E+02	--	--	7.2E+03	7.0E+05	--	--	3.8E-01	3.7E+01	--	--	7.2E+02	7.0E+04	--	--	7.2E+02	7.0E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.0E+05	6.4E+06	--	--	3.3E+01	7.1E+02	--	--	3.0E+04	6.4E+05	--	--	3.0E+04	6.4E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.3E+05	9.0E+06	--	--	1.4E+01	1.0E+03	--	--	1.3E+04	9.0E+05	--	--	1.3E+04	9.0E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.0E+04	2.6E+05	--	--	7.7E+00	2.9E+01	--	--	7.0E+03	2.6E+04	--	--	7.0E+03	2.6E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	9.0E+04	--	--	--	1.0E+01	--	--	--	9.0E+03	--	--	--	9.0E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	9.5E+03	2.9E+05	--	--	5.0E-01	1.5E+01	--	--	9.5E+02	2.9E+04	--	--	9.5E+02	2.9E+04
1,3-Dichloropropene[C]	0	--	--	3.4E+00	2.1E+02	--	--	6.5E+03	4.0E+05	--	--	3.4E-01	2.1E+01	--	--	6.5E+02	4.0E+04	--	--	6.5E+02	4.0E+04
Dieldrin[C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.7E+00	3.9E+01	9.9E-01	1.0E+00	6.0E-02	1.4E-02	5.2E-05	5.4E-05	3.3E+01	9.7E+00	9.9E-02	1.0E-01	2.7E+00	9.7E+00	9.9E-02	1.0E-01
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.5E+07	4.0E+07	--	--	1.7E+03	4.4E+03	--	--	1.5E+06	4.0E+06	--	--	1.5E+06	4.0E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.4E+05	7.7E+05	--	--	3.8E+01	8.5E+01	--	--	3.4E+04	7.7E+04	--	--	3.4E+04	7.7E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.4E+08	9.9E+08	--	--	2.7E+04	1.1E+05	--	--	2.4E+07	9.9E+07	--	--	2.4E+07	9.9E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.8E+06	4.1E+06	--	--	2.0E+02	4.5E+02	--	--	1.8E+05	4.1E+05	--	--	1.8E+05	4.1E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.2E+04	4.8E+06	--	--	6.9E+00	5.3E+02	--	--	6.2E+03	4.8E+05	--	--	6.2E+03	4.8E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.2E+04	2.5E+05	--	--	1.3E+00	2.8E+01	--	--	1.2E+03	2.5E+04	--	--	1.2E+03	2.5E+04
2,4-Dinitrotoluene[C]	0	--	--	1.1E+00	3.4E+01	--	--	2.1E+03	6.5E+04	--	--	1.1E-01	3.4E+00	--	--	2.1E+02	6.5E+03	--	--	2.1E+02	6.5E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	4.5E-05	4.6E-05	--	--	5.0E-09	5.1E-09	--	--	4.5E-06	4.6E-06	--	--	4.5E-06	4.6E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	6.9E+02	3.8E+03	--	--	3.6E-02	2.0E-01	--	--	6.9E+01	3.8E+02	--	--	6.9E+01	3.8E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.5E+00	3.9E+01	5.6E+04	8.0E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	3.0E+01	9.7E+00	5.6E+03	8.0E+03	2.5E+00	9.7E+00	5.6E+03	8.0E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.5E+00	3.9E+01	5.6E+04	8.0E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	3.0E+01	9.7E+00	5.6E+03	8.0E+03	2.5E+00	9.7E+00	5.6E+03	8.0E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.5E+00	3.9E+01	--	--	5.5E-02	1.4E-02	--	--	3.0E+01	9.7E+00	--	--	2.5E+00	9.7E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	5.6E+04	8.0E+04	--	--	6.2E+00	8.9E+00	--	--	5.6E+03	8.0E+03	--	--	5.6E+03	8.0E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	9.6E-01	2.5E+01	5.3E+01	5.4E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	1.2E+01	6.2E+00	5.3E+00	5.4E+00	9.6E-01	6.2E+00	5.3E+00	5.4E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.6E+02	2.7E+02	--	--	2.9E-02	3.0E-02	--	--	2.6E+01	2.7E+01	--	--	2.6E+01	2.7E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	4.8E+05	1.9E+06	--	--	5.3E+01	2.1E+02	--	--	4.8E+04	1.9E+05	--	--	4.8E+04	1.9E+05
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.2E+05	1.3E+05	--	--	1.3E+01	1.4E+01	--	--	1.2E+04	1.3E+04	--	--	1.2E+04	1.3E+04
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	9.9E+05	4.8E+06	--	--	1.1E+02	5.3E+02	--	--	9.9E+04	4.8E+05	--	--	9.9E+04	4.8E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.5E+05	--	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	4.5E+04	--
Guthion	0	--	1.0E-02	--	--	--	6.9E+00	--	--	--	2.5E-03	--	--	--	1.7E+00	--	--	--	1.7E+00	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.8E+00	2.6E+00	1.5E+00	1.5E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	7.2E+01	6.6E-01	1.5E-01	1.5E-01	5.8E+00	6.6E-01	1.5E-01	1.5E-01
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.8E+00	2.6E+00	7.4E-01	7.4E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	7.2E+01	6.6E-01	7.4E-02	7.4E-02	5.8E+00	6.6E-01	7.4E-02	7.4E-02
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	5.3E+00	5.5E+00	--	--	2.8E-04	2.9E-04	--	--	5.3E-01	5.5E-01	--	--	5.3E-01	5.5E-01
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	8.4E+03	3.4E+05	--	--	4.4E-01	1.8E+01	--	--	8.4E+02	3.4E+04	--	--	8.4E+02	3.4E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	4.9E+01	9.3E+01	--	--	2.6E-03	4.9E-03	--	--	4.9E+00	9.3E+00	--	--	4.9E+00	9.3E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.7E+02	3.2E+02	--	--	9.1E-03	1.7E-02	--	--	1.7E+01	3.2E+01	--	--	1.7E+01	3.2E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.1E+01	--	1.9E+03	3.4E+03	2.4E-01	--	9.8E-02	1.8E-01	1.3E+02	--	1.9E+02	3.4E+02	1.1E+01	--	1.9E+02	3.4E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.6E+04	9.9E+05	--	--	4.0E+00	1.1E+02	--	--	3.6E+03	9.9E+04	--	--	3.6E+03	9.9E+04
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	2.7E+04	6.3E+04	--	--	1.4E+00	3.3E+00	--	--	2.7E+03	6.3E+03	--	--	2.7E+03	6.3E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	1.4E+03	--	--	--	5.0E-01	--	--	--	3.5E+02	--	--	--	3.5E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	7.2E+01	3.4E+02	--	--	3.8E-03	1.8E-02	--	--	7.2E+00	3.4E+01	--	--	7.2E+00	3.4E+01
Iron	0	--	--	3.0E+02	--	--	--	2.7E+05	--	--	--	3.0E+01	--	--	--	2.7E+04	--	--	--	2.7E+04	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	6.7E+05	1.8E+07	--	--	3.5E+01	9.6E+02	--	--	6.7E+04	1.8E+06	--	--	6.7E+04	1.8E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	1.0E+03	7.1E+03	1.4E+04	--	2.2E+01	2.6E+00	1.5E+00	--	1.2E+04	1.8E+03	1.4E+03	--	1.0E+03	1.8E+03	1.4E+03	--
Malathion	0	--	1.0E-01	--	--	--	6.9E+01	--	--	--	2.5E-02	--	--	--	1.7E+01	--	--	--	1.7E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	4.5E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.6E+01	5.3E+02	--	--	3.5E-01	1.9E-01	--	--	1.9E+02	1.3E+02	--	--	1.6E+01	1.3E+02	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.2E+04	1.4E+06	--	--	4.7E+00	1.5E+02	--	--	4.2E+03	1.4E+05	--	--	4.2E+03	1.4E+05
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	8.8E+04	1.1E+07	--	--	4.6E+00	5.9E+02	--	--	8.8E+03	1.1E+06	--	--	8.8E+03	1.1E+06
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	2.1E+01	9.0E+04	--	--	7.5E-03	1.0E+01	--	--	5.2E+00	9.0E+03	--	--	5.2E+00	9.0E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	1.7E+03	1.2E+04	5.5E+05	4.2E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	2.1E+04	2.9E+03	5.5E+04	4.2E+05	1.7E+03	2.9E+03	5.5E+04	4.2E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	9.0E+06	--	--	--	1.0E+03	--	--	--	9.0E+05	--	--	--	9.0E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.5E+04	6.2E+05	--	--	1.7E+00	6.9E+01	--	--	1.5E+03	6.2E+04	--	--	1.5E+03	6.2E+04
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	1.3E+01	5.7E+04	--	--	6.9E-04	3.0E+00	--	--	1.3E+00	5.7E+03	--	--	1.3E+00	5.7E+03
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	6.3E+04	1.1E+05	--	--	3.3E+00	6.0E+00	--	--	6.3E+03	1.1E+04	--	--	6.3E+03	1.1E+04
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	9.5E+01	9.7E+03	--	--	5.0E-03	5.1E-01	--	--	9.5E+00	9.7E+02	--	--	9.5E+00	9.7E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	3.1E+02	4.6E+03	--	--	7.0E+00	1.7E+00	--	--	3.9E+03	1.1E+03	--	--	3.1E+02	1.1E+03	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	7.3E-01	9.0E+00	--	--	1.6E-02	3.3E-03	--	--	9.0E+00	2.3E+00	--	--	7.3E-01	2.3E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	9.7E+00	1.2E+00	1.2E+00	--	3.5E-03	6.4E-05	6.4E-05	--	2.4E+00	1.2E-01	1.2E-01	--	2.4E+00	1.2E-01	1.2E-01
Pentachlorophenol [C]	0	1.2E+01	9.1E+00	2.7E+00	3.0E+01	1.4E+02	6.3E+03	5.1E+03	5.7E+04	2.9E+00	2.3E+00	2.7E-01	3.0E+00	1.6E+03	1.6E+03	5.1E+02	5.7E+03	1.4E+02	1.6E+03	5.1E+02	5.7E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	9.0E+06	7.8E+08	--	--	1.0E+03	8.6E+04	--	--	9.0E+05	7.8E+07	--	--	9.0E+05	7.8E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	7.5E+05	3.6E+06	--	--	8.3E+01	4.0E+02	--	--	7.5E+04	3.6E+05	--	--	7.5E+04	3.6E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.4E+04	--	--	--	1.5E+00	--	--	--	1.4E+03	--	--	--	1.4E+03	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	3.6E+03	--	--	--	4.0E-01	--	--	--	3.6E+02	--	--	--	3.6E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	5.0E-01	--	--	--	4.5E+02	--	--	--	4.5E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.7E+04	--	--	--	3.0E+00	--	--	--	2.7E+03	--	--	--	2.7E+03	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.2E+02	3.5E+03	1.5E+05	3.8E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.8E+03	8.7E+02	1.5E+04	3.8E+05	2.2E+02	8.7E+02	1.5E+04	3.8E+05
Silver	0	2.4E+00	--	--	--	2.6E+01	--	--	--	5.9E-01	--	--	--	3.3E+02	--	--	--	2.6E+01	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.3E+08	--	--	--	2.5E+04	--	--	--	2.3E+07	--	--	--	2.3E+07	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	3.2E+03	7.6E+04	--	--	1.7E-01	4.0E+00	--	--	3.2E+02	7.6E+03	--	--	3.2E+02	7.6E+03
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.3E+04	6.3E+04	--	--	6.9E-01	3.3E+00	--	--	1.3E+03	6.3E+03	--	--	1.3E+03	6.3E+03
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.2E+02	4.2E+02	--	--	2.4E-02	4.7E-02	--	--	2.2E+01	4.2E+01	--	--	2.2E+01	4.2E+01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	4.6E+05	5.4E+06	--	--	5.1E+01	6.0E+02	--	--	4.6E+04	5.4E+05	--	--	4.6E+04	5.4E+05
Total dissolved solids	0	--	--	5.0E+05	--	--	--	4.5E+08	--	--	--	5.0E+04	--	--	--	4.5E+07	--	--	--	4.5E+07	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	8.2E+00	1.4E-01	5.3E+00	5.3E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	1.0E+02	3.5E-02	5.3E-01	5.3E-01	8.2E+00	3.5E-02	5.3E-01	5.3E-01
Tributyltin	0	4.6E-01	7.2E-02	--	--	5.1E+00	5.0E+01	--	--	1.2E-01	1.8E-02	--	--	6.4E+01	1.2E+01	--	--	5.1E+00	1.2E+01	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.2E+04	6.3E+04	--	--	3.5E+00	7.0E+00	--	--	3.2E+03	6.3E+03	--	--	3.2E+03	6.3E+03
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	1.1E+04	3.0E+05	--	--	5.9E-01	1.6E+01	--	--	1.1E+03	3.0E+04	--	--	1.1E+03	3.0E+04
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	4.8E+04	5.7E+05	--	--	2.5E+00	3.0E+01	--	--	4.8E+03	5.7E+04	--	--	4.8E+03	5.7E+04
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	2.7E+04	4.6E+04	--	--	1.4E+00	2.4E+00	--	--	2.7E+03	4.6E+03	--	--	2.7E+03	4.6E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	4.5E+03	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	4.8E+02	4.6E+04	--	--	2.5E-02	2.4E+00	--	--	4.8E+01	4.6E+03	--	--	4.8E+01	4.6E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	1.1E+03	6.8E+04	6.7E+06	2.3E+07	2.4E+01	2.5E+01	7.4E+02	2.6E+03	1.3E+04	1.7E+04	6.7E+05	2.3E+06	1.1E+03	1.7E+04	6.7E+05	2.3E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.1E+02
Arsenic	9.0E+02
Barium	1.8E+05
Cadmium	1.4E+01
Chromium III	2.1E+03
Chromium VI	7.2E+01
Copper	4.9E+01
Iron	2.7E+04
Lead	4.0E+02
Manganese	4.5E+03
Mercury	6.3E+00
Nickel	6.8E+02
Selenium	8.9E+01
Silver	1.1E+01
Zinc	4.4E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: RAAP - 030 Permit No.: VA0000248

Receiving Stream: New River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	y
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	440 MGD
7Q10 (Annual) =	550 MGD
30Q10 (Annual) =	637 MGD
1Q10 (Wet season) =	520 MGD
30Q10 (Wet season)	1058 MGD
30Q5 =	717 MGD
Harmonic Mean =	1511 MGD

Mixing Information

Annual - 1Q10 Mix =	3.52 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	3.52 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	80.3 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	16.3 deg C
90% Maximum pH =	8.3 SU
10% Maximum pH =	7.3 SU
Discharge Flow =	1.55 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	3.1E+05	4.6E+05	--	--	6.7E+01	9.9E+01	--	--	3.1E+04	4.6E+04	--	--	3.1E+04	4.6E+04
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	2.8E+03	4.3E+03	--	--	6.1E-01	9.3E-01	--	--	2.8E+02	4.3E+02	--	--	2.8E+02	4.3E+02
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	5.0E+02	2.4E+03	--	--	5.1E-02	2.5E-01	--	--	5.0E+01	2.4E+02	--	--	5.0E+01	2.4E+02
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	3.3E+01	--	4.8E-01	4.9E-01	7.5E-01	--	4.9E-05	5.0E-05	2.1E+02	--	4.8E-02	4.9E-02	3.3E+01	--	4.8E-02	4.9E-02
Ammonia-N (mg/l) (Yearly)	0	4.71E+00	9.23E-01	--	--	5.18E+01	3.80E+02	--	--	1.18E+00	2.31E-01	--	--	3.36E+02	9.50E+01	--	--	5.18E+01	9.50E+01	--	--
Ammonia-N (mg/l) (High Flow)	0	4.71E+00	1.36E+00	--	--	6.04E+01	9.29E+02	--	--	1.18E+00	3.40E-01	--	--	3.97E+02	2.32E+02	--	--	6.04E+01	2.32E+02	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	3.8E+06	1.9E+07	--	--	8.3E+02	4.0E+03	--	--	3.8E+05	1.9E+06	--	--	3.8E+05	1.9E+06
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	2.6E+03	3.0E+05	--	--	5.6E-01	6.4E+01	--	--	2.6E+02	3.0E+04	--	--	2.6E+02	3.0E+04
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.7E+03	5.3E+04	4.6E+03	--	8.5E+01	3.8E+01	1.0E+00	--	2.4E+04	1.3E+04	4.6E+02	--	3.7E+03	1.3E+04	4.6E+02	--
Barium	0	--	--	2.0E+03	--	--	--	9.3E+05	--	--	--	2.0E+02	--	--	--	9.3E+04	--	--	--	9.3E+04	--
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	2.1E+04	5.0E+05	--	--	2.2E+00	5.1E+01	--	--	2.1E+03	5.0E+04	--	--	2.1E+03	5.0E+04
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	8.4E-01	2.0E+00	--	--	8.6E-05	2.0E-04	--	--	8.4E-02	2.0E-01	--	--	8.4E-02	2.0E-01
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
Bis2-Chloroethyl Ether[c]	0	--	--	3.0E-01	5.3E+00	--	--	2.9E+02	5.2E+03	--	--	3.0E-02	5.3E-01	--	--	2.9E+01	5.2E+02	--	--	2.9E+01	5.2E+02
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	6.5E+05	3.0E+07	--	--	1.4E+02	6.5E+03	--	--	6.5E+04	3.0E+06	--	--	6.5E+04	3.0E+06
Bis 2-Ethylhexyl Phthalate[c]	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+04	2.1E+04	--	--	1.2E+00	2.2E+00	--	--	1.2E+03	2.1E+03	--	--	1.2E+03	2.1E+03
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	4.2E+04	1.4E+06	--	--	4.3E+00	1.4E+02	--	--	4.2E+03	1.4E+05	--	--	4.2E+03	1.4E+05
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	7.0E+05	8.8E+05	--	--	1.5E+02	1.9E+02	--	--	7.0E+04	8.8E+04	--	--	7.0E+04	8.8E+04
Cadmium	0	3.1E+00	9.5E-01	5.0E+00	--	3.4E+01	3.4E+02	2.3E+03	--	7.7E-01	2.4E-01	5.0E-01	--	2.2E+02	8.5E+01	2.3E+02	--	3.4E+01	8.5E+01	2.3E+02	--
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	2.2E+03	1.6E+04	--	--	2.3E-01	1.6E+00	--	--	2.2E+02	1.6E+03	--	--	2.2E+02	1.6E+03
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.6E+01	1.5E+00	7.8E+00	7.9E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	1.7E+02	3.8E-01	7.8E-01	7.9E-01	2.6E+01	3.8E-01	7.8E-01	7.9E-01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	9.5E+06	8.2E+07	1.2E+08	--	2.2E+05	5.8E+04	2.5E+04	--	6.1E+07	2.0E+07	1.2E+07	--	9.5E+06	2.0E+07	1.2E+07	--
TRC	0	1.9E+01	1.1E+01	--	--	2.1E+02	3.9E+03	--	--	4.8E+00	2.8E+00	--	--	1.4E+03	9.8E+02	--	--	2.1E+02	9.8E+02	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	6.0E+04	7.4E+05	--	--	1.3E+01	1.6E+02	--	--	6.0E+03	7.4E+04	--	--	6.0E+03	7.4E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	3.9E+03	1.3E+05	--	--	4.0E-01	1.3E+01	--	--	3.9E+02	1.3E+04	--	--	3.9E+02	1.3E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.6E+05	5.1E+06	--	--	3.4E+01	1.1E+03	--	--	1.6E+04	5.1E+05	--	--	1.6E+04	5.1E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	4.6E+05	7.4E+05	--	--	1.0E+02	1.6E+02	--	--	4.6E+04	7.4E+04	--	--	4.6E+04	7.4E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	3.8E+04	7.0E+04	--	--	8.1E+00	1.5E+01	--	--	3.8E+03	7.0E+03	--	--	3.8E+03	7.0E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	9.1E-01	1.5E+01	--	--	2.1E-02	1.0E-02	--	--	5.9E+00	3.6E+00	--	--	9.1E-01	3.6E+00	--	--
Chromium III	0	4.8E+02	6.2E+01	--	--	5.2E+03	2.2E+04	--	--	1.2E+02	1.5E+01	--	--	3.4E+04	5.5E+03	--	--	5.2E+03	5.5E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.8E+02	3.9E+03	--	--	4.0E+00	2.8E+00	--	--	1.1E+03	9.8E+02	--	--	1.8E+02	9.8E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	4.6E+04	--	--	--	1.0E+01	--	--	--	4.6E+03	--	--	--	4.6E+03	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.8E-04	1.8E-03	--	--	3.7E-01	1.8E+00	--	--	3.7E-01	1.8E+00
Copper	0	1.1E+01	7.4E+00	1.3E+03	--	1.2E+02	2.6E+03	6.0E+05	--	2.7E+00	1.9E+00	1.3E+02	--	7.8E+02	6.6E+02	6.0E+04	--	1.2E+02	6.6E+02	6.0E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.4E+02	1.9E+03	6.5E+04	7.4E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	1.6E+03	4.6E+02	6.5E+03	7.4E+05	2.4E+02	4.6E+02	6.5E+03	7.4E+05
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	3.0E+00	3.0E+00	--	--	3.1E-04	3.1E-04	--	--	3.0E-01	3.0E-01	--	--	3.0E-01	3.0E-01
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	2.1E+00	2.1E+00	--	--	2.2E-04	2.2E-04	--	--	2.1E-01	2.1E-01	--	--	2.1E-01	2.1E-01
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.2E+01	3.6E-01	2.1E+00	2.1E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	7.8E+01	8.9E-02	2.1E-01	2.1E-01	1.2E+01	8.9E-02	2.1E-01	2.1E-01
Demeton	0	--	1.0E-01	--	--	--	3.6E+01	--	--	--	2.5E-02	--	--	--	8.9E+00	--	--	--	8.9E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.9E+00	6.0E+01	--	--	4.3E-02	4.3E-02	--	--	1.2E+01	1.5E+01	--	--	1.9E+00	1.5E+01	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.9E+05	6.0E+05	--	--	4.2E+01	1.3E+02	--	--	1.9E+04	6.0E+04	--	--	1.9E+04	6.0E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.5E+05	4.5E+05	--	--	3.2E+01	9.6E+01	--	--	1.5E+04	4.5E+04	--	--	1.5E+04	4.5E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	2.9E+04	8.8E+04	--	--	6.3E+00	1.9E+01	--	--	2.9E+03	8.8E+03	--	--	2.9E+03	8.8E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.0E+02	2.7E+02	--	--	2.1E-02	2.8E-02	--	--	2.0E+01	2.7E+01	--	--	2.0E+01	2.7E+01
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	5.4E+03	1.7E+05	--	--	5.5E-01	1.7E+01	--	--	5.4E+02	1.7E+04	--	--	5.4E+02	1.7E+04
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	3.7E+03	3.6E+05	--	--	3.8E-01	3.7E+01	--	--	3.7E+02	3.6E+04	--	--	3.7E+02	3.6E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.5E+05	3.3E+06	--	--	3.3E+01	7.1E+02	--	--	1.5E+04	3.3E+05	--	--	1.5E+04	3.3E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	6.5E+04	4.6E+06	--	--	1.4E+01	1.0E+03	--	--	6.5E+03	4.6E+05	--	--	6.5E+03	4.6E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	3.6E+04	1.3E+05	--	--	7.7E+00	2.9E+01	--	--	3.6E+03	1.3E+04	--	--	3.6E+03	1.3E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	4.6E+04	--	--	--	1.0E+01	--	--	--	4.6E+03	--	--	--	4.6E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	4.9E+03	1.5E+05	--	--	5.0E-01	1.5E+01	--	--	4.9E+02	1.5E+04	--	--	4.9E+02	1.5E+04
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	3.3E+03	2.0E+05	--	--	3.4E-01	2.1E+01	--	--	3.3E+02	2.0E+04	--	--	3.3E+02	2.0E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.6E+00	2.0E+01	5.1E-01	5.3E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	1.7E+01	5.0E+00	5.1E-02	5.3E-02	2.6E+00	5.0E+00	5.1E-02	5.3E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	7.9E+06	2.0E+07	--	--	1.7E+03	4.4E+03	--	--	7.9E+05	2.0E+06	--	--	7.9E+05	2.0E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.8E+05	3.9E+05	--	--	3.8E+01	8.5E+01	--	--	1.8E+04	3.9E+04	--	--	1.8E+04	3.9E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.3E+08	5.1E+08	--	--	2.7E+04	1.1E+05	--	--	1.3E+07	5.1E+07	--	--	1.3E+07	5.1E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	9.3E+05	2.1E+06	--	--	2.0E+02	4.5E+02	--	--	9.3E+04	2.1E+05	--	--	9.3E+04	2.1E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	3.2E+04	2.5E+06	--	--	6.9E+00	5.3E+02	--	--	3.2E+03	2.5E+05	--	--	3.2E+03	2.5E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	6.0E+03	1.3E+05	--	--	1.3E+00	2.8E+01	--	--	6.0E+02	1.3E+04	--	--	6.0E+02	1.3E+04
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+03	3.3E+04	--	--	1.1E-01	3.4E+00	--	--	1.1E+02	3.3E+03	--	--	1.1E+02	3.3E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	2.3E-05	2.4E-05	--	--	5.0E-09	5.1E-09	--	--	2.3E-06	2.4E-06	--	--	2.3E-06	2.4E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	3.5E+02	2.0E+03	--	--	3.6E-02	2.0E-01	--	--	3.5E+01	2.0E+02	--	--	3.5E+01	2.0E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.4E+00	2.0E+01	2.9E+04	4.1E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.6E+01	5.0E+00	2.9E+03	4.1E+03	2.4E+00	5.0E+00	2.9E+03	4.1E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.4E+00	2.0E+01	2.9E+04	4.1E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.6E+01	5.0E+00	2.9E+03	4.1E+03	2.4E+00	5.0E+00	2.9E+03	4.1E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.4E+00	2.0E+01	--	--	5.5E-02	1.4E-02	--	--	1.6E+01	5.0E+00	--	--	2.4E+00	5.0E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	2.9E+04	4.1E+04	--	--	6.2E+00	8.9E+00	--	--	2.9E+03	4.1E+03	--	--	2.9E+03	4.1E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	9.5E-01	1.3E+01	2.7E+01	2.8E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	6.1E+00	3.2E+00	2.7E+00	2.8E+00	9.5E-01	3.2E+00	2.7E+00	2.8E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.3E+02	1.4E+02	--	--	2.9E-02	3.0E-02	--	--	1.3E+01	1.4E+01	--	--	1.3E+01	1.4E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	2.5E+05	9.7E+05	--	--	5.3E+01	2.1E+02	--	--	2.5E+04	9.7E+04	--	--	2.5E+04	9.7E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	6.0E+04	6.5E+04	--	--	1.3E+01	1.4E+01	--	--	6.0E+03	6.5E+03	--	--	6.0E+03	6.5E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	5.1E+05	2.5E+06	--	--	1.1E+02	5.3E+02	--	--	5.1E+04	2.5E+05	--	--	5.1E+04	2.5E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	2.3E+05	--	--	--	5.0E+01	--	--	--	2.3E+04	--	--	--	2.3E+04	--
Guthion	0	--	1.0E-02	--	--	--	3.6E+00	--	--	--	2.5E-03	--	--	--	8.9E-01	--	--	--	8.9E-01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.7E+00	1.4E+00	7.7E-01	7.7E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	3.7E+01	3.4E-01	7.7E-02	7.7E-02	5.7E+00	3.4E-01	7.7E-02	7.7E-02
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.7E+00	1.4E+00	3.8E-01	3.8E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	3.7E+01	3.4E-01	3.8E-02	3.8E-02	5.7E+00	3.4E-01	3.8E-02	3.8E-02
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	2.7E+00	2.8E+00	--	--	2.8E-04	2.9E-04	--	--	2.7E-01	2.8E-01	--	--	2.7E-01	2.8E-01
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	4.3E+03	1.8E+05	--	--	4.4E-01	1.8E+01	--	--	4.3E+02	1.8E+04	--	--	4.3E+02	1.8E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	2.5E+01	4.8E+01	--	--	2.6E-03	4.9E-03	--	--	2.5E+00	4.8E+00	--	--	2.5E+00	4.8E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	8.9E+01	1.7E+02	--	--	9.1E-03	1.7E-02	--	--	8.9E+00	1.7E+01	--	--	8.9E+00	1.7E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.0E+01	--	9.6E+02	1.8E+03	2.4E-01	--	9.8E-02	1.8E-01	6.8E+01	--	9.6E+01	1.8E+02	1.0E+01	--	9.6E+01	1.8E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.9E+04	5.1E+05	--	--	4.0E+00	1.1E+02	--	--	1.9E+03	5.1E+04	--	--	1.9E+03	5.1E+04
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.4E+04	3.2E+04	--	--	1.4E+00	3.3E+00	--	--	1.4E+03	3.2E+03	--	--	1.4E+03	3.2E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	7.1E+02	--	--	--	5.0E-01	--	--	--	1.8E+02	--	--	--	1.8E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+01	1.8E+02	--	--	3.8E-03	1.8E-02	--	--	3.7E+00	1.8E+01	--	--	3.7E+00	1.8E+01
Iron	0	--	--	3.0E+02	--	--	--	1.4E+05	--	--	--	3.0E+01	--	--	--	1.4E+04	--	--	--	1.4E+04	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	3.4E+05	9.4E+06	--	--	3.5E+01	9.6E+02	--	--	3.4E+04	9.4E+05	--	--	3.4E+04	9.4E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	9.0E+01	1.0E+01	1.5E+01	--	9.9E+02	3.6E+03	7.0E+03	--	2.2E+01	2.6E+00	1.5E+00	--	6.4E+03	9.1E+02	7.0E+02	--	9.9E+02	9.1E+02	7.0E+02	--
Malathion	0	--	1.0E-01	--	--	--	3.6E+01	--	--	--	2.5E-02	--	--	--	8.9E+00	--	--	--	8.9E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	2.3E+04	--	--	--	5.0E+00	--	--	--	2.3E+03	--	--	--	2.3E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.5E+01	2.7E+02	--	--	3.5E-01	1.9E-01	--	--	1.0E+02	6.8E+01	--	--	1.5E+01	6.8E+01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	2.2E+04	7.0E+05	--	--	4.7E+00	1.5E+02	--	--	2.2E+03	7.0E+04	--	--	2.2E+03	7.0E+04
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	4.5E+04	5.8E+06	--	--	4.6E+00	5.9E+02	--	--	4.5E+03	5.8E+05	--	--	4.5E+03	5.8E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.1E+01	4.6E+04	--	--	7.5E-03	1.0E+01	--	--	2.7E+00	4.6E+03	--	--	2.7E+00	4.6E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.5E+02	1.7E+01	6.1E+02	4.6E+03	1.7E+03	6.0E+03	2.8E+05	2.1E+06	3.8E+01	4.2E+00	6.1E+01	4.6E+02	1.1E+04	1.5E+03	2.8E+04	2.1E+05	1.7E+03	1.5E+03	2.8E+04	2.1E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	4.6E+06	--	--	--	1.0E+03	--	--	--	4.6E+05	--	--	--	4.6E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	7.9E+03	3.2E+05	--	--	1.7E+00	6.9E+01	--	--	7.9E+02	3.2E+04	--	--	7.9E+02	3.2E+04
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	6.7E+00	2.9E+04	--	--	6.9E-04	3.0E+00	--	--	6.7E-01	2.9E+03	--	--	6.7E-01	2.9E+03
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	3.2E+04	5.9E+04	--	--	3.3E+00	6.0E+00	--	--	3.2E+03	5.9E+03	--	--	3.2E+03	5.9E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	4.9E+01	5.0E+03	--	--	5.0E-03	5.1E-01	--	--	4.9E+00	5.0E+02	--	--	4.9E+00	5.0E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	3.1E+02	2.3E+03	--	--	7.0E+00	1.7E+00	--	--	2.0E+03	5.9E+02	--	--	3.1E+02	5.9E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	7.1E-01	4.6E+00	--	--	1.6E-02	3.3E-03	--	--	4.6E+00	1.2E+00	--	--	7.1E-01	1.2E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	5.0E+00	6.2E-01	6.2E-01	--	3.5E-03	6.4E-05	6.4E-05	--	1.2E+00	6.2E-02	6.2E-02	--	1.2E+00	6.2E-02	6.2E-02
Pentachlorophenol [C]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	1.3E+02	3.2E+03	2.6E+03	2.9E+04	2.9E+00	2.3E+00	2.7E-01	3.0E+00	8.4E+02	8.0E+02	2.6E+02	2.9E+03	1.3E+02	8.0E+02	2.6E+02	2.9E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	4.6E+06	4.0E+08	--	--	1.0E+03	8.6E+04	--	--	4.6E+05	4.0E+07	--	--	4.6E+05	4.0E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	3.8E+05	1.9E+06	--	--	8.3E+01	4.0E+02	--	--	3.8E+04	1.9E+05	--	--	3.8E+04	1.9E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	7.0E+03	--	--	--	1.5E+00	--	--	--	7.0E+02	--	--	--	7.0E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	1.9E+03	--	--	--	4.0E-01	--	--	--	1.9E+02	--	--	--	1.9E+02	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	2.3E+03	--	--	--	5.0E-01	--	--	--	2.3E+02	--	--	--	2.3E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	1.4E+04	--	--	--	3.0E+00	--	--	--	1.4E+03	--	--	--	1.4E+03	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.2E+02	1.8E+03	7.9E+04	1.9E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	1.4E+03	4.4E+02	7.9E+03	1.9E+05	2.2E+02	4.4E+02	7.9E+03	1.9E+05
Silver	0	2.4E+00	--	--	--	2.6E+01	--	--	--	5.9E-01	--	--	--	1.7E+02	--	--	--	2.6E+01	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	1.2E+08	--	--	--	2.5E+04	--	--	--	1.2E+07	--	--	--	1.2E+07	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+03	3.9E+04	--	--	1.7E-01	4.0E+00	--	--	1.7E+02	3.9E+03	--	--	1.7E+02	3.9E+03
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	6.7E+03	3.2E+04	--	--	6.9E-01	3.3E+00	--	--	6.7E+02	3.2E+03	--	--	6.7E+02	3.2E+03
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.1E+02	2.2E+02	--	--	2.4E-02	4.7E-02	--	--	1.1E+01	2.2E+01	--	--	1.1E+01	2.2E+01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	2.4E+05	2.8E+06	--	--	5.1E+01	6.0E+02	--	--	2.4E+04	2.8E+05	--	--	2.4E+04	2.8E+05
Total dissolved solids	0	--	--	5.0E+05	--	--	--	2.3E+08	--	--	--	5.0E+04	--	--	--	2.3E+07	--	--	--	2.3E+07	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	8.0E+00	7.1E-02	2.7E+00	2.7E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	5.2E+01	1.8E-02	2.7E-01	2.7E-01	8.0E+00	1.8E-02	2.7E-01	2.7E-01
Tributyltin	0	4.6E-01	7.2E-02	--	--	5.1E+00	2.6E+01	--	--	1.2E-01	1.8E-02	--	--	3.3E+01	6.4E+00	--	--	5.1E+00	6.4E+00	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.6E+04	3.2E+04	--	--	3.5E+00	7.0E+00	--	--	1.6E+03	3.2E+03	--	--	1.6E+03	3.2E+03
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	5.8E+03	1.6E+05	--	--	5.9E-01	1.6E+01	--	--	5.8E+02	1.6E+04	--	--	5.8E+02	1.6E+04
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	2.4E+04	2.9E+05	--	--	2.5E+00	3.0E+01	--	--	2.4E+03	2.9E+04	--	--	2.4E+03	2.9E+04
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+04	2.3E+04	--	--	1.4E+00	2.4E+00	--	--	1.4E+03	2.3E+03	--	--	1.4E+03	2.3E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	2.3E+04	--	--	--	5.0E+00	--	--	--	2.3E+03	--	--	--	2.3E+03	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	2.4E+02	2.3E+04	--	--	2.5E-02	2.4E+00	--	--	2.4E+01	2.3E+03	--	--	2.4E+01	2.3E+03
Zinc	0	9.7E+01	9.8E+01	7.4E+03	2.6E+04	1.1E+03	3.5E+04	3.4E+06	1.2E+07	2.4E+01	2.5E+01	7.4E+02	2.6E+03	6.9E+03	8.7E+03	3.4E+05	1.2E+06	1.1E+03	8.7E+03	3.4E+05	1.2E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.6E+02
Arsenic	4.6E+02
Barium	9.3E+04
Cadmium	1.3E+01
Chromium III	2.1E+03
Chromium VI	7.0E+01
Copper	4.8E+01
Iron	1.4E+04
Lead	4.0E+02
Manganese	2.3E+03
Mercury	6.2E+00
Nickel	6.7E+02
Selenium	8.8E+01
Silver	1.0E+01
Zinc	4.3E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

4/1/2015 4:09:51 PM

Facility = RAAP - 005
Chemical = WET - Acute - C.dub.
Chronic averaging period = 4
WLAa = 107.63
WLAc = 1342.46
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = .927748
Variance = .309858
C.V. = 0.6
97th percentile daily values = 2.25760
97th percentile 4 day average = 1.54357
97th percentile 30 day average= 1.11891
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

408.16
0
0

4/1/2015 4:10:11 PM

Facility = RAAP - 005
Chemical = WET - Acute - P.prom
Chronic averaging period = 4
WLAa = 107.63
WLAc = 1342.46
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 5
Expected Value = .731296
Variance = .192526
C.V. = 0.6
97th percentile daily values = 1.77955
97th percentile 4 day average = 1.21672
97th percentile 30 day average= .881982
< Q.L. = 4
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

408.16
0
0
0
0

4/2/2015 10:08:02 AM

Facility = RAAP - 006
Chemical = TRC
Chronic averaging period = 4
WLAa = 30
WLAc = 140
Q.L. = 20
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 50
Variance = 900
C.V. = 0.6
97th percentile daily values = 121.670
97th percentile 4 day average = 83.1895
97th percentile 30 day average= 60.3026
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 30
Average Weekly limit = 30
Average Monthly LImit = 30

The data are:

50

4/1/2015 3:31:11 PM

Facility = RAAP - 006
Chemical = WET - Chronic - P.prom.
Chronic averaging period = 4
WLAa = 4.716
WLAc = 42.655
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = 2.3125
Variance = 1.92515
C.V. = 0.6
97th percentile daily values = 5.62727
97th percentile 4 day average = 3.84751
97th percentile 30 day average= 2.78899
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 4.716
Average Weekly limit = 4.716
Average Monthly LImit = 4.716

The data are:

1
1
1
6.25

4/2/2015 10:10:29 AM

Facility = RAAP - 007
Chemical = Copper
Chronic averaging period = 4
WLAa = 31
WLAc = 390
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 8.2
Variance = 24.2064
C.V. = 0.6
97th percentile daily values = 19.9540
97th percentile 4 day average = 13.6430
97th percentile 30 day average= 9.88963
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

8.2

4/2/2015 10:19:07 AM

Facility = RAAP - 007
Chemical = Copper
Chronic averaging period = 4
WLAa = 120
WLAc = 1300
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 20.9
Variance = 157.251
C.V. = 0.6
97th percentile daily values = 50.8584
97th percentile 4 day average = 34.7732
97th percentile 30 day average= 25.2065
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

20.9

4/2/2015 10:09:01 AM

Facility = RAAP - 007
Chemical = TRC
Chronic averaging period = 4
WLAa = 54
WLAc = 580
Q.L. = 20
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 50
Variance = 900
C.V. = 0.6
97th percentile daily values = 121.670
97th percentile 4 day average = 83.1895
97th percentile 30 day average= 60.3026
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 54
Average Weekly limit = 54
Average Monthly LImit = 54

The data are:

50

4/1/2015 3:32:50 PM

Facility = RAAP - 007
Chemical = WET - Chronic - C.dub.
Chronic averaging period = 4
WLAa = 8.49
WLAc = 134.95
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = 10
Variance = 36
C.V. = 0.6
97th percentile daily values = 24.3341
97th percentile 4 day average = 16.6379
97th percentile 30 day average= 12.0605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 8.49
Average Weekly limit = 8.49
Average Monthly LImit = 8.49

The data are:

10
10
10
10

4/8/2015 1:25:13 PM

Facility = RAAP - 026
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 39.6
WLAc = 149
Q.L. = .2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

4/7/2015 12:20:58 PM

Facility = RAAP - Outfall 026
Chemical = TRC
Chronic averaging period = 4
WLAa = 110
WLAc = 1500
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 4000
Variance = 5760000
C.V. = 0.6
97th percentile daily values = 9733.67
97th percentile 4 day average = 6655.16
97th percentile 30 day average= 4824.21
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 110
Average Weekly limit = 110
Average Monthly LImit = 110

The data are:

4000

4/7/2015 12:28:30 PM

Facility = RAAP - 028
Chemical = TRC
Chronic averaging period = 4
WLAa = 720
WLAc = 22000
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 4000
Variance = 5760000
C.V. = 0.6
97th percentile daily values = 9733.67
97th percentile 4 day average = 6655.16
97th percentile 30 day average= 4824.21
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 720
Average Weekly limit = 720
Average Monthly LImit = 720

The data are:

4000

4/2/2015 10:19:22 AM

Facility = RAAP - 029
Chemical = Copper
Chronic averaging period = 4
WLAa = 120
WLAc = 1300
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 20.9
Variance = 157.251
C.V. = 0.6
97th percentile daily values = 50.8584
97th percentile 4 day average = 34.7732
97th percentile 30 day average= 25.2065
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

20.9

4/1/2015 4:14:06 PM

Facility = RAAP - 029
Chemical = WET - Acute - P.prom.
Chronic averaging period = 4
WLAa = 33.55
WLAc = 692.82
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = 1.16619
Variance = .4896
C.V. = 0.6
97th percentile daily values = 2.83782
97th percentile 4 day average = 1.94029
97th percentile 30 day average= 1.40648
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
17.8
17.8

4/2/2015 10:48:28 AM

```
Facility  = RAAP - 031
Chemical  = Bis(2-Ethylhexyl) Phthalate
Chronic averaging period =  4
WLAa     =
WLAc     =  8
Q.L.       = 5
# samples/mo. = 1
# samples/wk. = 1
```

Summary of Statistics:

```
# observations = 1
Expected Value =  93
Variance       =  3113.64
C.V.           = 0.6
97th percentile daily values  =  226.307
97th percentile 4 day average =  154.732
97th percentile 30 day average=  112.162
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```

```
A limit is needed based on Chronic Toxicity
Maximum Daily Limit   = 11.7005982724259
Average Weekly limit  = 11.7005982724259
Average Monthly LImit = 11.7005982724259
```

The data are:

93

4/2/2015 10:49:50 AM

Facility = RAAP - 031
Chemical = Copper
Chronic averaging period = 4
WLAa = 6.8
WLAc = 5
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 1.6
Variance = .9216
C.V. = 0.6
97th percentile daily values = 3.89346
97th percentile 4 day average = 2.66206
97th percentile 30 day average= 1.92968
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.6

4/2/2015 11:03:36 AM

Facility = RAAP - 031
Chemical = Iron
Chronic averaging period = 4
WLAa =
WLAc = 93
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 563
Variance = 114108.
C.V. = 0.6
97th percentile daily values = 1370.01
97th percentile 4 day average = 936.713
97th percentile 30 day average= 679.007
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 136.019454916951
Average Weekly limit = 136.019454916951
Average Monthly LImit = 136.019454916951

The data are:

563

4/2/2015 11:04:12 AM

Facility = RAAP - 031
Chemical = Lead
Chronic averaging period = 4
WLAa = 56
WLAc = 6.9
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 1.1
Variance = .4356
C.V. = 0.6
97th percentile daily values = 2.67675
97th percentile 4 day average = 1.83016
97th percentile 30 day average= 1.32665
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.1

4/2/2015 10:54:27 AM

Facility = RAAP - 031
Chemical = Manganese
Chronic averaging period = 4
WLAa =
WLAc = 15
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 23.7
Variance = 202.208
C.V. = 0.6
97th percentile daily values = 57.6719
97th percentile 4 day average = 39.4318
97th percentile 30 day average= 28.5834
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 21.9386217607985
Average Weekly limit = 21.9386217607985
Average Monthly LImit = 21.9386217607985

The data are:

23.7

4/2/2015 11:06:18 AM

Facility = RAAP - 032
Chemical = Iron
Chronic averaging period = 4
WLAa =
WLAc = 280
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 512
Variance = 94371.8
C.V. = 0.6
97th percentile daily values = 1245.90
97th percentile 4 day average = 851.860
97th percentile 30 day average= 617.499
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 409.520939534904
Average Weekly limit = 409.520939534904
Average Monthly LImit = 409.520939534904

The data are:

512

```
"Model Run For I:\kaharlow\Raap - VA0000248\VA0000248_10_Reissuance\Technical\DO
Models\026.mod On 5/7/2010 3:11:48 PM"

"Model is for NEW RIVER."
"Model starts at the RAAP OUTFALL 026 discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
559,     2,        0,        8.801,    13.5

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
1,       30,       6,        ,5,       23.3

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
1,       600,      1.318,    1.096

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
560,     8.794,    5.125,    .023,     9.776,    13.5175

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
1,     .742,   3,      2.572,  .35,    .213,   0,      0

"Output for Segment 1"
"Segment starts at RAAP OUTFALL 026"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        8.794,    5.125,    .023
.1,      .1,       8.787,    5.104,    .023
.2,      .2,       8.78,     5.083,    .023
.3,      .3,       8.773,    5.062,    .023
.4,      .4,       8.766,    5.041,    .023
.5,      .5,       8.76,     5.02,     .023
.6,      .6,       8.754,    5,        .023
.7,      .7,       8.769,    5,        .023
.8,      .8,       8.783,    5,        .023
.9,      .9,       8.797,    5,        .023
1,       1,        8.798,    5,        .023


"END OF FILE"
```

```
"Model Run For I:\kaharlow\Raap - VA0000248\VA0000248_10_Reissuance\Technical\DO
Models\Complete1.mod On 4/16/2010 2:08:48 PM"

"Model is for NEW RIVER."
"Model starts at the OUTFALL 029 discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
559,     2,        0,        8.801,    13.5

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
1.57,    60,       0,        ,7,       20

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
.1,      500,      1.472,    1.179

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
560.57,  8.796,    5.406,    0,        9.775,    13.5182

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
1,     .743,   3,      2.573,  .35,    .213,   0,      0

"Output for Segment 1"
"Segment starts at OUTFALL 029"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        8.796,    5.406,    0
.1,      .1,       8.788,    5.385,    0



"Discharge/Tributary Input Data for Segment 2"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
1,       30,       13.6,     ,5,       20

"Incremental Flow Input Data for Segment 2"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
0,       2,        0,        ,8.795,   13.5

"Hydraulic Information for Segment 2"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
.02,     600.001,  1.016,    .922

"Initial Mix Values for Segment 2"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
561.57,  8.781,    5.509,    .082,     9.772,    13.52975

"Rate Constants for Segment 2. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .371,   2.999,  2.573,  .15,    .091,   0,      0

"Output for Segment 2"
"Segment starts at OUTFALL 026"
"Total", "Segm."
```

```
"Dist.", "Dist.",  "DO",      "cBOD",    "nBOD"
"(mi)",  "(mi)",   "(mg/l)",  "(mg/l)",  "(mg/l)"
.1,      0,        8.781,     5.509,     .082
.12,     .02,      8.782,     5.506,     .082



"Discharge/Tributary Input Data for Segment 3"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "deg C"
5.55,    24,       0,         ,7,        20

"Incremental Flow Input Data for Segment 3"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "deg C"
0,       2,        0,         ,8.787,    13.5

"Hydraulic Information for Segment 3"
"Length","Width",  "Depth",   "Velocity"
"(mi)",  "(ft)",   "(ft)",    "(ft/sec)"
4.88,    599.999,  1.025,     .927

"Initial Mix Values for Segment 3"
"Flow",  "DO",     "cBOD",    "nBOD",    "DOSat",   "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "(mg/l)",  "deg C"
567.12,  8.765,    6.039,     .081,      9.763,     13.59307

"Rate Constants for Segment 3. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .373,   3,      2.577,  .15,    .092,   0,      0

"Output for Segment 3"
"Segment starts at OUTFALL 007"
"Total", "Segm."
"Dist.", "Dist.",  "DO",      "cBOD",    "nBOD"
"(mi)",  "(mi)",   "(mg/l)",  "(mg/l)",  "(mg/l)"
.12,     0,        8.765,     6.039,     .081
.22,     .1,       8.767,     6.024,     .081
.32,     .2,       8.769,     6.009,     .081
.42,     .3,       8.771,     5.994,     .081
.52,     .4,       8.773,     5.979,     .081
.62,     .5,       8.775,     5.964,     .081
.72,     .6,       8.777,     5.949,     .081
.82,     .7,       8.779,     5.934,     .081
.92,     .8,       8.781,     5.919,     .081
1.02,    .9,       8.783,     5.904,     .081
1.12,    1,        8.785,     5.89,      .081
1.22,    1.1,      8.787,     5.876,     .081
1.32,    1.2,      8.787,     5.862,     .081
1.42,    1.3,      8.787,     5.848,     .081
1.52,    1.4,      8.787,     5.834,     .081
1.62,    1.5,      8.787,     5.82,      .081
1.72,    1.6,      8.787,     5.806,     .081
1.82,    1.7,      8.787,     5.792,     .081
1.92,    1.8,      8.787,     5.778,     .081
2.02,    1.9,      8.787,     5.764,     .081
2.12,    2,        8.787,     5.75,      .081
2.22,    2.1,      8.787,     5.736,     .081
2.32,    2.2,      8.787,     5.722,     .081
2.42,    2.3,      8.787,     5.708,     .081
2.52,    2.4,      8.787,     5.694,     .081
2.62,    2.5,      8.787,     5.68,      .081
2.72,    2.6,      8.787,     5.666,     .081
2.82,    2.7,      8.787,     5.652,     .081
2.92,    2.8,      8.787,     5.638,     .081
3.02,    2.9,      8.787,     5.624,     .081
3.12,    3,        8.787,     5.61,      .081
```

```
3.22,     3.1,      8.787,    5.596,    .081
3.32,     3.2,      8.787,    5.582,    .081
3.42,     3.3,      8.787,    5.568,    .081
3.52,     3.4,      8.787,    5.554,    .081
3.62,     3.5,      8.787,    5.54,     .081
3.72,     3.6,      8.787,    5.526,    .081
3.82,     3.7,      8.787,    5.512,    .081
3.92,     3.8,      8.787,    5.498,    .081
4.02,     3.9,      8.787,    5.485,    .081
4.12,     4,        8.787,    5.472,    .081
4.22,     4.1,      8.787,    5.459,    .081
4.32,     4.2,      8.787,    5.446,    .081
4.42,     4.3,      8.787,    5.433,    .081
4.52,     4.4,      8.787,    5.42,     .081
4.62,     4.5,      8.787,    5.407,    .081
4.72,     4.6,      8.787,    5.394,    .081
4.82,     4.7,      8.787,    5.381,    .081
4.92,     4.8,      8.787,    5.368,    .081
5,        4.88,     8.787,    5.357,    .081


"Discharge/Tributary Input Data for Segment 4"
"Flow",   "cBOD5",  "TKN",    "DO",     "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
.07,      30,       9,        ,5,       20

"Incremental Flow Input Data for Segment 4"
"Flow",   "cBOD5",  "TKN",    "DO",     "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
0,        2,        0,        ,8.793,   13.5

"Hydraulic Information for Segment 4"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
3,        760.001,  .886,     .842

"Initial Mix Values for Segment 4"
"Flow",   "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
567.19,   8.787,    5.366,    .084,     9.77,     13.59386

"Rate Constants for Segment 4. - (All units Per Day)"
"k1",   "k1@T", "k2",    "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,     .373,   3,       2.577,  .15,    .092,   0,      0

"Output for Segment 4"
"Segment starts at OUTFALL 028"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
5,        0,        8.787,    5.366,    .084
5.1,      .1,       8.791,    5.352,    .084
5.2,      .2,       8.793,    5.338,    .084
5.3,      .3,       8.793,    5.324,    .084
5.4,      .4,       8.793,    5.31,     .084
5.5,      .5,       8.793,    5.296,    .084
5.6,      .6,       8.793,    5.282,    .084
5.7,      .7,       8.793,    5.268,    .084
5.8,      .8,       8.793,    5.254,    .084
5.9,      .9,       8.793,    5.24,     .084
6,        1,        8.793,    5.226,    .084
6.1,      1.1,      8.793,    5.212,    .084
6.2,      1.2,      8.793,    5.198,    .084
6.3,      1.3,      8.793,    5.184,    .084
6.4,      1.4,      8.793,    5.17,     .084
6.5,      1.5,      8.793,    5.156,    .084
```

6.6,	1.6,	8.793,	5.142,	.084
6.7,	1.7,	8.793,	5.128,	.084
6.8,	1.8,	8.793,	5.114,	.084
6.9,	1.9,	8.793,	5.1,	.084
7,	2,	8.793,	5.086,	.084
7.1,	2.1,	8.793,	5.072,	.084
7.2,	2.2,	8.793,	5.058,	.084
7.3,	2.3,	8.793,	5.044,	.084
7.4,	2.4,	8.793,	5.03,	.084
7.5,	2.5,	8.793,	5.016,	.084
7.6,	2.6,	8.793,	5.002,	.084
7.7,	2.7,	8.793,	5,	.084
7.8,	2.8,	8.793,	5,	.084
7.9,	2.9,	8.793,	5,	.084
8,	3,	8.793,	5,	.084

"END OF FILE"

```
"Model Run For I:\kaharlow\Raap - VA0000248\VA0000248_10_Reissuance\Technical\DO
Models\Complete1.mod On 4/16/2010 2:08:48 PM"

"Model is for NEW RIVER."
"Model starts at the OUTFALL 029 discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
559,     2,        0,        8.801,    13.5

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
1.57,    60,       0,        ,7,       20

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
.1,      500,      1.472,    1.179

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
560.57,  8.796,    5.406,    0,        9.775,    13.5182

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
1,     .743,   3,      2.573,  .35,    .213,   0,      0

"Output for Segment 1"
"Segment starts at OUTFALL 029"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        8.796,    5.406,    0
.1,      .1,       8.788,    5.385,    0



"Discharge/Tributary Input Data for Segment 2"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
1,       30,       13.6,     ,5,       20

"Incremental Flow Input Data for Segment 2"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
0,       2,        0,        ,8.795,   13.5

"Hydraulic Information for Segment 2"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
.02,     600.001,  1.016,    .922

"Initial Mix Values for Segment 2"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
561.57,  8.781,    5.509,    .082,     9.772,    13.52975

"Rate Constants for Segment 2. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .371,   2.999,  2.573,  .15,    .091,   0,      0

"Output for Segment 2"
"Segment starts at OUTFALL 026"
"Total", "Segm."
```

```
"Dist.", "Dist.",  "DO",      "cBOD",    "nBOD"
"(mi)",  "(mi)",   "(mg/l)",  "(mg/l)",  "(mg/l)"
.1,      0,        8.781,     5.509,     .082
.12,     .02,      8.782,     5.506,     .082



"Discharge/Tributary Input Data for Segment 3"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "deg C"
5.55,    24,       0,         ,7,        20

"Incremental Flow Input Data for Segment 3"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "deg C"
0,       2,        0,         ,8.787,    13.5

"Hydraulic Information for Segment 3"
"Length","Width",  "Depth",   "Velocity"
"(mi)",  "(ft)",   "(ft)",    "(ft/sec)"
4.88,    599.999,  1.025,     .927

"Initial Mix Values for Segment 3"
"Flow",  "DO",     "cBOD",    "nBOD",    "DOSat",   "Temp"
"(mgd)", "(mg/l)", "(mg/l)",  "(mg/l)",  "(mg/l)",  "deg C"
567.12,  8.765,    6.039,     .081,      9.763,     13.59307

"Rate Constants for Segment 3. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .373,   3,      2.577,  .15,    .092,   0,      0

"Output for Segment 3"
"Segment starts at OUTFALL 007"
"Total", "Segm."
"Dist.", "Dist.",  "DO",      "cBOD",    "nBOD"
"(mi)",  "(mi)",   "(mg/l)",  "(mg/l)",  "(mg/l)"
.12,     0,        8.765,     6.039,     .081
.22,     .1,       8.767,     6.024,     .081
.32,     .2,       8.769,     6.009,     .081
.42,     .3,       8.771,     5.994,     .081
.52,     .4,       8.773,     5.979,     .081
.62,     .5,       8.775,     5.964,     .081
.72,     .6,       8.777,     5.949,     .081
.82,     .7,       8.779,     5.934,     .081
.92,     .8,       8.781,     5.919,     .081
1.02,    .9,       8.783,     5.904,     .081
1.12,    1,        8.785,     5.89,      .081
1.22,    1.1,      8.787,     5.876,     .081
1.32,    1.2,      8.787,     5.862,     .081
1.42,    1.3,      8.787,     5.848,     .081
1.52,    1.4,      8.787,     5.834,     .081
1.62,    1.5,      8.787,     5.82,      .081
1.72,    1.6,      8.787,     5.806,     .081
1.82,    1.7,      8.787,     5.792,     .081
1.92,    1.8,      8.787,     5.778,     .081
2.02,    1.9,      8.787,     5.764,     .081
2.12,    2,        8.787,     5.75,      .081
2.22,    2.1,      8.787,     5.736,     .081
2.32,    2.2,      8.787,     5.722,     .081
2.42,    2.3,      8.787,     5.708,     .081
2.52,    2.4,      8.787,     5.694,     .081
2.62,    2.5,      8.787,     5.68,      .081
2.72,    2.6,      8.787,     5.666,     .081
2.82,    2.7,      8.787,     5.652,     .081
2.92,    2.8,      8.787,     5.638,     .081
3.02,    2.9,      8.787,     5.624,     .081
3.12,    3,        8.787,     5.61,      .081
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3.22,     3.1,      8.787,    5.596,    .081
3.32,     3.2,      8.787,    5.582,    .081
3.42,     3.3,      8.787,    5.568,    .081
3.52,     3.4,      8.787,    5.554,    .081
3.62,     3.5,      8.787,    5.54,     .081
3.72,     3.6,      8.787,    5.526,    .081
3.82,     3.7,      8.787,    5.512,    .081
3.92,     3.8,      8.787,    5.498,    .081
4.02,     3.9,      8.787,    5.485,    .081
4.12,     4,        8.787,    5.472,    .081
4.22,     4.1,      8.787,    5.459,    .081
4.32,     4.2,      8.787,    5.446,    .081
4.42,     4.3,      8.787,    5.433,    .081
4.52,     4.4,      8.787,    5.42,     .081
4.62,     4.5,      8.787,    5.407,    .081
4.72,     4.6,      8.787,    5.394,    .081
4.82,     4.7,      8.787,    5.381,    .081
4.92,     4.8,      8.787,    5.368,    .081
5,        4.88,     8.787,    5.357,    .081


"Discharge/Tributary Input Data for Segment 4"
"Flow",   "cBOD5",  "TKN",    "DO",     "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
.07,      30,       9,        ,5,       20

"Incremental Flow Input Data for Segment 4"
"Flow",   "cBOD5",  "TKN",    "DO",     "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
0,        2,        0,        ,8.793,   13.5

"Hydraulic Information for Segment 4"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
3,        760.001,  .886,     .842

"Initial Mix Values for Segment 4"
"Flow",   "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
567.19,   8.787,    5.366,    .084,     9.77,     13.59386

"Rate Constants for Segment 4. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .373,   3,      2.577,  .15,    .092,   0,      0

"Output for Segment 4"
"Segment starts at OUTFALL 028"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
5,        0,        8.787,    5.366,    .084
5.1,      .1,       8.791,    5.352,    .084
5.2,      .2,       8.793,    5.338,    .084
5.3,      .3,       8.793,    5.324,    .084
5.4,      .4,       8.793,    5.31,     .084
5.5,      .5,       8.793,    5.296,    .084
5.6,      .6,       8.793,    5.282,    .084
5.7,      .7,       8.793,    5.268,    .084
5.8,      .8,       8.793,    5.254,    .084
5.9,      .9,       8.793,    5.24,     .084
6,        1,        8.793,    5.226,    .084
6.1,      1.1,      8.793,    5.212,    .084
6.2,      1.2,      8.793,    5.198,    .084
6.3,      1.3,      8.793,    5.184,    .084
6.4,      1.4,      8.793,    5.17,     .084
6.5,      1.5,      8.793,    5.156,    .084
```

6.6,	1.6,	8.793,	5.142,	.084
6.7,	1.7,	8.793,	5.128,	.084
6.8,	1.8,	8.793,	5.114,	.084
6.9,	1.9,	8.793,	5.1,	.084
7,	2,	8.793,	5.086,	.084
7.1,	2.1,	8.793,	5.072,	.084
7.2,	2.2,	8.793,	5.058,	.084
7.3,	2.3,	8.793,	5.044,	.084
7.4,	2.4,	8.793,	5.03,	.084
7.5,	2.5,	8.793,	5.016,	.084
7.6,	2.6,	8.793,	5.002,	.084
7.7,	2.7,	8.793,	5,	.084
7.8,	2.8,	8.793,	5,	.084
7.9,	2.9,	8.793,	5,	.084
8,	3,	8.793,	5,	.084

"END OF FILE"

Attachment F

Historical Limit Development

Excerpt from 1979 Fact Sheet

TABLE I. EFFLUENT LIMITATIONS

012

( ) Final Limitation

( ) Interim Limitation

Effective Dates: From _____

To _____

TNT WASTE TREATMENT PLANT

Parameter	BASIS					BASED ON			MONITORING	
	Effluent Guidelines			Best Engr. Judgment	Water * Quality Stds.	Multiplier	Production	Permit Limit	Sample Type	Frequency
	BPT (Prop) (Final)	BAT (Prop) (Final)	NSPS (Prop) (Final)							
Oxidized Nitrogen	—	—	—	*	—	—	—	50/142 Kg/d 29/82 mg/l	24hr comp	1/month
Sulfate	—	—	—	*	—	—	—	3442/2495 Kg/d 1400/1430 mg/l	24hr comp	1/month
~~TNT + Nitrobodies~~	—	—	—	*	—	—	—	~~[illegible] Kg/d~~ ~~[illegible] mg/l~~		
TNT + NITROBODIES	—	—	—	*	—	—	—	0.87/1.37 Kg/d 0.5/0.75 mg/l	24hr comp	2/month
COD	—	—	—	*	—	—	—	91/146 Kg/d 52/233 mg/l	24hr comp	1/month
Temperature	—	—	—	*	—			32°C summer 17°C winter	Recorded	cont.
pH	—	—	—	—	5	—	—	6.0 – 9.0	Recorded	cont.

*See Attachment #1

*1. Per 208 Plan and date _____
2. Per 303(C) Plan and date _____
3. Per EPA and date _____
4. Per 401 Certification and date _____
5. Other State Standard

ATTACHMENT 1

1. Outfall 004 - This is an open ditch which prior to the finish of Project MCA33.10A received several small contaminated process and drainage streams. The parameters listed are those for which testing was done prior to the removal of these streams. As the only water to be contained in this ditch is to be storm and spring flows, a one-year testing program is included to provide assurance that all contaminated water is removed.

2. Outfall 401 - This is the Oleum manufacture waste acid treatment plant. Processes employed are equalization, neutralization, pH adjustment and clarification with vacuum filtration for sludge dewatering. TSS limits are based on limits normally to be expected in a solids containing system with simple settling. Sulfate limits are based on the solubility limit of calcium sulfate as this is the form in which almost all of the SO_4 in the system is expected to be. It is the judgment of the staff that as no provision is made for the removal of soluble sulfate the minimum amount which can be listed as a permit limit is the solubility of the compound. As calcium sulfate normally exists in one of three forms with varing solubilities, it was necessary to choose one form as the one on which to base the limit. Of the three forms (anhydrous, 2 H_2O and, 1/2 H_2O). It is obvious that the anhydrous was least likely to be predominant. Of the remaining, the two water hydrate was the lesser soluble and was chosen as the more conservative guess. The limits are thus based on the solubility of $CaSO_4.2H_2O$ in water at 20°C. The solubility of this species is 2410 mg/l. Of this approximately 57% or 1370 mg/l is contributed by the sulfate radical. All sulfate results are to be reported as SO_4. As the solids in this system are almost exclusively calcium sulfate, it was felt that some provision must be made to account for the calcium sulfate existing as suspended matter. It was decided that for the sake of simplicity all TSS would be assumed to be SO_4 and thus the TSS limit was added to the sulfate limit. This was in all cases a negligible addition. All quantity limits were based on the concentration limits listed and a flow figure of 0.25 mg/d which was supplied by Arsenal personnel as the design flow for this facility.

3. Outfall 005 (Cooling Water) - This outfall previously carried the effluent from the C-line waste acid treatment plant. Upon completion of Project MCA 972.550, the C-line waste acid treatment plant will be abandoned and all waste diverted to the main waste acid treatment plant associated with Discharge 007. To insure that all contaminated streams have been removed from this discharge, the parameters: oxidized nitrogen, sulfate, BOD and COD, are to be monitored for a period of one year. No limits are included on the permit as the tests are to be conducted only for the purpose of verification. Temperature limits are based on a best estimation of the temperature of flows currently being discharged. Special Condition 1 attached to the permit requires that these temperature limits be investigated and modified if necessary.

4. Outfall 006 (Main Plant General Purpose Sewer) - This outfall previously contained a number of contaminated streams of varing orgins. With the completion of several projects throughout the plant, all contaminated waste streams will be eliminated leaving only non-contact cooling water from power house and water treatment plant raw water overflow-OS streams associated with plant processes. The raw water overflow contains only untreated unchanged river water with no additatives whatsoever. In addition to these process streams there is also storm runoff and spring water. BOD, COD, and oxidized nitrogen testing is included on the requirements for this discharge to provide assurance that all contaminated streams have been removed. Temperature limitations are based ont the best available data existing at the time of the permit drafting. Special Condition No. 1 requires that a study be done on this discharge to determine if these limits should be changed.

5. Outfall 007 (Main Plant Acid Treatment Plant) - BOD and COD carrying streams will be removed from this outfall by MCA 33.10A. Testing requirement is to give assurances that no such stream still exists. TSS limits are based on 30 and 45 mg/l and a flow rate of 7.0 MGD which is the best estimate by Arsenal personnel for the future flow rates. Sulfate quantities limits are based on 1400 and 1415 mg/l as discussed under Outfall 401. Oxidized nitrogen quantities are based on a 85% reduction of the NO_3 quantities determined to be in the raw stream at mobilization production rates. It was previously determined that the segment of the New River into which this discharge flows is not water quality limiting with respect to nitrate and thus effluent limitations apply. As no guidelines for nitrate removal exist, Radford Arsenal with the concurrence of EPA and the Virginia Water Control Board decided that an 85% removal rate should be the target, pending a BPT definition. With this in mind, RAAP personnel designed a system to produce this level of effluent nitrate. Pertinent data has been reviewed by the staff. The RAAP staff is satisfied that these levels will be met. No nitrate removal facilities as such are involved as the reduction in effluent in the quantity is accomplished by recycle in the production process. No NO_3 concentration limit is given as most NO3 exists in this system as calcium nitrate which is soluble in water in the range of 1800 g/l. Due to the uncertainty with the permit limits as stated in this permit, Special Condition No. 2 is added to this discharge which will allow for an evaluation of the efficiency of this system during a certain period after which the permit limits may be modified. Proper temperature limits are also somewhat in question and for this reason Special Condition No. 1 applies which will require RAAP to perform a temperature survey after which temperature limits may also be modified.

6. Outfall 012 (TNT Waste Treatment Plant) - Oxidized nitrogen, TNT, and COD limits are based on the best estimates for the capability of the proposed treatment plant. The final limits were derived from the estimated full mobilization loadings with 85% removal. Sulfate limits were determined as discussed under Outfall 401. Special Condition No. 2 is applicable to this discharge and thus an efficiency study will be undertaken during the first year of actual operation to determine if these limits are correct.

The temperature survey in accordance with Special Condition No. 1 will also be conducted. COD Quantity limits are based on a concentration in the effluent of 52 mg/l average and 233 mg/l maximum and a flow rate of 0.46 MGD. The flow figure was arrived at by back calculating from oxidized nitrogen and TNT quantities.

7. Outfall 013 - This discharge is associated with a drainage ditch in the TNT manufacturing area which was found some years ago to be carrying a measured pollutant load. However, no pollutant quantities have been detected in recent years. It is proposed to sample this discharge with a higher than previously required frequency and if no unusual levels of pollutants are found during a 6-month period the discharge will be removed from the permit.

8. Outfall 014 (Inert Gas Plant Cooling Water) - The temperature limits on this discharge are based on best estimate by Arsenal personnel of actual temperatures. Special Condition No. 1 applies in this case which will require a study to be performed to determine if these limits are applicable.

9. Outfall 015 (Non-Contact Cooling Water) - Temperature limits for this discharge are based on past records and best estimate of temperature by Arsenal personnel. As the limit is not greater than stream standards, no Special Condition No. 1 type of survey is necessary.

10. Outfall 017 (Runoff from the Open Burning Area) - This outfall is included on the permit as there is a potential for contaminated discharge from this area. To date no discharge has ever been reported from this area. Testing requirement is included; therefore, for information proposes only should discharge occur.

11. Outfall 023 (Compressor House Cooling Water) - The temperature limit of 36°C is based on a best estimate by Arsenal personnel. Special Condition No. 1 applies in this case.

12. Outfall 026 (Main Plant Sewage Treatment Plant) - BOD and TSS values are based on standard secondary treatment definition for sewage treatment plants. Quantity limits are calculated with a flow of 1.0 MGD. Chlorine residual limits are based on practices currently in use in the State of Virginia.

13. Outfall 028 (horseshoe Area Waste Treatment Plant - All limits determined the same as in Outfall 026. Flow limits of 0.075 MGD was used for calculation of quantity limits.

14. Outfall 029 (Main Plant Biological Waste Treatment Plant) - BOD and COD limits are based on 85% removal of the estimated laoding on the plant. Oxidized ntirogen loadings are unsure at this time and so are not limited. Special Condition No. 2 calling for an efficiency survey to establish limits applies to this discharge. TSS limits are based on 85% removal of TSS loading as shown in Table II of the April 25, 1978, design capacity submittal from Col. Watts. This, as are all limits on this discharge is a tentative figure pending resilution of Special Condition No. 2.

Attachment G

TMP Justification Memorandum

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

WEST CENTRAL REGIONAL OFFICE

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: RFAAP **VA0000248** - TMP Justification

TO: Deborah DeBiasi - OPS

FROM: Kevin Harlow

DATE: April 8, 2015

Revised facility information along with included table showing historic TMP results are attached.

Outfall 005: The current mode of operation is to discharge only cooling water, cooling tower blowdown and storm water, and potentially wastewater from the oleum plant. The oleum plant is in standby mode and will take considerable effort to make it active. Occasionally, spills from tank dikes have found their way into this outfall. Discharges from this outfall meet the applicability criteria in the guidance to flows in excess of 50,000 gpd. No toxicity was observed during the current permit. Annual acute biological testing should be continued in the permit. The species used should be alternated between C. dubia and P. promelas. If the oleum plant becomes active, quarterly testing with both species should resume.

Outfall 006: No major changes in the sources of effluent at this outfall. Discharges from this outfall meet the applicability criteria in the guidance due to flows in excess to 50,000 gpd. An acute toxicity limit of 1.0 TUa was placed into the permit during the 2005 permit reissuance. The facility did not have any trouble achieving compliance with this limit. Chronic toxicity data using P. promelas showed some toxicity but the WETLIM10 and STATS.EXE output showed that the 1.0 TUa was the most restrictive limit and that a chronic toxicity limit is not needed. Annual chronic tests using *Pimephales promelas* will also continue. The acute multi-dilution NOAEC tests shall be 48-Hour Static Acute tests using *Pimephales promelas*

Outfall 007: No major changes in the sources of wastewater at this outfall. All waste acid is directed to the A-B line treatment system and this outfall. This outfall has had an effective acute WET limit since 1994. The 8.0 TUa limit was corrected in the 2005 permit reissuance to a 6.6 TUa limit. The facility did not have any trouble meeting this new limit during the compliance schedule. Chronic toxicity data using C. dubia showed some toxicity but the WETLIM10 and STATS.EXE output showed that the 6.6 TUa (*C. dubia*) was the most restrictive limit and that a chronic toxicity limit is not needed. Once a year, tests shall be conducted using both *Ceriodaphnia dubia* and *Pimephales promelas*. Continued chronic testing using *C. dubia* is also required since the IWC at 7Q10 exceeds 1%.

Outfall 014: Following removal of cooling water from this outfall in 1992, the discharge has been comprised of storm water and spring water. A petroleum odor was detected in this area during a 2000 site visit. The spring was determined to be infiltrating a collapsed pipeline in 2000. The pipeline was subsequently repaired excluding the contaminated spring. Toxicity testing during the

2005 and 2010 permit terms did not exhibit toxicity. However, given the IWC=100%, continue acute toxicity testing alternating between P. promelas and C. dubia is to continue.

Outfall 026 & 028: No toxicity was demonstrated in the 2010 permit. However, there is a chance that toxics from manufacturing or laboratory operations could be routed to these STPs. The facility disinfects by chlorination and dechlorinates. The permittee shall perform annual acute tests alternating between using *Pimephales promelas* and *Ceriodaphnia dubia.*

Outfall 029: There are no major changes in the sources of effluent at this outfall. A WET limit became effective in 1994. No tests have failed since a seven million gallon equalization basin has been in use. Ceriodaphnia dubia was chosen as the most sensitive species in 1994. Small changes in the manufacturing formulations have been made and will probably continue in the future. Acute WET testing will continue with the most sensitive species, *C. dubia.* Once each year both species should be tested to verify that manufacturing changes have not resulted in vertebrate toxicity.

Outfall 030: Toxicity will be evaluated at Outfall 030 using annual acute and chronic WET tests. Testing will alternate between using P. promelas for the acute test and C. dubia for the chronic test, and C. dubia for the acute test and P. promelas for the chronic test.

SUMMARY OF TMP REQUIREMENTS:

005: Annual acute tests on 24 hour composite samples during dry weather. Alternate between Pimephales promelas and Ceriodaphnia dubia. If the oleum plant becomes active, quarterly acute and chronic testing with both species should be initiated.

006: Quarterly acute tests on 24 hour composite samples using Pimephales promelas. Both species should be used once each year to verify the most sensitive species. Annual chronic tests on 24 hour composite samples using P. Promelas.

007: Quarterly acute tests on 24 hour composite samples with a WET limit using Ceriodaphnia dubia. Both species should be used once each year to verify the most sensitive species. Annual chronic testing using Ceriodaphnia dubia.

014: Annual acute on 24 hour composite samples alternating between Pimephales promelas and Ceriodaphnia dubia.

024: Quarterly acute tests on 24 hour composite samples with both C. dubia and P. promelas upon commencement of discharge.

026: Annual acute on 24 hour composite samples alternating between Pimephales promelas and Ceriodaphnia dubia.

028: Annual acute tests on 24 hour composite samples alternating between Pimephales promelas and Ceriodaphnia dubia.

029: Quarterly acute tests on 24 hour composite samples with a WET limit using Ceriodaphnia dubia. Both Species should be used once each year to verify the most sensitive species.

030: Annual acute and chronic WET tests. Testing will alternate between using P. promelas for the acute test and C. dubia for the chronic test, and C. dubia for the acute test and P. promelas for the chronic test.

Attachment H

NPDES Permit Rating Worksheet

NPDES Permit Rating Work Sheet

___ Regular Addition
___ Discretionary Addition
___ Score change, but no status change
___ Deletion

NPDES NO: VA0000248

Facility Name:

Radford Army Ammunition Plant

City: Radford

Receiving Water: New River

Reach Number: VAW-N22R

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

___ YES: score is 600 (stop here) _x_ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

___ YES; score is 700 (stop here)
_x_ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: |___|___|___|___| Primary SIC Code: 2892

Other SIC Codes: 2819 2823 2873 4911

Industrial Subcategory Code: |_0_|_0_|_2_| (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
__ No process waste streams	0	0	___ 3.	3	15	___ 7.	7	35
___ 1.	1	5	___ 4.	4	20	_x_ 8.	8	40
___ 2.	2	10	___ 5.	5	25	___ 9.	9	45
			___ 6.	6	30	___ 10.	10	50

Code Number Checked: |_0_|_8_|

Total Points Factor 1: |_4_|_0_|

FACTOR 2: Flow/Stream Flow Volume *(Complete Either Section A or Section B; check only one)*

Section A--Wastewater Flow Only Considered

Wastewater Type (See Instructions)			Code	Points
Type I:	Flow < 5 MGD	___	11	0
	Flow 5 to 10 MGD	___	12	10
	Flow > 10 to 50 MGD	___	13	20
	Flow > 50 MGD	___	14	30
Type II:	Flow < 1 MGD	___	21	10
	Flow 1 to 5 MGD	___	22	20
	Flow > 5 to 10 MGD	___	23	30
	Flow > 10 MGD	___	24	50
Type III:	Flow < 1 MGD	___	31	0
	Flow 1 to 5 MGD	___	32	10
	Flow > 5 to 10 MGD	___	33	20
	Flow > 10 MGD	___	34	30

Section B--Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10%	___	41	0
	≥ 10% to < 50%	___	42	10
	≥ 50%	___	43	20
Type II:	<10%	_X__	51	0
	≥ 10% to < 50%	___	52	20
	≥ 50%	___	53	30

Code Checked from Section A or B: |_5_|_1_|

Total Points Factor 2: |_0_|_0_|

NPDES Permit Rating Work Sheet

FACTOR 3: Conventional Pollutants
(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ___ BOD _X__ COD ___ Other:

Permit Limits: (check one)			Code	Points
	__	< 100 lbs/day	1	0
	___	100 to 1000 lbs/day	2	5
	___	>1000 to 3000 lbs/day	3	15
	_X_	>3000 lbs/day	4	20

Code Checked: |_4_|

Points Scored: |_2_|_0_|

B. Total Suspended Solids (TSS)

Permit Limits: (check one)			Code	Points
	__	< 100 lbs/day	1	0
	___	100 to 1000 lbs/day	2	5
	___	>1000 to 5000 lbs/day	3	15
	_X__	>5000 lbs/day	4	20

Code Checked: |_4_|

Points Scored: |_2_|_0_|

C. Nitrogen Pollutant: (check one) ___ Ammonia _X__ Other: _____Oxidized Nitrogen_____

Permit Limits: (check one)			Code	Points
	__	< 300 lbs/day	1	0
	___	300 to 1000 lbs/day	2	5
	___	>1000 to 3000 lbs/day	3	15
	_X__	>3000 lbs/day	4	20

Code Checked: |_4_|

Points Scored: |_2_|_0_|

Total Points Factor 3: |_6_|_0_|

FACTOR 4: Public Health Impact
Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

_X_ YES (if yes, check toxicity potential number below) ___ NO (if no, go to Factor 5)

Determine the human health toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the <u>human</u> <u>health</u> toxicity group column -- check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
___ No process waste streams	0	0	___ 3.	3	0	___ 7.	7	15
___ 1.	1	0	___ 4.	4	0	_X_ 8.	8	20
___ 2.	2	0	___ 5.	5	5	___ 9.	9	25
			___ 6.	6	10	___ 10.	10	30

Code Number Checked: |_0_|_8_|

Total Points Factor 4: |_2_|_0_|

NPDES Permit Rating Work Sheet

NPDES No.: VA0000248

FACTOR 5: Water Quality Factors

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge?

		Code	Points
_X__	Yes	1	10
___	No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

		Code	Points
_x_	Yes	1	0
___	No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effl toxicity?

		Code	Points
_X__	Yes	1	10
___	No	2	0

Code Number Checked:A |_1_| B |_1_| C |_1_|

Points Factor 5:A |_1_|_0_| + B |_0_| + C |_10_| = |_2_|_0_| TOTAL

FACTOR 6: Proximity to Near Coastal Waters N/A

A. Base Score: Enter flow code here (from Factor 2): |___|___|

Enter the multiplication factor that corresponds to the flow code: |___|___|

Check appropriate facility HPRI Code (from PCS):

	HPRI #	*Code*	*HPRI Score*
___	1	1	20
___	2	2	0
___	3	3	30
___	4	4	0
___	5	5	20

Flow Code	Multiplication Factor
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked: |___|

Base Score: (HPRI Score) _____ x (Multiplication Factor) _____ = _____0____ (TOTAL POINTS)

B. Additional Points--NEP Program
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?
N/A

		Code	Points
___	Yes	1	10
___	No	2	0

C. Additional Points--Great Lakes Area of Concern
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see instructions)

N/A

		Code	Points
___	Yes	1	10
___	No	2	0

Code Number Checked:A |_N/A_| B |_N/A_| C |_N/A_|

Points Factor 5: A |___|___| + B |___|___| + C |___|___| = |_____0_____| TOTAL

NPDES Permit Rating Work Sheet

NPDES NO: VA0000248

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	____40_____
2	Flow/Stream Flow Volume	____00_____
3	Conventional Pollutants	____60_____
4	Public Health Impacts	____20_____
5	Water Quality Factors	____20_____
6	Proximity to Near Coastal Waters	____00_____
	TOTAL (Factors 1-6)	**____140_____**

S1. Is the total score equal to or greater than 80? __X_ Yes (Facility is a major) __ No

S2. If the answer to the above question is no, would you like this facility to be discretionary major?

__ No

___ Yes (add 500 points to the above score and provide reason below:

Reason: _____

_____

_____

_____

_____

NEW SCORE: ____140_____

OLD SCORE: ____140_____

_____Kevin Harlow_____

Permit Reviewer's Name

(__540_____)___562____-___6788_____

Phone Number

____March 22, 2015_____

Date

npdesrs.dak (2/21/95)