VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **Minor Municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from the operation of a domestic sewage treatment plant. This permit action consists of reissuing the permit for a five-year term with limitations on pH, BOD_5, TSS, and TRC. SIC Code: 4952

1. Facility Name and Address:
Carver Estates Sewage Treatment Facility
P.O. Box 7
Collinsville, VA 24078

Location: 364 Parkway Drive, Martinsville, VA 24112
(Please see location map in **Attachment A.**)

2. Permit No. **VA0029858** Existing Permit Expiration Date: November 18, 2008

3. Owner Contact: Name: Mr. Michael E. Ward Title: Director of Regulatory Compliance and Technical Applications
Telephone No: (276) 634-2540

4. Application Complete Date: August 14, 2008
Permit Drafted By: Lynn V. Wise Date: October 6, 2008 West Central Regional Office
Reviewed By: Kip D. Foster Date: 10/9/08
Public Notice Dates: from 10/15/08 to 11/14/08

5. Receiving Stream Name: Grassy Creek River Mile: 1.77
Basin: Roanoke River Subbasin: Roanoke River Section: 4a Class: III
Special Standards: PWS

7-Day, 10-Year Low Flow: 0.66 MGD	1-Day, 10-Year Low Flow: 0.61 MGD
7Q10 High Flow: 1.01 MGD	1Q10 High Flow: 0.92 MGD
30-Day, 5-Year Low Flow: 0.97 MGD	Harmonic Mean Flow: 1.97 MGD
30-Day, 10-Year Low Flow: 0.83 MGD	30Q10 High Flow: 1.27 MGD
Tidal? YES/**NO**	On 303(d) list? YES/**NO**

6. Operator License Requirements: IV 7. Reliability Class: I

8. Permit Characterization:
( ) Private ( ) Federal ( ) State (X) POTW ( ) PVOTW

( ) Possible Interstate Effect ( ) Interim Limits in Other Document

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Carver Estates STF

NPDES Permit Number: VA0029858

Permit Writer Name: Lynn V. Wise

Date: November 12, 2008

Major [ ] **Minor** [X] **Industrial** [ ] **Municipal** [X]

I.A. Draft Permit Package Submittal Includes:	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?		X	
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?			X
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed? slightly lower	X		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?		X	
a. Has a TMDL been developed and approved by EPA for the impaired water?			X
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?			X
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs

(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?	X		
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?	X		

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?			X

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply
Duty to reapply
Need to halt or reduce activity not a defense
Duty to mitigate
Proper O & M
Permit actions

Property rights
Duty to provide information
Inspections and entry
Monitoring and records
Signatory requirement
Bypass
Upset

Reporting Requirements
- Planned change
- Anticipated noncompliance
- Transfers
- Monitoring reports
- Compliance schedules
- 24-Hour reporting
- Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

Part II. NPDES Draft Permit Checklist

NA

Region III NPDES Permit Quality Review Checklist – For Non-Municipals

(To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet **or** permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?			
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?			

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?			
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)	Yes	No	N/A
1. Is the facility subject to a national effluent limitations guideline (ELG)?			
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?			
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?			
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?			
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			

NA

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ) – cont.	Yes	No	N/A
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?			

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?			
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			
3. Does the fact sheet provide effluent characteristics for each outfall?			
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?			
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?			
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?			
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?			
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?			
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?			
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?			
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?			
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?			
8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?			

NA

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?			
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?			
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?			

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?			
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?			
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?			

List of Standard Conditions – 40 CFR 122.41

Duty to comply
Duty to reapply
Need to halt or reduce activity not a defense
Duty to mitigate
Proper O & M
Permit actions

Property rights
Duty to provide information
Inspections and entry
Monitoring and records
Signatory requirement
Bypass
Upset

Reporting Requirements
- Planned change
- Anticipated noncompliance
- Transfers
- Monitoring reports
- Compliance schedules
- 24-Hour reporting
- Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?			

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	LYNN V. WISE
Title	ENVIRONMENTAL ENGINEER, SR.
Signature	Lynn V. Wise
Date	11/12/08

9. Provide a brief description of the wastewater treatment system.

Discharge Description

OUTFALL NUMBER	DISCHARGE SOURCE	TREATMENT	DESIGN FLOW
001	Domestic Sewage	Three aerated lagoons in series, chlorine disinfection and dechlorination.	0.06 MGD

The Carver Estates Sewage Treatment Facility treats sewage for a population of 262. The average daily flow rate is approximately 39,000 gallons per day; however, the facility typically only discharges four to six times per year for seven to 20 days per discharge event. The effluent is discharged to Grassy Creek. The long-term plan is to send the sewage to the Upper Smith River Wastewater Treatment Plant (pump station) to be treated at the City of Martinsville. It is unknown at this time when that may occur.

A schematic diagram of the treatment system may be found in **Attachment A**.

10. Sewage Sludge Use or Disposal:

Any sludge generated at the facility is held within the lagoon system. No sludge has been removed nor is it believed that it will be necessary to remove any sludge during the next permit term.

11. Discharge Location Description:

Please see **Attachment A** for a copy of the USGS topo map which shows the discharge location, significant dischargers to the receiving stream, water intakes, and other items of interest.

Name: Martinsville West Quadrangle Number: 017B
Outfall Location: Latitude 36° 40' 07" Longitude 79° 55' 48"

12. Material Storage:

55-gallon drum of hypochlorite solution (for disinfection); 55-gallon drum of sodium bisulfite solution (for dechlorination)
All materials are stored indoors. Bulk material to make up solutions is kept at the Lower Smith River pump station.

13. Ambient Water Quality Information:

The Carver Estates STP discharges to Grassy Creek in the Roanoke River watershed at river mile 1.77. The stream is classified as Class III (Non-tidal Waters, Coastal and Piedmont Zones), and is designated as a Public Water Supply. It is noted that the E.I. Dupont intake, located approximately three miles downstream, is currently inactive. Critical stream flow determinations were performed using site-specific flow measurements and correlating them to the continuous record gage on the South Mayo River near Nettleridge, VA (#02069700). Based upon decreases in the critical flows at these gages, the stream flows at the discharge point have decreased slightly from those determined in 2003.

13. Ambient Water Quality Information (continued):

The critical flows are listed on the front page of this Fact Sheet. A copy of the Flow Frequency Determination memo may be found in **Attachment B**.

The PReP complaint logs from the past five years were reviewed. None were received which may be attributed to the operation of the Carver Estates STP.

There are no ambient water quality monitoring stations on Grassy Creek.

14. Antidegradation Review & Comments: Tier 1 _____ Tier 2 __**XX**___ Tier 3 _____
The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with the Tier determination. If data or information is not available to make a determination, the stream is assumed to be Tier 2. In addition, public water supplies are assumed to be Tier 2 unless information is available to indicate otherwise. Therefore, Grassy Creek is designated as a Tier 2 water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection, "significant degradation" means that no more that 25% 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% of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The significant degradation baseline (antidegradation baseline) for aquatic life protection is calculated for each pollutant as follows:

0.25 (WQS - existing quality) + existing quality = Antidegradation baseline

The antidegradation baseline for human health protection is calculated for each pollutant as follows:

0.10 (WQS - existing quality) + existing quality = Antidegradation baseline

The "antidegradation baselines" become the new water quality criteria in Tier 2 waters and effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant.

Effluent limitations are discussed in detail in Section 16. below. The discharge is in compliance with antidegradation requirements set forth in the Water Quality Standard Regulation, 9 VAC 25-260-30. The antidegradation review was conducted as described in Guidance Memorandum 00-2011, dated August 24, 2000, and complies with the antidegradation policy contained in Virginia's Water Quality Standards.

15. Site Visit: Date: September 23, 2008 Performed by: Lynn V. Wise
Please see **Attachment A** for a copy of the site visit report.

16. Effluent Screening & Limitation Development:

A review of the DMR data for the past five years indicates the facility is generally in compliance with the current limitations. The limitations from the previous permit were reviewed and carried forward as appropriate. Effluent screening and limitation development documentation may be found in **Attachment C**.

Flow - The design flow of this facility is 0.06 MGD.

BOD_5/TSS/DO - The federal secondary treatment regulation is the basis for the BOD limitations (30 mg/l monthly average, 45 mg/l max weekly average) in this permit. In April 1993, DEQ modeled the effluent using the Agency desktop dissolved oxygen model used at that time and found that neither TKN nor more stringent BOD limitations were needed. A copy of that model may be found in **Attachment C**. The basis for the TSS limitations is provided by 40 CFR 133.103(c) for equivalent to secondary limitations for stabilization ponds and is in accordance with the Agency permit manual for facilities East of the Blue Ridge Mountains. A monthly average of 60 mg/l and a max weekly average of 90 mg/l is included.

pH - The minimum limit of 6.0 and the maximum limit of 9.0 standard units are in accordance with the federal secondary treatment regulations and the water quality standards for this water body.

E. coli – The revised Water Quality Standards (WQS) which became effective on January 15, 2003, included *E. coli* bacteria standards in 9 VAC 25-260-170.A, as well as the revised disinfection policy of 9 VAC 25-260-170.B. These standards replaced the existing fecal coliform standard and disinfection policy of 9 VAC 25-160-170.

The use of chlorine as a surrogate for the applicable bacteria standard was demonstrated during the current permit cycle in accordance with GM 03-2007. Therefore, residual chlorine is monitored after the contact tank in lieu of bacteria limitations.

TOXICS

The need for limitations for toxic substances was evaluated using mixing zone and antidegradation (tier 1) concepts. The criteria were calculated using the revised critical stream flows, the plant design flow, MIX.EXE predication of mixing, and for ammonia, the 90th percentile pH and temperature of the resulting mix. The wasteload allocations were calculated and used in the STATS.EXE program. **Attachment C** contains supporting documentation regarding toxic limit evaluations.

Ammonia - In accordance with current agency guidance, the STATS.EXE program was run using a single effluent data point of 9.0 mg/l as representative of the concentration of ammonia in domestic effluents. The program indicated that there was no reasonable potential for the effluent to cause or contribute to violation of the water quality criteria for ammonia. Therefore, no limitations are required.

Total Residual Chlorine (TRC) – In accordance with Agency guidance, all chlorinated effluents must have a chlorine limit. A single datum that is sufficiently large to force the program to calculate a limit is entered into STATS.EXE. The resulting limitations are a monthly average of 0.094 mg/l and a maximum weekly average of 0.113 mg/l. The maximum weekly limitation is less stringent than the

16. Effluent Screening & Limitation Development (continued):

current permit limitation of 0.1 mg/l ("Nondetect" based on the Agency-accepted quantification level of 0.1mg/l for TRC). Due to antibacksliding requirements, the limitation may not be relaxed. The monthly average limit has decreased slightly due to reduced critical stream flow. Therefore, a monthly average of 0.094 mg/l and maximum weekly average of 0.1 mg/l will be included. Disinfection requirements are also included and reported on the Discharge Monitoring Report.

Other Toxics - For a time prior to the permit reissuance in 1998, the facility was using cupric sulfate to control algal growth in the lagoons. By letter dated September 17, 1998, the authority stated that the chemical was no longer being used and would not be used in the future. The permit required monthly copper monitoring in the first year to determine whether limitations for copper were necessary. The STATS.EXE program indicated there was no reasonable potential for the effluent to violate the in-stream criteria for copper indicating that limitations are not required. (Please see WLA spreadsheet and STATS.EXE. printouts in **Attachment C**.)

It is noted that the facility no longer uses Diquat as was discussed in the previous permit Fact Sheet.

No other suitable toxics data is available. In accordance with Agency guidance, continued monitoring for water quality standards parameters is not necessary.

Basis for Effluent Limitations

PARAMETER	BASIS
Flow	NA – monitoring only
BOD/TSS	1 - Secondary Treatment (40 CFR Part 133)
PH	2
TRC	2

1. Federal Effluent guidelines – cite CFR
2. Water Quality-based Limits: - show calculations or cite WQM plan reference
3. Best Engineering Judgement: - provide narrative rationale
4. Best Professional Judgement: - provide narrative rationale
5. Other (e.g. wasteload allocation model): - specify & document with model output or WLA from TMDL or basin plan

17. Basis for Sludge Use & Disposal Requirements:

N/A. No limitations or monitoring requirements. The permittee must handle sludge in accordance with the facility's Sludge Management Plan.

18. Antibacksliding Statement:

In accordance with the Antibacksliding policy, all limits are at least as stringent as in the previous permit.

19. Compliance Schedules:

None

20. Special Conditions:

a. **Additional Chlorine Limitations and Monitoring Requirements**
Rationale: Required by the Sewage Collection and Treatment regulations, 9 VAC 25-790, Bacteria standards; other 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. **95% Capacity Reopener**
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 2 for all POTW and PVOTW permits.

c. **Indirect Dischargers**
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

d. **O&M Manual Requirement**
Rationale: Required by the Code of Virginia, § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790 and the VPDES Permit Regulation, 9 VAC 25-31-190 E.

Revisions to the O&M Manual were approved on August 18, 2008. This special condition requires an updated manual or a statement that the existing manual is up-to-date.

e. **Licensed Operator Requirement**
Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 D and the Code of Virginia §54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators. A class IV operator is required for this facility.

f. **Reliability Class**
Rationale: Required by the Sewage Collection and Treatment Regulations, 12 VAC 5-581-20 and 120 for all municipal facilities. A Reliability Class I has been assigned to this facility.

g. **Sludge Reopener**
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C 4 for all permits issued to treatment works treating domestic sewage.

h. **Compliance Reporting Under Part I.A and I.B**
Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when toxic 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.

i. **Sludge Use and Disposal**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 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. Technical requirements may be derived from the Department of Health's Biosolids Use Regulations, 12 VAC 5-585-10 et seq.

j. **Closure Plan**
Rationale: Treatment units or equipment no longer used must be closed out or removed from the site in such a manner that state waters are not adversely impacted or human health endangered. Authority for this requirement is provided by 9 VAC 25-31-210 A

k. **Pretreatment (Significant Discharger Survey)**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations.

l. **Part II, Conditions Applicable to All Permits**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. Changes to Permit:

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	TRC (Final Effluent)	------	------	0.1 mg/l	0.094 mg/l	Reduced critical stream flow reduced the applicable wasteload allocation. Disinfection requirements are unchanged and are found in Part I.B.	10/6/08
Special Condition Changes:							
1. Removed "Added Bacterial Effluent Limitations and Monitoring Requirements"						1. The permittee demonstrated chlorine could be used as a surrogate during the past permit term.	10/6/08
2. Language changes to the O&M Manual Requirement and Compliance Reporting special conditions						2. To be consistent with the VPDES permit manual	10/9/08

22. Variances/Alternate Limits or Conditions:

No variances were requested or granted. Because Warning Letters have been issued to the facility in the past three years, reducing monitoring frequencies were not considered.

23. Regulation of Users: 9 VAC 25-31-280 B 9 *If the treatment works is not owned by a state or a municipality, the fact sheet must include a statement about how industrial, indirect dischargers (users) are being regulated.*

N/A. This is a publicly owned treatment works.

24. Public Notice Information required by 9 VAC 25-31-280 B:

All pertinent information is on file and may be inspected, and copied by contacting Lynn V. Wise at: Virginia DEQ, West Central Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019 Telephone No. (540) 562-6787, lvwise@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 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 if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. 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.

25. Additional Comments:

Previous Board Action: None.

Staff Comments:
By memo dated October 15, 2003, the Virginia Department of Health (VDH) noted that the downstream Dupont intake is currently inactive and that the Department would not object to reducing the Reliability Class to Class II. The staff has maintained Reliability Class I because the receiving stream remains designated as a Public Water Supply in the *Water Quality Standards* regulation. In addition, maintaining the current reliability class does not impose any new requirements on the permittee. VDH has no objection to the discharge or draft permit.

A screening for Threatened and Endangered (T&E) Species in the vicinity of the Carver Estates STF was performed and a T&E Species Coordination Form package was submitted to the Department of Game and Inland Fisheries, the Department of Conservation and Recreation, and the United States Fish & Wildlife Service. It was found that the Roanoke logperch, a State and Federal Endangered species, has been confirmed in the Smith River upstream of the confluence with Grassy Creek. The discharge from the Carver Estates STF is 1.77 miles upstream of the confluence of Grassy Creek with the Smith River. This is well outside of the mixing zone for the discharge and effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC-25-260-00 et seq. Further documentation of the T&E species review can be found in the Agency's files at the Regional Office.

The discharge is not controversial and is currently meeting the required effluent limitations.

Public Comment:

No public comments were received.

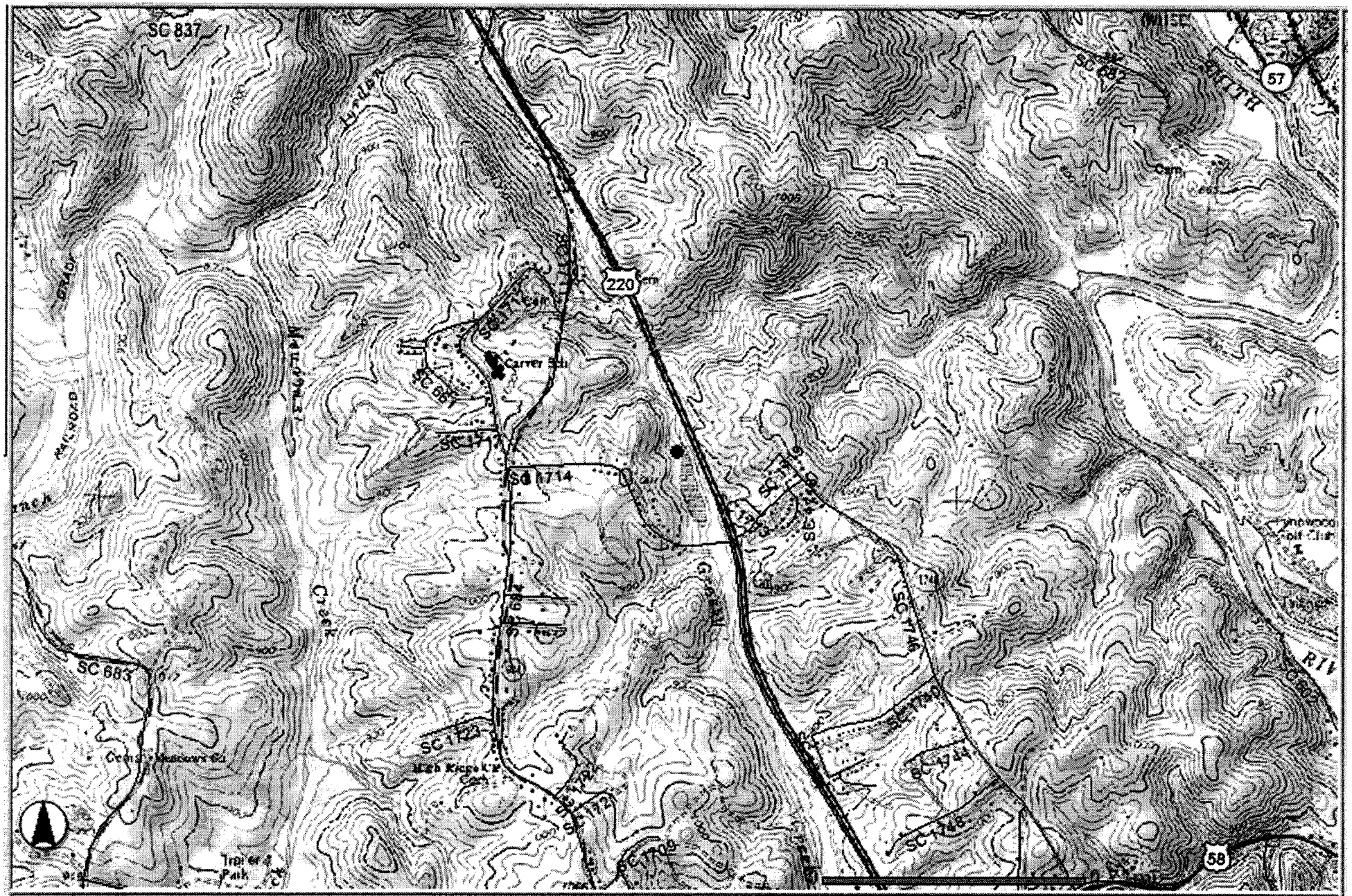
26. 303(d) Listed Segments (TMDL):

Not applicable.

ATTACHMENT A

GENERAL INFORMATION

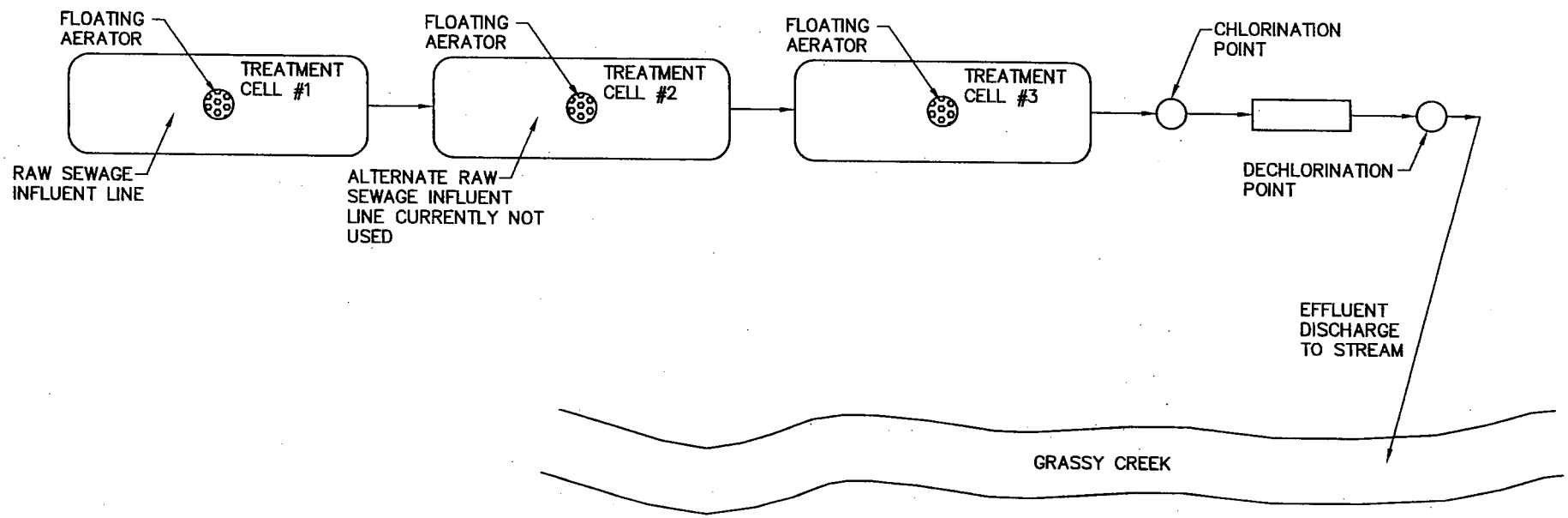
Location/USGS Topo Map
Treatment Plant Schematic
Site Visit Memo



VPDES Permits

Rec	VPDES_NM	NAME	MAJ_MIN	MUN_IND	FLOW	LAT	LONG	#SHAPE#	#ID#
1	VA0029858	Carver Estates - Sewage Treatment Plant	N	M	0.06000	36.66861	-79.93	[point]	838

Tuesday, Aug 12, 2008 03:09 PM



HENRY COUNTY PUBLIC SERVICE AUTHORITY
CARVER ESTATES SEWAGE TREATMENT FACILITY

FIGURE 2

SCALE: NO SCALE
JOB NO.: 12139.16

OLVER INCORPORATED

I:\Dwg\HENRY\12139.16\Carver Estates WWT Lagoon.dwg, Layout1, 4/10/2008 1:50:42 PM, chodge

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
West Central Regional Office, Water Division

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Site Visit – Carver Estates Sewage Treatment Facility
VPDES Permit No. VA0029858

TO: File

FROM: Lynn V. Wise, Environmental Engineer, Sr.

DATE: September 24, 2008

COPIES:

On September 23, 2008, the Carver Estates Sewage Treatment Facility was visited to gather information as part of the VPDES permit reissuance process. Present representing the Henry County Public Service Authority was: Mr. Michael Ward, Director of Regulatory Compliance and Technical Applications; Mr. Steve Clary, Wastewater Supervisor; and Mr. Kelly Custer, Senior Operator. The treatment facility has a design flow of 0.06 MGD, but is currently treating an average of 0.039 MGD. The system consists of three aerated lagoons in series, followed by chlorine disinfection and dechlorination prior to discharge to Grassy Creek.

Influent raw sewage is directed to the first lagoon. It was noted that the sewage could be routed to the second cell, but that has reportedly never been done. Each of the three cells was partially covered with what appeared to be a combination of duck weed and other algae. Poor visibility made it difficult to estimate how much sludge may be accumulating within the lagoons. Reportedly, PSA personnel float a boat out into the lagoons every two years and measure the sludge depth with a sludge judge. At the last check, the sludge depth ranged from 0.5 to 1.5 feet; there has been little change over the years that the treatment system has been in operation. Free board ranged from two to four feet. Mr. Clary indicated that the operational free board is about one foot at the present time. (There is a metal rod with marker lines on it to indicate the appropriate water depth and thus, when it is necessary to begin discharging.) The berms were mowed, but there were some thick weeds at the waterline. There was no sign of burrowing animals; traps are used to control muskrats and groundhogs. Riprap has been installed in places to mend areas previously breached by burrowing animals. The facility no longer uses any chemicals for control of algae/duck weed or midge flies.

Current practice is to only discharge from the system every other month; however, there has been no discharge from the system since May 2008. During months in which there is a discharge, the flow is continuous. Hypochlorite solution is used for disinfection. The treated wastewater flows through two contact chambers in series before dechlorination with a sodium bisulfite solution. There is no storage of bulk chemicals at the facility. Chemicals needed to formulate the disinfection and dechlorination solutions are brought to the site from the Lower Smith River pump station when needed. There was approximately 23 gallons of hypochlorite solution and no sodium bisulfite solution on site at the time of the inspection.

The effluent flows from a six-inch PVC pipe into Grassy Creek, about three feet above the water surface. At the discharge point, the creek was approximately 15 feet wide and had a pool and riffle nature. The creek bottom was silty with some large rocks. There was no evidence of solids build-up below the discharge. Concrete has been poured over riprap in two locations from the berm top to the creek bank to prevent the creek from eroding the lagoon berm. File records indicate this work was performed in 1997.

ATTACHMENT B

RECEIVING STREAM INFORMATION

Flow Frequency Determination Memo
Monitoring Station pH & Temperature Data

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
West Central Regional Office, Water Division

3019 Peters Creek Road — Roanoke, VA 24019

SUBJECT: Flow Frequency Determination; Carver Estates STF (VPDES Permit No. VA0029858)

TO: File

FROM: Lynn V. Wise, Environmental Engineer, Sr.

DATE: August 25, 2008

COPIES:

The Carver Estates STP discharges to Grassy Creek near Fieldale, VA. Stream flow frequencies are required at this site for the purpose of calculating effluent limitations for the VPDES permit.

The VDEQ conducted flow measurements on Grassy Creek from 1993 to 1997. The measurements were made upstream of the Carver Estates STP discharge point. The measurements correlated very well with the same day daily mean values from the continuous record gage on the South Mayo River near Nettleridge, VA (#02069700). The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plotted on the regression line and the associated flow frequencies at the measurement site/discharge point were determined from the graph. The data for the reference gage and the measurement site/discharge point are presented below:

South Mayo River near Nettleridge, VA (#02069700) :

Drainage Area = 84.6 mi^2

1Q10 = 22 cfs (14.2 mgd)	High Flow 1Q10 = 35 cfs (22.6 mgd)
7Q10 = 24 cfs (15.5 mgd)	High Flow 7Q10 = 39 cfs (25.2 mgd)
30Q10 = 31 cfs (20.04 mgd)	High Flow 30Q10 = 50 cfs (32.32 mgd)
30Q5 = 37 cfs (23.9 mgd)	HM = 82 cfs (53.0 mgd)

Grassy Creek above Carver Estates STP near Fieldale, VA (#02072950):

Drainage Area = 4.1 mi^2

1Q10 = .94 cfs (0.61 mgd)	High Flow 1Q10 = 1.42 cfs (0.92 mgd)
7Q10 = 1.02 cfs (0.66 mgd)	High Flow 7Q10 = 1.57 cfs (1.01 mgd)
30Q10 = 1.28 cfs (0.83 mgd)	High Flow 30Q10 = 1.96 cfs (1.27 mgd)
30Q5 = 1.50 cfs (0.97 mgd)	HM = 3.04 cfs (1.97 mgd)

The high flow months are January through June.

Station ID	Collection Date Time	Field pH	Temp Celsuis		
4ASRE033.19	8/21/1991 10:45	7.8	15.6		
4ASRE033.19	9/16/1991 10:45	7.7	26.6		
4ASRE033.19	10/21/1991 9:40	7.7	11.2		
4ASRE033.19	12/11/1991 10:00	7.4	7.6		
4ASRE033.19	3/16/1992 10:00	7.2	3.9	7.2	3.9
4ASRE033.19	4/20/1992 11:00	7.7	18.8	7.7	18.8
4ASRE033.19	5/19/1992 10:30	7.3	10.2	7.3	10.2
4ASRE033.19	6/16/1992 10:45	7.1	17.5	7.1	17.5
4ASRE033.19	7/16/1992 9:45	6.3	17.7		
4ASRE033.19	8/25/1992 10:30	7.5	17.3		
4ASRE033.19	9/24/1992 9:35	7.5	14.6		
4ASRE033.19	10/26/1992 9:20	7.3	10.4		
4ASRE033.19	11/9/1992 10:30	7.7	6.2		
4ASRE033.19	11/16/1992 11:00	6.6	6.4		
4ASRE033.19	12/22/1992 10:00	6.4	6.4		
4ASRE033.19	1/26/1993 9:45	7.6	2.8	7.6	2.8
4ASRE033.19	2/10/1993 10:30	8.2	6.7	8.2	6.7
4ASRE033.19	3/30/1993 9:50	7.2	7.3	7.2	7.3
4ASRE033.19	4/27/1993 9:35	7.3	9.7	7.3	9.7
4ASRE033.19	5/20/1993 9:45	7	13.3	7	13.3
4ASRE033.19	6/28/1993 9:55	6.7	19.8	6.7	19.8
4ASRE033.19	7/28/1993 9:30	7.1	16.5		
4ASRE033.19	8/25/1993 9:45	7.1	15.8		
4ASRE033.19	9/20/1993 9:50	7	17.4		
4ASRE033.19	10/27/1993 10:20	6.8	12.4		
4ASRE033.19	12/15/1993 10:30	7.4	6.7		
4ASRE033.19	1/24/1994 9:50	8.2	2.8	8.2	2.8
4ASRE033.19	2/24/1994 10:15	7.9	7	7.9	7
4ASRE033.19	3/23/1994 10:20	7.7	8.2	7.7	8.2
4ASRE033.19	4/28/1994 10:05	7.6	13.6	7.6	13.6
4ASRE033.19	5/31/1994 10:15	7.7	16.8	7.7	16.8
4ASRE033.19	6/27/1994 10:20	7.08	20.3	7.08	20.3
4ASRE033.19	7/28/1994 10:00	7.05	19.7		
4ASRE033.19	8/24/1994 10:00	7.26	15.2		
4ASRE033.19	9/12/1994 10:15	7.62	18.1		
4ASRE033.19	10/19/1994 10:40	6.77	12.8		
4ASRE033.19	11/15/1994 11:15	6.87	11.2		
4ASRE033.19	12/8/1994 10:15	7.7	10.8		
4ASRE033.19	1/25/1995 11:20	7.76	4.4	7.76	4.4
4ASRE033.19	2/23/1995 9:50	7.35	6.5	7.35	6.5
4ASRE033.19	3/28/1995 11:05	7.45	13	7.45	13
4ASRE033.19	4/18/1995 12:15	7.41	15.1	7.41	15.1
4ASRE033.19	5/17/1995 9:00	6.97	12.9	6.97	12.9
4ASRE033.19	6/20/1995 9:00	6.48	12.5	6.48	12.5
4ASRE033.19	7/31/1995 9:30	7.19	22.6		
4ASRE033.19	8/28/1995 9:00	7.44	16.7		
4ASRE033.19	9/27/1995 9:45	7.31	13.1		
4ASRE033.19	10/30/1995 9:15	7.03	9.8		
4ASRE033.19	11/28/1995 9:45	6.73	10.8		
4ASRE033.19	12/18/1995 8:40	6.63	4.9		
4ASRE033.19	1/24/1996 10:30	6.45	6	6.45	6
4ASRE033.19	2/26/1996 9:40	7.11	9.6	7.11	9.6
4ASRE033.19	3/25/1996 8:10	7.19	10.5	7.19	10.5
4ASRE033.19	4/17/1996 9:05	6.97	9.5	6.97	9.5
4ASRE033.19	5/16/1996 11:00	7.8	11.4	7.8	11.4
4ASRE033.19	6/13/1996 10:30	8.25	10.2	8.25	10.2
4ASRE033.19	7/24/1996 10:35	7.77	18.8		
4ASRE033.19	8/21/1996 10:00	7.85	18.3		
4ASRE033.19	9/23/1996 10:10	7.82	17.3		
4ASRE033.19	10/21/1996 9:55	7.28	11.4		
4ASRE033.19	11/7/1996 9:40	6.89	14.8		
4ASRE033.19	12/17/1996 9:55	6.82	8		
4ASRE033.19	1/27/1997 10:00	7.42	3.5	7.42	3.5
4ASRE033.19	2/19/1997 9:25	7.64	5.8	7.64	5.8
4ASRE033.19	3/10/1997 9:30	7.67	7.7	7.67	7.7
4ASRE033.19	4/28/1997 9:30	7.33	10.2	7.33	10.2
4ASRE033.19	5/14/1997 8:50	7.28	9.9	7.28	9.9
4ASRE033.19	6/25/1997 10:00 --	--			
4ASRE033.19	7/31/1997 10:15	7.43	15		
4ASRE033.19	8/21/1997 10:15	7.32	17.4		
4ASRE033.19	9/30/1997 13:00	7.5	15.6		
4ASRE033.19	10/28/1997 12:30	8.06	11.5		
4ASRE033.19	11/19/1997 12:15	8.06	7		
4ASRE033.19	12/11/1997 9:25	7.09	6.6		
4ASRE033.19	1/20/1998 12:00	7.16	5.9	7.16	5.9
4ASRE033.19	2/19/1998 8:45	6.62	6.3	6.62	6.3
4ASRE033.19	3/17/1998 10:50	7.16	5.9	7.16	5.9
4ASRE033.19	4/13/1998 12:20	7.84	10.1	7.84	10.1
4ASRE033.19	5/6/1998 9:45	7.31	10.6	7.31	10.6
4ASRE033.19	6/24/1998 13:00	8.19	16.1	8.19	16.1
4ASRE033.19	7/27/1998 9:35	7.09	20.6		
4ASRE033.19	8/10/1998 10:10	7.17	21.7		
4ASRE033.19	9/3/1998 10:50	7.46	15.8		
4ASRE033.19	10/29/1998 9:20	6.91	15.1		
4ASRE033.19	11/23/1998 9:05	7.1	6.2		
4ASRE033.19	12/9/1998 9:15	7.22	13.3		
4ASRE033.19	1/21/1999 9:00	7.76	5.4	7.76	5.4
4ASRE033.19	2/11/1999 9:00	6.75	6.8	6.75	6.8
4ASRE033.19	3/29/1999 9:15	7.84	9.5	7.84	9.5
4ASRE033.19	4/19/1999 9:45	7.55	11	7.55	11
4ASRE033.19	5/19/1999 12:50	8	14.1	8	14.1
4ASRE033.19	6/16/1999 9:35	7.73	11.2	7.73	11.2
4ASRE033.19	7/27/1999 8:45	7.63	13.2		
4ASRE033.19	8/26/1999 9:05	7.57	15.1		
4ASRE033.19	9/27/1999 12:30	7.55	19		
4ASRE033.19	10/21/1999 10:15	7.53	11.5		
4ASRE033.19	12/8/1999 9:40	7.07	6.6		
4ASRE033.19	1/12/2000 13:20	6.89	7.1	6.89	7.1
4ASRE033.19	2/23/2000 9:45	6.67	6.6	6.67	6.6
4ASRE033.19	3/22/2000 9:35	6.81	9.5	6.81	9.5
4ASRE033.19	4/5/2000 9:30	6.98	7.7	6.98	7.7
4ASRE033.19	5/23/2000 9:35	6.74	14.6	6.74	14.6
4ASRE033.19	6/21/2000 10:00	6.9	15.7	6.9	15.7
4ASRE033.19	7/20/2000 11:30	7.6	15.1		
4ASRE033.19	8/7/2000 11:30	7.6	17.3		
4ASRE033.19	10/19/2000 11:30	8.9	12		
4ASRE033.19	11/13/2000 11:30	8.8	9.4		
4ASRE033.19	12/7/2000 11:00	7.2	5.9		
4ASRE033.19	1/9/2001 11:00	7.7	3.4	7.7	3.4
4ASRE033.19	2/8/2001 10:30	7.7	6.4	7.7	6.4
4ASRE033.19	3/6/2001 11:30	8.1	5.5	8.1	5.5
4ASRE033.19	4/9/2001 10:30	8.1	13.6	8.1	13.6
4ASRE033.19	5/15/2001 11:30	7.7	15.1	7.7	15.1
4ASRE033.19	6/12/2001 10:30	8.1	13.7	8.1	13.7
4ASRE033.19	7/26/2001 14:30	7.6	19		
4ASRE033.19	9/4/2001 15:00	7.6	18.9		
4ASRE033.19	9/24/2001 12:30	7.8	17.6		
4ASRE033.19	10/24/2001 12:30	7.5	12.4		
4ASRE033.19	11/29/2001 14:00	7.6	12		
4ASRE033.19	12/17/2001 13:30	7.1	9.7		
4ASRE033.19	1/10/2002 14:30	7.9	8.6	7.9	8.6
4ASRE033.19	2/26/2002 12:30	8	8.3	8	8.3
4ASRE033.19	3/14/2002 14:00	6.9	12	6.9	12
4ASRE033.19	4/4/2002 13:00	7.2	11.7	7.2	11.7
4ASRE033.19	5/15/2002 11:00	7.79	13.9	7.79	13.9
4ASRE033.19	6/10/2002 11:50 --		20.4		20.4
4ASRE033.19	7/16/2002 12:00	8.29	20		
4ASRE033.19	8/6/2002 9:45	8.64	20.9		
4ASRE033.19	9/19/2002 13:35	8.45	17.4		
4ASRE033.19	10/29/2002 10:45	7.45	10.3		
4ASRE033.19	11/18/2002 14:30	7.25	12.6		
4ASRE033.19	12/17/2002 9:30	9.02	5.2		
4ASRE033.19	2/3/2003 13:30	7.9	5.5	7.9	5.5
4ASRE033.19	2/13/2003 9:00	8.5	2.3	8.5	2.3
4ASRE033.19	3/11/2003 14:00	7.4	5.8	7.4	5.8
4ASRE033.19	4/16/2003 9:30	7.3	7.2	7.3	7.2
	90th%	**8.1**	**18.8**	**8.1**	**15.9**
	10th%	**6.8**		**6.78**	

ATTACHMENT C

EFFLUENT SCREENING AND LIMITATIONS

Summary of Effluent DMR Data
Water Quality Standards Monitoring Data
Regional DO Model Output
Mix.Exe Output
WLA Spreadsheet
STATS.exe Output

Carver Estates STF
DMR Data

Due Date	BOD mg/l Mo. Avg	BOD mg/l Max Wk Avg	TSS mg/l Mo. Avg	TSS mg/l Max Wk Avg	pH su Min	pH su Max	Cl2, Tot mg/l Max
10-Dec-03							
10-Jan-04							
10-Feb-04	<QL	<QL	5	5	6.6	8.2	<QL
10-Mar-04	10	10	9	9	6.6	7.9	<QL
10-Apr-04	13	13	11	11	6.8	8.96	<QL
10-May-04							
10-Jun-04	5	5	18	18	6.3	7.2	<QL
10-Jul-04							
10-Aug-04							
10-Sep-04	<QL	<QL	9	9	6.7	7.3	<QL
10-Oct-04	<QL	<QL	4	4	6.3	7.1	<QL
10-Nov-04	5	5	10	10	6.4	7.1	<QL
10-Dec-04	<QL	<QL	8	8	6.6	7.5	<QL
10-Jan-05	5	5	7	7	6.7	8.5	<QL
10-Feb-05	11	11	13	13	6.9	8.5	<QL
10-Mar-05	28	41	17	17	6.9	8.4	<QL
10-Apr-05	10	10	13	13	7	7.8	<QL
10-May-05	**31**	44	18	18	6.8	7.9	<QL
10-Jun-05	5	5	7	7	6.8	7.9	<QL
10-Jul-05	5	5	60	90	6.7	7.1	<QL
10-Aug-05	<QL	<QL	7	7	6.7	7.1	<QL
10-Sep-05							
10-Oct-05							
10-Nov-05							
10-Dec-05							
10-Jan-06							
10-Feb-06	20	20	13	13	6.8	7.6	0.04
10-Mar-06	30	30	20	20	7	7.9	<QL
10-Apr-06	17	17	13	13	6.8	7.4	0.06
10-May-06	12	12	21	21	7	7.5	<QL
10-Jun-06							
10-Jul-06							
10-Aug-06							
10-Sep-06							
10-Oct-06							
10-Nov-06	16	16	6	6	6.8	7.3	0.07
10-Dec-06	<QL	<QL	11	11	6.8	7.6	0.03
10-Jan-07	11	11	15	15	6.8	8.2	<QL
10-Feb-07	19	19	13	13	6.8	7.2	0.03
10-Mar-07	23	23	13	13	6.9	7.7	0.04
10-Apr-07	25	25	17	17	6.5	8.4	0.02
10-May-07	18	18	36	36	6.6	7	<QL
10-Jun-07							
10-Jul-07	**37**	37	**67**	67	6.8	7.6	<QL
10-Aug-07							
10-Sep-07							
10-Oct-07							
10-Nov-07							
10-Dec-07	5	5	6	6	6.9	7.2	<QL
10-Jan-08	5	5	6	6	6.8	7.9	<QL
10-Feb-08							
10-Mar-08							
10-Apr-08	11	11	10	10	6.5	8.4	0.03
10-May-08	7	7	27	27	6.7	7.7	<QL
10-Jun-08							
10-Jul-08							
10-Aug-08							
10-Sep-08							
Limit	30	45	60	90	6	9	0.1

Carver Estates STF - Effluent pH & Temperature Data

	Annual	
	pH	Temp
Dec-04	6.97	8.6
	7.25	6.4
	7.05	6.1
	7.19	6.4
	6.94	6.6
	8.51	3.6
	6.84	3.2
	6.68	3.8
	6.93	8.4
	7.29	4.5
	8.36	5.3
	7.92	6.4
	6.82	6
Jan-05	7.13	9
	7.57	10
	8.18	11.1
	8.16	12.5
	7.58	10.9
	8.14	9.6
	8.49	10.1
	8.41	10.4
	8.12	13.6
	6.91	12.6
	7.31	6.8
	7.1	5.7
	7.57	4.7
	7.06	4.6
	6.98	5.2
	7.05	2.4
	7.44	3.5
	7.32	4.1
	7.68	4
	7.5	4
	7.72	2.4
	7.38	3.1
	7.96	5.4
Feb-05	7.57	4.7
	7.58	4.1
	7.54	5.1
	7.39	5.7
	6.93	6.7
	7.75	8
	7.65	8.7
	7.69	8.9
	7.22	6.5
	7.36	7.7
	8.38	8.2
	7.52	8
	7.72	8.8
	7.23	9.6
	7.28	8.3
	7.23	9.6
	7.12	8.4
	7.23	8.6
	7.21	9
	7.42	10
	7.29	9
Mar-05	7.38	6.3
	7.49	5.7
	7.06	5.5
	7.34	5.8
	7.38	8.1
	7.44	8.5
	7.33	8.9
	7.77	10.1
	7.28	10.4
	7.05	9.5
	7.42	10.5
	7.01	11
	7.33	11.3
	7.23	13.1
	7.23	12.5
	7.14	12.8
	7.07	12.7
	7.38	13.8
	7.39	14.2
Apr-05	7.27	14.9
	6.9	12.5
	7.44	13.6
	7.2	15.5
	7.9	17.6
	7.27	17
	7.18	19.3
	7.3	17.5
	7.03	15.5
	6.99	12.3
	7.19	14.7
	6.89	15
	7.03	17.9
	7.09	17.1
	7.13	18.3
	7	19.6
	6.82	14.2
May-05	7.86	19.4
	7.78	20.8
	7.29	19.9
	7.47	22
	7.24	21.6
	6.79	19.2
	7.45	22.2
	7.06	20.6
	6.92	21.5
	7.21	21.2
	6.91	23.6
	6.97	21
	6.95	20
	6.81	19.5
	6.92	20.5

	Annual	
	pH	Temp
Jun-05	7.01	21.1
	7.1	20.1
	6.86	19.4
	6.69	21.8
	7.1	23.7
	6.91	24
	6.72	25.2
	6.76	26.6
	6.83	27.3
	6.85	26.1
	6.85	26
	6.76	26
	6.9	27.2
	6.86	26.4
	6.81	24.8
Jul-05	6.84	25.9
	6.79	25.7
	7.06	25.9
	6.79	24.4
	6.72	25.9
	7	27.8
	6.91	26.6
	6.86	26.1
	6.87	28.5
	6.88	26.2
	6.74	26.8
	6.74	26.8
Jan-06	7.37	8.4
	7.19	8.1
	7.14	8.8
	6.93	9
	7.11	7.8
	7.3	9.7
	7.18	10.4
	7.27	9.8
	7.54	10.8
	7.64	9.5
	7.27	7.6
	7.14	7.2
	6.76	8
	7.37	8.8
	6.92	9.4
Feb-06	6.96	9.1
	7.46	9.6
	7.26	8
	7.32	8.3
	7.75	9.4
	7.21	8.5
	7.11	9.8
	7.01	11.4
	7.93	10.6
	7.12	9.7
	6.99	8.9
	7.36	9.8
	7.11	10.4
Mar-06	7.36	10.9
	7.12	11.9
	7.05	11.1
	7.07	10.4
	7.26	10.1
	7.41	11.3
	7.36	12.4
	7.41	12.7
	7.19	12.6
	7.26	16.5
	7.19	14
	7.16	15.4
	6.98	16.8
	7.15	18
	7.26	17.6
	7.13	15.3
	7.27	15.4
	6.84	11.7
	7.13	12.4
	7.12	11.4
	7.07	10.9
	7.02	11.4
	6.92	11.9
	6.96	13.4
	7.08	13.9
	6.99	13.8
	7.11	16.2
Apr-06	7.05	17.7
	7.31	19.4
	7.53	19.5
	7.14	18.1
	7.1	18
	7.31	20.5
	7.3	21.4
	7.08	20.6
	7.11	17.9
	7.14	18.3
	7.49	20.8
	7.39	21.1
	7.04	19.9

	Annual	
	pH	Temp
Oct-06	6.83	19.4
	6.86	18.6
	6.9	18.6
	6.97	18.2
	6.79	17.2
	7.01	16.9
	7.05	17
	6.97	17.2
	6.86	16.6
	7.01	18.4
	7.07	16.5
	7.27	14.9
	6.93	14.5
	6.83	15.3
	7.21	16
	8.13	16.8
	7.13	14.2
	6.98	12.4
	6.85	11.5
	6.9	12.3
	6.92	12
	6.96	12.4
	7.1	12.1
	6.96	12.4
	7.16	15.1
Nov-06	6.81	14.4
	6.96	14.5
	7.06	12.1
	7.2	11
	7.55	10.3
	7.11	11.9
	7.26	12.7
	7.21	13.4
	7.09	13.3
	7.06	12.9
	7.29	13.6
	7.18	13.2
	7.18	12.6
	7.17	15.4
	7.11	13.1
	7.13	12.4
	7.24	10.5
	6.98	11
	6.95	9.8
	6.92	9.7
	6.86	11.3
	6.91	9.6
	7.37	11.1
	7.13	12.8
Dec-06	7.07	14.1
	7.09	12.4
	7.39	11.6
	7.5	10.2
	6.95	8.8
	7.08	8.1
	7.73	8.2
	6.8	6.7
	7.28	6
	7.61	5.1
	8.15	5.8
Jan-07	6.77	8.7
	7.01	7.2
	6.9	8.8
	6.8	10
	6.81	11.4
	6.91	10.9
	7	8.1
	6.98	7.9
	6.86	7.9
	6.84	7.1
	6.88	7.1
	7.06	6.3
	7.04	7.1
	6.84	6.9
	6.96	5.7
	6.83	5.7
	7.19	6.3
	7.08	7.9
Feb-07	7.41	6.1
	7.18	5.1
	7.33	5.5
	7.13	4.4
	7.69	4.8
	7.41	5.4
	7.6	5
	7.23	4.9
	7.3	4.6
	7.19	4.2
	7.33	4.9
	6.94	7
	7.26	6.5
	7.1	5.3
	7.16	5.2
	6.88	4.4
	7.07	4
	6.95	6.4
	7.14	6
	7.07	8.3

	Annual	
	pH	Temp
Mar-07	7.28	9
	7.31	10.5
	7.96	13.3
	7.41	15.7
	7.29	15.4
	6.99	13.3
	7.01	12.6
	6.88	11.2
	6.93	10.5
	6.86	12.1
	7.16	13.2
	7.65	15
	8.4	15.8
	6.94	16.1
	7.01	16.9
	7.62	18.7
	7.48	20.5
	7.81	20.3
	6.9	17.4
	6.48	14.7
Apr-07	6.95	18.2
	6.91	17.9
	6.98	18.6
	6.81	14.9
	6.68	14.8
	6.79	14.1
	6.62	13.4
Jun-07	7.18	25.2
	6.86	23.9
	6.83	24.3
	6.86	23.5
	6.86	22
	6.89	22.3
	6.85	22.6
	6.85	23.2
	6.95	24
	6.86	25
	6.87	24
	7.57	25.7
Nov-07	6.96	13.4
	7.13	12.8
	6.94	10.6
	7.17	11.6
Dec-07	7.48	7.8
	7.19	7.5
	7.21	8.1
	7.07	7.9
	6.94	7.5
	7.01	8.9
	7.03	11
	6.86	11.3
	7.94	12.1
	7.23	11.9
	7.13	12
	7.32	11.6
	7.04	9.9
	7.05	8.1
	7.07	7.1
	7.11	7.5
	6.77	6.7
Mar-08	6.98	13.6
	7.08	12.6
	7.25	14.2
	7.28	12.8
	7.22	11.9
	7.34	13
	7.35	13
	7.7	13.3
	7.73	12.1
	7.8	12.5
	8.4	15.8
	7.35	15.5
	6.48	12.1
Apr-08	7.24	13.6
	7.01	13.2
	7.1	13.6
	7.08	13.9
	6.71	13.6
	6.97	14.3
	6.93	14.2
	7.14	16.8
	6.98	16.4
	7.09	17.9
	7.12	16.3
	6.95	15
	6.83	14.7
	6.85	13.8
	6.9	14
	7.09	15.5
	7.26	16.8
	6.9	17
	6.94	17.3
	7.07	17.1
	7.65	20.4
	7.15	18.5
	7.1	19.3
	7.16	19
	7.18	20.4
	6.84	20.3
	6.88	18
	6.89	18.1
90th%	**7.6**	**21.5**
10th%	**6.84**	

Carver Estates STF - Effluent pH & Temperature Data

	High Flow	
	pH	Temp
Jan-05	7.13	9
	7.57	10
	8.18	11.1
	8.16	12.5
	7.58	10.9
	8.14	9.6
	8.49	10.1
	8.41	10.4
	8.12	13.6
	6.91	12.6
	7.31	6.8
	7.1	5.7
	7.57	4.7
	7.06	4.6
	6.98	5.2
	7.05	2.4
	7.44	3.5
	7.32	4.1
	7.68	4
	7.5	4
	7.72	2.4
	7.38	3.1
	7.96	5.4
Feb-05	7.57	4.7
	7.58	4.1
	7.54	5.1
	7.39	5.7
	6.93	6.7
	7.75	8
	7.65	8.7
	7.69	8.9
	7.22	6.5
	7.36	7.7
	8.38	8.2
	7.52	8
	7.72	8.8
	7.23	9.6
	7.28	8.3
	7.23	9.6
	7.12	8.4
	7.23	8.6
	7.21	9
	7.42	10
	7.29	9
Mar-05	7.38	6.3
	7.49	5.7
	7.06	5.5
	7.34	5.8
	7.38	8.1
	7.44	8.5
	7.33	8.9
	7.77	10.1
	7.28	10.4
	7.05	9.5
	7.42	10.5
	7.01	11
	7.33	11.3
	7.23	13.1
	7.23	12.5
	7.14	12.8
	7.07	12.7
	7.38	13.8
	7.39	14.2
Apr-05	7.27	14.9
	6.9	12.5
	7.44	13.6
	7.2	15.5
	7.9	17.6
	7.27	17
	7.18	19.3
	7.3	17.5
	7.03	15.5
	6.99	12.3
	7.19	14.7
	6.89	15
	7.03	17.9
	7.09	17.1
	7.13	18.3
	7	19.6
	6.82	14.2
May-05	7.86	19.4
	7.78	20.8
	7.29	19.9
	7.47	22
	7.24	21.6
	6.79	19.2
	7.45	22.2
	7.06	20.6
	6.92	21.5
	7.21	21.2
	6.91	23.6
	6.97	21
	6.95	20
	6.81	19.5
	6.92	20.5

	High Flow	
	pH	Temp
Jun-05	7.01	21.1
	7.1	20.1
	6.86	19.4
	6.69	21.8
	7.1	23.7
	6.91	24
	6.72	25.2
	6.76	26.6
	6.83	27.3
	6.85	26.1
	6.85	26
	6.76	26
	6.9	27.2
	6.86	26.4
	6.81	24.8
Jan-06	7.37	8.4
	7.19	8.1
	7.14	8.8
	6.93	9
	7.11	7.8
	7.3	9.7
	7.18	10.4
	7.27	9.8
	7.54	10.8
	7.64	9.5
	7.27	7.6
	7.14	7.2
	6.76	8
	7.37	8.8
	6.92	9.4
Feb-06	6.96	9.1
	7.46	9.6
	7.26	8
	7.32	8.3
	7.75	9.4
	7.21	8.5
	7.11	9.8
	7.01	11.4
	7.93	10.6
	7.12	9.7
	6.99	8.9
	7.36	9.8
	7.11	10.4
Mar-06	7.36	10.9
	7.12	11.9
	7.05	11.1
	7.07	10.4
	7.26	10.1
	7.41	11.3
	7.36	12.4
	7.41	12.7
	7.19	12.6
	7.26	16.5
	7.19	14
	7.16	15.4
	6.98	16.8
	7.15	18
	7.26	17.6
	7.13	15.3
	7.27	15.4
	6.84	11.7
	7.13	12.4
	7.12	11.4
	7.07	10.9
	7.02	11.4
	6.92	11.9
	6.96	13.4
	7.08	13.9
	6.99	13.8
	7.11	16.2
Apr-06	7.05	17.7
	7.31	19.4
	7.53	19.5
	7.14	18.1
	7.1	18
	7.31	20.5
	7.3	21.4
	7.08	20.6
	7.11	17.9
	7.14	18.3
	7.49	20.8
	7.39	21.1
	7.04	19.9
Jan-07	6.77	8.7
	7.01	7.2
	6.9	8.8
	6.8	10
	6.81	11.4
	6.91	10.9
	7	8.1
	6.98	7.9
	6.86	7.9
	6.84	7.1
	6.88	7.1
	7.06	6.3
	7.04	7.1
	6.84	6.9
	6.96	5.7
	6.83	5.7
	7.19	6.3
	7.08	7.9

	High Flow	
	pH	Temp
Feb-07	7.41	6.1
	7.18	5.1
	7.33	5.5
	7.13	4.4
	7.69	4.8
	7.41	5.4
	7.6	5
	7.23	4.9
	7.3	4.6
	7.19	4.2
	7.33	4.9
	6.94	7
	7.26	6.5
	7.1	5.3
	7.16	5.2
	6.88	4.4
	7.07	4
	6.95	6.4
	7.14	6
	7.07	8.3
Mar-07	7.28	9
	7.31	10.5
	7.96	13.3
	7.41	15.7
	7.29	15.4
	6.99	13.3
	7.01	12.6
	6.88	11.2
	6.93	10.5
	6.86	12.1
	7.16	13.2
	7.65	15
	8.4	15.8
	6.94	16.1
	7.01	16.9
	7.62	18.7
	7.48	20.5
	7.81	20.3
	6.9	17.4
	6.48	14.7
Apr-07	6.95	18.2
	6.91	17.9
	6.98	18.6
	6.81	14.9
	6.68	14.8
	6.79	14.1
	6.62	13.4
Jun-07	7.18	25.2
	6.86	23.9
	6.83	24.3
	6.86	23.5
	6.86	22
	6.89	22.3
	6.85	22.6
	6.85	23.2
	6.95	24
	6.86	25
	6.87	24
	7.57	25.7
Mar-08	6.98	13.6
	7.08	12.6
	7.25	14.2
	7.28	12.8
	7.22	11.9
	7.34	13
	7.35	13
	7.7	13.3
	7.73	12.1
	7.8	12.5
	8.4	15.8
	7.35	15.5
	6.48	12.1
Apr-08	7.24	13.6
	7.01	13.2
	7.1	13.6
	7.08	13.9
	6.71	13.6
	6.97	14.3
	6.93	14.2
	7.14	16.8
	6.98	16.4
	7.09	17.9
	7.12	16.3
	6.95	15
	6.83	14.7
	6.85	13.8
	6.9	14
	7.09	15.5
	7.26	16.8
	6.9	17
	6.94	17.3
	7.07	17.1
	7.65	20.4
	7.15	18.5
	7.1	19.3
	7.16	19
	7.18	20.4
	6.84	20.3
	6.88	18
	6.89	18.1
90th%	**7.65**	**21.3**
10th%	**6.85**	

Water Quality Standards Monitoring for Carver Estates lagoon, VA0029858

Date	Dissolved copper ug/l	SSTV	QL	Hardness mg/l
12/10/98	24	7	5	
01/07/99	16	7	5	
02/03/99	8	7	5	
03/04/99	15	7	5	
04/08/99	14	7	5	
05/06/99	5	7	5	
06/01/99	no flow			
07/01/99	no flow			
08/19/99	< 5	7	5	
09/02/99	5	7	5	
10/27/99	5	7	5	
11/4/99	6	7	5	
12/9/99	6	7	5	
1/6/00	7	7	5	
11/14/01			5	29
2/20/02			5	61
5/16/02			5	36

****

REGIONAL MODELING SYSTEM VERSION 3.0

****

MODEL SIMULATION FOR THE Carver Estates Lagoon DISCHARGE

TO Grassy Creek

COMMENT: TKN = ammonia limit + refractory portion

THE SIMULATION STARTS AT THE Carver Estates Lagoon DISCHARGE

********** PROPOSED PERMIT LIMITS **********

FLOW = .06 MGD cBOD5 = 30 Mg/L TKN = 19.2 Mg/L D.O. = 5 Mg/L

**** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0.066 Mg/L ****

THE SECTION BEING MODELED IS 1 SEGMENT LONG
RESULTS WILL BE GIVEN AT 0.1 MILE INTERVALS

********** BACKGROUND CONDITIONS **********

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 0.29904 MGD
THE DISSOLVED OXYGEN OF THE STREAM IS 6.651 Mg/L
THE BACKGROUND cBODu OF THE STREAM IS 5 Mg/L
THE BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

********** MODEL PARAMETERS **********

SEG.	LEN. Mi	VEL. F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV. Ft	TEMP. °C	DO-SAT Mg/L
1	4.50	0.323	20.000	0.700	0.350	0.000	820.00	31.00	7.390

(The K Rates shown are at 20°C ... the model corrects them for temperature.)

4/23/93

********** RESPONSE FOR SEGMENT 1 **********

TOTAL STREAMFLOW = 0.3590 MGD
(Including Discharge)

TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	6.375	16.698	11.722
0.100	6.341	16.336	11.543
0.200	6.329	15.981	11.366
0.300	6.329	15.634	11.192
0.400	6.338	15.295	11.021
0.500	6.351	14.963	10.852
0.600	6.366	14.639	10.686
0.700	6.384	14.321	10.522
0.800	6.402	14.010	10.361
0.900	6.420	13.706	10.202
1.000	6.438	13.409	10.046
1.100	6.456	13.118	9.892
1.200	6.474	12.833	9.741
1.300	6.492	12.554	9.592
1.400	6.510	12.282	9.445
1.500	6.527	12.016	9.300
1.600	6.543	11.755	9.158
1.700	6.560	11.500	9.017
1.800	6.576	11.250	8.879
1.900	6.592	11.006	8.743
2.000	6.607	10.767	8.609
2.100	6.622	10.534	8.478
2.200	6.637	10.305	8.348
2.300	6.651	10.081	8.220
2.400	6.651	9.863	8.094
2.500	6.651	9.649	7.970
2.600	6.651	9.439	7.848
2.700	6.651	9.234	7.728
2.800	6.651	9.034	7.609
2.900	6.651	8.838	7.493
3.000	6.651	8.646	7.378
3.100	6.651	8.459	7.265
3.200	6.651	8.275	7.154
3.300	6.651	8.095	7.044
3.400	6.651	7.920	6.937
3.500	6.651	7.748	6.830
3.600	6.651	7.580	6.726
3.700	6.651	7.415	6.623
3.800	6.651	7.254	6.521
3.900	6.651	7.097	6.421
4.000	6.651	6.943	6.323
4.100	6.651	6.792	6.226
4.200	6.651	6.645	6.131
4.300	6.651	6.501	6.037
4.400	6.651	6.359	5.945

TMB 4/23/93

4.500	6.651	6.221	5.854

****

REGIONAL MODELING SYSTEM Ver 3.0 (OWRM - 4/90)
04-23-1993 10:08:41

DATA FILE = CARVERLG.MOD

TDS
4/23/93

Mixing Zone Predictions for Carver Estates STF

Effluent Flow = 0.06 MGD
Stream 7Q10 = 0.66 MGD
Stream 30Q10 = 0.83 MGD
Stream 1Q10 = 0.61 MGD
Stream slope = 0.0469 ft/ft
Stream width = 15 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .0915 ft
Length = 2150.24 ft
Velocity = .8123 ft/sec
Residence Time = .0306 days

Recommendation:

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

Mixing Zone Predictions @ 30Q10

Depth = .1039 ft
Length = 1930.82 ft
Velocity = .8836 ft/sec
Residence Time = .0253 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = .0876 ft
Length = 2230.5 ft
Velocity = .7894 ft/sec
Residence Time = .7849 hours

Recommendation:

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

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Carver Estates Permit No.: VA0029858

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

Stream Information

Mean Hardness (as CaCO3) =	23	mg/L
90% Temperature (Annual) =	18.8	deg C
90% Temperature (Wet season) =	15.9	deg C
90% Maximum pH =	8.1	SU
10% Maximum pH =	6.8	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) =	0.61	MGD
7Q10 (Annual) =	0.66	MGD
30Q10 (Annual) =	0.83	MGD
1Q10 (Wet season) =	0.92	MGD
30Q10 (Wet season)	1.27	MGD
30Q5 =	0.97	MGD
Harmonic Mean =	1.97	MGD
Annual Average =	N/A	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) =	43	mg/L
90% Temp (Annual) =	21.5	deg C
90% Temp (Wet season) =	21.3	deg C
90% Maximum pH =	7.6	SU
10% Maximum pH =	6.84	SU
Discharge Flow =	0.06	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	--	--	na	2.7E+03	--	--	na	4.6E+04	--	--	na	2.7E+02	--	--	na	4.6E+03	--	--	**na**	**4.6E+03**
Acrolein	0	--	--	na	7.8E+02	--	--	na	1.3E+04	--	--	na	7.8E+01	--	--	na	1.3E+03	--	--	**na**	**1.3E+03**
Acrylonitrile[c]	0	--	--	na	6.6E+00	--	--	na	2.2E+02	--	--	na	6.6E-01	--	--	na	2.2E+01	--	--	**na**	**2.2E+01**
Aldrin [c]	0	3.0E+00	--	na	1.4E-03	3.4E+01	--	na	4.7E-02	7.5E-01	--	na	1.4E-04	8.4E+00	--	na	4.7E-03	**8.4E+00**	--	**na**	**4.7E-03**
Ammonia-N (mg/l) (Yearly)	0	8.05E+00	1.72E+00	na	--	9.0E+01	2.5E+01	na	--	2.01E+00	4.30E-01	na	--	2.2E+01	6.4E+00	na	--	**2.2E+01**	**6.4E+00**	**na**	--
Ammonia-N (mg/l) (High Flow)	0	7.70E+00	2.01E+00	na	--	1.3E+02	4.5E+01	na	--	1.93E+00	5.02E-01	na	--	3.1E+01	1.1E+01	na	--	**3.1E+01**	**1.1E+01**	**na**	--
Anthracene	0	--	--	na	1.1E+05	--	--	na	1.9E+06	--	--	na	1.1E+04	--	--	na	1.9E+05	--	--	**na**	**1.9E+05**
Antimony	0	--	--	na	4.3E+03	--	--	na	7.4E+04	--	--	na	4.3E+02	--	--	na	7.4E+03	--	--	**na**	**7.4E+03**
Arsenic	o	3.4E+02	1.5E+02	na	--	3.8E+03	1.8E+03	na	--	8.5E+01	3.8E+01	na	--	9.5E+02	4.5E+02	na	--	**9.5E+02**	**4.5E+02**	**na**	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Benzene [c]	0	--	--	na	7.1E+02	--	--	na	2.4E+04	--	--	na	7.1E+01	--	--	na	2.4E+03	--	--	**na**	**2.4E+03**
Benzidine[c]	0	--	--	na	5.4E-03	--	--	na	1.8E-01	--	--	na	5.4E-04	--	--	na	1.8E-02	--	--	**na**	**1.8E-02**
Benzo (a) anthracene [c]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	**na**	**1.7E+00**
Benzo (b) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	**na**	**1.7E+00**
Benzo (k) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	**na**	**1.7E+00**
Benzo (a) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	**na**	**1.7E+00**
Bis2-Chloroethyl Ether	0	--	--	na	1.4E+01	--	--	na	2.4E+02	--	--	na	1.4E+00	--	--	na	2.4E+01	--	--	**na**	**2.4E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	1.7E+05	--	--	na	2.9E+06	--	--	na	1.7E+04	--	--	na	2.9E+05	--	--	**na**	**2.9E+05**
Bromoform [c]	0	--	--	na	3.6E+03	--	--	na	1.2E+05	--	--	na	3.6E+02	--	--	na	1.2E+04	--	--	**na**	**1.2E+04**
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	8.9E+04	--	--	na	5.2E+02	--	--	na	8.9E+03	--	--	**na**	**8.9E+03**
Cadmium	0	8.2E-01	3.8E-01	na	--	9.2E+00	4.6E+00	na	--	2.1E-01	9.5E-02	na	--	2.3E+00	1.1E+00	na	--	**2.3E+00**	**1.1E+00**	**na**	--
Carbon Tetrachloride [c]	0	--	--	na	4.4E+01	--	--	na	1.5E+03	--	--	na	4.4E+00	--	--	na	1.5E+02	--	--	**na**	**1.5E+02**
Chlordane [c]	0	2.4E+00	4.3E-03	na	2.2E-02	2.7E+01	5.2E-02	na	7.4E-01	6.0E-01	1.1E-03	na	2.2E-03	6.7E+00	1.3E-02	na	7.4E-02	**6.7E+00**	**1.3E-02**	**na**	**7.4E-02**
Chloride	0	8.6E+05	2.3E+05	na	--	9.6E+06	2.8E+06	na	--	2.2E+05	5.8E+04	na	--	2.4E+06	6.9E+05	na	--	**2.4E+06**	**6.9E+05**	**na**	--
TRC	0	1.9E+01	1.1E+01	na	--	2.1E+02	1.3E+02	na	--	4.8E+00	2.8E+00	na	--	5.3E+01	3.3E+01	na	--	**5.3E+01**	**3.3E+01**	**na**	--
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	3.6E+05	--	--	na	2.1E+03	--	--	na	3.6E+04	--	--	**na**	**3.6E+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	--	--	na	3.4E+02	--	--	na	1.2E+04	--	--	na	3.4E+01	--	--	na	1.2E+03	--	--	na	**1.2E+03**
Chloroform [C]	0	--	--	na	2.9E+04	--	--	na	9.8E+05	--	--	na	2.9E+03	--	--	na	9.8E+04	--	--	na	**9.8E+04**
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	7.4E+04	--	--	na	4.3E+02	--	--	na	7.4E+03	--	--	na	**7.4E+03**
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	6.9E+03	--	--	na	4.0E+01	--	--	na	6.9E+02	--	--	na	**6.9E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	9.3E-01	4.9E-01	na	--	2.1E-02	1.0E-02	na	--	2.3E-01	1.2E-01	na	--	**2.3E-01**	**1.2E-01**	na	--
Chromium III	0	1.8E+02	2.4E+01	na	--	2.0E+03	2.9E+02	na	--	4.6E+01	6.0E+00	na	--	5.1E+02	7.1E+01	na	--	**5.1E+02**	**7.1E+01**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.8E+02	1.3E+02	na	--	4.0E+00	2.8E+00	na	--	4.5E+01	3.3E+01	na	--	**4.5E+01**	**3.3E+01**	na	--
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Chrysene [C]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	na	**1.7E+00**
Copper	0	3.6E+00	2.7E+00	na	--	4.1E+01	3.3E+01	na	--	9.1E-01	6.8E-01	na	--	1.0E+01	8.2E+00	na	--	**1.0E+01**	**8.2E+00**	na	--
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.5E+02	6.2E+01	na	3.7E+06	5.5E+00	1.3E+00	na	2.2E+04	6.1E+01	1.6E+01	na	3.7E+05	**6.1E+01**	**1.6E+01**	na	**3.7E+05**
DDD [C]	0	--	--	na	8.4E-03	--	--	na	2.8E-01	--	--	na	8.4E-04	--	--	na	2.8E-02	--	--	na	**2.8E-02**
DDE [C]	0	--	--	na	5.9E-03	--	--	na	2.0E-01	--	--	na	5.9E-04	--	--	na	2.0E-02	--	--	na	**2.0E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	5.9E-03	1.2E+01	1.2E-02	na	2.0E-01	2.8E-01	2.5E-04	na	5.9E-04	3.1E+00	3.0E-03	na	2.0E-02	**3.1E+00**	**3.0E-03**	na	**2.0E-02**
Demeton	0	--	1.0E-01	na	--	--	1.2E+00	na	--	--	2.5E-02	na	--	--	3.0E-01	na	--	--	**3.0E-01**	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	na	**1.7E+00**
Dibutyl phthalate	0	--	--	na	1.2E+04	--	--	na	2.1E+05	--	--	na	1.2E+03	--	--	na	2.1E+04	--	--	na	**2.1E+04**
Dichloromethane (Methylene Chloride) [C]	0	--	--	na	1.6E+04	--	--	na	5.4E+05	--	--	na	1.6E+03	--	--	na	5.4E+04	--	--	na	**5.4E+04**
1,2-Dichlorobenzene	0	--	--	na	1.7E+04	--	--	na	2.9E+05	--	--	na	1.7E+03	--	--	na	2.9E+04	--	--	na	**2.9E+04**
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	4.5E+04	--	--	na	2.6E+02	--	--	na	4.5E+03	--	--	na	**4.5E+03**
1,4-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	4.5E+04	--	--	na	2.6E+02	--	--	na	4.5E+03	--	--	na	**4.5E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	7.7E-01	--	--	na	2.6E+01	--	--	na	7.7E-02	--	--	na	2.6E+00	--	--	na	**2.6E+00**
Dichlorobromomethane [C]	0	--	--	na	4.6E+02	--	--	na	1.6E+04	--	--	na	4.6E+01	--	--	na	1.6E+03	--	--	na	**1.6E+03**
1,2-Dichloroethane [C]	0	--	--	na	9.9E+02	--	--	na	3.3E+04	--	--	na	9.9E+01	--	--	na	3.3E+03	--	--	na	**3.3E+03**
1,1-Dichloroethylene	0	--	--	na	1.7E+04	--	--	na	2.9E+05	--	--	na	1.7E+03	--	--	na	2.9E+04	--	--	na	**2.9E+04**
1,2-trans-dichloroethylene	0	--	--	na	1.4E+05	--	--	na	2.4E+06	--	--	na	1.4E+04	--	--	na	2.4E+05	--	--	na	**2.4E+05**
2,4-Dichlorophenol	0	--	--	na	7.9E+02	--	--	na	1.4E+04	--	--	na	7.9E+01	--	--	na	1.4E+03	--	--	na	**1.4E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	3.9E+02	--	--	na	1.3E+04	--	--	na	3.9E+01	--	--	na	1.3E+03	--	--	na	**1.3E+03**
1,3-Dichloropropene	0	--	--	na	1.7E+03	--	--	na	2.9E+04	--	--	na	1.7E+02	--	--	na	2.9E+03	--	--	na	**2.9E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	1.4E-03	2.7E+00	6.7E-01	na	4.7E-02	6.0E-02	1.4E-02	na	1.4E-04	6.7E-01	1.7E-01	na	4.7E-03	**6.7E-01**	**1.7E-01**	na	**4.7E-03**
Diethyl Phthalate	0	--	--	na	1.2E+05	--	--	na	2.1E+06	--	--	na	1.2E+04	--	--	na	2.1E+05	--	--	na	**2.1E+05**
Di-2-Ethylhexyl Phthalate [C]	0	--	--	na	5.9E+01	--	--	na	2.0E+03	--	--	na	5.9E+00	--	--	na	2.0E+02	--	--	na	**2.0E+02**
2,4-Dimethylphenol	0	--	--	na	2.3E+03	--	--	na	3.9E+04	--	--	na	2.3E+02	--	--	na	3.9E+03	--	--	na	**3.9E+03**
Dimethyl Phthalate	0	--	--	na	2.9E+06	--	--	na	5.0E+07	--	--	na	2.9E+05	--	--	na	5.0E+06	--	--	na	**5.0E+06**
Di-n-Butyl Phthalate	0	--	--	na	1.2E+04	--	--	na	2.1E+05	--	--	na	1.2E+03	--	--	na	2.1E+04	--	--	na	**2.1E+04**
2,4 Dinitrophenol	0	--	--	na	1.4E+04	--	--	na	2.4E+05	--	--	na	1.4E+03	--	--	na	2.4E+04	--	--	na	**2.4E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	7.65E+02	--	--	na	1.3E+04	--	--	na	7.7E+01	--	--	na	1.3E+03	--	--	na	**1.3E+03**
2,4-Dinitrotoluene [C]	0	--	--	na	9.1E+01	--	--	na	3.1E+03	--	--	na	9.1E+00	--	--	na	3.1E+02	--	--	na	**3.1E+02**
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	na	1.2E-06	--	--	na	na	--	--	na	1.2E-07	--	--	na	1.2E-07	--	--	na	**na**
1,2-Diphenylhydrazine[C]	0	--	--	na	5.4E+00	--	--	na	1.8E+02	--	--	na	5.4E-01	--	--	na	1.8E+01	--	--	na	**1.8E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.5E+00	6.7E-01	na	4.1E+03	5.5E-02	1.4E-02	na	2.4E+01	6.1E-01	1.7E-01	na	4.1E+02	**6.1E-01**	**1.7E-01**	na	**4.1E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.5E+00	6.7E-01	na	4.1E+03	5.5E-02	1.4E-02	na	2.4E+01	6.1E-01	1.7E-01	na	4.1E+02	**6.1E-01**	**1.7E-01**	na	**4.1E+02**
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	4.1E+03	--	--	na	2.4E+01	--	--	na	4.1E+02	--	--	na	**4.1E+02**
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	9.6E-01	4.3E-01	na	1.4E+01	2.2E-02	9.0E-03	na	8.1E-02	2.4E-01	1.1E-01	na	1.4E+00	**2.4E-01**	**1.1E-01**	na	**1.4E+00**
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	1.4E+01	--	--	na	8.1E-02	--	--	na	1.4E+00	--	--	na	**1.4E+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	--	--	na	2.9E+04	--	--	na	5.0E+05	--	--	na	2.9E+03	--	--	na	5.0E+04	--	--	na	**5.0E+04**
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	6.4E+03	--	--	na	3.7E+01	--	--	na	6.4E+02	--	--	na	**6.4E+02**
Fluorene	0	--	--	na	1.4E+04	--	--	na	2.4E+05	--	--	na	1.4E+03	--	--	na	2.4E+04	--	--	na	**2.4E+04**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.2E-01	na	--	--	2.5E-03	na	--	--	3.0E-02	na	--	--	**3.0E-02**	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	2.1E-03	5.8E+00	4.6E-02	na	7.1E-02	1.3E-01	9.5E-04	na	2.1E-04	1.5E+00	1.1E-02	na	7.1E-03	**1.5E+00**	**1.1E-02**	na	**7.1E-03**
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	1.1E-03	5.8E+00	4.6E-02	na	3.7E-02	1.3E-01	9.5E-04	na	1.1E-04	1.5E+00	1.1E-02	na	3.7E-03	**1.5E+00**	**1.1E-02**	na	**3.7E-03**
Hexachlorobenzene[c]	0	--	--	na	7.7E-03	--	--	na	2.6E-01	--	--	na	7.7E-04	--	--	na	2.6E-02	--	--	na	**2.6E-02**
Hexachlorobutadiene[c]	0	--	--	na	5.0E+02	--	--	na	1.7E+04	--	--	na	5.0E+01	--	--	na	1.7E+03	--	--	na	**1.7E+03**
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	1.3E-01	--	--	na	4.4E+00	--	--	na	1.3E-02	--	--	na	4.4E-01	--	--	na	**4.4E-01**
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	4.6E-01	--	--	na	1.6E+01	--	--	na	4.6E-02	--	--	na	1.6E+00	--	--	na	**1.6E+00**
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	6.3E-01	1.1E+01	--	na	2.1E+01	2.4E-01	--	na	6.3E-02	2.7E+00	--	na	2.1E+00	**2.7E+00**	--	na	**2.1E+00**
Hexachlorocyclopentadiene	0	--	--	na	1.7E+04	--	--	na	2.9E+05	--	--	na	1.7E+03	--	--	na	2.9E+04	--	--	na	**2.9E+04**
Hexachloroethane[c]	0	--	--	na	8.9E+01	--	--	na	3.0E+03	--	--	na	8.9E+00	--	--	na	3.0E+02	--	--	na	**3.0E+02**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.4E+01	na	--	--	5.0E-01	na	--	--	6.0E+00	na	--	--	**6.0E+00**	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	1.7E+01	--	--	na	4.9E-02	--	--	na	1.7E+00	--	--	na	**1.7E+00**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone[c]	0	--	--	na	2.6E+04	--	--	na	8.8E+05	--	--	na	2.6E+03	--	--	na	8.8E+04	--	--	na	**8.8E+04**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	**0.0E+00**	na	--
Lead	0	2.0E+01	2.3E+00	na	--	2.3E+02	2.8E+01	na	--	5.1E+00	5.8E-01	na	--	5.7E+01	6.9E+00	na	--	**5.7E+01**	**6.9E+00**	na	--
Malathion	0	--	1.0E-01	na	--	--	1.2E+00	na	--	--	2.5E-02	na	--	--	3.0E-01	na	--	--	**3.0E-01**	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.6E+01	9.2E+00	na	8.8E-01	3.5E-01	1.9E-01	na	5.1E-03	3.9E+00	2.3E+00	na	8.8E-02	**3.9E+00**	**2.3E+00**	na	**8.8E-02**
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	6.9E+04	--	--	na	4.0E+02	--	--	na	6.9E+03	--	--	na	**6.9E+03**
Methoxychlor	0	--	3.0E-02	na	--	--	3.6E-01	na	--	--	7.5E-03	na	--	--	9.0E-02	na	--	--	**9.0E-02**	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	**0.0E+00**	na	--
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	3.6E+05	--	--	na	2.1E+03	--	--	na	3.6E+04	--	--	na	**3.6E+04**
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	6.3E+02	7.5E+01	na	7.9E+04	1.4E+01	1.6E+00	na	4.6E+02	1.6E+02	1.9E+01	na	7.9E+03	**1.6E+02**	**1.9E+01**	na	**7.9E+03**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	3.3E+04	--	--	na	1.9E+02	--	--	na	3.3E+03	--	--	na	**3.3E+03**
N-Nitrosodimethylamine[c]	0	--	--	na	8.1E+01	--	--	na	2.7E+03	--	--	na	8.1E+00	--	--	na	2.7E+02	--	--	na	**2.7E+02**
N-Nitrosodiphenylamine[c]	0	--	--	na	1.6E+02	--	--	na	5.4E+03	--	--	na	1.6E+01	--	--	na	5.4E+02	--	--	na	**5.4E+02**
N-Nitrosodi-n-propylamine[c]	0	--	--	na	1.4E+01	--	--	na	4.7E+02	--	--	na	1.4E+00	--	--	na	4.7E+01	--	--	na	**4.7E+01**
Parathion	0	6.5E-02	1.3E-02	na	--	7.3E-01	1.6E-01	na	--	1.6E-02	3.3E-03	na	--	1.8E-01	3.9E-02	na	--	**1.8E-01**	**3.9E-02**	na	--
PCB-1016	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1221	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1232	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1242	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1248	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1254	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB-1260	0	--	1.4E-02	na	--	--	1.7E-01	na	--	--	3.5E-03	na	--	--	4.2E-02	na	--	--	**4.2E-02**	na	--
PCB Total[c]	0	--	--	na	1.7E-03	--	--	na	5.8E-02	--	--	na	1.7E-04	--	--	na	5.8E-03	--	--	na	**5.8E-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**
Pentachlorophenol [C]	0	7.2E+00	5.5E+00	na	8.2E+01	8.0E+01	6.6E+01	na	2.8E+03	1.8E+00	1.4E+00	na	8.2E+00	2.0E+01	1.6E+01	na	2.8E+02	**2.0E+01**	**1.6E+01**	**na**	**2.8E+02**
Phenol	0	--	--	na	4.6E+06	--	--	na	7.9E+07	--	--	na	4.6E+05	--	--	na	7.9E+06	--	--	**na**	**7.9E+06**
Pyrene	0	--	--	na	1.1E+04	--	--	na	1.9E+05	--	--	na	1.1E+03	--	--	na	1.9E+04	--	--	**na**	**1.9E+04**
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Gross Alpha Activity	0	--	--	na	1.5E+01	--	--	na	2.6E+02	--	--	na	1.5E+00	--	--	na	2.6E+01	--	--	**na**	**2.6E+01**
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	6.9E+01	--	--	na	4.0E-01	--	--	na	6.9E+00	--	--	**na**	**6.9E+00**
Strontium-90	0	--	--	na	8.0E+00	--	--	na	1.4E+02	--	--	na	8.0E-01	--	--	na	1.4E+01	--	--	**na**	**1.4E+01**
Tritium	0	--	--	na	2.0E+04	--	--	na	3.4E+05	--	--	na	2.0E+03	--	--	na	3.4E+04	--	--	**na**	**3.4E+04**
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.2E+02	6.0E+01	na	1.9E+05	5.0E+00	1.3E+00	na	1.1E+03	5.6E+01	1.5E+01	na	1.9E+04	**5.6E+01**	**1.5E+01**	**na**	**1.9E+04**
Silver	0	3.2E-01	--	na	--	3.5E+00	--	na	--	7.9E-02	--	na	--	8.9E-01	--	na	--	**8.9E-01**	--	**na**	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	1.1E+02	--	--	na	3.7E+03	--	--	na	1.1E+01	--	--	na	3.7E+02	--	--	**na**	**3.7E+02**
Tetrachloroethylene[C]	0	--	--	na	8.9E+01	--	--	na	3.0E+03	--	--	na	8.9E+00	--	--	na	3.0E+02	--	--	**na**	**3.0E+02**
Thallium	0	--	--	na	6.3E+00	--	--	na	1.1E+02	--	--	na	6.3E-01	--	--	na	1.1E+01	--	--	**na**	**1.1E+01**
Toluene	0	--	--	na	2.0E+05	--	--	na	3.4E+06	--	--	na	2.0E+04	--	--	na	3.4E+05	--	--	**na**	**3.4E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	na	7.5E-03	8.2E+00	2.4E-03	na	2.5E-01	1.8E-01	5.0E-05	na	7.5E-04	2.0E+00	6.0E-04	na	2.5E-02	**2.0E+00**	**6.0E-04**	**na**	**2.5E-02**
Tributyltin	0	4.6E-01	6.3E-02	na	--	5.1E+00	7.6E-01	na	--	1.2E-01	1.6E-02	na	--	1.3E+00	1.9E-01	na	--	**1.3E+00**	**1.9E-01**	**na**	--
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	1.6E+04	--	--	na	9.4E+01	--	--	na	1.6E+03	--	--	**na**	**1.6E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	4.2E+02	--	--	na	1.4E+04	--	--	na	4.2E+01	--	--	na	1.4E+03	--	--	**na**	**1.4E+03**
Trichloroethylene [C]	0	--	--	na	8.1E+02	--	--	na	2.7E+04	--	--	na	8.1E+01	--	--	na	2.7E+03	--	--	**na**	**2.7E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	6.5E+01	--	--	na	2.2E+03	--	--	na	6.5E+00	--	--	na	2.2E+02	--	--	**na**	**2.2E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	**na**	--
Vinyl Chloride[C]	0	--	--	na	6.1E+01	--	--	na	2.1E+03	--	--	na	6.1E+00	--	--	na	2.1E+02	--	--	**na**	**2.1E+02**
Zinc	0	3.6E+01	3.6E+01	na	6.9E+04	4.0E+02	4.4E+02	na	1.2E+06	9.1E+00	9.1E+00	na	6.9E+03	1.0E+02	1.1E+02	na	1.2E+05	**1.0E+02**	**1.1E+02**	**na**	**1.2E+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, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	7.4E+03
Arsenic	2.7E+02
Barium	na
Cadmium	6.9E-01
Chromium III	4.3E+01
Chromium VI	1.8E+01
Copper	4.1E+00
Iron	na
Lead	4.2E+00
Manganese	na
Mercury	8.8E-02
Nickel	1.1E+01
Selenium	9.0E+00
Silver	3.5E-01
Zinc	4.0E+01

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

10/7/2008 4:36:48 PM

Facility = Carver Estates
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 210
WLAc = 130
Q.L. = 0.1
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 1000
Variance = 360000
C.V. = 0.6
97th percentile daily values = 2433.41
97th percentile 4 day average = 1663.79
97th percentile 30 day average= 1206.05
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 190.13472192692
Average Weekly limit = 113.416328636012
Average Monthly LImit = 94.2347921730776

The data are:

1000

10/7/2008 4:35:35 PM

Facility = Carver Estates
Chemical = ammonia
Chronic averaging period = 30
WLAa = 90
WLAc = 25
Q.L. = 0.2
# 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

Facility = Carver Estates STF
Chemical = copper
Chronic averaging period = 4
WLAa = 64.06
WLAc = 51.64
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 12
Expected Value = 9.71122
Variance = 37.2270
C.V. = 0.628283
97th percentile daily values = 24.9658
97th percentile 4 day average = 16.4986
97th percentile 30 day average= 11.8065
< Q.L. = 1
Model used = delta lognormal

No Limit is required for this material

The data are:

24
16
8
15
14
5
0
5
5
6
6
7