

National Pollutant Discharge Elimination System Permit

(for Discharge to Surface Waters)

This NPDES Permit Authorizes

PALMETTO UTILITIES, INC.

Spears Creek WWTP

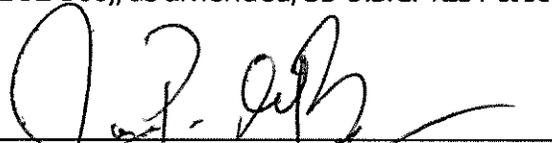
to discharge from a facility located

**about 1/3 mile WNW of Highway Church Road bridge over I-20
at the dead end of Brazzell Lane, about 3 miles S. of Elgin in
Kershaw County**

to receiving waters named

Wateree River

in accordance with limitations, monitoring requirements and other conditions set forth herein. This permit is issued in accordance with the provisions of the Pollution Control Act of South Carolina (S.C. Code Sections 48-1-10 *et seq.*, 1976), Regulation 61-9 and with the provisions of the Federal Clean Water Act (PL 92-500), as amended, 33 U.S.C. 1251 *et seq.*, the "Act."


Jeffrey P. deBessonnet, P.E., Director
Water Facilities Permitting Division

Issue Date: July 17, 2017

Expiration Date¹: August 31, 2022

Effective Date: September 1, 2017

Permit Number: SC0043451

¹ This permit will continue to be in effect beyond the expiration date if a complete timely re-application is received pursuant to Regulation 61-9.122.6 and signed per Regulation 61-99.122.22.



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PART I. Definitions

Any term not defined in this Part has the definition stated in the South Carolina Pollution Control Act (PCA) or in "Water Pollution Control Permits", R.61-9 or its normal meaning.

- A. The "Act", or CWA shall refer to the Clean Water Act (Formerly referred to as the Federal Water Pollution Control Act) Public Law 92-500, as amended means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117, 33 U.S.C. 1251 et seq. Specific references to sections within the CWA will be according to Pub. L. 92-500 notation.
- B. The "arithmetic mean" of any set of values is the summation of the individual values divided by the number of individual values.
- C. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
- D. A "composite sample" shall be defined as one of the following four types:
 - 1. An influent or effluent portion collected continuously over a specified period of time at a rate proportional to the flow.
 - 2. A combination of not less than 8 influent or effluent grab samples collected at regular (equal) intervals over a specified period of time and composited by increasing the volume of each aliquot in proportion to flow. If continuous flow measurement is not used to composite in proportion to flow, the following method will be used: An instantaneous flow measurement should be taken each time a grab sample is collected. At the end of the sampling period, the instantaneous flow measurements should be summed to obtain a total flow. The instantaneous flow measurement can then be divided by the total flow to determine the percentage of each grab sample to be combined. These combined samples form the composite sample.
 - 3. A combination of not less than 8 influent or effluent grab samples of equal volume but at variable time intervals that are inversely proportional to the volume of the flow. In other words, the time interval between aliquots is reduced as the volume of flow increases.
 - 4. If the effluent flow varies by less than 15 percent, a combination of not less than 8 influent or effluent grab samples of constant (equal) volume collected at regular (equal) time intervals over a specified period of time. (This method maybe used with prior Department approval.)

All samples shall be properly preserved in accordance with Part II.J.4. Continuous flow or the sum of instantaneous flows measured and averaged for the specified compositing time period shall be used with composite results to calculate mass.

- E. "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over

the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.

- F. "Daily maximum" other than for bacterial indicators (i.e. fecal coliform, E. coli and enterococci) is the highest average value recorded of samples collected on any single day during the calendar month. Daily average for bacterial indicators means the highest arithmetic average of bacterial samples collected for each bacterial indicator species (i.e. fecal coliform, E. coli and/or enterococci) in any 24 hour period during a calendar month.
- G. "Daily minimum" is the lowest average value recorded of samples collected on any single day during the calendar month.
- H. The "Department" or "DHEC" shall refer to the South Carolina Department of Health and Environmental Control.
- I. The "geometric mean" of any set of values is the N^{th} root of the product of the individual values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).
- J. A "grab sample" is an individual, discrete or single influent or effluent portion of at least 100 milliliters collected at a time representative of the discharge and over a period not exceeding 15 minutes and retained separately for analysis.
- K. The "instantaneous maximum or minimum" is the highest or lowest value recorded of all samples collected during the calendar month.
- L. The "monthly average", other than for fecal coliform, E. coli and enterococci, is the arithmetic mean of all samples collected in a calendar month period. Monthly average (for bacterial indicators only) means the calendar month (i.e., 28 days, 29 days, 30 days, or 31 days) geometric mean of all bacterial samples collected [for each of the bacterial indicator species (i.e., E. coli, enterococcus, and/or fecal coliform)] during that calendar month. The monthly average loading is the arithmetic average of all daily discharges made during the month.
- M. "POTW" means a treatment works as defined by section 212 of the Clean Water Act, which is owned by a state or municipality (as defined by section 502[4] of the CWA). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature or a regional entity composed of two (2) or more municipalities or parts thereof. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality, as defined in section 502(4) of the CWA, which has jurisdiction over the Indirect Discharges to and the discharge from such a treatment works.
- N. "Practical Quantitation Limit (PQL)" is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specific sample weights, volumes, and processing steps have been followed. It is also

referred to as the reporting limit.

- O. "Privately owned treatment works" means any device or system which both is used to treat wastes from any facility whose operator is not the operator of the treatment works and is not a POTW.
- P. "Quarter" is defined as the first three calendar months beginning with the month that this permit becomes effective (unless otherwise specified in this permit) and each group of three calendar months thereafter.
- Q. "Quarterly average" is the arithmetic mean of all samples collected in a quarter.
- R. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- S. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- T. "Weekly average", is the arithmetic mean of all the samples collected during a one-week period. For self-monitoring purposes, weekly periods in a calendar month are defined as three (3) consecutive seven-day intervals starting with the first day of the calendar month and a fourth interval containing seven (7) days plus those days beyond the 28th day in a calendar month. The value to be reported is the single highest of the four (4) weekly averages computed during a calendar month. The weekly average loading is the arithmetic average of all daily discharges made during the week.
- U. "Ultimate Oxygen Demand" (UOD) is the oxygen consumed by aquatic microbes in metabolizing the remaining organic and nitrogenous matter in the effluent from the permittee's wastewater treatment plant. This demand is expressed in pounds per day and is calculated by multiplying the effluent biochemical oxygen demand (BOD₅) concentration by the F-ratio and adding that to 4.57 times the effluent ammonia (NH₃-N) concentration and multiplying the sum by the flow and the constant 8.34. The UOD loading is the arithmetic average of all individual loading determinations made during the sampling period.

$$\text{U.O.D. (lbs/day)} = \{(\text{BOD}_5(\text{mg/l}) * \text{F-ratio multiplier}) + \{\text{NH}_3\text{-N}(\text{mg/l}) * 4.57\}\} * \text{Flow}(\text{MGD}) * 8.345$$

$$\text{F-ratio} = 1.50:1; \text{ i.e., F-ratio multiplier} = 1.50$$

Legend (refers to Part III.A., Effluent Limitations and Monitoring Requirements)

Abbreviation	Stands for
BOD ₅	5-Day Biochemical Oxygen Demand
TSS	Total Suspended Solids
DO	Dissolved Oxygen
TRC	Total Residual Chlorine
NH ₃ -N	Ammonia Nitrogen

Abbreviation	Stands for
24 Hr C	24-hour Composite
Cont.	Continuous
Cal	Calculated
Eff.	Effluent
Inst	Instantaneous

PART II. Standard Conditions

A. Duty to comply

The permittee must comply with all conditions of the permit. Any permit noncompliance constitutes a violation of the Clean Water Act and the Pollution Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. The Department's approval of wastewater facility Plans and Specifications does not relieve the permittee of responsibility to meet permit limits.

1. a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
- b. It is the responsibility of the permittee to have a treatment facility that will meet the final effluent limitations of this permit. The approval of plans and specifications by the Department does not relieve the permittee of responsibility for compliance.
2. Failure to comply with permit conditions or the provisions of this permit may subject the permittee to civil penalties under S.C. Code Section 48-1-330 or criminal sanctions under S.C. Code Section 48-1-320. Sanctions for violations of the Federal Clean Water Act may be imposed in accordance with the provisions of 40 CFR Part 122.41(a)(2) and (3).
3. A person who violates any provision of this permit, a term, condition or schedule of compliance contained within a valid NPDES permit, or the State law is subject to the actions defined in the State law.

B. Duty to reapply

1. If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. Any permittee with a currently effective permit shall submit a new permit application at least 180 days before the expiration date of the existing permit unless the Department has issued a prior written consent for a later submittal date. The Department shall not consent for applications to be submitted later than the expiration date of the existing permit.
2. If a privately-owned treatment works as defined in Part I.N, wishes to continue an activity regulated by this permit after the expiration date of this permit, the privately-owned treatment works must apply for and obtain a new permit. A privately-owned treatment works with a currently effective permit shall submit a new application 180 days before the existing permit expires, unless permission for a later date has been granted by the Department. The Department may not grant permission for applications to be submitted later than the expiration date of the existing permit.

C. Need to halt or reduce activity not a defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper operation and maintenance

1. The permittee shall at all times properly operate and maintain in good working order and operate as efficiently as possible all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance based on design facility removals, adequate funding, adequate operator staffing and training and also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Power Failures.

In order to maintain compliance with effluent limitations and prohibitions of this permit, the permittee shall either:

- a. provide an alternative power source sufficient to operate the wastewater control facilities;
- b. or have a plan of operation which will halt, reduce, or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

3. The permittee shall develop and maintain at the facility a complete Operations and Maintenance Manual for the waste treatment facilities and/or land application system. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste treatment facilities and land application system. The manual shall contain a general description of: the treatment process(es), the operational procedures to meet the requirements of (E)(1) above, and the corrective action to be taken should operating difficulties be encountered.

4. The permittee shall provide for the performance of daily treatment facility inspections by a certified operator of the appropriate grade as specified in Part V. The inspections shall include, but should not necessarily be limited to, areas which require visual observation to determine efficient operation and for which immediate corrective measures can be taken using the O & M manual as a guide. All inspections shall be recorded and shall include the date, time, and name of the person making the inspection, corrective measures taken, and routine equipment maintenance, repair, or replacement performed. The permittee shall maintain all records of inspections at the permitted facility as required by the permit, and the records shall be made available for on-site review during normal working hours.

5. A roster of operators associated with the facility's operation and their certification grades shall be submitted to the DHEC/Bureau of Water/Water Pollution Control Division. For existing facilities, this roster shall be submitted within thirty (30) days of the effective date of this permit. For new facilities, this roster must be submitted prior to placing the facility into operation. Additionally, any changes in operator or operators (including their certification grades) shall be submitted to the Department as they occur.

6. Wastewater Sewer Systems

- a. Purpose. This section establishes rules for governing the operation and maintenance of wastewater sewer systems, including gravity or pressure interceptor sewers. It is the purpose of this section to establish standards for the management of sewer systems to prevent and/or minimize system failures that would lead to public health or environmental impacts.
- b. Applicability. This section applies to all sewer systems that have been or would be subject to a DHEC construction permit under Regulation 61-67 and whose owner owns or operates the wastewater treatment system to which the sewer discharges.
- c. General requirements. The permittee must:
 - (1) Properly manage, operate, and maintain at all times all parts of its sewer system(s), to include maintaining contractual operation agreements to provide services, if appropriate;
 - (2) Provide adequate capacity to convey base flows and peak flows for all parts of the sewer system or, if capital improvements are necessary to meet this standard, develop a schedule of short and long term improvements;
 - (3) Take all reasonable steps to stop and mitigate the impact of releases of wastewater to the environment; and
 - (4) Notify the Department within 30 days of a proposed change in ownership of a sewer system.

F. Permit actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

G. Property rights

This permit does not convey any property rights of any sort, or any exclusive privilege nor does it authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

H. Duty to provide information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

I. Inspection and entry

The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and Pollution Control Act, any substances or parameters at any location.

J. Monitoring and records

1. a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Flow Measurements

Where primary flow meters are required, appropriate flow measurement devices and methods consistent with accepted scientific practices shall be present and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of not greater than 10 percent from the true discharge rates throughout the range of expected discharge volumes. The primary flow device, where required, must be accessible to the use of a continuous flow recorder.

- c. The permittee shall maintain all records of inspections at the permitted facility as required by the permit, and the records shall be made available for on-site review during normal working hours.
2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by R.61-9.503 or R.61-9.504), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

3. Records of monitoring information shall include:

- a. The date, exact place, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;

- c. The date(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
4. a. Analyses for required monitoring must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal specified in R.61-9.503, unless other test procedures have been specified in the permit
- b. Unless addressed elsewhere in this permit, the permittee shall use a sufficiently sensitive analytical method for each sample that achieves a value below the derived permit limit stated in Part III. For the purposes of reporting analytical data on the Discharge Monitoring Report (DMR):
- (1) Analytical results below the PQL from methods available in 40 CFR 136 or otherwise specified in the permit shall be reported as zero (0), provided the PQL is below the value specified in Part V.G.5 and the result is also below the PQL. Zero (0) shall also be used to average results which are below the PQL. When zero (0) is reported or used to average results, the permittee shall report, in the "Comment Section" or in an attachment to the DMR, the analytical method used, the PQL achieved, and the number of times results below the PQL were reported as zero (0).
 - (2) Analytical results above the PQL from methods available in 40 CFR 136 or otherwise specified in the permit shall be reported as the value achieved, even if the PQL is below the value specified in Part V.G.5. When averaging results using a value containing a < the average shall be calculated using the value and reported as < the average of all results collected.
3. (a) Mass value for a pollutant collected using a grab sample shall be calculated using the 24-hour totalized flow for the day the sample was collected (if available) or the instantaneous flow at the time of the sample and either the concentration value actually achieved or the value as determined from the procedures in (1) or (2) above, as appropriate. Grab samples should be collected at a time representative of the discharge.
- (b) Mass value for a pollutant collected using a composite sample shall be calculated using the 24-hour totalized flow measured for the day the sample was collected and either the concentration value actually achieved or the value as determined from the procedures in (1) or (2) above, as appropriate.
5. The PCA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$25,000 or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment provided by the Clean Water Act is also by imprisonment of not more than 4 years.

K. Signatory requirement

1. All applications, reports, or information submitted to the Department shall be signed and certified.

- a. Applications. All permit applications shall be signed as follows:
- (1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or
 - (b) The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - (3) For a municipality, State, Federal, or other public agency or public facility: By either a principal executive officer, mayor, or other duly authorized employee or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
 - (a) The chief executive officer of the agency, or
 - (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator, Region IV, EPA).
- b. All reports required by permits, and other information requested by the Department, shall be signed by a person described in Part II.K.1.a of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- (1) The authorization is made in writing by a person described in Part II.K.1.a of this section;
 - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) and,
 - (3) The written authorization is submitted to the Department.
- c. Changes to authorization. If an authorization under Part II.K.1.b of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II.K.1.b of this section must be submitted to the Department prior to or

together with any reports, information, or applications to be signed by an authorized representative.

- d. Certification. Any person signing a document under Part II.K.1.a or b of this section shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
2. The PCA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$25,000 per violation, or by imprisonment for not more than two years per violation, or by both.

L. Reporting requirements

1. Planned changes

The permittee shall give written notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in R 61-9.122.29(b); or
- b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Part II.L.8 of this section.
- c. The alteration or addition results in a significant change in the permittee's sewage sludge or industrial sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan (included in the NPDES permit directly or by reference);

2. Anticipated noncompliance

The permittee shall give advance notice to DHEC/Bureau of Water/Water Pollution Control Division of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers

This permit is not transferable to any person except after notice to DHEC/Bureau of Water/NPDES Administration Section. The Department may require modification or revocation and reissuance of the permit to change the name of permittee and incorporate such other requirements as may be necessary under the Pollution Control Act and the Clean Water Act. (See section 122.61; in some cases, modification or revocation and reissuance is mandatory.)

- a. Transfers by modification. Except as provided in paragraph b of this section, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under R.61-9.122.62(e)(2)), or a minor modification made (under R.61-9.122.63(d)), to identify the new permittee and incorporate such other requirements as may be necessary under CWA.
 - b. Other transfers. As an alternative to transfers under paragraph a of this section, any NPDES permit may be transferred to a new permittee if:
 - (1) The current permittee notifies the Department at least 30 days in advance of the proposed transfer date in Part II.L.3.b(2) of this section;
 - (2) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and
 - (3) Permits are non-transferable except with prior consent of the Department. A modification under this subparagraph may also be a minor modification under section 122.63.
4. Monitoring reports

Monitoring results shall be reported at the intervals specified in the permit. Monitoring periods are calculated beginning with the permit effective date, unless otherwise stated elsewhere in this permit. If the permit is modified, the effective date of the modification is used to begin calculation of the monitoring period for those items that are part of the modification unless otherwise stated elsewhere in this permit.

- a. Monitoring results (with the exception of any Annual Reporting requirements under section 503.18, section 503.28, section 503.48 or section 504.18) must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Department for reporting results of monitoring of sludge use or disposal practices.
 - (1) Effluent Monitoring:

Until final approval of DHEC's designated electronic DMR system, effluent monitoring results obtained at the required frequency shall be reported on a Discharge Monitoring Report Form (EPA Form 3320-1). The DMR is due postmarked no later than the 28th day of the month following the end of the monitoring period. One original and one copy of the Discharge Monitoring Reports (DMRs) shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data & Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

Once DHEC notifies the permittee that the electronic DMR system is operational, the permittee will be required to use the electronic DMR system beginning the monitoring period following the notification. Completed electronic DMRs must be received no later than 11:59 PM on the 28th day of the month following the end of the monitoring period.

(2) Groundwater Monitoring:

Groundwater monitoring results obtained at the required frequency shall be reported on a Groundwater Monitoring Report Form (DHEC 2110) or the format the analyzing laboratory utilizes, postmarked no later than the 28th day of the month following the end of the monitoring period. One original and one copy of the Groundwater Monitoring Report Form (DHEC 2110) shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data & Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

(3) Sludge Monitoring:

Sludge monitoring results obtained at the required frequency shall be reported in a laboratory format postmarked no later than the 28th day of the month following the end of the monitoring period. Two copies of these results shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data & Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

(4) All other reports required by this permit shall be submitted at the frequency specified elsewhere in the permit to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data & Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

- b. If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in R.61-9.503, R.61-9.504, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Department.
 - c. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Department in the permit.
5. Twenty-four hour reporting

- a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally to local DHEC office within 24 hours from the time the permittee becomes aware of the circumstances. During normal working hours call:

County	DHEC Region	Phone No.
Anderson, Oconee	Upstate BEHS Anderson	864-260-5585
Abbeville, Greenwood, Laurens, McCormick	Upstate BEHS Greenwood	864-227-5915
Greenville, Pickens	Upstate BEHS Greenville	864-372-3273
Cherokee, Spartanburg, Union	Upstate BEHS Spartanburg	864-596-3327
Fairfield, Lexington, Newberry, Richland	Midlands BEHS Columbia	803-896-0620
Chester, Lancaster, York	Midlands BEHS Lancaster	803-285-7461
Aiken, Barnwell, Edgefield, Saluda	Midlands BEHS Aiken	803-642-1637
Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro	Pee Dee BEHS Florence	843-661-4825
Clarendon, Kershaw, Lee, Sumter	Pee Dee BEHS Sumter	803-778-6548
Georgetown, Horry, Williamsburg	Pee Dee BEHS Myrtle Beach	843-238-4378
Berkeley, Charleston, Dorchester	Low Country BEHS Charleston	843-953-0150
Beaufort, Colleton, Hampton, Jasper	Low Country BEHS Beaufort	843-846-1030
Allendale, Bamberg, Calhoun, Orangeburg	Low Country BEHS Orangeburg	803-533-5490

After-hour reporting should be made to the 24-Hour Emergency Response telephone number 803-253-6488 or 1-888-481-0125 outside of the Columbia area.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; and, if the noncompliance has not been corrected, the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

- b. The following shall be included as information which must be reported within 24 hours under this paragraph.
- (1) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See R.61-9.122.41(L)(6)(ii)(A).
 - (2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit to be reported within 24 hours (See R 61-9.122.44(g)). If the permit contains maximum limitations for any of the pollutants listed below, a violation of the maximum limitations shall be reported orally to the DHEC/Bureau of Water/Water Pollution Control Division within 24 hours or the next business day.

(i) Total Residual Chlorine (TRC)

c. The Department may waive the written report on a case-by-case basis for reports under Part II.L.5.b of this section if the oral report has been received within 24 hours.

6. Other noncompliance.

The permittee shall report all instances of noncompliance not reported under Part II.L.4 and 5 of this section and Part IV at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.L.5 of this section.

7. Other information.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

8. [Reserved]

M. Bypass

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.M.2 and 3 of this section.

2. Notice.

a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least ten days before the date of the bypass to DHEC/Bureau of Water/Water Facilities Permitting Division.

b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part II(L)(5) of this permit (24-hour reporting).

3. Prohibition of bypass

a. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Part II.M.2 of this section.

b. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in Part II.M.3.a of this section.

N. Upset

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Part II.N.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - b. The permitted facility was at the time being properly operated; and
 - c. The permittee submitted notice of the upset as required in Part II.L.5.b(2) of this section.
 - d. The permittee complied with any remedial measures required under Part II.D of this section.
3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

O. Misrepresentation of Information

1. Any person making application for a NPDES discharge permit or filing any record, report, or other document pursuant to a regulation of the Department, shall certify that all information contained in such document is true. All application facts certified to by the applicant shall be considered valid conditions of the permit issued pursuant to the application.
2. Any person who knowingly makes any false statement, representation, or certification in any application, record, report, or other documents filed with the Department pursuant to the State law, and the rules and regulations pursuant to that law, shall be deemed to have violated a permit condition and shall be subject to the penalties provided for pursuant to 48-1-320 or 48-1-330.

Part III. Limitations and Monitoring Requirements

A. Effluent Limitations and Monitoring Requirements

1. **FINAL LIMITS:** During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS		
	Pounds per Day		Other Units		Measurement Frequency	Sample Type	Sample Point
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum			
Flow	---	---	MR MGD	MR MGD	Daily	Cont.	Eff.
Combined Flow*	---	---	Zero ⁺	MR ⁺	1 / Month	Calc.	Eff.
BOD ₅	2302	4604	23 mg/l	46 mg/l	Weekdays	24 Hr C	Eff.
TSS*	1131	2962	11.3 mg/l	29.6 mg/l	Weekdays	24 Hr. C	Eff.
NH ₃ -N	691	1381	6.9 mg/l	13.8 mg/l	Weekdays	24 Hr C	Eff.
UOD [□]	3,906	MR	---	---	Weekdays	Calc.	Eff.
TRC [◆]	48.6	83.9	0.485 mg/l [○]	0.838 mg/l [○]	Weekdays	Grab	Eff.
DO	---	---	2.0 mg/l minimum at all times		Daily	Grab	Eff.
pH	---	---	6.0 - 8.5 Standard Units		Daily	Grab	Eff.
Total Phosphorus [◆]	147.0 [★]	MR	3.0 [★] mg/l	MR mg/l	Weekly	24 Hr C	Eff.
Total Phosphorus Monthly Loading [▼]	MR	---	---	---	1 / Month	Calc.	Eff.
Total Phosphorus Annual Loading [★]	MR	---	---	---	1 / Month	Calc.	Eff.
Total Nitrogen [◆]	MR	MR	MR mg/l	MR mg/l	1 / Month	Calc.	Eff.

- ★ See Part V.J.
- ◆ See Part V.G.5.
- † Report Cumulative Monthly Average Flow of SC0043451 and ND0068411 as '0' (Zero) when < or = 12.0 MGD, otherwise report as '1' (One).
- ‡ TSS concentration limits are based on Centralized Waste Treatment Limitations 40 CFR Part 437.A and mass limits on 12 MGD discharge flow.
- Permittee may report TRC as Zero (0.0) provided (UV disinfection was used and) the discharge was not chlorinated over the monitoring period.
- ◐ Intended for operational flexibility, Total Phosphorus mass and concentration limits do not correspond to each other at the average design flow.
- ▼ Monthly Loading in pounds is defined as [8.345 X Average Monthly MGD Flow X Average mg/l Concentration X Number of Days in the month].
- ★ Annual Loading in pounds is defined as the sum of the current and eleven (11) consecutively preceding Average Monthly Loadings in pounds.

Part III. A., Limitations and Monitoring Requirements, continued;

2. FINAL LIMITS; Centralized Waste (Metals) Treatment per 40 CFR Part 437.A.;

During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below:

Following limits are applicable to the monthly average 40,000 gallons per day flow of the Metals Waste Stream:										
EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS				
	Pounds per Day [‡]		Daily Maximum	Other Units		Measurement Frequency [‡]	Sample Type	Sample Point		
	Monthly Average	Monthly Average		Monthly Average	Daily Maximum					
Oil & Grease (Hexane) [♦]	MR	50.2 mg/l	MR	205.0 mg/l		1 / Month	Grab	Eff.		
Total Antimony [♦]	MR	0.0312 mg/l	MR	0.111 mg/l		1 / Month	24 Hr. C	Eff.		
Total Arsenic [♦]	MR	0.0199 mg/l	MR	0.0993 mg/l		1 / Month	24 Hr. C	Eff.		
Total Cadmium [♦]	MR	0.163 mg/l	MR	0.782 mg/l		1 / Month	24 Hr. C	Eff.		
Total Chromium [♦]	MR	0.0522 mg/l	MR	0.167 mg/l		1 / Month	24 Hr. C	Eff.		
Total Cobalt [♦]	MR	0.0703 mg/l	MR	0.182 mg/l		1 / Month	24 Hr. C	Eff.		
Total Copper [♦]	MR	0.216 mg/l	MR	0.659 mg/l		1 / Month	24 Hr. C	Eff.		
Total Lead [♦]	MR	0.283 mg/l	MR	1.32 mg/l		1 / Month	24 Hr. C	Eff.		
Total Mercury [♦]	MR	0.000246 mg/l	MR	0.000641 mg/l		1 / Quarter	Grab	Eff.		
Total Nickel [♦]	MR	0.309 mg/l	MR	0.794 mg/l		1 / Month	24 Hr. C	Eff.		
Total Selenium [♦]	MR	0.0698 mg/l	MR	0.176 mg/l		1 / Month	24 Hr. C	Eff.		
Total Silver [♦]	MR	0.0122 mg/l	MR	0.0318 mg/l		1 / Month	24 Hr. C	Eff.		
Total Tin [♦]	MR	0.0367 mg/l	MR	0.0955 mg/l		1 / Month	24 Hr. C	Eff.		
Total Titanium [♦]	MR	0.00612 mg/l	MR	0.0159 mg/l		1 / Month	24 Hr. C	Eff.		
Total Vanadium [♦]	MR	0.0618 mg/l	MR	0.0628 mg/l		1 / Month	24 Hr. C	Eff.		
Total Zinc [♦]	MR	0.252 mg/l	MR	0.657 mg/l		1 / Month	24 Hr. C	Eff.		

[‡] Numerical mass limits are not practical due to the small-fraction CWT flow; 40,000 Gallons Per Day vs. 12 MGD plant average.

[‡] Subject to Departmental Approval, permittee may request reduction of each 1 / Month to 1 / Quarter after one (1) full year.

[♦] See Part V.G.5.

Part III.A. - Effluent Limitations and Monitoring Requirements, continued

3. **FINAL LIMITS:** During the period beginning on the effective date of this permit, and lasting until the expiration date, the permittee is authorized to discharge from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below: if each E. coli daily maximum (as defined by R.61-68. B.29) during a calendar month reporting period is less than or equal to 349 MPN/100 ml or the provisions of R.61-68. E.14(c) (12), included as "Bacteria Supplemental Data Sheet" at the end of Part V of this permit, were not met, then the following limits apply:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Point
E. coli (MPN/100ml)	126	349	Weekdays	Grab	Effluent

Otherwise, report "Conditional Monitoring-Not Required" on the Discharge Monitoring Report (DMR) form for this portion (Part III.A.3.) of the permit, and report all E. coli data for this monitoring period in 4. below.

4. **FINAL LIMITS:** During the period beginning on the effective date of this permit, and lasting until the expiration date, the permittee is authorized to discharge from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below: if any E. coli daily maximum (as defined by R.61-68. B.29) during a calendar month reporting period is greater than 349 MPN/100 ml and in each instance the provisions of R.61-68. E.14(c)(12), included as "Bacteria Supplemental Data Sheet" at the end of Part V of this permit, were met, then the following limits apply:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	Individual Sample Maximum	Measurement Frequency	Sample Type	Sample Point
E. coli (MPN/100ml)	126	800*	Weekdays	Grab	Effluent

* For this reporting period only.

Otherwise report "Conditional Monitoring-Not Required" on the Discharge Monitoring Report (DMR) form for this portion (Part III.A.4.) of the permit, and report all E. coli data for this monitoring period in 3. above. In addition, if data is reported in item 4., the "Bacteria Supplemental Data Sheet" contained in Part V of this permit must be attached to the Discharge Monitoring Report (DMR) and signed by the authorized DMR representative, documenting compliance with the provisions of R.61-68. E.14(c)(12). If this attachment is not included with the DMR submittal, the permittee may not use this portion (Part III.A.4.) for reporting E. coli data.

Note for 3. and 4. above: Sample results reported should include all data collected for this monitoring period including any additional E. coli samples that might be collected under the provisions of R.61-68. E.14(c)(12).

B. Whole Effluent Toxicity Limitations and Monitoring Requirements

During the period beginning on the effective date and lasting through the Expiration date, the permittee is authorized to discharge from outfall 001:

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type ⁺
<i>Ceriodaphnia dubia</i> Chronic Whole Effluent Toxicity @ CTC = 100% [▼]	25 %	40 %	3 / Quarter	24-hour Composite

- ⁺ Samples used to demonstrate compliance with discharge limitations and monitoring requirements specified above shall be collected at or near the final point-of-discharge but prior to mixing with the receiving waters or other waste streams.
- [▼] In-stream Waste Concentration of 100% will be used until CORMIX reviews are concluded and the IWC is finalized. See Part V.B. for additional toxicity reporting requirements.

The following notes apply only to valid tests. For invalid tests see Part V.B.

- Note 1: The overall % effect is defined as the larger of the % survival effect or the % reproduction effect from DMR Form 3880 (11/2010). Permittee must maintain the DMR form for each toxicity test and provide the same upon request.
- Note 2: If only one test is conducted during a month, the monthly average and daily maximum are each equal to the overall % effect.
- Note 3: If more than one test is conducted during a month, the monthly average is the arithmetic mean of the overall % effect values of all tests conducted during the month.
- Note 4: The monthly average to be reported on the DMR is the highest monthly average for any month during the monitoring period. There is no averaging of data from tests from one month to another.
- Note 5: The daily maximum to be reported on the DMR is the highest of the % survival effect or % reproduction effect of all tests conducted during the monitoring period.
- Note 6: When a sample is collected in one month and the test is completed in the next month, the overall % effect applies to the month in which the sample was collected.
- Note 7: Tests must be separated by at least 7 days (from the time the first sample is collected to start one test until the time the first sample is collected to start a different test). There is no restriction on when a new test may begin following a failed or invalid test.
- Note 8: For any split sample:
 - a. Determine the % survival effect and % reproduction effect values separately for each test.
 - b. Determine the arithmetic mean of the % survival effects and of the % reproduction effects for all tests.
 - c. The monthly average and daily maximum shall be the higher of the % effect values from (b) above.
 - d. For the purposes of reporting, split samples are reported as an individual sample regardless of the number of times it is split. All laboratories used shall be identified and each test shall be reported individually on DHEC Form 3880 (11/2010).

C. Groundwater Requirements

None Applicable to This Permit.

D. Sludge Disposal Requirements

Sludge Transportation and Disposal

Sludge solids will be removed from this facility and transported to Waste Management's Richland Landfill, Inc.'s - #SC 402400-1101, (formerly DWP-126) in Elgin, SC under the following conditions:

- a. All containers for sludge collection and transportation shall be structurally sound in every respect and be so constructed as to prevent leakage or spillage of any kind while in the process of pumping, storage, or transit.
- b. The quantity transported shall not exceed 3,600 standard tons of dry sludge per year.
- c. The hauling of sludge may be revoked or suspended after notice and opportunity for a hearing when, in the opinion of the South Carolina Department of Health and Environmental Control, the Permittee has failed to comply with the permitting, hauling, transportation, or disposal requirements
- d. To the extent provided under Federal and State law, the Permittee is responsible for handling, transportation, and disposal of sludge from the various sources transported to the approved disposal site. This responsibility includes, but is not limited to spills, accidents, unauthorized leaks, or other hazards which may occur.

E. Land Application Requirements

None Applicable to This Permit.

F. Instream Biological Assessment

Not Applicable to This Permit.

Part IV. Schedule of Compliance

A. Schedule(s)

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedules:

None Applicable to This Permit.

2. The permittee shall achieve compliance with the Whole Effluent Toxicity limitations specified for discharges in accordance with the following schedules:

None Applicable to This Permit.

3. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date

Part V. Other Requirements**A. Effluent Limitations and Monitoring Requirements**

1. There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the effluent cause a visible sheen on the receiving waters.
2. a. Effluent samples taken in compliance with the monitoring requirements specified in Part III, shall be taken at the following location(s): nearest accessible point after final treatment but prior to actual discharge or mixing with the receiving waters.
- b. Influent samples taken in compliance with the monitoring requirements specified in Part III, shall be taken at the following location(s): nearest accessible point prior to any primary treatment unit (e.g. after the bar screen and before primary treatment).
3. Samples shall be collected in accordance with Part I.
4. MR = Monitor and Report only.

B. Effluent Toxicity Limitations and Monitoring Requirements

1. Acute Toxicity

None Applicable to This Permit.

2. Chronic Toxicity

For the requirements identified in Part III.B:

- a. A *Ceriodaphnia dubia* three brood chronic toxicity test shall be conducted at the frequency stated in Part III.B, Effluent Toxicity Limitations and Monitoring Requirements, using the Test Concentration of 100% and the following: 0% (control), 20%, 40%, 60%, 80% and 100% effluent. The permittee may add additional chronic test concentrations without prior authorization from the Department provided each test begins with at least 10 replicates in each concentration and all data is used to determine permit compliance.
- b. The test shall be conducted using EPA Method 1002.0 in accordance with "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA/821/R-02/013 (October 2002).
- c. The permittee shall use the linear interpolation method described in "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA/821/R-02/013 (October 2002), Appendix M to estimate the percent effect at the CTC according to the equations in d below.
- d. The linear interpolation estimate of percent effect is $\left(1 - \frac{M_{CTC}}{M_1}\right) * 100$ if the CTC is a tested

concentration. Otherwise, it is $\left(1 - \frac{M_J - \frac{M_{J+1} - M_J}{C_{J+1} - C_J} * C_J + \frac{M_{J+1} - M_J}{C_{J+1} - C_J} * CTC}{M_1} \right) * 100$.

- e. A test shall be invalidated if any part of Method 1002.0 is not followed or if the laboratory is not certified at the time the test is conducted.
- f. All valid toxicity test results shall be reported on the DHEC Form 3880 (11/2010) in accordance with Part II.L.4. and submitted upon Departmental request. In addition, results from all invalid tests including lab control data must be appended to DMRs.. Permittee has sole responsibility for scheduling toxicity tests and ensure sufficient opportunities to complete and report the number of valid test results required for each monitoring period.
- g. The permittee is responsible for reporting a valid test during each monitoring period. However, the Department acknowledges that invalid tests may occur. All the following conditions must be satisfied for the permittee to comply with Whole Effluent Toxicity (WET) testing requirements for a particular monitoring period when a valid test was not obtained.
 - (1) A minimum of five (5) tests have been conducted which were invalid in accordance with Part V.B.1.e above;
 - (2) The data and results of all invalid tests are attached to the DMR;
 - (3) At least one additional State-certified laboratory was used after two (2) consecutive invalid tests were determined by the first laboratory. The name(s) and lab certification number(s) of the additional lab(s) shall be reported in the comment section of the DMR; and
 - (4) A valid test was reported during each of the previous three reporting periods.

If these conditions are satisfied, the permittee may enter "H" in the appropriate boxes on the toxicity DMR and add the statement to the Comment Section of the DMR that "H indicates invalid tests."

- h. This permit may be modified based on new information that supports a modification in accordance with Regulation 61-9.122.62 and Regulation 61-68.D.

3. Biological Assessment

None Applicable to This Permit.

C. Groundwater Requirements

None Applicable to This Permit.

D. Sludge Disposal Requirements

1. a. and b. [Reserved].
 - c. Until such time as a specific federal sludge disposal permit is issued under the provisions of 40 CFR Part 503, the direct enforceability (§ 503.3(b)) of the sludge standards requires that the permittee shall not use or dispose of sewage sludge through practice for which requirements are established in 40 CFR Part 503, except in accordance with those requirements. If the Department includes State sludge permit requirements under R.61-9.503, the conditions of that permit shall apply in addition to any requirements under 40 CFR Part 503.
2. a. The permittee must obtain prior Departmental approval of planned changes in the facility when the alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
 - b. The sludge disposal permit may be modified or revoked and reissued if there are material and substantial alterations or additions to the permitted facility or activity (including a change or changes in the permittee's sludge use or disposal practice) which occurred after the permit issuance which justify the application of permit conditions which are different from or absent in the existing permit.
3. The sludge disposal permit may be terminated if there is a change in any condition that requires either a temporary or permanent reduction or elimination of any discharge or sludge use or disposal practice controlled by the permit.
4. Periodic inspections will be conducted by Department authorized representatives to ensure compliance with State regulations and permit stipulations. Any necessary modification to this permit may be based upon these evaluations.
5. Records of monitoring required by the permits related to sludge use and disposal activities must be kept at least five (5) years (or longer as required by 40 CFR Part 503 or R.61-9.503).
6. Sludge monitoring procedures shall be those specified in 1) R.61-9.503; 2) 40 CFR Part 503; 3) 40 CFR Part 136; or 4) other procedures specified in the sludge permit (in that order of "preference" depending on the availability and applicability of a particular method at the time the sludge permit is issued).
7. The permittee shall submit the results of all sludge monitoring if done more frequently than required by the sludge permit. The permittee may be required to maintain specific records at the facility and on request may also be required to furnish them to the Department.
8. Odor Control Requirements

The permittee shall use best management practices normally associated with the proper operation and maintenance of a sludge wastewater treatment site, any sludge storage or lagoon areas, transportation of sludges, and all individual activities permitted under R.61-9.503 to ensure that an undesirable level of odor does not exist.

- a. The permittee is required to prepare an odor abatement plan for the sewage sludge treatment sites, any sludge storage or lagoon areas, and land application or surface disposal sites. It must be noted this state regulation that went into effect on June 27, 2003, and continues in effect, required permittees that land-apply sludge to prepare the plan by December 24, 2003. Otherwise, the permittee had until June 27, 2004 to prepare the plan and this requirement remains in effect. The plan must have included the following topics:
 - (1) Operation and maintenance practices which are used to eliminate or minimize undesirable odor levels in the form of best management practices for odor control.
 - (2) Use of treatment processes for the reduction of undesirable odors;
 - (3) Use of setbacks.
 - (4) Contingency plans and methods to address odor problems for the different type of disposal/application methods used.
- b. Unless otherwise requested, prior to issuance of a new or expanded land application disposal permit (either NPDES or ND), the Department may review the odor abatement plan for compliance with this Part (503.50). The Department may require changes to the plan as appropriate.
- c. No permittee may cause, allow, or permit emission into the ambient air of any substance or combinations of substances in quantities that an undesirable level of odor is determined to result unless preventative measures of the type set out below are taken to abate or control the emission to the satisfaction of the Department. When an odor problem comes to the attention of the Department through field surveillance or specific complaints, the Department may determine, in accordance with section 48-1-120 of the Pollution Control Act, if the odor is at an undesirable level by considering the character and degree of injury or interference to:
 - (1) The health or welfare of the people;
 - (2) Plant, animal, freshwater aquatic, or marine life;
 - (3) Property; or
 - (4) Enjoyment of life or use of affected property.
- d. After determining that an undesirable level of odor exists, the Department may require:
 - (1) the permittee to submit a corrective action plan to address the odor problem,
 - (2) remediation of the undesirable level of odor within a reasonable timeframe, and
 - (3) in an order, specific methods to address the problem.

- e. In accordance with R.61-9.503.50(e), if the permittee fails to control or abate the odor problems addressed in this section within the specified timeframe, the Department may revoke disposal/application activities associated with the site or the specific aspect of the sludge management program.

E. Land Application

Not Applicable to This Permit.

F. Pretreatment

1. Pretreatment Regulations and Program Requirements

-Not Applicable-

2. Prohibited Discharges

The Permittee shall prohibit the discharge of pollutant(s) into its treatment works by any non-domestic source(s) if such pollutant(s) may inhibit or interfere with the operation or performance of the works. Further, the Permittee shall prohibit the introduction of the following pollutants into its treatment works:

- a. Pollutant(s) which create a fire or explosion hazard at the treatment plant or in the collection system; these include, but are not limited to, waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21.
- b. Pollutant(s) which will cause corrosive structural damage to the treatment plant or the collection system and in no case any influent of less than 5.0 standard pH units unless the plant is specifically designed for such influent.
- c. Solid or viscous pollutant(s) in amounts that would cause obstruction or interfere to flow in the treatment plant or in the collection system.
- d. Any pollutant including oxygen demanding (BOD, etc.) pollutants in the plant influent at a flow rate and / or concentration which would cause interference in treatment plant or in the collection system.
- e. Heat in amounts which would inhibit biological activity in the treatment plant or the collection system resulting in Interference and in no case in such quantities that temperature at the treatment plant or the collection system exceeds 40°C (104°F) unless the Department has, upon request, approved alternate temperature limits.
- f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin except for those allowed under 40 CFR 437.A. (Centralized Waste Treatment - Metals) in amounts that would cause interference or pass through.
- g. Pollutants which would result in toxic gases, vapors, or fumes within the treatment plant or the collection system in quantities that may cause acute worker health and safety problems.
- h. Any trucked or hauled pollutants, except at discharge points designated by the permittee.

G. Additional Operational Requirements

1. The wastewater treatment plant is assigned a classification of Group IV-B (Biological) in the Permit to Construct which is issued by the Department. This classification corresponds to an operator with a Grade A Certification.
2. [Reserved]
3. For parameters with a sample frequency of once per month or greater, the Permittee shall monitor (at least one sample) consistent with conditions established by this Permit on the **first (1st) Tuesday** of every calendar month, unless otherwise approved by the Department. (For example; with a once / week (01/07) sampling frequency, the permittee shall monitor one weekly sample on the day of the week noted during the monthly DMR reporting period.)

For parameters with a sampling frequency of less than once per month (if any), the permittee shall monitor these parameters on specific date noted above on any of the months during the appropriate reporting period unless otherwise approved by the Department. (For example, with a once per quarter (1/90) sampling frequency, the permittee may monitor on the day of the week noted in either the first, second or third month in the quarterly reporting period.)

For parameters requiring multiple samples for a single test the Permittee may collect the samples on any date during the reporting period, unless otherwise approved by the Department. The permittee must notify the Department of the planned sampling dates upon request.

In accordance with R.61-9.122.41(j)(1)(iii), the Department may waive compliance with the permit requirement for a specific sampling event for extenuating circumstances. Additional monitoring, as necessary to meet the frequency requirements of this Permit (Part III.A., III.B., and III.C., if applicable) shall be performed by the Permittee.

4. [Reserved]
5. For purposes of reporting, the Permittee shall use the reporting threshold equivalent to the PQL listed below and conduct analyses in accordance with the method specified below:

Parameter	Analytical Method	PQL
Oil & Grease (Hexane)	1664A	5.0 mg/l
Total Residual Chlorine	①	0.050 mg/l
Total Kjeldahl Nitrogen ♦	①	0.100 mg/l
Nitrate-Nitrite as N ♦	①	0.020 mg/l
Total Phosphorus	①	0.050 mg/l
Total Antimony	①	0.005 mg/l
Total Arsenic	①	0.005 mg/l

Total Cadmium	①	0.0001 mg/l
Total Chromium	①	0.005 mg/l
Total Cobalt	①	0.020 mg/l
Total Copper	①	0.010 mg/l
Total Lead	①	0.002 mg/l
Total Mercury	EPA 1669 (sampling); EPA 1631E (analysis) Low Level Mercury Method	0.0000005 mg/l
Total Nickel	①	0.010 mg/l
Total Selenium	①	0.005 mg/l
Total Silver	①	0.005 mg/l
Total Tin	①	0.010 mg/l
Total Titanium	①	0.050 mg/l
Total Vanadium	①	0.005 mg/l
Total Zinc	①	0.010 mg/l

- ◆ There being no EPA accepted method to directly measure Total Nitrogen, it should be reported as the sum of Total Kjeldahl Nitrogen (TKN) and Nitrate-Nitrite Nitrogen (NO₃+NO₂)-N concentrations from each sample.
- ① The Permittee must use a suitable analytical method (40 CFR Part 136 approved) from a SCDHEC certified laboratory with a PQL equal to or lower than the PQL listed above. If the permittee is using a PQL below the PQL listed above, then for purposes of reporting, the lower PQL shall be used in accordance with Part II.J.4.b.

H. Wastewater Design Flow

- a. For the purposes of identification of the treatment capacity (under R.61-67.300. A.8), the monthly average design flow is 12.0 MGD.
- b. For NPDES billing (under R.61-30. B(2)(b)), the "actual flow limit" for this wastewater treatment facility shall be identified as the monthly average design flow of 12.0 Million Gallons per Day.
- c. For the purposes of effluent limitations for the Centralized Waste Treatment Category (Metals), the identified treatment capacity is 40,000 GPD. Construction Permit(s) for the metal-bearing centralized treatment stream will be limited to this volume.

I. Water Treatment Plant Notification

The permittee shall notify the following downstream water treatment plants of any emergency condition, plant upset, bypass or other system failure, which has the potential to affect the quality of water withdrawn for drinking purposes:

(1) None Applicable to This Permit.

This notification should be made as soon as possible and in anticipation of such event, if feasible, without taking away any response time necessary to attempt to alleviate this situation.

J. Conditional Combined Total Discharge Flow Limitation.

1. Whenever treated effluent is pumped to both this (Wateree River) and the Rapid Infiltration Basin (ND0068411) outfalls, the permittee shall ensure that cumulative total flow from the WWTP as measured at its effluent flow meters does not exceed the monthly average value of Twelve (12.0) Million Gallons per Day.
2. Whenever effluent has been discharged at both outfalls within the same calendar month, The Permittee shall state so in narrative on Discharge Monitoring Reports of both SC0043451 and ND0068411 for that month.

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**BACTERIA SUPPLEMENTAL DATA SHEET
 MONITORING PERIOD**

YEAR MO DAY		YEAR MO DAY	
FROM		TO	

Select the current daily maximum limit	<input type="checkbox"/> 349 MPN/100 ml (E.coli) <input type="checkbox"/> 104 MPN/100 ml (Enterococci) <input type="checkbox"/> 501 MPN/100 ml (Enterococci) <input type="checkbox"/> 43 MPN/100 ml (Fecal coliform)
--	---

1. Report data and sample time for daily maximum bacteria value greater than the permitted limitation.

Sample Result (MPN/100 ml) §	Sample Date (mm/dd/yyyy)	Sample Time (24 Hr. Format)	Parameter
	/ /	: hrs	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform

§ Sample result above must be less than or equal to 800 MPN/100 ml for E. coli and Enterococci or less than or equal to 200 MPN/100 ml for Fecal Coliform to use this form.

2. Two additional bacterial samples collected within 48 hours of the original sample result (of item #1) that exceeded the daily maximum limitation.

Sample Number	Sample Result (MPN/100 ml)	Sample Date (mm/dd/yyyy)	Sample Time (24 Hr. Format)	Parameter
1.		/ /	: hrs	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform
2.		/ /	: hrs	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform

The two additional sample results in item #2, do not exceed the daily maximum bacteria limits in the permit and were collected within 48-hours of the original sample result of item #1.

Yes

No*

3. Report the total number of bacterial samples collected in the previous twelve months: _____
 (If requested, this data must be provided to the Department to verify this information)

4. Choose one of the following:

- a. The number from item #3 above is less than 120; and no more than one (1) bacterial sample exceeded the daily maximum limit in the previous twelve (12) months, and that value is identified in item #1 above.

- b. The number in item #3 above is 120 samples or more, and no more than four (4) individual bacterial samples exceeded the daily maximum limit in the previous twelve (12) months, and those values were:

Sample Number	Sample Result (MPN/100 ml)	Sample Date (mm/dd/yyyy)	Parameter
1.	Same as Item #1 above	Same as Item #1 above	Same as Item #1 above
2.		/ /	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform
3.		/ /	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform
4.		/ /	<input type="checkbox"/> E.coli <input type="checkbox"/> Enterococci <input type="checkbox"/> Fecal coliform

- c. Neither (a) **nor** (b) above is true*.

5. The following statements are true:
- The disinfection equipment and wastewater solids handling system were fully functional and operating during this monitoring period.
 - There is neither an existing Consent Order nor Administrative Order is associated with the facility's operation of this disinfection system.
 - The laboratory data included with this report is sufficiently sensitive to accurately represent the effluent bacteria concentrations. No values for the monitoring period were reported as ">" greater than.

* If you check any of the starred boxes or if statements 5(a), (b) or (c) are not true, you cannot use this form.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name: _____

Signature: _____

Date: _____

Note: The bacteria supplemental data sheets are required only in the event the permittee reports bacteria data under Part III.A.4.



RATIONALE

Permitting Engineer: Murali Koppa
Date: April 25, 2017

Name of Facility: Palmetto Utilities / Spears Creek WWTP
NPDES Permit Number: SC0043451

Facility Rating: Major Minor
 Issuance (New) Reissuance
 Modification Expansion of existing facility

Facility Description (SIC code): 3X Sequential Batch Reactors; Influent PS → Flow meter → Bar Screens → Grit Removal → 3X continuous inflow SBRs → Effluent Flow EQ Tanks → Disinfection by UV → Flow Meters → Effluent PS → ±12-mile FM → Diffuser in Wateree River. Aerobic Sludge Digestion → Polymer Addition → Belt Press → Municipal Landfill. (Standard Indl. Classification 6514, "Dwellings Other Than Apartment Operators")

WWTP Location: the dead-end of Brazell Lane, about 1/3 mile WNW of Hwy. S-28-102 (Highway Church Road) bridge over I-20, in turn about 3 miles S. of Elgin, South Carolina.

Discharge location: near the northwest corner - Interstate Highway 20 at Wateree River crossing.

County: Kershaw
Watershed: Catawba-Santee (Cycle - 03), unit #03050104-03, Wateree River (Middle)

NPDES Permit Application type: EPA Form 3510-2A and -2C for Centralized Waste Treatment / Metals
Application Received Date: Nov. 10th 2016 (incomplete) and April 12th 2017 (complete).

If this application is for a new or expansion of an existing facility, is the anti-degradation assessment completed, per the requirements of R.61-68. D: Yes

Number of Outfalls: One (1)
Effluent Comprised of: Domestic Waste Water
Receiving Water (RW): Wateree River
RW Classification (from R.61-68): Freshwaters (FW)

Discharge to Impaired Waters: Yes (see State 303(d) list for impaired waters for year 2014).
If Yes, list impairment details: AL-DO and REC-E. COLI @ CW-019 (±3 river mi. upstream, at US 1 / US 601), AL-DO and FISH-HG @ CW-214 (immediate downstream, at Interstate Hwy. 20) and FISH-HG @ CW-206 (±44 river miles downstream, at US Highway 378 / 76).

Is the discharge to a waterbody or for a parameter listed in an approved TMDL? No
If Yes, list the parameter(s) for which the TMDL is written and the waterbody segments impacted: -N/A-

Does any discharge have the potential to affect a threatened or endangered species? Yes
(endangered species information from SCDNR Heritage Trust, 2008)

If Yes, list the species and the waterbody in which the species resides: Short nose Sturgeon, Wateree and Catawba Rivers.

Design Average Discharge: Twelve (12.0) Million Gallons per Day.

EPA review of the draft permit is required if any box below is checked (Mark all that apply)

- Major permits (POTW 1.0 MGD or more OR meets "Major" criteria in EPA Non-Municipal Permit Rating system)
- Minor permits (Private facility with average discharge 0.5 MGD or greater)
- Permits with discharges which may adversely affect the waters of another State (Coordination with the other State is also required)
List State and name of waterbody(ies) that reach affected state: -N/A-
- Permits with site-specific limits for any parameter(s)
List parameters with site-specific limits:
- Priority permits
- Modification(s) to any permit listed above or a modification that changes a permit to put it into one of the above categories (where it previously was not)
- Modification to any permit where the schedule of compliance interim dates are extended more than once

Stream Data from Wasteload Allocation dated (Aug. 16th 2016)

Receiving Stream Flow Data:

7Q10 at discharge point (Q_{7Q10})	800.000 cfs	516.129 mgd
Average Annual Flow at discharge point (AAF_d)	5852.000 cfs	3775.484 mgd

Treated wastewater discharged from this outfall at the Design Average Flow does not have the potential to affect an existing or proposed surface water drinking water source or any state-approved source water protection area (SWPA). Please refer to sections II.B and G of this rationale for additional information on source water protection.

Map showing the SWP area and the discharge point included: N/A

7Q10 at source water protection area boundary (Q_{7Q10i})	0.000 cfs	0.000 mgd
Average Annual Flow at source water protection area boundary (AAF_i)	0.000 cfs	0.000 mgd

Data from Discharge Monitoring Reports (DMRs) for the months (-N/A; there has been no discharge to-date at this outfall-) and the NPDES permit application as well as all subsequently presented data have been used to evaluate permit limitations.

I. GENERAL INFORMATION

- A. The effluent from this facility may be subject to the requirements of any of the following regulations: R.61-68, R.61-69, R.61-9.122, 124, 125, 129, 133, and 403; 40 CFR Part 136; Subchapter N (40 CFR Parts 400 through 402 and 404 through 471); and R.61-9.503, 504 and 505.
- B. Authority: This permit is written in accordance with applicable laws and regulations including, but not limited to, Regulation 61-9, Regulation 61-68, Pollution Control Act and Clean Water Act.
- C. Under R.61-9.124.8 (Fact Sheet), a fact sheet shall be prepared for every draft permit for a major NPDES facility or activity, for every Class I sludge management facility, for every NPDES draft permit that incorporates a variance or requires an explanation under section 124.56(b), and for every draft permit which the Department finds is the subject of wide-spread public interest or raises major issues. The Rationale will be included as an attachment to the Fact Sheet prepared under this regulation.
- D. The conclusions noted in the Rationale establish proposed effluent limitations and permit requirements addressed in R.61-9.122.43 (Establishing Permit Conditions), R.61-9.122.44 (Establishing Limitations, Standards and other permit conditions) and other appropriate sections of R.61-9.

II. RATIONALE GUIDANCE PROCEDURES

- A. The receiving waterbody 7Q10, annual average flow or other critical flow condition at the discharge point, and 7Q10, annual average flow, or other critical flow condition for source water protection are determined by the SCDHEC's Wasteload Allocation Section. The 7Q10, Annual Average Flow or other critical flow conditions are based on information published or verified by the USGS, an estimate extrapolation from published or verified USGS data or from data provided by the permittee. These flows may be adjusted by the Wasteload Allocation Section to account for existing water withdrawals that impact the flow. The 7Q10 (or 30Q5 if provided by the applicant), annual average flow at the discharge point, or other critical flow condition or 7Q10 (or 30Q5 if provided by the applicant), annual average flow or other critical flow condition for source water protection for a proposed or existing surface water drinking water intake will be used to determine dilution factors, as appropriate, in accordance with R.61-68.C.4.a & 4.b for aquatic life, human health, and organoleptic effects respectively.
- B. Water and organism consumption, drinking water MCLs data will be evaluated as human health values when calculating dilution factors. "The Department may, after Notice of Intent included in a notice of a proposed NPDES permit in accordance with Regulation 61-9.124.10, determine that drinking water MCLs or W/O shall not apply to discharges to those waterbodies where there is: no potential to affect an existing or proposed drinking water source and no state-approved source water protection area. For permitting purposes, a proposed drinking water source is one for which a complete permit application, including plans and specifications for the intake, is on file with the Department at the time of consideration of an NPDES permit application for a discharge that will affect or has the potential to affect the drinking water source." See R.61-68.E.14.c.(5).

The Department will implement this protection in NPDES permits using the source water protection program already developed for the drinking water program. A source water protection program was developed originally in 1999 to define the source water protection areas for each drinking water intake. The program

was designed to identify source water protection areas (SWPAs) to aid drinking water systems in identifying sources of potential contamination that could affect their intakes. In September 2009, this program was modified to redefine the SWPAs as smaller, more manageable areas. The revised document developed in September 2009 is entitled "South Carolina Drinking Water Source Assessment and Protection Program." For the purposes of NPDES permitting, the SWPA referred to in Regulation 61-68.E.14.c(5) is the Primary Protection Area defined in the revised assessment and protection document. More information regarding the use of these protection areas is provided later in this rationale with the discussion of the procedure for establishing permit limits in Section G.2.

- C. Application of numeric criteria to protect human health: If separate numeric criteria are given for organism consumption, water and organism consumption (W/O), and drinking water Maximum Contaminant Levels (MCLs), they shall be applied as appropriate. The most stringent of the criteria shall be applied to protect the existing and classified uses of the waters of the State. See R.61-68.E.14.b.(1).
- D. Numeric criteria have been established in R.61-68 based on organoleptic data (prevention of undesirable taste and odor). For those substances which have aquatic life and/or human health numeric criteria and organoleptic numeric criteria, the most stringent of the three shall be used for derivation of permit effluent limitations. See R.61-68.E.13.
- E. Sampling Frequency: Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit (R.61-9.122.41). Typically requirements to report monitoring results shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge but in no case less than once a year (R.61-9.122.44)
- F. Compliance Schedules:
 - 1. A person issued an NPDES permit by the Department who is not in compliance with applicable effluent standards and limitations or other requirements contained therein at the time the permit is issued, shall be required to achieve compliance within a period of time as set forth by the Department, with effluent standards and limitations, with water quality standards, or with specific requirements or conditions set by the Department. The Department shall require compliance with terms and conditions of the permit in the shortest reasonable period of time as determined thereby or within a time schedule for compliance which shall be specified in the issued permit.
 - 2. If a time schedule for compliance specified in an NPDES permit which is established by the Department, exceeds nine (9) months, the time schedule shall provide for interim dates of achievement for compliance with certain applicable terms and conditions of the permit. (R.61-9.122.47)
- G. Procedure for establishing effluent limitations:
 - 1. Effluent limits (mass and concentration) for Five day Biochemical Oxygen Demand (BOD₅), Ultimate Oxygen Demand (UOD), Dissolved Oxygen (DO), Total Ammonia Nitrogen (as N), and Nutrients are established by the WLA Section, with consideration given to technology-based limitations.

- a. Five day Biochemical Oxygen Demand BOD₅, Ultimate Oxygen Demand (UOD), Dissolved Oxygen (DO):

Effluent limits for conventional oxygen demanding constituents (BOD₅, UOD and DO) are established to protect in-stream water quality and uses, while utilizing a portion of the assimilative capacity of the receiving water. The ability of a water body to assimilate oxygen-demanding substances is a function of its physical and chemical characteristics above and below the discharge point. Various mathematical techniques, called models, have been developed to estimate this capacity. The Department follows the procedures as outlined in the "State/EPA Region IV Agreement on the Development of Wasteload Allocations/Total Maximum Daily Loads and NPDES Permit Limitations" dated October 30, 1991 (as updated) for determining the assimilative capacity of a given water body. Mathematical models such as QUAL2E and QUAL2E-UNCAS are used in accordance with "Enhanced Stream Water Quality Models QUAL2E and QUAL2E-UNCAS: Documentation and Users Manual" (EPA/600/3-87/007; dated May 1987) as updated. BOD₅ limit based on the Wasteload Allocation is considered to be the monthly average limit. The weekly average limit is established by multiplying the monthly average limit by 1.50. This multiplier (1.50) is equal to the ratio between weekly average and monthly average BOD₅ limits for secondary treatment (R.61-9.133.102). For facilities subject to secondary treatment regulation the BOD₅ limits will be in accordance with Regulation R.61-9.133.102. These parameters will be identified in Part III of this rationale when they are applicable to the permit.

- b. Total Ammonia Nitrogen (as N):

Ammonia limitations based on oxygen demand will be determined from modeling information as described above. These values will be used as monthly average derived limits and a weekly average will be determined by multiplying the monthly average derived limit by 1.50. These values will be compared with the ammonia water quality criteria for protection of aquatic life from Regulation 61-68, as shown below. The more stringent of the limitations will be imposed. Calculations for aquatic life criteria and other wasteload recommendations will be shown later in Part III of this rationale when ammonia is a pollutant of concern.

Ammonia limits based on the 1999 Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update). The 1999 Ammonia Update contains EPA's most recent freshwater aquatic life criteria for Total Ammonia Nitrogen (as N), superseding all previous EPA recommended freshwater criteria for ammonia. The 1999 Ammonia Update pertains to Fresh Waters. EPA has issued a Federal Register notice of availability for the 1999 Update, which summarizes changes in the 1999 Update and describes EPA's recommendations for implementing the criteria. The full text of the Federal Register Notice is available at <http://www.epa.gov/ost/standards/ammonia/> on the Internet. The thirty-day (monthly) average, and weekly average limits for Total Ammonia Nitrogen (as N) are calculated using the following equations (R.61.68; Attachment 3 "Calculation of Freshwater Ammonia Criteria"):

- (i) Determining the Criterion Concentration:

Step 1: (1) Establishing the CCC (Criterion Continuous Concentration) when fish early life stages (ELS) are **present**:

$$\text{CCC (in mg N/L)} = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \times \left\{ \min(2.85, 1.45 \times 10^{0.028 \times (25-T)}) \right\}$$

- (2) Establishing the CCC (Criterion Continuous Concentration) when fish early life stages (ELS) are **absent**:

$$\text{CCC (in mg N/L)} = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \times (1.45 \times 10^{0.028 \times (25-\max(T,7))})$$

- Step 2: (1) Establishing the CMC (Criterion Maximum Concentration) when salmonids are **present**:

$$\text{CMC (in mg N/L)} = \left\{ \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right\}$$

- (2) Establishing the CMC (Criterion Maximum Concentration) when salmonids are **absent**:

$$\text{CMC (in mg N/L)} = \left\{ \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}} \right\}$$

Where:

CCC: Criterion Continuous Concentration in mg N/L

CMC: Criterion Maximum Concentration in mg N/L

pH: pH of receiving stream provided by WLA Section in standard units (typically assumed to be 7.5 standard units)

T: Critical Summer and Winter temperature of the receiving stream in °C, provided by WLA Section.

max (T, 7): Critical Summer and Winter temperature of the receiving stream in °C, provided by WLA Section, or 7°C whichever is higher.

- Step 3: Calculating the Dilution Factor based on 7Q10 of the receiving stream (R.61-68.C.4.a)

$$DF_1 = \left(\frac{Q_{7Q10} + Q_d}{Q_d} \right)$$

Where:

Q_{7Q10} 7Q10 for the receiving stream in mgd

Q_d Wastewater Treatment Plant Discharge in mgd

- Step 4: Calculating Limits for Total Ammonia Nitrogen (as N):

For protection of aquatic life:

- (1) Monthly Average Limit (
- C_{avg}
-):

$$C_{avg} = (CCC \times DF_1) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

- (2) Weekly Average Limit (
- C_{wtkly}
-):

$$C_{wtkly} \text{ (mg/l)} = 1.5 \times C_{avg}$$

The multiplier used will be consistent with secondary treatment multipliers for weekly average values under R.61-9.133.

- (3) Daily Maximum Limit (
- C_{max}
-):

$$C_{max} = (CMC \times DF_1) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

Where:

C_b Background Total Ammonia Nitrogen (as N) Concentration in mg/l, provided by WLA Section

Q_{7Q10} 7Q10 for the receiving stream in mgd

Q_d Wastewater Treatment Plant Discharge in mgd

The most restrictive of either limits calculated to protect aquatic life or oxygen demand will be used. See Part III for description of the controlling limit.

Note: For receiving stream flow data, see table provided earlier.

Note: Regulation R.61-68 Attachment 3 "Calculation of Freshwater Ammonia Criteria" provides equations for establishing the CMC (Criterion Maximum Concentration) for determining the daily maximum permit limit for Total Ammonia Nitrogen (as N). Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia (dated December 22, 1999) requires the use of stream 1Q10 or 1B3 as the design flow for calculating the daily maximum limits using the CMC. Since 1Q10 or 1B3 are not available, the Department will establish only the monthly average and weekly average effluent limits for Total Ammonia Nitrogen (as N) using the procedures stated above.

c. Discharges of Nutrients:

In order to protect and maintain lakes and other waters of the State, consideration is given to the control of nutrients reaching the waters of the State. Therefore, in accordance with regulation R.61-68.E.11, the Department controls the nutrients as prescribed below. Nutrient limitations will be determined from the best available information and/or modeling performed by the Wasteload Allocation Section to meet these water quality standards.

- i. Discharges of nutrients from all sources, including point and nonpoint, to waters of the State shall

- be prohibited or limited if the discharge would result in or if the waters experience growths of microscopic or macroscopic vegetation such that the water quality standards would be violated or the existing or classified uses of the waters would be impaired. Loading of nutrients shall be addressed on an individual basis as necessary to ensure compliance with the narrative and numeric criteria.
- ii. Numeric nutrient criteria for lakes are based on an ecoregional approach which takes into account the geographic location of the lakes within the State and are listed below. These numeric criteria are applicable to lakes of 40 acres or more. Lakes of less than 40 acres will continue to be protected by the narrative criteria.
 1. For the Blue Ridge Mountains ecoregion of the State, total phosphorus shall not exceed 0.02 mg/l, chlorophyll *a* shall not exceed 10 ug/l, and total nitrogen shall not exceed 0.35 mg/l.
 2. For the Piedmont and Southeastern Plains ecoregions of the State, total phosphorus shall not exceed 0.06 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.
 3. For the Middle Atlantic Coastal Plains ecoregion of the State, total phosphorus shall not exceed 0.09 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.
 - iii. In evaluating the effects of nutrients upon the quality of lakes and other waters of the State, the Department may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms in order to protect the existing and classified uses of the waters.
 - iv. The Department shall take appropriate action, to include, but not limited to: establishing numeric effluent limitations in permits, establishing Total Maximum Daily Loads, establishing waste load allocations, and establishing load allocations for nutrients to ensure that the lakes attain and maintain the above narrative and numeric criteria and other applicable water quality standards.
 - v. The criteria specific to lakes shall be applicable to all portions of the lake. For this purpose, the Department shall define the applicable area to be that area covered when measured at full pool elevation.
2. Effluent concentration limits (C_{efflim}) for pollutants other than the parameters listed in G.1 a-c above are established using the following procedures:

Following information to be used (where applicable) for establishing effluent concentration limits:

Q_{7Q10}	7Q10 of the receiving stream at the discharge point in mgd.
AAF_d	Stream Average Annual Flow (AAF) at the discharge point in mgd.
Q_{7Q10i}	7Q10 for the receiving stream at water treatment plant (WTP) intake downstream of the discharge in mgd.
AAF_i	Stream Average Annual Flow at water treatment plant (WTP) intake downstream of the discharge in mgd.

Q_d Design Wastewater Treatment Plant Flow in mgd

a. Determine dilution factors:

The following information is to be used (where applicable) for establishing effluent concentration limits:

DF_1 : Dilution factor based on 7Q10 of the receiving stream at the discharge point (Q_{7Q10}). This dilution factor is used to determine the derived limits for protection of the following aquatic life and human health concerns for the reasons indicated:

- i. Aquatic Life (see R.61-68.C.4.a(1)). Protection of aquatic life on a short-term basis is needed at the point where aquatic organisms become exposed to the discharge.
- ii. Human Health – Organism Consumption for parameters identified as non-carcinogens per R.61-68.C.4.b(1). Protection for human health on a short-term basis for consumption of aquatic organisms is needed at the point the aquatic organisms become exposed to the discharge.

$$DF_1 = \left(\frac{Q_{7Q10} + Q_d}{Q_d} \right)$$

DF_2 : Dilution factor, at the discharge point, based on the Average Annual Flow of the receiving stream at the discharge point (AAF_d). This dilution factor is used to determine the derived limits for protection of the following aquatic life, human health and organoleptic concerns for the reasons indicated:

- i. Human Health – Organism Consumption for parameters identified as carcinogens per R.61-68.C.4.b(1). Protection for human health on a long-term basis to prevent cancer due to consumption of aquatic organisms is needed at the point the aquatic organisms become exposed to the discharge.
- ii. Organoleptic effects per R.61-68.C.4.b(1). Protection for taste and odor issues related to the discharge is needed at the point where the discharge enters the stream.

$$DF_2 = \left(\frac{AAF_d + Q_d}{Q_d} \right)$$

DF_3 : Dilution factor based on the 7Q10 at the source water protection area boundary for protection of a proposed or existing water intake downstream of the discharge (Q_{7Q10}). This dilution factor is used to determine the derived limits for protection of the following human health concerns for the reasons indicated:

- i. Human Health - Water and Organism (W/O) Consumption for parameters identified as non-carcinogens per R.61-68.C.4.b(1) and E.14.c(5) to protect for short-term health effects when the discharge has the potential to affect a surface water drinking water intake. Protection of human health relative to drinking the water from the waterbody and consuming aquatic organisms from the same waterbody is provided by this criterion, but drinking the water withdrawn from the waterbody may require a higher level of protection in terms of applicable dilution than consumption of organisms.
- ii. Human Health - Drinking Water Maximum Contaminant Level (MCL) for parameters identified as non-carcinogens per R.61-68.C.4.b(1) and E.14.c(5) to protect for short-term health effects when the discharge has the potential to affect a surface water drinking water intake. Protection of human health relative to drinking the water from the waterbody after conventional treatment per R.61-68.G is provided by this criterion

$$DF_3 = \left(\frac{Q_{7Q10i} + Q_d}{Q_d} \right)$$

DF₄: This dilution factor is based on the Average Annual Flow or other critical flow condition (*AAF_i*) for protection of a proposed or existing surface water drinking water intake that the discharge has the potential to affect. This dilution factor is used to determine the derived limits for protection of the following human health concerns for the reasons indicated:

- i. Human Health-Water and Organism Consumption for parameters identified as carcinogens per R.61-68.C.4.b(1) and E.14.c(5) to protect for long-term health effects due to cancer when the discharge has the potential to affect a surface water drinking water intake. Protection of human health relative to drinking the water from the waterbody and consuming aquatic organisms from the same waterbody is provided by this criterion, but drinking the water withdrawn from the waterbody may require a higher level of protection in terms of applicable dilution than consumption of organisms.
- ii. Human Health - Drinking Water Maximum Contaminant Level (MCL) for parameters identified as carcinogens per R.61-68.C.4.b(1) and E.14.c(5) to protect for long-term health effects due to cancer when the discharge has the potential to affect a surface water drinking water intake. Protection of human health relative to drinking the water from the waterbody after conventional treatment per R.61-68.G is provided by this criterion.

$$DF_4 = \left(\frac{AAF_i + Q_d}{Q_d} \right)$$

For both *DF₃* and *DF₄*, to satisfy the mixing zone requirements of R.61-68.C.10(a) for both W/O and MCL criteria, the Department will use the following flows to determine dilution:

1. The following applies to discharges and intakes in flowing rivers:

- a. Where the discharge is within the SWPA (15 river miles) of the intake, the flow at the 15-river mile boundary of the tributary with the largest applicable critical flow will be used.
 - b. Where the discharge is outside the SWPA (15 river miles) of the intake, the applicable critical flow at the intake will be used.
2. When the discharge is either in the tributary to a lake or in a lake and the intake is in the same lake that does not behave as a run-of-river impoundment*, the flow is determined using the sum of the applicable critical flows of all tributaries entering the lake.
 3. The following applies when both the discharge and the intake are in a lake arm that behaves as a run-of-river impoundment*:
 - a. Where the discharge is within the SWPA (15-mile buffer which may include both lake and river miles) of the intake, the flow at the 15-mile boundary of the tributary with the largest applicable critical flow will be used.
 - b. Where the discharge is outside the SWPA (15-mile buffer which may include both lake and river miles) of the intake, the applicable critical flow at the intake will be used.
 4. Where the discharge is in the arm of a lake and the intake is in the upper reach of another arm of the lake, no protection of W/O or MCL criteria is needed because the discharge does not have the potential to affect the intake,
 5. If the discharge has the potential to affect multiple intakes, the SWPA of the intake closest to the discharge will be protected. However, the permittee may be required to provide notification to all potentially affected intakes.

* Run-of-river impoundment is defined as a lake or reservoir (or arm of a lake or reservoir) that is narrow and/or shallow offering little dilution or delay in contaminant flow toward an intake.

Dilution Factors (using formulas above):

DF_1	44.0108
DF_2	315.6237
DF_3 , if applicable	1
DF_4 , if applicable	1

- b. Determine monthly average derived limits using the following procedures:

WQS_{al} Freshwater Standard (based on an established criteria or other published data per R.61-68), for protection of Aquatic Life; may be a CCC or CMC as defined below

WQS_{org} Freshwater Standard (based on an established criteria or other published data per R.61-68), for protection of Human Health – Organism Consumption

- WQS_{wo} Freshwater Standard (based on an established criteria or other published data per R.61-68), for protection of Human Health – Water & Organism Consumption.
- WQS_{mcl} Freshwater Standard (based on an established criteria or other published data per R.61-68), for Drinking Water MCL (Maximum Contaminant Level).
- WQS_{ol} : Freshwater Standard (based on an established criteria or other published data per R.61-68), based on Organoleptic Data.
- C_{aqlife} Concentration limit derived from aquatic life data
- C_{HH} Concentration limit derived from human health data as determined from organism (C_{org}), water/organism (C_{wo}) and MCL (C_{mcl}) data
- C_b The background concentration of the concerned parameter in mg/l is typically determined from ambient monitoring data or data provided by applicant. If the waterbody to which the discharge flows is not on the 303(d) list, the 90th percentile of ambient monitoring data for aquatic life protection for the parameters identified in the Appendix (Water Quality Numeric Criteria) to Regulation 61-68 from the last 3 years, or whatever is available if less than 3 years, will typically be used. If the waterbody to which the discharge flows is not on the 303(d) list, the median value of ambient monitoring data for human health protection for the parameters identified in the Appendix (Water Quality Numeric Criteria) to Regulation 61-68 from the last 3 years, or whatever is available if less than 3 years, will typically be used. The background concentration is assumed to be zero (0) in the absence of actual data based on Departmental guidance and EPA recommendation.
- C_{ol} Concentration limit derived from organoleptic data
- i. Determine the derived limit for protection of Aquatic Life (C_{aqlife})
1. The following guidelines apply to determining aquatic life limits using this basic equation:

$$C_{aqlife} = (DF_1 \times WQS_{at}) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

- a Typically, the Criterion Maximum Concentration (CMC) is applied as a daily maximum derived limit and the Criterion Continuous Concentration (CCC) is applied as a monthly average derived limit, after consideration of dilution and background concentrations. Exceptions exist based on EPA criteria and are indicated for specific parameters. The CMC and CCC for specific metals will be adjusted using the procedures in 60 FR 22229, "Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance-Revision of Metals Criteria," May 4, 1995 and the "Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," Oct. 1, 1993 and applied as a daily maximum and monthly average, respectively, after consideration of dilution and background concentrations. For specific metals, this calculation is explained in detail later in this rationale.

monthly average = C_{aqlife} using CCC as WQS_{at}

daily maximum = C_{aqlife} using CMC as WQS_{al}

- b. If only a CMC exists for a particular parameter, the daily maximum derived permit limit will be set using that value, after consideration of dilution and background concentrations. If no other values (e.g., human health) exist for that parameter on which to base a monthly average limit and the discharge is continuous, the monthly average will be set equal to the daily maximum to satisfy Regulation 61-9.122.45(d). In no case shall the monthly average limit be set higher than the daily maximum limit. If only a CCC is given, it will be used as a monthly average derived limit and the daily maximum derived limit will be two (2) times the value obtained for the monthly average based on a simplified statistical procedure for determining permit limits recommended in Section 5.4.2 of the US EPA's "Technical Support Document for Water Quality-based Toxics Control", EPA/505/2-90-001, March 1991 (hereafter known as the TSD).

If a CCC exists and no CMC exists and no other acute or chronic data exists, the aquatic life limits are

monthly average = C_{aqlife} using CCC as WQS_{al}
 daily maximum = $2 \times C_{aqlife}$

If a CMC and no CCC exists, and no other acute or chronic data exists, the aquatic life limits are

monthly average = C_{aqlife} using CMC as WQS_{al}
 daily maximum = C_{aqlife} using CMC as WQS_{al}

- c. If only an acute toxicity effect concentration for a number of species for a particular pollutant is given as an LC_{50} , the lowest concentration should be divided by an acute-to-chronic ratio (ACR) of 10 and a sensitivity factor of 3.3, for an acceptable instream concentration in order to protect against chronic toxicity effects (from R.61-68.E.16.a(1)). Other acute toxicity data will be handled similarly. The value obtained from this calculation will be used as a monthly average derived limit after consideration of dilution and background concentrations. The daily maximum will be two (2) times the value obtained for the monthly average based on a simplified statistical procedure for determining permit limits recommended in Section 5.4.2 of the TSD considering an assumed coefficient of variation (CV) of 0.6 and 95th percentile occurrence probability.

monthly average = C_{aqlife} using other data as WQS_{al}
 daily maximum = $2 \times C_{aqlife}$

- d. If a chronic toxicity effect concentration for a number of species for a particular pollutant is given as a no observed effect concentration (NOEC), the lowest concentration should be divided by a sensitivity factor of 3.3 in order to protect against chronic toxicity to the most sensitive species (from R.61-68.E.16.a(2)).

Other chronic toxicity data will be handled similarly. The value obtained from this calculation will be used as a monthly average derived limit after consideration of dilution and background concentrations. The daily maximum will be two (2) times the value obtained for the monthly average based on a simplified statistical procedure for determining permit limits recommended in Section 5.4.2 of the TSD considering an assumed coefficient of variation (CV) of 0.6 and 95th percentile occurrence probability.

$$\begin{aligned} \text{monthly average} &= C_{aqlife} \text{ using other data as } WQS_{al} \\ \text{daily maximum} &= 2 \times C_{aqlife} \end{aligned}$$

- e. If both acute and chronic data are available for a particular pollutant, monthly average derived limits will be calculated as in (c) and (d) above for each acute and chronic, respectively. The more stringent of the monthly average derived limits will be the monthly average derived limit used after consideration of dilution and background concentrations. The daily maximum will be two (2) times the value obtained for the monthly average based on a simplified statistical procedure for determining permit limits recommended in Section 5.4.2 of the TSD considering an assumed coefficient of variation (CV) of 0.6 and 95th percentile occurrence probability.

$$\begin{aligned} \text{monthly average} &= C_{aqlife} \text{ using other data as } WQS_{al} \\ \text{daily maximum} &= 2 \times C_{aqlife} \end{aligned}$$

2. Consider the background concentration (C_b) of the parameter of concern. If the background concentration is equal to or greater than the applicable standard (WQS , as defined above) for the parameter of concern, then the derived concentration limit (C_{aqlife}) for that parameter is established equal to the standard (WQS) so that no additional amount of that pollutant is added to the waterbody. An exception exists where the naturally occurring instream concentration for a substance is higher than the derived permit effluent limitation. In those situations, the Department may establish permit effluent limitations (C_{efflim}) at a level higher than the derived limit, but no higher than the natural background concentration (i.e. a "rise above background" limit). In such cases, the Department may require biological instream monitoring and/or whole effluent toxicity (WET) testing (R.61-68.E.14.c(2)).

If C_b is not based on naturally occurring concentrations and

$$C_b \geq WQS$$

Then

$$C_{aqlife} = WQS.$$

If C_b is based on naturally occurring concentrations and

$$C_b \geq WQS$$

Then

$$C_{\text{aq life}} < C_{\text{eff lim}} \leq C_b.$$

- For the parameters listed in **Table A** below, Regulation 61-9.122.45(c) requires that permit limits be expressed in terms of total recoverable metal (with limited exceptions). In order to translate from the water quality criterion to a total recoverable metal, Regulation R.61-68.E.14.c(4) provides for the use of the EPA Office of Water Policy and "Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria", October 1, 1993. A subsequent revision published in the Federal Register (60 FR 22229) on May 4, 1995 updated the data in the original report. See R.61-68 Appendix for CMC and CCC values and equations, Attachment 1 for "Conversion Factors for Dissolved Metals" and Attachment 2 "Parameters for Calculating Freshwater Dissolved Metals Criteria that are Hardness-Dependent".

Per R.61-68.E.14.a(3), the CMC and CCC are based on a hardness of 25 mg/l if the ambient or mixed stream hardness is equal to or less than 25 mg/l. Concentrations of hardness less than 400 mg/l may be based on the mixed stream hardness if it is greater than 25 mg/l and less than 400 mg/l and 400 mg/l if the ambient stream hardness is greater than 400 mg/l. The ambient stream hardness is assumed to be 25 mg/l in the absence of actual stream data. Mixed stream hardness may be determined using flow-weighted effluent hardness and stream hardness.

The following equations and constants will be used to calculate aquatic life metals limits based on these documents. The values of the terms referenced in this section and determined from the equations below are included in the Metals spreadsheet attached to this rationale. The following metals are subject to this section:

Table A:

Parameter	k_{po}	a	CMC	CF_{CMC}	CCC	CF_{CCC}
			($\mu\text{g/l}$)		($\mu\text{g/l}$)	
Arsenic	0.48×10^6	-0.7286	340	100	150	100
Cadmium	4.00×10^6	-1.1307	0.95*	100*	0.83*	96.7*
Chromium+3	3.36×10^6	-0.9304	580*	31.6	68*	86
Chromium+6	3.36×10^6	-0.9304	16	98.2	11	96.2
Copper	1.04×10^6	-0.7436	3.8*	96	2.9*	96
Lead	2.8×10^6	-0.8	14*	99.3*	0.54*	99.3*
Mercury	2.91×10^6	-1.1356	1.6	85	0.091	85
Nickel	0.49×10^6	-0.5719	150*	99.8	16*	99.7
Zinc	1.25×10^6	-0.7038	37*	97.8	37*	98.6

* The equations for calculating the CCC, CMC, and conversion factors are given in the

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Appendix to Regulation 61-68 and Attachments 1 and 2 for each parameter. The values given for the CMC and CCC and CF in the table are based on 25 milligrams/liter (mg/l) hardness (as expressed as CaCO₃).

Effluent TSS concentration (TSS_e) (mg/l) (based on monthly average permit limit)	Error! Reference source not found.
Background or In-stream TSS concentration (TSS_b) (mg/l)	Error! Reference source not found.
Calculated In-stream Average TSS concentration after mixing (TSS_{avg}) (mg/l)	!Undefined Bookmark, TSSB

The equation for C_d below changes the total metal to dissolved metal. From Technical Guidance Manual for Performing Waste Load Allocations Book II, Rivers and Streams, EPA/440/484/022,

$$S = CCC \text{ or } CMC \text{ (adjusted for hardness)}$$

$$C_d = S \times CF$$

where C_d = Dissolved metal concentration ($\mu\text{g/l}$)

S = a constant to represent the CCC or CMC ($\mu\text{g/l}$)

CF = Conversion factor considered most relevant in fresh water for aquatic life as defined by EPA for each metal

Once the dissolved metal concentration is known, determine C_p using the equation for C_d above and the following equations.

$$C_p = C_d \times \left\{ 1 + \left(K_{pb} \times TSS_b \times 10^{-6} \right) \right\}$$

$$K_{pb} = K_{po} \times (TSS_b)^a$$

where C_p = Particulate sorbed metal concentration ($\mu\text{g/l}$). This value represents the revised water quality criterion for the metal to be used for ambient data comparison.

- K_{pb} = Linear partition coefficient using the stream TSS (liters/mg)
 K_{po} = Metal-specific equilibrium constant (liters/mg)
 α = Metal-specific constant
 TSS_b = Background or in-stream Total Suspended Solids (TSS) concentration (mg/l). The background TSS is assumed to be 1 mg/l in the absence of actual instream data based on the 5th percentile of ambient TSS data on South Carolina waterbodies from 1993-2000.

To determine the effluent limit (C_{aqlife}), use the following equations to translate the limits into a total recoverable metal concentration.

$$TSS_{avg} = \frac{(Q_d \times TSS_e) + (Q_{7Q10} \times TSS_b)}{Q_d + Q_{7Q10}}$$

where TSS_e = Effluent Total Suspended Solids (TSS) concentration (mg/l) determined from actual long-term average data or proposed permit limits if no data available.

TSS_{avg} = Average in-stream (mixed) TSS concentration (mg/l)

$$C_t = C_d \times \left\{ 1 + (K_p \times TSS_{avg} \times 10^{-6}) \right\}$$

$$K_p = K_{po} \times (TSS_{avg})^\alpha$$

where C_t = Total metal concentration ($\mu\text{g/l}$)

K_p = Linear partition coefficient (liters/mg). This is the distribution of metal at equilibrium between the particulate and dissolved forms.

Once C_t has been calculated, it is multiplied by DF_t and background concentrations are accounted for to obtain the derived limit (max or avg) (C_{aqlife}):

$$C_{aqlife} = (C_t \times DF_t) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

monthly average = C_{aqlife} based on CCC

daily maximum = C_{aqlife} based on CMC

3. Where a Water Effects Ratio (WER) is used to adjust a criterion, derived limits for the adjusted aquatic life criterion ($C_{aq\text{life-}adj}$) are calculated as follows. The WER is a type of site-specific permit effluent limit (as allowed by R.61-68.E.14.c(7)) derived using a ratio determined from EPA methodology. Both DHEC and EPA must approve the WER prior to implementation. See EPA's 1994 "Interim Guidance on the Determination and Use of Water-Effect Ratios (WERs) for Metals." The approved WER will be shown in the water quality spreadsheets on the Data sheet. The revised aquatic life value will be shown with the WER, hardness and dissolved metals adjustments, as appropriate, in the aquatic life columns on the Pollutant spreadsheet.

- a. For metals identified in #2 above, revise the equation for S as follows:

$$S = [\text{CCC or CMC (adjusted for hardness)}] \times \text{WER}$$

Follow the remaining calculations in #2 above to get an adjusted $C_{aq\text{life}}$ value that will be used to determine derived limits:

monthly average = $C_{aq\text{life-}adj}$ based on CCC

daily maximum = $C_{aq\text{life-}adj}$ based on CMC

- b. For other parameters, use the appropriate equation in #1 above to derive an adjusted $C_{aq\text{life}}$ value. The monthly average will be calculated as follows using the appropriate WQS_{dl} and the daily maximum calculated using the appropriate equations in #1 above.

$$C_{aq\text{life-}adj} = (DF_1 \times WQS_{dl} \times \text{WER}) - \left\{ C_h \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

4. Where the Recalculation Procedure is used to adjust a criterion, derived limits for the adjusted aquatic life criterion ($C_{aq\text{life-}adj}$) are calculated as follows. The Recalculation Procedure is intended to cause a site-specific criterion to appropriately differ from the State-adopted national aquatic life criterion if justified by demonstrated pertinent toxicological differences between the aquatic species that occur at the site and those that were used in the derivation of the criterion. It is important to note that the site (the portion of the waterbody or watershed being affected) must be clearly defined. This procedure is used to develop site-specific criteria in accordance with R.61-68.C.12. Both DHEC and EPA must approve the recalculated criterion prior to implementation.

The approved recalculated aquatic life criteria (SS-CCC and SS-CMC, as appropriate) will be shown adjusted for hardness on the Data spreadsheet. The additional dissolved metals adjustments, as appropriate, will be shown in the aquatic life columns on the Pollutant spreadsheet. If the parameter being adjusted is one of the metals in #2 above, SS will include all the appropriate metals adjustments.

$$C_{aq\text{life-}adj} = (DF_1 \times SS - \left\{ C_h \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\})$$

monthly average = $C_{aqlife-adj}$ based on CCC
daily maximum = $C_{aqlife-adj}$ based on CMC

5. Where a WER and recalculation procedure are combined to adjust a criterion, derived limits ($C_{aqlife-adj}$) for aquatic life protection are calculated by combining the calculations in #3 and #4.

$$C_{aqlife-adj} = (DF_1 \times SS \times WER) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

monthly average = $C_{aqlife-adj}$ based on CCC
daily maximum = $C_{aqlife-adj}$ based on CMC

6. Other scientifically defensible methods for developing site-specific aquatic life effluent limits or site-specific criterion may be used on a case-by-case basis.
- ii. Determine derived limit for protection of Human Health
1. The following guidelines apply to determining human health limits:
- The human health criterion given by Regulation 61-68 will be applied as a monthly average derived limit after consideration of dilution and background concentrations (C_{HH-avg}). Exceptions exist based on EPA criteria and are indicated for specific parameters. No limits on human health based on water and organism consumption or drinking water MCLs will be imposed if there is no potential to affect a drinking water intake or source water protection area (i.e., if there is no intake downstream of the discharge).
 - The daily maximum permit limit will be determined from the monthly average derived value from (a) above and a multiplier (M) determined using a statistical procedure recommended in Section 5.5 using average = 95th percentile from Table 5-3 in the TSD. The permitted or proposed number of samples per month (n) is used with the coefficient of variation (CV) to determine M . CV is assumed to be 0.6 as a default value if information is not known.

$$M = \frac{e^{(Z_n \sigma_n - 0.5 \sigma_n^2)}}{e^{(Z_d \sigma_n - 0.5 \sigma_n^2)}}$$

where:

$$\sigma_n^2 = \ln \left(\frac{CV^2}{n} + 1 \right)$$

$$\sigma^2 = \ln(CV^2 + 1)$$

CV = coefficient of variation of the effluent concentration. For a data set where $n > 10$, the CV is calculated as standard deviation divided by mean for the data set being evaluated. For data set where $n < 10$, the CV is estimated

to equal 0.6. For less than 10 items of data, the uncertainty in the CV is too large to calculate a standard deviation or mean with sufficient confidence. n = the number of effluent samples per month, (where frequency is less than 1/month, $n = 1$)

z_m = the percentile exceedance probability for the daily maximum permit limit (=2.326 for 99th percentile basis)

z_a = the percentile exceedance probability for the monthly average permit limit (=1.645 for 95th percentile basis)

$$C_{HH-max} = M * C_{HH-avg}$$

2. Consider the background concentration (C_b) of the parameter of concern. If the background concentration is equal to or greater than the applicable standard (WQS , as defined above) for the parameter of concern, then the derived concentration limit (C_{HHe}) for that parameter and for the protection of that standard is established equal to the standard (WQS). An exception exists where the naturally occurring instream concentration for a substance is higher than the derived permit effluent limitation. In those situations, the Department may establish permit effluent limitations (C_{efflim}) at a level higher than the derived limit, but no higher than the natural background concentration (i.e. a "rise above background" limit). In such cases, the Department may require biological instream monitoring and/or whole effluent toxicity (WET) testing (See R.61-68.E.14.c(3)).

If C_b is not based on naturally occurring concentrations and

$$C_b \geq WQS$$

Then, generally,

$$C_{HH} = WQS.$$

If C_b is based on naturally occurring concentrations and

$$C_b \geq WQS$$

Then, generally,

$$C_{HH} < C_{eff\ lim} \leq C_b.$$

3. Human Health – Organism Consumption (C_{org}).

- a. For Carcinogens

The Monthly Average is calculated as follows:

$$C_{org} = (DF_2 \times WQS_{org}) - \left\{ C_b \times \left(\frac{AAF_d}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{org-max} = M * C_{org}$$

- b. For Non-carcinogens

The Monthly Average is calculated as follows:

$$C_{org} = (DF_1 \times WQS_{org}) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{org-max} = M * C_{org}$$

4. Human Health – Water and Organism Consumption (C_{wo})

a. For Carcinogens

The Monthly Average is calculated as follows:

$$C_{wo} = (DF_2 \times WQS_{wo}) - \left\{ C_b \times \left(\frac{AAF_i}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{wo-max} = M * C_{wo}$$

b. For Non-carcinogens

The Monthly Average is calculated as follows:

$$C_{wo} = (DF_1 \times WQS_{wo}) - \left\{ C_b \times \left(\frac{Q_{7Q10}}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{wo-max} = M * C_{wo}$$

5. Human Health – Drinking Water Maximum Contaminant Level (MCL) (C_{mcl}).

a. For Carcinogens

The Monthly Average is calculated as follows:

$$C_{mcl} = (DF_4 \times WQS_{mcl}) - \left\{ C_b \times \left(\frac{AAF_i}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{mcl-max} = M * C_{mcl}$$

b. For Non-carcinogens

The Monthly Average is calculated as follows:

$$C_{mcl} = (DF_3 \times WQS_{mcl}) - \left\{ C_b \times \left(\frac{Q_{7Q10i}}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{mcl-max} = M * C_{mcl}$$

6. Human Health - Organoleptic criteria (C_{ol}).

The Monthly Average is calculated as follows:

$$C_{ol} = (DF_2 \times WQS_{ol}) - \left\{ C_b \times \left(\frac{AAF_d}{Q_d} \right) \right\}$$

The Daily Maximum is calculated as

$$C_{ol-max} = M * C_{ol}$$

- iii. Parameters given in a wasteload allocation for oxygen-demanding pollutants and nutrients will be limited as

monthly average = C_{wla}

weekly average = $1.50 \times C_{wla}$ (for POTW)

daily maximum = $1.50 \times C_{wla}$ (for private facilities)

- c. Determine most stringent of applicable water quality data using the monthly average derived limits determined or calculated above:

monthly average C_{efflim} = minimum of derived monthly averages (C_{aqlife} , C_{org} , C_{wo} , C_{mcl} , C_{ol} , C_{wla})

daily maximum C_{efflim} = minimum of derived daily maximums (C_{aqlife} , $C_{org-max}$, C_{wo-max} , $C_{mcl-max}$, C_{ol-max} , $C_{wla-max}$)

- d. Determine whether the discharge causes, has the reasonable potential to cause or contributes to a water quality violation

Regulation 61-9.122.44(d)(1)(i) states: "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Department determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

When determining whether a discharge causes, has the reasonable potential to cause or contributes to an instream excursion, the Department will use procedures which account for controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and, where appropriate, the

dilution of the effluent in the receiving water (R.61-9.122.44(d)(1)(ii)).

Based on the above statements, there are three scenarios when limitations are required, as follows:

- i. When data provided by the permit applicant indicates discharge values greater than the proposed limitation derived above, that discharge may cause an excursion above a narrative or numeric water quality criterion.
- ii. A discharge will be determined to contribute to an excursion of a water quality criterion when the waterbody is impaired (e.g., on the 303(d) list) for the parameter of concern and that parameter is also being discharged.
- iii. Reasonable potential to cause a water quality violation is determined using the following information:

Chapter 3 of the TSD provides information for determining the need for permit limits based on the regulatory statements above. A statistical procedure is also presented in Chapter 3 for use in determining reasonable potential from effluent data. "National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-Based Effluent Limitations Set Below Analytical Detection/Quantitation Level" draft dated March 22, 1994, offers recommendations on how to interpret data below detection capabilities to make a reasonable potential analysis.

All pollutants given in a wasteload allocation or an effluent limitation guideline will be limited in the permit.

When effluent data consists of non-quantifiable/non-detectable values or when no effluent data is available, other factors and information are considered to determine reasonable potential. In situations where a pollutant is known to be present in the wastestream (due to production data or other information), we know it is being discharged and has the potential to impact even though it may not be quantifiable. The fact that it is present will be enough information to say reasonable potential exists for that pollutant. Therefore, a reasonable potential decision is based on various data and information, and not just non-quantifiable/non-detectable data. Consideration is given to existing data, dilution in the stream, type of receiving water, designated use, type of industry/wastestream, ambient data, history of compliance, and history of toxic impact. If any source of information indicates reasonable potential to cause, or contribute to an exceedance of the water quality standard, a water quality limit will be developed.

Note: The result of the following calculations may indicate that reasonable potential does not exist. However, as stated above, other information may "override" this numerical determination to justify the need for a limit.

1. The procedure for determining reasonable potential from actual effluent data is explained in Box 3-2 on page 53 of the TSD. Multiplying factors are determined from Table 3-2 at a 95% confidence level and 95% probability in Section 3.3.2. The following describes the procedures used for determining reasonable potential for chemical-specific parameters, under certain circumstances.

Step 1: Data Analysis: The statistical calculations involved in the "Reasonable Potential" analysis

require discrete numerical data. The following describes how the effluent data will be used in determining reasonable potential.

Actual analytical results should be used whenever possible. Results less than detection and quantification should be used as follows:

- a. If the permittee reports results below the practical quantitation limit (PQL) (as defined by the permit), then the reported "less than PQL" value for a given sample is generally assumed to be zero.
- b. If the permittee uses a detection/quantification level that is **greater** than the PQL, then the reported "less than" value for a given sample is generally assumed to be a discrete value equal to the detection/quantification level used by the permittee.
- c. If the reported data consists of both discrete and non-discrete values and/or the data is reported using varying detection/quantification levels, then, generally, a combination of the above two approaches is used, or the data is evaluated in a manner that is most appropriate for that data set.

Note: For information on the acceptable analytical methods and practical quantitation limits (PQL) please refer to NPDES permit application supplement "Practical Quantitation Limits (PQL) and Acceptable Analytical Methods".

Step 2: Using data from the permit application, other data supplied by the applicant and/or Discharge Monitoring Report (DMR) data, determine the total number of observations (n) for a particular set of effluent data and determine the highest value (C_{max}) from that data set. For the monthly average comparison, the data set will include monthly average results and n will be the number of months in which they sampled in the time period being evaluated. For the daily maximum comparison, the data set will include daily maximum results and n will be the total number of samples in the time period being evaluated. Individual results may not necessarily be used in the calculation

Step 3: Determine the coefficient of variation (CV) for the data set. For a data set where $n > 10$, the CV is calculated as standard deviation divided by mean for the data set being evaluated. For data set where $n < 10$, the CV is estimated to equal 0.6. For less than 10 items of data, the uncertainty in the CV is too large to calculate a standard deviation or mean with sufficient confidence.

$$CV = 0.6 \quad \text{for } n < 10$$

$$CV = \frac{\sigma}{\mu} \quad \text{for } n > 10$$

where: σ = Standard Deviation of the samples
 μ = Mean of the samples

Step 4: Determine the appropriate multiplying factor (MF) from either Table 3-2 or using the formulae in Section 3.3.2 of the TSD.

- a. Determine the percentile represented by the highest concentration in the sample data.

$$p_n = (1 - \text{Confidence Level})^{1/n}$$

where: p_n = Percentile represented by the highest concentration in the data
 n = number of samples
Confidence Level = 0.95 i.e. 95%

- b. Determine the multiplying factor (MF), which is the relationship between the percentile described above (C_p) and the selected upper bound of the lognormal effluent distribution, which in this case will be the 95th percentile (C_{95}).

$$MF = \frac{C_{95}}{C_p} = \frac{e^{(Z_{95}\sigma + 0.5\sigma^2)}}{e^{(Z_p\sigma + 0.5\sigma^2)}}$$

where: Z_{95} is the standardized Z-score for the 95th percentile of the standardized normal distribution = 1.645

Z_p is the standardized Z-score for the p^{th} percentile of the standardized normal distribution. (determined in (b) above)

Note: The values of Z-scores are listed in tables for the normal distribution. If using Microsoft® Excel, this can be calculated using the NORMSINV function.

$$\sigma^2 = \ln(CV^2 + 1)$$

$$\sigma = \sqrt{\ln(CV^2 + 1)}$$

Step 5: Multiply the highest value from the data set (C_{max}) by the multiplying factor (MF) determined in Step 4 to obtain the maximum receiving water concentration (RWC).

$$RWC = C_{max} \times MF$$

Step 6: RWC is less than or equal to the derived monthly average limit (C_{efflim}) implies that a reasonable potential does not exist.

$RWC >$ Derived monthly average limit (C_{efflim}) implies that a reasonable potential exists.

H. Other considerations

1. When the derived permit effluent limitation based on aquatic life numeric criteria is below the practical quantitation limit for a substance, the derived permit effluent limitation shall include an accompanying statement in the permit that the practical quantitation limit using approved analytical methods shall be considered as being in compliance with the limit. Appropriate biological monitoring requirements shall be incorporated into the permit to determine compliance with appropriate water quality standards (R.61-68.E.14.c(2)).
2. When the derived permit effluent limitation based on human health numeric criteria is below the practical quantitation limit for a substance, the derived permit effluent limitation shall include an accompanying statement in the permit that the practical quantitation limit using approved analytical methods shall be considered as being in compliance with the limit (R.61-68.E.14.c(3)).
3. The effluent concentration limits determined above may not necessarily be the NPDES permit limit. NPDES Permit limits are determined after a reasonable potential analysis is conducted using these derived limits and also after evaluating other issues such as anti-backsliding and antidegradation.
4. When mass limits are calculated, the formula to be used is as follows.
$$\text{Mass (lb/day)} = \text{Flow (mgd)} * \text{Concentration (mg/l)} * 8.345$$
5. Per Regulation 61-9.122.45(d), for continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as maximum daily and average monthly discharge limitations for all dischargers other than publicly owned treatment works.
6. Antbacksliding: When a permit is reissued, the terms and conditions of the reissued permit must be at least as stringent as those final limits in the previous permit unless certain exceptions are met (see Regulation 61-9.122.44.i).
7.
 - a. E. coli: In order to protect recreational uses in freshwaters (including FW, and all types of Trout Waters) of the State, NPDES permit effluent limitations shall be as specified in R.61-68.E14.c(8)
 - b. Fecal Coliform: In order to protect for the consumption of shellfish for any discharge either directly or indirectly in Class SFH waters or in Class SA, Class SB, ORW or ONRW waters with existing and/or approved shellfish harvesting uses as described in R.61-68.C.7, including protection of shellfish upstream and/or downstream uses in all waters regardless of their classification, NPDES permit effluent limitations shall be as specified in R.61-68.E14.c (11)
 - c. Provisions for meeting daily maximum bacteria limits shall be in accordance with R.61-68.E.14.c(12).
8. pH and DO: In accordance with Reg. 61-68.G.9 & 10 the in-stream DO and pH requirements are as follows:

Stream Classification	pH Requirement	D.O. Requirement
Trout Waters: Natural (TN) Put, Grow and Take (TGPT)	Between 6.0 and 8.0	Not less than 6 mg/l
Freshwater (FW) Put and Take (TPT)	Between 6.0 and 8.5	Daily average not less than 5.0 mg/l with a low of 4.0 mg/l

9. The calculations for the assessment of effluent limits has been compiled using a Microsoft Excel spreadsheet. This spreadsheet is attached for documentation of individual calculations. The limits noted in Part III reflect the most restrictive conditions that apply.
10. The wasteload allocation (WLA) completed by the Wasteload Allocation Section is incorporated into this rationale by reference. A copy of the WLA is attached.

III. PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

Background Information:

Palmetto Utilities has two (2) discrete 6 MGD discharge permits - ND0068411 to nearby Rapid Infiltration Basins and SC0043451 to the Wateree River. They own and operate a 6 MGD activated sludge plant that discharges to the RIBs. While there has not been a discharge line to the Wateree River to-date, a 12 MGD line construction was permitted in Dec. 2016.

Construction of a SBR technology based triple reactor 6 MGD plant designed from inception to be expandable to 12 MGD (when used in conjunction with current plant basin & clarifier tankages re-purposed for effluent equalization and sludge handling) that allows flow to the RIBs and / or the river -the latter following UV disinfection- was permitted in August 2016.

Outfall 001

All data results reflect the discharge to ND0068411 (being a common treatment facility) or Application Form 2A entries.

Biological Assessment:

Not Applicable to This Permit.

Whole Effluent Toxicity Testing:

1. Previous permit limits (effective Nov. 1st 2006):
Quarterly 25 % average / 40 % maximum Chronic Toxicity effects using 100% Test Concentration.
Test & Report the larger of (%) effects on reproduction and mortality using *Ceriodaphnia dubia* test species.
2. NPDES Application (EPA Form 3510-2A):
No. of toxicity tests: 4, using *Pimephales promelas* (Fathead Minnow) and
4, using *Ceriodaphnia dubia* (Water Flea) as test specimens.
Test type and results: Chronic Toxicity effects using 100 percent Test Concentration:

	<u>Pimephales promelas</u>				<u>Ceriodaphnia dubia</u>				
Report Date	Dec.08, 2016	Dec.22, 2016	Jan.19, 2017	Feb.01, 2017	Report Date	Nov.23, 2016	Dec.08, 2016	Dec.22, 2016	Jan.18, 2017
% effect Survival	Zero	Zero	Zero	2.5	% effect Mortality	Zero	Zero	Zero	Zero
% effect Growth	27	18	12	Zero	% effect Repr. Rdcn.	Zero	Zero	Zero	Zero

3. Other information:
 - DMR Data: None Available.
 - CORMIX runs: Submitted, preliminary reviewed, to be finalized when as-built plans are available.
 - Diffuser geometry: Eight fishtail type 8" nozzles discharging upstream close to the river bed. Nozzles equispaced along a 40-foot segment of a buried-in-bed 36-inch HDPE pipe with the first located at ±120 feet from the right bank near Interstate Hwy. 20 bridge.
4. Conclusion: Existing 100% CTC Thrice per Quarter 25 / 40 percent average / maximum effects limits will be carried over until as-built (diffuser) plans are submitted, CORMIX review concluded and In-stream Waste Concentration established.

Flow:

1. Previous permit limits (effective Nov. 1st 2006):
 - Monthly average: 6.0 MGD
 - Weekly average: 6.0 MGD
2. NPDES Application (EPA Form 3510-2A): (No. of flow analyses: 10)
 - Average Daily Value: 3.50 MGD
 - Maximum Daily Value: 4.50 MGD
3. DMR Data: None Available.
4. Water Quality Data: -N/A-
5. Categorical Limitation: -N/A-
6. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences.
7. Detection Limit: -N/A-
8. Proposed Flow Conditions: Design flow will be defined and flow will be required to be monitored & reported.
 - Design Average Flow: 12.0 MGD
 - Monthly average: MR in MGD

Daily Maximum: MR in MGD

9. **Conclusion:** Following the requirement to Monitor & Report ("MR") flow, monthly average and daily maximum mass limits for toxic pollutants (TRC, metals, etc) based on the design flow noted on each effluent limits page will be specified in addition to those for conventional pollutants. A new condition added in Part V. states the average design flow to identify the treatment capacity (R.61-67.300. A.8), and for calculating the annual NPDES fee (R.61-30.2. b.) for billing. Also, & Weekly Average limit will be replaced by a Daily Maximum to comply with SC R.61-9.122.45. (d). (1).

An additional condition will be included in permit part V. to ensure that Total Discharge is limited to 12.0 MGD between this (Wateree River) outfall and the extant Rapid Infiltration Basins approved vide Land Application permit ND0068411.

Five Day Biochemical Oxygen Demand (BOD₅):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average:	30.0 mg/l
Weekly average:	45.0 mg/l
Sampling frequency:	Weekdays
Sample type:	24-hour Composite

2. Governing Water Quality Criterion: Not applicable

3. NPDES Application (EPA Form 3510-2A): (No. of BOD₅ analyses: 10)

Average Daily Value:	11.1 mg/l
Maximum Daily Value:	28.0 mg/l

4. DMR Data: None Available.

5. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences. Its vendor-provided process design lists effluent BOD₅ concentration to be 10 mg/l.

6. From Aug. 16th 2016 WLA: 16.88 mg/l (critical)
"... BOD₅ limits can be higher ... as long as the 3,906 lb/day (UOD) is maintained."

7. Cause, Reasonable Potential to Cause or Contribute to excursions of instream Dissolved Oxygen Criteria, based on WQ Regulation R.61-68: -N/A-

8. Effluent Guidelines Limitations: Secondary Treatment Regulation in accordance with R.61-9.133.102, 103 or 105.

30-day average:	not to exceed 30 mg/l
7-day average:	not to exceed 45 mg/l

9. **Conclusion:** The Palmetto NPDES permit BOD limits have been revised to 23 mg/l / Monitor & Report monthly average / daily maximum for all months. The wasteload allocation (WLA) did not require specific BOD limits

provided the UOD limit is met. We have reassessed the permit requirements based on what might be required using full design flow (12 MGD) and a highly treated ammonia effluent concentration (1 mg/l). In order for the UOD limit of 3,906 lbs/day to be met under this condition, the maximum BOD concentration could be approximately 23 mg/l. This concentration limit will be used to set an upper boundary for BOD.

Monthly average:	23 mg
Daily maximum:	46 mg/l
Sampling frequency:	Weekdays
Sample type:	24-hour Composite

Total Suspended Solids (TSS):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average:	30.0 mg/l
Weekly average:	45.0 mg/l
Sampling frequency:	Weekdays
Sample type:	24-hour Composite

2. Governing Water Quality Criterion: Not applicable

3. NPDES Application (EPA Form 3510-2A): (No. of TSS analyses: 10)

Average Daily Value:	5.70 mg/l
Maximum Daily Value:	11.00 mg/l

4. DMR Data: None Available.

5. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences. Its vendor-provided process design lists effluent TSS concentration to be 10 mg/l.

Permittee has applied for Centralized Waste Treatment of an average of 40,000 gallons per day metal-working (40 CFR Part 437.A.) waste stream and 437.14 limits effluent TSS concentrations to 11.3/29.6 mg/l monthly avg./daily maximum.

6. Cause, RP to Cause or Contribute to excursions of Secondary Treatment

Regulation R.61-9.133.: -N/A-

7. Effluent Guidelines Limitations: Secondary Treatment Regulation in accordance with R.61-9.133.102, 103 or 105.

30-day average:	not to exceed 30 mg/l
7-day average:	not to exceed 45 mg/l

8. Conclusion: Secondary Treatment technology limits would be carried over with a Daily Maximum limit replacing the Weekly Average limit to comply with R. 61-9.122.45. (d). (1). However, with the inclusion of Centralized Waste Treatment and blended CWT and domestic flows, the more stringent CWT-based limits (above item #5) will be imposed.

Monthly average: 11.3 mg/l
Daily maximum: 29.6 mg/l
Sampling frequency: Weekdays
Sample type: 24-hour Composite

Total Ammonia Nitrogen (as N):

1. Previous permit limits (effective Nov. 1st 2006):
 - a. March - October:

Monthly average: Monitor & Report ("MR")
Weekly average: Monitor & Report ("MR")
Sampling frequency: Weekdays
 - b. November - February:

Monthly average: Monitor & Report ("MR")
Weekly average: Monitor & Report ("MR")
Sampling frequency: Weekdays
 - c. Sample type: 24-hour Composite
2. Governing WQ Criterion: -N/A-
3. NPDES Application (EPA Form 3510-2A): (No. of Ammonia measurements analyses: 3)

Average Daily Value: 5.40 mg/l
Maximum Daily Value: 7.70 mg/l
4. DMR Data: None Available.
5. From Aug. 16th 2016 WLA: 3.0 mg/l for critical months and -None- for seasonal moonths.
"... NH3 limits can be higher ... as long as the 3,906 lb/day (UOD) is maintained."
6. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences. Its vendor-provided process design lists effluent NH3-N concentration to be 1.0 mg/l.
An upstream discharger with numerical limits has commented objecting to M&R.
7. Cause, Reasonable Potential to Cause or Contribute to excursions of either Aquatic Life or Dissolved Oxygen, based on WQ Regulation R.61-68: -N/A-
8. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)
9. Conclusion: Limits have been revised to 6.9 / 13.8 mg/l monthly average / daily maximum for all months. The wasteload allocation (WLA) did not require specific ammonia limits provided the UOD limit is met. We have reassessed the permit requirements based on what might be required using full design flow (12 MGD) and a highly treated BOD effluent concentration (5 mg/l). In order for the UOD limit of 3,906 lbs/day to be met under

this condition, the maximum ammonia concentration could be 6.9 mg/l. This concentration limit will be used to set an upper boundary for ammonia.

- a. March - October:
 - Monthly average: 6.9 mg/l
 - Weekly average: 13.8 mg/l
 - Sampling frequency: Weekdays
- b. November - February:
 - Monthly average: 6.9 mg/l
 - Weekly average: 13.8 mg/l
 - Sampling frequency: Weekdays
- c. Sample type: 24-hour Composite

Pathogen Indicative Bacteria:

1. Previous permit limits (effective Nov. 1st 2006):
 - Bacteria type: Fecal Coliform, General
 - Monthly average: 200 / 100 ml
 - Daily maximum: 400 / 100 ml
 - Sampling frequency: Weekdays
 - Sample type: Grab
2. Governing WQ Criterion: -N/A-
3. NPDES Application (EPA Form 3510-2A): (No. of bacteria measurements analyses: Zero)
 - Average Daily Value: -N/A-
 - Maximum Daily Value: -N/A-
4. DMR Data: -N/A-
5. Other Information:

Permit application information refers to their land application site (ND0068411) for which no disinfection (chlorination) was required. Flow to the Wateree River discharge outfall will be disinfected by UV irradiation at the new treatment plant.

The Department has, as part of WQ Standards Reg. 61-68 updates, changed over to monitoring for E. Coli instead of Fecal Coliform as the indicator bacteria species for pathogenic organisms in discharges to Fresh Waters. Please see Part III.A
6. Cause, Reasonable Potential to Cause or Contribute to excursions of either Aquatic Life Criteria, based on WQ Regulation R.61-68. -N/A-
7. Effluent Guidelines Limitations: See R.61-68. E.14.c.(8).
8. Conclusion: Existing monitoring protocol will be carried over except that Pathogen indicative bacteria type will be changed to E-Coli in accordance regulation R.61-68. E.14.c.(8).

Bacteria type:	e. Coli
Monthly average:	126 / 100 ml
Daily maximum:	349 / 100 ml
Sampling Frequency:	Weekdays
Sample type:	Grab

Total Residual Chlorine (TRC):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average:	0.011 mg/l
Daily maximum:	0.019 mg/l
Sampling frequency:	Weekdays
Sample type:	Grab

2. Governing WQ Criterion: Aquatic Life Toxicity; see Water Classifications and Standards (R.61-68).

3. NPDES Application (EPA Form 3510-2A): (No. of TRC measurements: Zero)

Average Daily Value:	-N/A-
Maximum Daily Value:	-N/A-

4. DMR Data: None Available.

5. Other Information: Permit application information refers to their land application site (ND0068411) for which no disinfection (chlorination) was required. Flow to the Wateree River discharge outfall will be disinfected by UV irradiation at the new treatment plant.

6. Cause, RP to Cause or Contribute to excursions of either Aquatic Life Criteria, based on Water Classifications and Standards R.61-68.: -N/A-

7. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)

8. **Conclusion:** TRC limits will be based on Aquatic Life Toxicity at 7Q10 receiving stream flow (517.02 MGD). A footnote requiring TRC to be sampled if and only when the effluent is chlorinated will be added to each limits page.

Monthly average:	0.485 mg/l
Daily maximum:	0.838 mg/l
Sampling frequency:	Weekdays
Sample type:	Grab

Dissolved Oxygen (DO):

1. Previous permit limits (effective Nov. 1st 2006):

Minimum at all times:	2.0 mg/l
Sampling frequency:	Daily

Sample type: Grab

2. Governing Water Quality Criterion: Effluent Limits for D.O. are established in accordance with Reg. 61-68. G.9 & 10. For Water Classification Fresh Waters (FW),
Are Site Specific D.O. Standards applicable to Receiving Waters? (from R.61-69): No
If Yes, the site specific standard description is: -N/A-
3. NPDES Application (EPA Form 3510-2A): (No. of DO measurements: 31)
Average Daily Value: 5.17 mg/l
Maximum Daily Value: 7.09 mg/l
4. DMR Data: None Available.
5. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences.
6. From Aug. 16th 2016 WLA: 2.0 mg/l minimum at all times
7. Cause, Reasonable Potential to Cause or Contribute to excursions of WQ Criteria, based on Water Classifications and Standards R.61-68.
8. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)
9. Conclusion: Existing "minimum at all times" DO limit will be carried over:
Minimum at all times: 2.0 mg/l
Sampling frequency: Daily
Sample type: Grab

pH:

1. Previous permit limits (effective Nov. 1st 2006):
pH value at all times: 6.0 to 8.5 Standard Units.
Sampling Frequency: Daily
Sample type: Grab
2. Governing Water Quality Criterion: Effluent Limits for pH are established in accordance with Reg. 61-68. G.9 & 10.: For Fresh Waters (FW) Classification, this value is: 6.0 to 8.5 Standard Units
Site Specific pH. Standards applicable to Receiving Waters; See (Classified Waters: R.61-69): No
If Yes, the site specific standard description is: -N/A-
3. NPDES Application (EPA Form 3510-2A): (No. of pH measurements: unspecified)
Minimum Daily Value: 6.30 Standard Units
Maximum Daily Value: 6.80 Standard Units

4. DMR Data: -N/A-
5. Other information: Permit application information refers to their land application site (ND0068411) from a plant that will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences.
Permittee has applied for Centralized Waste Treatment of a maximum of 40,000 gallons per day metal-working (40 CFR Part 437.A.) waste stream and 437.14 limits effluent pH to within the 6.0 to 9.0 Standard Units range at all times.
6. Cause, RP to Cause or Contribute to excursions of Water Quality Criteria, based on Water Classifications and Standards R.61-68. -N/A-
7. Effluent Guidelines Limitations: 6.0 - 9.0 standard units. [R.61-9.133.102(c)]
6. Conclusion: The more stringent -and existing- Stream Standards based pH limit range will be carried over.
- pH value at all times: 6.0 to 8.5 Standard Units.
Sampling Frequency: Daily
Sample type: Grab

Ultimate Oxygen Demand

1. Previous Permit Limits (effective Nov. 1st 2006):
Monthly average: 3,906 lbs./day
Weekly Average: MR lbs./day
Measurement frequency: Weekdays
Sample type: Calculated
2. Governing Water Quality Criterion: Not applicable
3. NPDES Application (EPA Form 3510-2A): (No. of BOD₅ analyses: -N/A-)
Average Daily Value: -N/A-
Maximum Daily Value: -N/A-
4. DMR Data: None Available.
5. Other information: The allocated UOD limit of 3,906 lbs per day is 31% of the total 12,600 lbs per day Wateree River UOD loading as per the May 24, 2006 agreement between Central Midlands Council of Governments, Santee-Lynches Regional Council of Governments, Palmetto Utilities, Richland County, City of Camden and SCDHEC.

UOD is the oxygen consumed by aquatic microbes in metabolizing the remaining organic and nitrogenous matter in the wastewater treatment plant effluent. This demand expressed in lbs / day is calculated by (a). multiplying the effluent biochemical oxygen demand (BOD₅) concentration (mg/l) by f-ratio, (b). adding that to 4.57 times the effluent ammonia (NH₃-N) concentration (mg/l) and (c). multiplying the sum by the NPDES permitted MGD flow and the constant 8.345

i.e., U.O.D. (lbs. / day) = $[(\text{BOD}_5 \text{ (in mg/l)} * (\text{f-ratio multiplier})) + \{\text{NH}_3\text{-N (in mg/l)} * 4.57\}] * \text{Flow (in MGD)} * 8.345$

Existing WWTP discharging to their land application site (ND0068411) will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences. Its vendor-provided process design calculations imply discharged UOD mass will be 1,959.7 lbs./day or $\approx \frac{1}{2}$ of the permittee's allocation.

6. From Aug. 16th 2016 WLA: 3,906 lbs./day at 1.50:1 f-ratio.
7. Cause, Reasonable Potential to Cause or Contribute to excursions of instream Water Quality Criteria, from Regulation R.61-68: -N/A-
8. Effluent Guidelines Limitations: -N/A-
9. Conclusion: Existing monthly average UOD limit will be carried over. Daily Maximum limits will replace Weekly Average limits in order to comply with R. 61-9.122.45. (d). (1).

Monthly average:	3,906 lb / day
Daily maximum:	MR lb / day
Sampling Frequency:	Weekdays
Sample type:	Calculated

Total Mercury (Hg)

1. Previous permit limits: Effective Nov. 1st 2006

Monthly average:	Monitor & Report (MR)
Daily maximum:	Monitor & Report (MR)
Sampling frequency:	1/ Quarter
Sample type:	Grab
2. Governing WQ Criterion:

Monthly average:	0.00091 mg/l
Daily maximum:	0.0016 mg/l
3. NPDES Application (EPA Form 3510-2A): (No. of analyses: 6)

Average Daily Value:	1.44e-6 mg/l
Maximum Daily Value:	2.00e-6 mg/l
4. DMR data; None - there has been no discharge to this outfall since previous issuance.
5. Other information: Receiving stream is Fish - Hg impaired at 2 consecutive downstream stations. Permittee has applied for **Centralized Waste Treatment** of a maximum of 40,000 gallons per day metal-working (40 CFR Part 437.A.) waste stream and 437.14 limits effluent Hg to 0.000246 / 0.000641 mg/l mo. average / daily max. Maximum metal-bearing flow contributes but 1/300th or <0.34% of the 12 MGD plant design average flow at which the in-stream dilution factor is 44.1:1 at 7Q10 stream flow.

6. Cause, Reasonable Potential to Cause or Contribute WQ excursions based on Reasonable Potential Calculations using NPDES Effluent Data: No Extant Reasonable Potential
Derived limits: 0.002245 mg/l monthly average
0.003277 mg/l daily maximum
7. Effluent Guidelines Limitations: -N/A-
8. Conclusion: Receiving stream being Fish-Hg impaired, existing Monitor & Report requirements would be carried over. However, with the inclusion of **Centralized Waste Treatment** for metals and blended CWT and domestic flows, item #5 CWT-based limits will be imposed. At the $\pm 13,230:1$ minimum overall dilution, this is judged to be the more stringent.
- Monthly average: 0.000246 mg/l
Daily maximum: 0.000641 mg/l
Sampling Frequency: 1 / Quarter
Sample type: Grab

Total Phosphorus:

1. Previous Permit Limits (effective Nov. 1st 2006):
- Monthly average: 3 mg/l and 147 lb/d
Daily maximum: MR mg/l and MR lb/d
Sampling Frequency: Once / Month
Sample type: 24-hour Composite
2. Governing WQ Criterion: See Section II.G.1.c of this rationale.
3. NPDES Application (EPA Form 3510-2A): (No. of analyses: 3)
Average Daily Value: 2.2 mg/l
Maximum Daily Value: 4.1 mg/l
4. DMR Data: None Available.
5. Other information: The allocated 147 lbs. per day loading limit is from the May 24, 2006 agreement between Central Midlands Council of Governments, Santee-Lynches Regional CoG, Palmetto Utilities, Richland County, City of Camden and SCDHEC.
- An upstream discharger with weekly monitoring has objected to mo. frequency.

In order to protect and maintain lakes and other waters of the State, consideration needs to be given to the control of nutrients reaching the waters of the State. Therefore, the Department shall control nutrients as prescribed below.

- a. Discharges of nutrients from all sources, including point and non-point, to waters of the State shall be prohibited or limited if the discharge would result in or if the waters experience growths of microscopic or macroscopic vegetation such that the water quality standards would be violated or the existing or classified uses of the waters would be impaired. Loading of nutrients shall be addressed on an individual basis as

necessary to ensure compliance with the narrative and numeric criteria.

- b. Numeric nutrient criteria for lakes are based on an ecoregional approach that takes into account the geographic location of the lakes within the State and are listed below. These numeric criteria are applicable to lakes of 40 acres or more. Lakes of less than 40 acres will continue to be protected by the narrative criteria. For the Piedmont and Southeastern Plains ecoregions of the State, total phosphorus shall not exceed 0.06 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.
 - c. In evaluating the effects of nutrients upon the quality of lakes and other waters of the State, the Department may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms in order to protect the existing and classified uses of the waters.
 - d. The Department shall take appropriate action, to include, but not limited to: establishing numeric effluent limitations in permits, establishing Total Maximum Daily Loads, establishing waste load allocations, and establishing load allocations for nutrients to ensure that the lakes attain and maintain the above narrative and numeric criteria and other applicable water quality standards.
 - e. Existing WWTP discharging to their land application site (ND0068411) will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before discharge flow commences. Its vendor-provided process design calculations list effluent Total P concentration to be 3.0 mg/l when chemical-precipitation assisted.
6. From Aug. 16th 2016 WLA: 3.0 mg/l and 147 lbs./day.
 7. Effluent limitation guidelines: -N/A-
 8. **Conclusion:** Existing limits as per the May 2006 agreement will be carried over in order to verify compliance and manage the nutrient loading to downstream water-bodies. Watershed Water Quality documents cite a decreasing trend at station CW-222 / SC-002, about 1.6 miles upstream of Congaree River confluence.

Monthly average:	3 mg/l and 147 lb/d
Daily maximum:	MR mg/l and MR lb/d
Sampling Frequency:	Weekly
Sample type:	24-hour Composite

The incompatibility between the concentration and mass limits (12 MGD X 8.345 lbs./gal X 3 mg/l =>>147 lbs./day) is intended for operational flexibility. Permittee remains responsible for ensuring that neither is exceeded.

Total Nitrogen as N:

1. Previous Permit Limits (effective Nov. 1st 2006):

Monthly average:	Monitor & Report (MR)
Daily maximum:	Monitor & Report (MR)
Sampling Frequency:	Once / Month
Sample type:	Calculated

2. Governing WQ Criterion: See Section II.G.1.c of this rationale.
3. NPDES Application (EPA Form 3510-2A): (No. of analyses: 3 each)
 - Average Daily Value: 5.9 mg/l (TKN) and 5.6 mg/l (NO₂+NO₃)
 - Maximum Daily Value: 6.5 mg/l (TKN) and 5.9 mg/l (NO₂+NO₃)
4. DMR Data: None Available.
5. Other information: Reported as the sum of Total Kjeldahl and (NO₂+NO₃) Nitrogens of each sample.

In order to protect and maintain lakes and other waters of the State, consideration needs to be given to the control of nutrients reaching the waters of the State. Therefore, the Department shall control nutrients as prescribed below.

 - a. Discharges of nutrients from all sources, including point and non-point, to waters of the State shall be prohibited or limited if the discharge would result in or if the waters experience growths of microscopic or macroscopic vegetation such that the water quality standards would be violated or the existing or classified uses of the waters would be impaired. Loading of nutrients shall be addressed on an individual basis as necessary to ensure compliance with the narrative and numeric criteria.
 - b. Numeric nutrient criteria for lakes are based on an ecoregional approach that takes into account the geographic location of the lakes within the State and are listed below. These numeric criteria are applicable to lakes of 40 acres or more. Lakes of less than 40 acres will continue to be protected by the narrative criteria. For the Piedmont and Southeastern Plains ecoregions of the State, total phosphorus shall not exceed 0.06 mg/l, chlorophyll a shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l
 - c. In evaluating the effects of nutrients upon the quality of lakes and other waters of the State, the Department may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms in order to protect the existing and classified uses of the waters.
 - d. The Department shall take appropriate action, to include, but not limited to: establishing numeric effluent limitations in permits, establishing Total Maximum Daily Loads, establishing waste load allocations, and establishing load allocations for nutrients to ensure that the lakes attain and maintain the above narrative and numeric criteria and other applicable water quality standards.
 - e. Existing WWTP discharging to their land application site (ND0068411) will be functionally closed out, re-purposed for sludge handling and replaced by a SBR-based WWTP before this discharge flow commences. Its vendor-provided process design calculations list effluent Total N concentration to be 9.0 mg/l.
6. From Aug. 16th 2016 WLA: Monitor & Report (MR)
7. Effluent limitation guidelines: -N/A-
8. Conclusion: Being a eutrophication-contributing nutrient and due to presence of very large downstream waterbodies (Lake Marion and Lake Moultrie), monitoring for Total Nitrogen will continue be required, as below:
 - Monthly average: Monitor & Report (MR)
 - Daily maximum: Monitor & Report (MR)

Sampling Frequency: Once / Month
Sample type: Calculated

Note: Since there is no EPA accepted method to directly measure Total Nitrogen, it should be reported as the sum of TKN and Nitrate + Nitrite Nitrogen values from each sample. Please Refer Permit Part V.G.5.

Cadmium, Total (Cd):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average: 0.026 mg/l
Daily maximum: 0.141 mg/l
Sampling frequency: 1 / Month
Sample type: 24-hour Composite

2. Governing Water Quality Criterion: Aquatic Life

Monthly average: 0.0005 mg/l
Daily maximum: 0.0027 mg/l

3. Other Information:

DMR Data: None - there has been no discharge to this outfall since previous issuance.

PQL: 0.00010 mg/l

NPDES Application (EPA Form 3510-2A). (No. of Cd measurements = 3)

Average Daily Value: Not detected

Maximum Daily Value: Not detected

Influent includes: Metal Treatment and Recovery effluent for Centralized Waste Treatment (CWT).

4. Cause, Reasonable Potential to Cause or Contribute, based on Reasonable Potential Calculations:

Monthly average: -NONE-

Daily maximum: -NONE-

See calculations, attached

5. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)

6. Conclusion: Monitoring will be required per 40 CFR subpart 437.14 (CWT) as below.

Copper, Total (Cu):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average: 0.334 mg/l
Daily maximum: 0.438 mg/l
Sampling frequency: 1 / Month
Sample type: 24-hour Composite

2. Governing Water Quality Criterion: Aquatic Life

Monthly average: 0.0057 mg/l

Daily maximum: 0.0074 mg/l

Influent includes: Metal Treatment and Recovery effluent for **Centralized Waste Treatment (CWT)**.

3. Other Information:

DMR Data: None - there has been no discharge to this outfall since previous issuance.
PQL: 0.01 mg/l
NPDES Application (EPA Form 3510-2A): (No. of Cu measurements = 3)
Average Daily Value: 0.0051 mg/l
Maximum Daily Value: 0.0074 mg/l

4. Cause, Reasonable Potential to Cause or Contribute, based on Reasonable Potential Calculations:

Monthly average: -NONE-
Daily maximum: -NONE-
See calculations, attached

5. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)

6. Conclusion: Monitoring will be required per 40 CFR subpart 437.14 (CWT) as below.

Lead, Total (Pb):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average: 0.043 mg/l
Daily maximum: MR, in mg/l
Sampling frequency: 1 / Month
Sample type: 24-hour Composite

2. Governing Water Quality Criterion: Aquatic Life

Monthly average: 0.00070 mg/l
Daily maximum: 0.018 mg/l

3. Other Information:

DMR Data: None - there has been no discharge to this outfall since previous issuance.
PQL: 0.002 mg/l
NPDES Application (EPA Form 3510-2A): (No. of Pb measurements: 3)
Average Daily Value: Not detected
Maximum Daily Value: Not detected

Influent includes: Metal Treatment and Recovery effluent for **Centralized Waste Treatment (CWT)**.

4. Cause, Reasonable Potential to Cause or Contribute, based on Reasonable Potential Calculations:

Monthly average: -NONE-
Daily maximum: -NONE-
See calculations, attached

5. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)

6. Conclusion: Monitoring will be required per 40 CFR subpart 437.14 (CWT) as below.

Total Zinc (Zn):

1. Previous permit limits (effective Nov. 1st 2006):

Monthly average: MR, in mg/l
Daily maximum: MR, in mg/l
Sampling frequency: 1 / Month
Sample type: 24-hour Composite

2. Governing Water Quality Criterion: Aquatic Life

Monthly average: -N/A-
Daily maximum: 0.081 mg/l

3. Other Information:

DMR Data: None - there has been no discharge to this outfall since previous issuance.
PQL=0.002 mg/l
NPDES Application (EPA Form 3510-2A): (No. of Zn measurements = 3)
Average Daily Value: 0.0643 mg/l
Maximum Daily Value: 0.077 mg/l
Influent includes: Metal Treatment and Recovery effluent for Centralized Waste Treatment (CWT).

4. Cause, Cause, Reasonable Potential to Cause or Contribute, based on Reasonable Potential Calculations:

Monthly average: -NONE-
Daily maximum: -NONE-
See calculations, attached

5. Effluent Guidelines Limitations: See R.61-9.133 (Not applicable to this parameter)

6. Conclusion: Monitoring will be required per 40 CFR subpart 437.14 (CWT) as below.

Other Information:

- Part D, Expanded Effluent Testing Data lists all pollutants except Copper, Mercury, Zinc, Cyanides, Phenols and Chloroform as "Non-Detect". Reasonable Potential calculations spreadsheet indicate no extant RP for any of these.
- The ≈44.1:1 Dilution ratio at 12 MGD discharge and critical low receiving stream flow (7Q10) being larger than the 5:1 threshold, (by-default) monitoring for future RP evaluation of Total Cd, Cu, Pb and Zn would not normally be required. The addition of Centralized Waste Treatment however mandates monitoring and categorical limits as described below.

Other Pollutants:

Influent includes 40,000 GPD monthly average of metal-bearing waste and Form 2C has been completed. New Source Performance Standards for Metal Treatment and Recovery, Centralized Waste Treatment Point Source Category (40 CFR subpart 437.14) requires the below listed maximum pollutant concentrations in the effluent. Except for pH, there

were no (Reasonable Potential Calculations derived) Water Quality limitations for these. Please refer to the pH rationale for details.

Metal-bearing waste stream being a very small fraction -no more than 0.34%- of the 12 MGD design average discharge flow, numerical mass limits are deemed impractical for these except for Total Suspended Solids. Mass limits for TSS will be based on the monthly average domestic wastewater flow of 12 MGD. Please refer to the TSS rationale for details.

All below pollutants will be required to be monitored monthly except for quarterly monitoring frequency for Total Mercury.

Pollutant	Monthly Average	Daily Maximum	Pollutant	Monthly Average	Daily Maximum
Oil & Grease (Hexane)	50.2 mg/l	205.0 mg/l	Total Lead	0.283 mg/l	1.32 mg/l
pH	← 6.0 to 9.0 Standard Units →		Total Mercury	0.000246 mg/l	0.000641 mg/l
TSS	11.3 mg/l	29.6 mg/l	Total Nickel	0.309 mg/l	0.794 mg/l
Total Antimony	0.0312 mg/l	0.111 mg/l	Total Selenium	0.0698 mg/l	0.176 mg/l
Total Arsenic	0.0199 mg/l	0.0993 mg/l	Total Silver	0.0122 mg/l	0.0318 mg/l
Total Cadmium	0.163 mg/l	0.782 mg/l	Total Tin	0.0367 mg/l	0.0955 mg/l
Total Chromium	0.0522 mg/l	0.167 mg/l	Total Titanium	0.00612 mg/l	0.0159 mg/l
Total Cobalt	0.0703 mg/l	0.182 mg/l	Total Vanadium	0.0518 mg/l	0.0628 mg/l
Total Copper	0.216 mg/l	0.659 mg/l	Total Zinc	0.252 mg/l	0.657 mg/l

