STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

January 29, 2018

Honorable Robert Scott
Mayor
City of Bruceton
PO BOX 136
Bruceton, TN 38317

Subject: **Modified NPDES Permit No. TN0062014**
Bruceton Wastewater Lagoon
Bruceton, Carroll County, Tennessee

Dear Mayor Scott:

In accordance with the provisions of the Tennessee Water Quality Control Act, Tennessee Code Annotated (T.C.A.), Sections 69-3-101 through 69-3-120, the Division of Water Resources hereby issues the enclosed NPDES Permit. The continuance and/or reissuance of this NPDES Permit is contingent upon your meeting the conditions and requirements as stated therein.

Please be advised that a petition for permit appeal may be filed, pursuant to T.C.A. Section 69-3-105, subsection (i), by the permit applicant or by any aggrieved person who participated in the public comment period or gave testimony at a formal public hearing whose appeal is based upon any of the issues that were provided to the commissioner in writing during the public comment period or in testimony at a formal public hearing on the permit application. Additionally, for those permits for which the department gives public notice of a draft permit, any permit applicant or aggrieved person may base a permit appeal on any material change to conditions in the final permit from those in the draft, unless the material change has been subject to additional opportunity for public comment. Any petition for permit appeal under this subsection (i) shall be filed with the Technical Secretary of the Water Quality, Oil and Gas Board within thirty (30) days after public notice of the commissioner's decision to issue or deny the permit. A copy of the filing should also be sent to TDEC's Office of General Counsel.

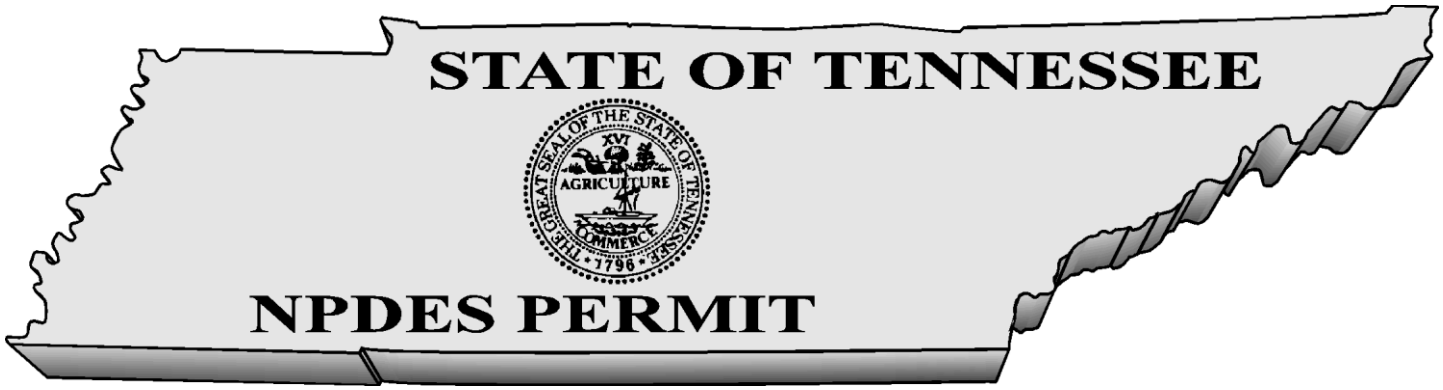
If you have questions, please contact the Jackson Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Miss Julie Harse at (615) 532-0682 or by E-mail at *Julie.Harse@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Jackson Environmental Field Office
Mr. William J. Meinert, PE, Vice President, O'Brien & Gere, bill.meinert@obg.com
Mr. Brian A. Edwards, Director Public Services, Bruceton Wastewater Lagoon, bruceton@tds.net



Modified
No. TN0062014

Authorization to discharge under the
National Pollutant Discharge Elimination System (NPDES)

Issued By

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass TN Tower, 11th Fl
312 Rosa L. Parks Ave.
Nashville, Tennessee 37243

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.)

Discharger:	**Bruceton Wastewater Lagoon**
is authorized to discharge:	**Treated municipal wastewater from Outfall 001**
from a facility located:	**in Bruceton, Carroll County, Tennessee**
to receiving waters named:	**The Big Sandy River at mile 31.0**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on:	**March 1, 2018**
This permit shall expire on:	**September 31, 2018**
Issuance date:	**February 1, 2018**

for Tisha Calabrese Benton
Director

CN-0759 RDAs 2352 and 2366

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1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The Town of Bruceton is authorized to discharge treated municipal wastewater from Outfall 001 to the The Big Sandy River at mile 31.0. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of 0.572 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

Description : External Outfall, Number : 001, Monitoring : Dry Weather, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
BOD, 5-day, 20 C	<=	65	mg/L	Grab	Weekly	Daily Maximum
BOD, 5-day, 20 C	<=	45	mg/L	Grab	Weekly	Monthly Average
BOD, 5-day, 20 C	<=	50	mg/L	Grab	Weekly	Weekly Average
BOD, 5-day, 20 C	<=	310	lb/d	Grab	Weekly	Daily Maximum
BOD, 5-day, 20 C	<=	215	lb/d	Grab	Weekly	Monthly Average
BOD, 5-day, 20 C	<=	239	lb/d	Grab	Weekly	Weekly Average
Chlorine, total residual (TRC)	<=	.8	mg/L	Grab	Five Per Week	Instantaneous Maximum
E. coli, MTEC-MF	<=	941	#/100mL	Grab	Weekly	Daily Maximum
E. coli, MTEC-MF	<=	126	#/100mL	Grab	Weekly	Monthly Geometric Mean
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Oxygen, dissolved (DO)	>=	1	mg/L	Grab	Five Per Week	Instantaneous Minimum
Settleable Solids	<=	1	mL/L	Grab	Two Per Week	Daily Maximum
Total Suspended Solids (TSS)	<=	120	mg/L	Grab	Weekly	Daily Maximum
Total Suspended Solids (TSS)	<=	525	lb/d	Grab	Weekly	Weekly Average
Total Suspended Solids (TSS)	<=	477	lb/d	Grab	Weekly	Monthly Average
Total Suspended Solids (TSS)	<=	572	lb/d	Grab	Weekly	Daily Maximum
Total Suspended Solids (TSS)	<=	110	mg/L	Grab	Weekly	Weekly Average
Total Suspended Solids (TSS)	<=	100	mg/L	Grab	Weekly	Monthly Average

pH	>=	6	SU	Grab	Five Per Week	Minimum
pH	<=	9	SU	Grab	Five Per Week	Maximum

Description : External Outfall, Number : 001, Monitoring : Percent Removal, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
BOD, 5-day, % removal	>=	65	%	Calculated	Monthly	Monthly Average Minimum

Description : External Outfall, Number : 001, Monitoring : Raw Sewage Influent, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
BOD, 5-day, 20 C	Report	-	mg/L	Grab	Weekly	Monthly Average
BOD, 5-day, 20 C	Report	-	mg/L	Grab	Weekly	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average

Description : External Outfall, Number : 001, Monitoring : Wet Weather, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Bypass of Treatment	Report	-	occur/mo	Occurrences	Continuous	Monthly Total
Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Notes: The permittee shall achieve 65% removal of BOD_5 on a monthly average basis. The permittee shall report all instances of overflow and/or bypasses. See Part 2.3.3.a for the definition of overflow and Part 1.3.5.1 for reporting requirements.

Unless elsewhere specified, summer months are May through October; winter months are November through April.

See Part 1.2.3 for test procedures.

See Part **Error! Reference source not found.** for biomonitoring test and reporting requirements. See next page for percent removal calculations.

Total residual chlorine (TRC) monitoring shall be applicable when chlorine, bromine, or any other oxidants are added. The acceptable methods for analysis of TRC are any methods specified in Title 40 CFR, Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/l unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request. In cases where the permit limit is less that the MDL, the reporting of TRC at less than the MDL shall be interpreted to constitute compliance with the permit.

The wastewater discharge must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be

considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

There shall be no distinctly visible floating scum, oil or other matter contained in the wastewater discharge. The wastewater discharge must not cause an objectionable color contrast in the receiving stream.

The wastewater discharge shall not contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner that prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 68-31-101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68-46-101 et seq.

For the purpose of evaluating compliance with the permit limits established herein, where certain limits are below the State of Tennessee published required detection levels (RDLs) for any given effluent characteristics, the results of analyses below the RDL shall be reported as Below Detection Level (BDL), unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed.

For BOD_5, the treatment facility shall demonstrate a minimum of 65% removal efficiency on a monthly average basis. This is calculated by determining an average of all daily influent concentrations and comparing this to an average of all daily effluent concentrations. The formula for this calculation is as follows:

$$\left[1 - \frac{\text{average of daily effluent concentration}}{\text{average of daily influent concentration}}\right] \times 100\% = \%\ \text{removal}$$

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than plus or minus 10% from the true discharge rates throughout the range of expected discharge volumes.

Samples and measurements taken in compliance with the monitoring requirements specified above shall be representative of the volume and nature of the monitored discharge, and shall be taken at the following location(s):

Influent samples must be collected prior to mixing with any other wastewater being returned to the head of the plant, such as sludge return. Those systems with more than one influent line must collect samples from each and proportion the results by the flow from each line.

Effluent samples must be representative of the wastewater being discharged and collected prior to mixing with any other discharge or the receiving stream. This can be a different point for different parameters, but must be after all treatment for that parameter or all expected change:

a. The chlorine residual must be measured after the chlorine contact chamber and any dechlorination. It may be to the advantage of the permittee to measure at the end of any long outfall lines.

b. Samples for *E. coli* can be collected at any point between disinfection and the actual discharge.

c. The dissolved oxygen can drop in the outfall line; therefore, D.O. measurements are required at the discharge end of outfall lines greater than one mile long. Systems with outfall lines less than one mile may measure dissolved oxygen as the wastewater leaves the treatment facility. For systems with dechlorination, dissolved oxygen must be measured after this step and as close to the end of the outfall line as possible.

d. Total suspended solids and settleable solids can be collected at any point after the final clarifier.

e. Biomonitoring tests (if required) shall be conducted on final effluent.

1.2.2. Sampling Frequency

Where the permit requires sampling and monitoring of a particular effluent characteristic(s) at a frequency of less than once per day or daily, the permittee is precluded from marking the “No Discharge” block on the Discharge Monitoring Report if there has been any discharge from that particular outfall during the period which coincides with the required monitoring frequency; i.e. if the required monitoring frequency is once per month or 1/month, the monitoring period is one month, and if the discharge occurs during only one day in that period then the permittee must sample on that day and report the results of analyses accordingly.

1.2.3. Test Procedures

a. Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304 (h) of the Clean Water Act (the "Act"), as amended, under which such procedures may be required.

b. Unless otherwise noted in the permit, all pollutant parameters shall be determined according to methods prescribed in Title 40, CFR, Part 136, as amended, promulgated pursuant to Section 304 (h) of the Act.

c. Composite samples must be proportioned by flow at time of sampling. Aliquots may be collected manually or automatically. The sample aliquots must be maintained at ≤ 6 degrees Celsius during the compositing period.

d. In instances where permit limits established through implementation of applicable water criteria are below analytical capabilities, compliance with those limits will be determined using the detection limits described in the TN Rules, Chapter 1200-4-3-.05(8).

e. All sampling for total mercury at the municipal wastewater plant (application, pretreatment, etc.) shall use Methods 1631, 245.7 or any additional method in 40 CFR 136 with a maximum detection limit of 5 ng/L.

1.2.4. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date and time of sampling;

b. The exact person(s) collecting samples;

c. The dates and times the analyses were performed;

d. The person(s) or laboratory who performed the analyses;

e. The analytical techniques or methods used, and;

f. The results of all required analyses.

1.2.5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation shall be retained for a minimum of three (3) years, or longer, if requested by the Division of Water Resources.

1.3. REPORTING

1.3.1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly using Discharge Monitoring Report (DMR) forms supplied by the Division of Water Resources. Submittals shall be postmarked no later than 15 days after the completion of the reporting period. A completed DMR with an original signature shall be submitted to the following address:

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES
ENFORCEMENT & COMPLIANCE SECTION
WILLIAM R. SNODGRASS TN TOWER, 11TH FL
312 ROSA L. PARKS AVE.
NASHVILLE TN 37243

A copy of the completed and signed DMR shall be mailed to the Jackson Environmental Field Office (EFO) at the following address:

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES
JACKSON ENVIRONMENTAL FIELD OFFICE
1625 HOLLYWOOD DRIVE
JACKSON TN 38305

A copy should be retained for the permittee's files. In addition, any communication regarding compliance with the conditions of this permit must be sent to the two offices listed above.

The first DMR is due on the 15th of the month following permit effectiveness.

DMRs and any other information or report must be signed and certified by a responsible corporate officer as defined in 40 CFR 122.22, a general partner or proprietor, or a principal municipal executive officer or ranking elected official, or his duly authorized representative. Such authorization must be submitted in writing and must explain the duties and responsibilities of the authorized representative.

The electronic submission of DMR data will be accepted only if formally approved beforehand by the division. For purposes of determining compliance with this permit, data approved by the division to be submitted electronically is legally equivalent to data submitted on signed and certified DMR forms.

1.3.2. Additional Monitoring by Permittee

If the permittee monitors any pollutant specifically limited by this permit more frequently than required at the location(s) designated, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form. Such increased frequency shall also be indicated on the form.

1.3.3. Falsifying Results and/or Reports

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

1.3.4. Monthly Report of Operation

Monthly operational reports shall be submitted on standard forms to the appropriate Division of Water Resources Environmental Field Office in Jackson, Nashville, Chattanooga, Columbia, Cookeville, Memphis, Johnson City, or Knoxville. Reports shall be submitted by the 15th day of the month following data collection.

1.3.5. Bypass and Overflow Reporting

1.3.5.1. Report Requirements

A summary report of known or suspected instances of overflows in the collection system or bypass of wastewater treatment facilities shall accompany the Discharge Monitoring Report. The report must contain the date and duration of the instances of overflow and/or bypassing and the estimated quantity of wastewater released and/or bypassed.

The report must also detail activities undertaken during the reporting period to (1) determine if overflow is occurring in the collection system, (2) correct those known or suspected overflow points and (3) prevent future or possible overflows and any resulting bypassing at the treatment facility.

On the DMR, the permittee must report the number of sanitary sewer overflows, dry-weather overflows and in-plant bypasses separately. Three lines must be used on the DMR form, one for sanitary sewer overflows, one for dry-weather overflows and one for in-plant bypasses.

1.3.5.2. Anticipated Bypass Notification

If, because of unavoidable maintenance or construction, the permittee has need to create an in-plant bypass which would cause an effluent violation, the permittee must notify the division as soon as possible, but in any case, no later than 10 days prior to the date of the bypass.

1.3.6. Reporting Less Than Detection

A permit limit may be less than the accepted detection level. If the samples are below the detection level, then report “BDL” or “NODI =B” on the DMRs. The permittee must use the correct detection levels in all analytical testing required in the permit. The required detection levels are listed in the Rules of the Department of Environment and Conservation, Division of Water Resources, Chapter 1200-4-3-.05(8).

For example, if the limit is 0.02 mg/l with a detection level of 0.05 mg/l and detection is shown; 0.05 mg/l must be reported. In contrast, if nothing is detected reporting “BDL” or “NODI =B” is acceptable.

1.4. COMPLIANCE WITH SECTION 208

The limits and conditions in this permit shall require compliance with an area-wide waste treatment plan (208 Water Quality Management Plan) where such approved plan is applicable.

1.5. REOPENER CLAUSE

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 307(a)(2) and 405(d)(2)(D) of the Clean Water Act, as amended, if the effluent standard, limitation or sludge disposal requirement so issued or approved:

a. Contains different conditions or is otherwise more stringent than any condition in the permit; or

b. Controls any pollutant or disposal method not addressed in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

2.0. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee

shall submit such information and forms as are required to the Director of the Division of Water Resources (the "director") no later than 180 days prior to the expiration date. Such forms shall be properly signed and certified.

2.1.2. Right of Entry

The permittee shall allow the director, the Regional Administrator of the U.S. Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or where records are required to be kept under the terms and conditions of this permit, and at reasonable times to copy these records;

b. To inspect at reasonable times any monitoring equipment or method or any collection, treatment, pollution management, or discharge facilities required under this permit; and

c. To sample at reasonable times any discharge of pollutants.

2.1.3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Water Pollution Control Act, as amended, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division of Water Resources. As required by the Federal Act, effluent data shall not be considered confidential.

2.1.4. Proper Operation and Maintenance

a. The permittee shall at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory and process controls and appropriate quality assurance procedures. This provision requires the operation of backup 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. Backup continuous pH and flow monitoring equipment are not required.

b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology based effluent limitations such as those in State of Tennessee Rule 1200-4-5-.09.

2.1.5. Treatment Facility Failure (Industrial Sources)

The permittee, in order to maintain compliance with this permit, shall control production, all discharges, or both, upon reduction, loss, or failure of the treatment facility, until the facility is restored or an alternative method of treatment is provided.

This requirement applies in such situations as the reduction, loss, or failure of the primary source of power.

2.1.6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

2.1.7. Severability

The provisions of this permit are severable. If any provision of this permit due to any circumstance, is held invalid, then the application of such provision to other circumstances and to the remainder of this permit shall not be affected thereby.

2.1.8. Other Information

If the permittee becomes aware of failure to submit any relevant facts in a permit application, or of submission of incorrect information in a permit application or in any report to the director, then the permittee shall promptly submit such facts or information.

2.2. CHANGES AFFECTING THE PERMIT

2.2.1. Planned Changes

The permittee shall give notice to the director 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 40 CFR 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 40 CFR 122.42(a)(1).

2.2.2. Permit Modification, Revocation, or Termination

a. This permit may be modified, revoked and reissued, or terminated for cause as described in 40 CFR 122.62 and 122.64, Federal Register, Volume 49, No. 188 (Wednesday, September 26, 1984), as amended.

b. The permittee shall furnish to the director, within a reasonable time, any information which the director 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 director, upon request, copies of records required to be kept by this permit.

c. If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for any toxic pollutant under Section 307(a) of the Federal Water Pollution Control Act, as amended, the director shall modify or revoke and reissue the permit to conform to the prohibition or to the effluent standard, providing that the effluent standard is more stringent than the limitation in the permit on the toxic pollutant. The permittee shall comply with these effluent standards or prohibitions within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified or revoked and reissued to incorporate the requirement.

d. The filing of a request by the permittee for a modification, revocation, reissuance, termination, or notification of planned changes or anticipated noncompliance does not halt any permit condition.

2.2.3. Change of Ownership

This permit may be transferred to another party (provided there are neither modifications to the facility or its operations, nor any other changes which might affect the permit limits and conditions contained in the permit) by the permittee if:

a. The permittee notifies the director of the proposed transfer at least 30 days in advance of the proposed transfer date;

b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and liability between them; and

c. The director, within 30 days, does not notify the current permittee and the new permittee of his intent to modify, revoke or reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

Pursuant to the requirements of 40 CFR 122.61, concerning transfer of ownership, the permittee must provide the following information to the division in their formal notice of intent to transfer ownership: 1) the NPDES permit number of the subject permit; 2) the effective date of the proposed transfer; 3) the name and address of the transferor; 4) the name and address of the transferee; 5) the names of the responsible parties for both the transferor and transferee; 6) a statement that the transferee assumes responsibility for the subject NPDES permit; 7) a statement that the transferor relinquishes responsibility for the subject NPDES permit; 8) the signatures of the responsible parties for both the transferor and transferee pursuant to the requirements of 40 CFR 122.22(a), “Signatories to permit applications”; and, 9) a statement regarding any proposed modifications to the facility, its operations, or any other changes which might affect the permit limits and conditions contained in the permit.

2.2.4. Change of Mailing Address

The permittee shall promptly provide to the director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

2.3. NONCOMPLIANCE

2.3.1. Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable state and federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

2.3.2. Reporting of Noncompliance

a. 24-Hour Reporting

In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response team).

A written submission must be provided within five days of the time the permittee becomes aware of the circumstances unless the director on a case-by-case basis waives this requirement. The permittee shall provide the director with the following information:

i. A description of the discharge and cause of noncompliance;

ii. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

iii. The steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.3.2.a above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps

taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

2.3.3. Overflow

a. "**Overflow**" means any release of sewage from any portion of the collection, transmission, or treatment system other than through permitted outfalls.

b. Overflows are prohibited.

c. The permittee shall operate the collection system so as to avoid overflows. No new or additional flows shall be added upstream of any point in the collection system, which experiences chronic overflows (greater than 5 events per year) or would otherwise overload any portion of the system.

d. Unless there is specific enforcement action to the contrary, the permittee is relieved of this requirement after: 1) an authorized representative of the Commissioner of the Department of Environment and Conservation has approved an engineering report and construction plans and specifications prepared in accordance with accepted engineering practices for correction of the problem; 2) the correction work is underway; and 3) the cumulative, peak-design, flows potentially added from new connections and line extensions upstream of any chronic overflow point are less than or proportional to the amount of inflow and infiltration removal documented upstream of that point. The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to a Monthly Operating Report submitted to the local TDEC Environmental Field Office. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

e. In the event that more than 5 overflows have occurred from a single point in the collection system for reasons that may not warrant the self-imposed moratorium or completion of the actions identified in this paragraph, the permittee may request a meeting with the Division of Water Resources EFO staff to petition for a waiver based on mitigating evidence.

2.3.4. Upset

a. "***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based 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.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i. An upset occurred and that the permittee can identify the cause(s) of the upset;

ii. The permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

iii. The permittee submitted information required under "Reporting of Noncompliance" within 24-hours of becoming aware of the upset (if this information is provided orally, a written submission must be provided within five days); and

iv. The permittee complied with any remedial measures required under "Adverse Impact."

2.3.5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the 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.

2.3.6. Bypass

a. "***Bypass***" is the intentional diversion of waste streams from any portion of a treatment facility. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause 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.

b. Bypasses are prohibited unless all of the following 3 conditions are met:

i. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;

ii. There are no feasible alternatives to bypass, such as the construction and 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 preventative maintenance;

iii. The permittee submits notice of an unanticipated bypass to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours of becoming aware of the bypass (if this information is provided orally, a written submission must be provided within five days). When the need for

the bypass is foreseeable, prior notification shall be submitted to the director, if possible, at least 10 days before the date of the bypass.

c. Bypasses not exceeding permit limitations are allowed **only** if the bypass is necessary for essential maintenance to assure efficient operation. All other bypasses are prohibited. Allowable bypasses not exceeding limitations are not subject to the reporting requirements of 2.3.6.b.iii, above.

2.3.7. Washout

a. For domestic wastewater plants only, a "washout" shall be defined as loss of Mixed Liquor Suspended Solids (MLSS) of 30.00% or more. This refers to the MLSS in the aeration basin(s) only. This does not include MLSS decrease due to solids wasting to the sludge disposal system. A washout can be caused by improper operation or from peak flows due to infiltration and inflow.

b. A washout is prohibited. If a washout occurs the permittee must report the incident to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours by telephone. A written submission must be provided within five days. The washout must be noted on the discharge monitoring report. Each day of a washout is a separate violation.

2.4. LIABILITIES

2.4.1. Civil and Criminal Liability

Except as provided in permit conditions for "***Bypassing*****,"** "***Overflow,"*** and "***Upset*****,"** nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of wastewater to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its wastewater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created.

2.4.2. Liability Under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the Federal Water Pollution Control Act, as amended.

3.0. PERMIT SPECIFIC REQUIREMENTS

3.1. CERTIFIED OPERATOR

The waste treatment facilities shall be operated under the supervision of a certified wastewater treatment operator and the collection system shall be operated under the supervision of a certified collection system operator in accordance with the Water Environmental Health Act of 1984.

3.2. POTW PRETREATMENT PROGRAM GENERAL PROVISIONS

As an update of information previously submitted to the division, the permittee will undertake the following activity.

a. The current pretreatment program is in the inactive stage. The program will remain inactive as long as no significant industries discharge into the collection system. Should a significant industrial user request permission to discharge into the Bruceton system, then the City must request that the division reactivate the pretreatment program. This must be done prior to the industrial discharge taking place.

   The permittee shall submit the results of an Industrial Waste Survey (IWS) in accordance with 40 CFR 403.8(f)(2)(i), including any industrial users (IU) covered under Section 301(i)(2) of the Act. As much information as possible must be obtained relative to the character and volume of pollutants contributed to the POTW by the IUs. This information will be submitted to the Division of Water Resources, Pretreatment Section within one hundred twenty (120) days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date. Development of a pretreatment program may be required after completion of the industrial user review. All requirements and conditions of the pretreatment program are enforceable through the NPDES permit.

b. The permittee shall enforce 40 CFR 403.5, "prohibited discharges". Pollutants introduced into the POTW by a non-domestic source shall not cause pass through or interference as defined in 40 CFR Part 403.3. These general prohibitions and the specific prohibitions in this section apply to all non-domestic sources introducing pollutants into the POTW whether the source is subject to other National Pretreatment Standards or any state or local pretreatment requirements.

   Specific prohibitions. Under no circumstances shall the permittee allow introduction of the following wastes in the waste treatment system:

   i. Pollutants which create a fire or explosion hazard in the POTW;

ii. Pollutants which will cause corrosive structural damage to the treatment works, but in no case discharges with pH less than 5.0 unless the system is specifically designed to accept such discharges.

iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the treatment system resulting in interference.

iv. Any pollutant, including oxygen-demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the treatment works.

v. Heat in amounts which will inhibit biological activity in the treatment works resulting in interference, but in no case heat in such quantities that the temperature at the treatment works exceeds 40°C (104°F) unless the works are designed to accommodate such heat.

vi. Any priority pollutant in amounts that will contaminate the treatment works sludge.

vii. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

viii. Pollutants which result in the presence of toxic gases, vapors or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

ix. Any trucked or hauled pollutants except at discharge points designated by the POTW.

c. The permittee shall notify the Tennessee Division of Water Resources of any of the following changes in user discharge to the system no later than 30 days prior to change of discharge:

i. New introductions into such works of pollutants from any source which would be a new source as defined in Section 306 of the Act if such source were discharging pollutants.

ii. New introductions of pollutants into such works from a source which would be subject to Section 301 of the "Federal Water Quality Act as Amended" if it were discharging such pollutants.

iii. A substantial change in volume or character of pollutants being introduced into such works by a source already discharging pollutants into such works at the time the permit is issued.

This notice will include information on the quantity and quality of the wastewater introduced by the new source into the publicly owned treatment works, and on any anticipated impact on the effluent discharged from such works. If this

discharge necessitates a revision of the current NPDES permit or pass-through guidelines, discharge by this source is prohibited until the Tennessee Division of Water Resources gives final authorization.

3.3. SLUDGE MANAGEMENT PRACTICES

a. The permittee shall give prior notice to the director of any change planned in the permittee's sludge disposal practice. In the event the Bruceton Wastewater Lagoon removes any sludge from any lagoon the permittee must comply with 40 CFR 503 et seq.

b. Before land applying municipal sludge the permittee must obtain approvals for each site(s) in writing from the division using the latest revision of Guidelines for Land Application or Surface Disposal of Biosolids, unless the sludge being land applied meets the pollutant concentrations of 40 CFR 503.13(b)(3), the Class A pathogen requirements in 40 CFR 503.32(a), and one of the vector attraction reduction requirements in 40 CFR 503.33 (b)(1) through (b)(8).

c. If sludge disposal moves to a municipal solid waste landfill, the permittee shall contact the local Division of Solid Waste Management office address for other permitting and approvals (see table below):

Division of Solid Waste Management			
Office	**Location**	**Zip Code**	**Phone No.**
Chattanooga	540 McCallie Avenue, Suite 550	37402-2013	(423) 634-5745
Jackson	1625 Hollywood Drive	38305	(731) 512-1300
Cookeville	1221 South Willow Avenue	38506	(931) 432-4015
Columbia	2484 Park Plus Drive	38401	(931) 380-3371
Johnson City	2305 Silverdale Road	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	(901) 371-3000
Nashville	711 R.S. Gass Boulevard	37243-1550	(615) 687-7000

3.4. PLACEMENT OF SIGNS

Within sixty (60) days of the effective date of this permit, the permittee shall place and maintain a sign(s) at each outfall and any bypass/overflow point in the collection system. For the purposes of this requirement, any bypass/overflow point that has discharged five (5) or more times in the last year must be so posted. The sign(s) should be clearly visible to the public from the bank and the receiving stream. The minimum sign size should be two feet by two feet (2' x 2') with one-inch (1") letters. The sign should be made of durable material and have a white background with black letters.

The sign(s) are to provide notice to the public as to the nature of the discharge and, in the case of the permitted outfalls, that the discharge is regulated by the Tennessee Department of Environment and Conservation, Division of Water

Resources. The following is given as an example of the minimal amount of information that must be included on the sign:

Permitted CSO or unpermitted bypass/overflow point:

UNTREATED WASTEWATER DISCHARGE POINT
Bruceton Wastewater Lagoon
(731) 586-2401
NPDES Permit NO. TN0062014
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Jackson

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
Bruceton Wastewater Lagoon
(731) 586-2401
NPDES Permit NO. TN0062014
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Jackson

No later than sixty (60) days from the effective date of this permit, the permittee shall have the above sign(s) on display in the location specified.

3.5. ANTIDEGRADATION

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.06, titled “Tennessee Antidegradation Statement,” which prohibits the degradation of high quality surface waters and the increased discharges of substances that cause or contribute to impairment, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other state or federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

4.0. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

A "***bypass***" is defined as the intentional diversion of waste streams from any portion of a treatment facility.

A "***calendar day***" is defined as the 24-hour period from midnight to midnight or any other 24-hour period that reasonably approximates the midnight to midnight time period.

A "***composite sample***" is a combination of not less than 8 influent or effluent portions, of at least 100 ml, collected over a 24-hour period. Under certain circumstances a lesser time period may be allowed, but in no case, less than 8 hours.

The "***daily maximum concentration***" is a limitation on the average concentration in units of mass per volume (e.g. milligrams per liter), of the discharge during any calendar day. When a proportional-to-flow composite sampling device is used, the daily concentration is the concentration of that 24-hour composite; when other sampling means are used, the daily concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period.

"***Discharge***" or "discharge of a pollutant" refers to the addition of pollutants to waters from a source.

A "***dry weather overflow***" is a type of sanitary sewer overflow and is defined as one day or any portion of a day in which unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall occurs and is not directly related to a rainfall event. Discharges from more than one point within a 24-hour period shall be counted as separate overflows.

"***Degradation***" means the alteration of the properties of waters by the addition of pollutants or removal of habitat.

"***De Minimis***" - Alterations, other than those resulting in the condition of pollution or new domestic wastewater discharges, that represent either a small magnitude or a short duration shall be considered a de minimis impact and will not be considered degradation for purposes of implementing the antidegradation policy. Discharges other than domestic wastewater will be considered de minimis if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged. Water withdrawals will be considered de minimis if less than five percent of the 7Q10 flow of the stream is removed (the calculations of the low flow shall take into account existing withdrawals). Habitat alterations authorized by an

Aquatic Resource Alteration Permit (ARAP) are de minimis if the division finds that the impacts are offset by a combination of impact minimization and/or insystem mitigation.

If more than one activity has been authorized in a segment and the total of the impacts uses no more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow, they are presumed to be de minimis. Where total impacts use more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow they may be treated as de minimis provided that the division finds on a scientific basis that the additional degradation has an insignificant effect on the resource and that no single activity is allowed to consume more than five percent of the assimilative capacity, available habitat or 7Q10 low flow.

An "***ecoregion***" is a relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.

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 the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

A "***grab sample***" is a single influent or effluent sample collected at a particular time.

The "***instantaneous maximum concentration***" is a limitation on the concentration, in milligrams per liter, of any pollutant contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The "***instantaneous minimum concentration***" is the minimum allowable concentration, in milligrams per liter, of a pollutant parameter contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The "***monthly average amount***", shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

The "***monthly average concentration***", other than for *E. coli* bacteria, is the arithmetic mean of all the composite or grab samples collected in a one-calendar month period.

A "***one week period***" (or "***calendar-week***") is defined as the period from Sunday through Saturday. For reporting purposes, a calendar week that contains a change of month shall be considered part of the latter month.

"***Pollutant***" means sewage, industrial wastes, or other wastes.

A "***quarter***" is defined as any one of the following three-month periods: January 1 through March 31, April 1 through June 30, July 1 through September 30, and/or October 1 through December 31.

A "***rainfall event***" is defined as any occurrence of rain, preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.

A "***rationale***" (or "fact sheet") is a document that is prepared when drafting an NPDES permit or permit action. It provides the technical, regulatory and administrative basis for an agency's permit decision.

A "***reference site***" means least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.

A "***reference condition***" is a parameter-specific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.

A **"*sanitary sewer overflow (SSO*)"** is defined as an unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall.

"***Sewage***" means water-carried waste or discharges from human beings or animals, from residences, public or private buildings, or industrial establishments, or boats, together with such other wastes and ground, surface, storm, or other water as may be present.

"***Severe property damage***" when used to consider the allowance of a bypass or SSO 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 or SSO. Severe property damage does not mean economic loss caused by delays in production.

"***Sewerage system***" means the conduits, sewers, and all devices and appurtenances by means of which sewage and other waste is collected, pumped, treated, or disposed.

A "***subecoregion***" is a smaller, more homogenous area that has been delineated within an ecoregion.

"***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based 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.

The term, "***washout***" is applicable to activated sludge plants and is defined as loss of mixed liquor suspended solids (MLSS) of 30.00% or more from the aeration basin(s).

"***Waters***" means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

The "***weekly average amount***", shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

The "***weekly average concentration***", is the arithmetic mean of all the composite samples collected in a one-week period. The permittee must report the highest weekly average in the one-month period.

4.2. ACRONYMNS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval

30Q20 – 30-day minimum, 20-year recurrence interval

7Q10 – 7-day minimum, 10-year recurrence interval

BAT – best available technology economically achievable

BCT – best conventional pollutant control technology

BDL – below detection level

BOD_5 – five day biochemical oxygen demand

BPT – best practicable control technology currently available

$CBOD_5$ – five day carbonaceous biochemical oxygen demand

CEI – compliance evaluation inspection

CFR – code of federal regulations

CFS – cubic feet per second

CFU – colony forming units

CIU – categorical industrial user

CSO – combined sewer overflow

DMR – discharge monitoring report

D.O. – dissolved oxygen

E. coli – *Escherichia coli*

EFO – environmental field office

LB(lb) - pound

IC_{25} – inhibition concentration causing 25% reduction in survival, reproduction and growth of the test organisms

IU – industrial user

IWS – industrial waste survey

LC_{50} – acute test causing 50% lethality

MDL – method detection level

MGD – million gallons per day

MG/L(mg/l) – milligrams per liter

ML – minimum level of quantification

ml – milliliter

MLSS – mixed liquor suspended solids

MOR – monthly operating report

NODI – no discharge

NOEC – no observed effect concentration

NPDES – national pollutant discharge elimination system

PL – permit limit

POTW – publicly owned treatment works

RDL – required detection limit

SAR – semi-annual [pretreatment program] report

SIU – significant industrial user

SSO – sanitary sewer overflow

STP – sewage treatment plant

TCA – Tennessee code annotated

TDEC – Tennessee Department of Environment and Conservation

TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation

TMDL – total maximum daily load

TRC – total residual chlorine

TSS – total suspended solids

WQBEL – water quality based effluent limit

ADDENDUM TO RATIONALE
Bruceton Wastewater Lagoon
PERMIT NO. TN0062014

November 30, 2017
Addendum prepared by: Miss Julie Harse

The facility has discontinued receiving wastewater from the one industrial user under the pretreatment program. The Environmental Waste Services landfill has filed for bankruptcy and been turned over to the TDEC Division of Solid Waste Management. Bruceton has chosen to inactivate the pretreatment program. The pretreatment program was the basis for requiring biomonitoring. The modified permit will remove the pretreatment program requirements and the biomonitoring.

ADDENDUM TO RATIONALE
Bruceton Wastewater Lagoon
PERMIT NO. TN0062014

October 1, 2013
Addendum prepared by: Miss Julie Harse

The facility's objection letter contained two comments. The division will grant the two requests since the minor requests do not affect the permit limits or water quality.

1. Part 1; Paragraph 1.1 – Numeric and Narrative Effluent Limitations

The official name of the permittee is the Town of Bruceton, Tennessee. **The Town of Bruceton requests that the wording of "City" be changed to "Town" in the first rhetorical paragraph of Paragraph 1.1. the final version of the referenced NPDES permit.**

2. Part 3; Paragraph 3.2 – POTW Pretreatment Program General Provisions; Subparagraph d. Reporting Requirements; Subparagraph ii

The referenced draft permit requires that the effluent wastewater from the Bruceton Wastewater Lagoon be analyzed for the parameters trivalent chromium, hexavalent chromium, copper, lead, nickel, zinc, cadmium, mercury and silver from a composite type sample. Due to the nature of a wastewater treatment lagoon, the wastewater that is discharged to the receiving stream is already"composited" prior to discharge and concentrations of pollutants will not significantly vary within a 24-hour period.

Additionally, the parameters listed in Part 1 of the referenced draft permit required to be monitored in the effluent wastewater are to be analyzed from grab samples; therefore, grab samples of effluent wastewater would also be appropriate for pretreatment monitoring requirements.

RATIONALE

Bruceton Wastewater Lagoon
NPDES PERMIT No. TN0062014
DATE: January 29, 2018
Permit Writer: Julie Harse

1. FACILITY INFORMATION

Bruceton Wastewater Lagoon
Honorable Robert Scott - Mayor
Bruceton, Carroll County, Tennessee
(731) 586-2401
Treatment Plant Average Design Flow: 0.572 MGD
Percentage Industrial Flow: 0%
Treatment Description: Lagoon with disinfection

2. RECEIVING STREAM INFORMATION

The Big Sandy River at mile 31.0
Watershed Group: Tennessee Western Valley (Kentucky Lake)
Hydrocode: 6040005
Low Flow: 7Q10 = 23.4 MGD (36.2 CFS)
Low Flow Reference:
USGS - Streamflow-Characteristic Estimation Methods for Unregulated Streams of Tennessee Scientific Investigations Report 2009–5159 Station #03532200

Stream Classification Categories:

Domestic Wtr Supply	Industrial	Fish & Aquatic	Recreation
	X	X	X
Livestock Wtr & Wlife	**Irrigation**	**Navigation**	
X	X		

Water Quality Assessment: Fully supporting

3. CURRENT PERMIT STATUS

Permit Type:	**Municipal**
Classification:	**Minor**
Issuance Date:	**31-AUG-08**
Expiration Date:	**31-AUG-13**
Effective Date:	**01-OCT-08**

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

a. Biomonitoring has been added to the permit based on the reactivation of the pretreatment program.

b. Compliance Schedule Summary

Description of Report to be Submitted	Reference Section in Permit
Monthly Discharge Monitoring Reports	1.3.1
Monthly Operational Reports	1.3.4
Monthly Bypass and Overflow Summary Report	1.3.5.1
Industrial Waste Survey Report within 120 days of the effective permit date	3.2.a
Sludge analysis must be submitted by February 19th of each calendar year	3.3.a
Biomonitoring Report beginning within 90 days of the effective permit date	**Error! Reference source not found.**

c. For comparison, this rationale contains a table depicting the previous permit limits and effluent monitoring requirements in Appendix 1.

5. PREVIOUS PERMIT DISCHARGE MONITORING REPORT REVIEW

A review of the DMR summary from October 2008 – May 2013 reveals that the City of Bruceton has violated permit limits for dissolved oxygen and pH (See below chart). A complete discharge monitoring report summary is located in Appendix 2.

Parameter	Date	Value
Dissolved Oxygen	11/2008	0.8 mg/L
	6/2009	0.9 mg/L
	8/2010	0.6 mg/L
pH	1/2010	11.6 SU

In the previous permit cycle the division conducted four inspections of the wastewater facility. The inspections and results are the following:

Date	Inspection Notes
4/4/2013	Facility in compliance
5/20/2011	1. One minimum dissolved oxygen excursion was reported for the period April 2010 through April 2011. 2. Excessive I&I 3. The influent overflow pump is out of service while the check valve is being rebuilt. Parts have been ordered. 4. The pretreatment program is being reactivated. 5. Both lift stations were inspected and found to be in good operating condition.
12/17/2010	Jere Dougan toured the lagoon with Brian Edwards. There's ordinarily duckweed on the ponds but Brian said it never returned after the flood. Jere Dougan didn't notice any odor coming from the ponds. Bruceton just finished a project rehabbing sewer line and several manholes. One of the three influent pumps is down.
1/28/2010	1. Brandon Turner has been hired as assistant water operator. 2. Bruceton is looking for money to do more collection system rehabilitation. 3. Influent flow meter needs to be calibrated. Aerators need repair.

6. PROPOSED EFFLUENT LIMITS & RATIONALE

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MINIMUM PERCENT REMOVAL	RATIONALE
BOD_5	45	215	50	239	65	310	T.C.A. 1200-4-5-.09 (for BOD_5)
Total Suspended Solids	100	477	110	525	120	572	T.C.A. 1200-4-5-.09
Dissolved Oxygen (mg/l)	1.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Chlorine Residual (mg/l)	—	—	—	—	0.8 (daily maximum)	—	Refer to 6.3 below
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	T.C.A. 1200-4-3-.03, Refer to 6.4 below
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	T.C.A. 1200-4-5-.09
pH (standard units)	6.0-9.0	—	—	—	—	—	T.C.A. 1200-4-3-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
IC_{25}	2.4% per sample	—	—	—	—	—	Refer to 6.5 below
Sanitary Sewer Overflows, Total Occurrences			Report				Refer to 6.8 below
Dry Weather Overflows, Total Occurrences			Report				Refer to 6.8 below
Bypass of Treatment, Total Occurrences			Report				Refer to 6.8 below

Note: Weekly limitations on BOD_5 and TSS concentrations are given as required per 40 CFR 133.105(a)(2) or 133.105(e)(1)(ii) & 133.105(b)(2) respectively; daily BOD_5 and TSS limitations are authorized by T.C.A. 1200-4-5-.09; monthly, weekly, and daily mass loads are limited per 40 CFR 122.45(f) and based on the design flow as per 40 CFR 122.45(b); monthly average percent removal rates for BOD_5 are required per 40 CFR 133.105(a)(3) and 133.105(e)(1)(iii). Monthly average percent removals for TSS are established per 40 CFR 133.105 (b)(3) and 133.103(c).

6.1. BOD_5, DISSOLVED OXYGEN, AND PERCENT REMOVALS REQUIREMENTS

a. Biochemical oxygen demand, or BOD, is a measure of the oxygen used when biological processes break down organic pollutants in wastewater. The amount of oxygen used is more specifically referred to as the five-day biochemical oxygen demand, or BOD_5. This parameter is used in the wastewater industry to measure both the strength of wastewater and the performance of wastewater treatment processes.

   Limits on the oxygen demand remaining in the treated wastewater is often necessary to prevent pollutants in the wastewater from driving oxygen in the receiving stream down below the levels necessary to support fish and aquatic life. Additionally, the breakdown of ammonia into other forms of nitrogen also requires oxygen and therefore exerts an oxygen demand on receiving wastewaters.

   For this facility, the monthly average BOD_5 limit of 45 mg/l is a technology-based effluent limit for domestic waste stabilization lagoons (1200-4-5-.09).

   The dissolved oxygen effluent limitation of 1.0 mg/l is a practical limit achievable by the facility rather than a water-quality based limit necessary to protect fish and aquatic life. A minimum oxygen level of 1.0 mg/l is necessary in a lagoon treatment system to prevent nuisance conditions associated with anaerobic conditions.

b. The treatment facility is required to remove 65% of the BOD_5 that enter the facility on a monthly basis. This is part of the minimum requirement for all municipal treatment facilities contained in Code of Federal Regulations 40 Part 133.102. The reasons stated by the U.S.E.P.A. for these requirements are to achieve these two basic objectives:

   (1) To encourage municipalities to correct excessive inflow and infiltration (I/I) problems in their sanitary sewer systems, and
   (2) To help prevent intentional dilution of the influent wastewater as a means of meeting permit limits.

6.2. NH_3-N TOXICITY

To access toxicity impacts, the state utilizes the EPA document, 1999 Update to Ambient Water Quality Criteria for Ammonia, pursuant to 1200-4-3-.0-3(3)(j), and assumed stream temperatures of 30°C and 20°C and pH of 8.0 to derive an allowable instream protection value protective of chronic exposure to a continuous discharge. A mass balance equation with sewage treatment facility and stream flows and this allowable value determines the monthly average permit limit. The criteria document states that a 30Q5 flow value is protective in deriving allowable values. Where the division has 30Q5 flow values, the division may use them. Otherwise, the division utilizes the available 7Q10 or 1Q10 values that are generally more conservative. The criteria continuous concentrations (CCC) derived from assumed temperature and pH values are as follows:

CCC values based on temperature and pH, in mg/L:

Temperature (°C)	7.5 pH	8.0 pH
25	2.22	1.24
27	1.94	1.09
30	1.61	0.90

Temperature (°C)	7.5 pH	8.0 pH
15	4.22	2.36
17	3.72	2.07
20	3.06	1.71

The mass balance equation is as follows:

$$CCC = \frac{Q_S C_S + Q_{STP} C_{STP}}{Q_S + Q_{STP}} \qquad \text{or,} \qquad C_{STP=} \frac{CCC(Q_S + Q_{STP}) - (Q_S C_S)}{Q_{STP}}$$

where:

CCC = Criteria continuous concentration (mg/l)
Q_S = 7Q10 flow of receiving stream (MGD)
Q_{STP} = Design flow of STP (MGD)
C_S = Assumed/Measured instream NH_3 (mg/l)
C_{STP} = Allowable STP discharge of NH_3 (mg/l)

C_{STP} = $\frac{0.9\ (23.4\ MGD + 0.572\ MGD) - (23.4\ MGD \times 0.1 mg/l)}{0.572\ MGD}$ = 33.6 mg/l (summer)

C_{STP} = $\frac{1.71\ (23.4\ MGD + 0.572\ MGD) - (23.4\ MGD \times 0.1 mg/l)}{0.572\ MGD}$ = 67.6 mg/l (winter)

The facility has chosen to reactivate their pretreatment program based on a potential industrial user that would send landfill leachate with high ammonia concentrations. The pretreatment program sewer use ordinance states in Section 6.10 that if the influent monthly average ammonia exceeds 30 mg/L “the Public Services Director shall initiate technical studies to determine the cause of the exceedance and shall recommend to the Town the necessary remedial measures”. Since the maximum influent ammonia is lower than the toxicity concentration of 33.6 mg/L, ammonia monitoring will not be added to the permit.

6.3. CHLORINATION

The residual chlorine limit is derived using the mass balance formula and the EPA instream protection value of 0.019 mg/l for fish and aquatic life. Applying this formula yields the following calculation:

$$\frac{0.019\ (Qd + Qs)}{Qd} = \text{Limit (mg/l)} = \frac{0.019(0.572 + 23.4)}{0.572} = 0.8 \text{ mg/l}$$

where:

0.019	=	instream protection value (acute)
0.572	=	Qd, design flow of STP (MGD)
23.4	=	Qs, 7Q10 flow of receiving stream (MGD)

6.4. *E. COLI* REQUIREMENTS

Disinfection of wastewater is required to protect the receiving stream from pathogenic microorganisms. *E. coli* is an indicator organism used as a measure of bacteriological health of a receiving stream and the effectiveness of disinfection. The *E. coli* daily maximum limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

6.5. BIOMONITORING

The division evaluates all dischargers for reasonable potential to exceed the narrative water quality criterion, “no toxics in toxic amounts”. The division has determined that for municipal facilities with stream dilutions of less than 500 to 1, any of the following conditions may demonstrate reasonable potential to exceed this criterion.

a. Toxicity is suspected or demonstrated.
b. A pretreatment program is required.
c. The design capacity of the facility is greater than 1.0 MGD.

The following calculation is the required dilution at which chronic toxicity testing must meet permit requirements.

$$IC_{25}\ \% = \frac{\text{Design Flow}}{\text{Low Flow+ Design Flow}} * 100 \geq \frac{.572}{23.4+.572} * 100 > 2.4\%$$

where:

23.4	=	Low Flow - 7Q10 (MGD)
.572	=	Design Flow Capacity (MGD)
IC_{25}	=	Concentration causing 25% reduction in survival, reproduction and growth of test organisms

6.6. METALS AND TOXICS

This POTW is required to implement/maintain a pretreatment program. More frequent monitoring will be required **in the permit** if (a) the reported concentrations approach or exceed calculated allowable values, (b) significant amounts of particular pollutants are present which may impact the treatment process sludge character or the receiving stream, or (c) minimum information is lacking to accurately calculate water quality protection values, in which case additional stream monitoring may also be required.

The application data does not indicate that the potential exists for the water quality criteria for any parameter to be exceeded. Appendix 3 lists the metal and toxic parameters calculations and the procedure used to derive the results.

6.7. VOLATILE ORGANIC, ACID-EXTRACTABLE, AND BASE-NEUTRAL COMPOUNDS

The division evaluated effluent concentrations of volatile organic, acid-extractable, and base-neutral compounds and antimony, arsenic, beryllium, selenium and thallium for potential to violate water quality criteria using the following mass balance equation:

$$Cm = \frac{QsCs + QwCw}{Qs + Qw}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow, (STP design flow)
Qs = stream low flow

to protect water quality:

$$Cw \leq Ca$$

where:

Ca = STP effluent concentration allowable

$$= \frac{(S_A)\,[Cm\,(Qs + Qw) - QsCs]}{Qw}$$

and (S_A) = the percent “Stream Allocation”.

The reasonable potential evaluation uses the following assumptions and procedures:

a. Stream background concentrations, Cs, for all volatile organic, acid-extractable, and base-neutral compounds equal zero unless actual stream data exists to

show otherwise. Use of the effluent concentrations of such pollutants contributed by upstream dischargers as background is not justifiable due to the volatility and reactivity of these pollutants.

b. The stream allocation, S_A , is 90% and is used as a factor of safety.

c. A mass balance uses the STP design flow, the receiving stream critical low flow (7Q10 or 1Q10), the state water quality numeric criteria, and the stream allocation safety factor to derive the allowable effluent concentrations.

d. When pollutants have potential to violate standards because the concentrations are below the scan detection levels but could be above the allowable water quality based effluent concentrations, the pollutants are handled one of three (3) ways:

   i. Additional testing of detected and non-detected pollutants is required if contributing industrial processes are likely to contain them and the effluent scans have not met the minimum required detection levels (RDL) in the state water quality standards or approximated the method detection limits (MDL) of the approved test methods for the pollutants in 40 CFR Part 136.
   ii. If the required RDL has been used and resulted in non-detection, or if an MDL has been used with non-detection and the contributing industrial processes do not reasonably contain that pollutant, the division drops the pollutant from further consideration.
   iii. Pollutants detected at levels high enough to violate standards are limited in the permit to the allowable concentration, Cw, based on STP design flow.

Calculations for this permit have been done using a standardized spreadsheet, titled "WQ Based Effluent Calculations- Other Compounds", and are located in Appendix 4. All metals other than antimony, arsenic, beryllium, selenium, and thallium have been evaluated using procedures described in the rationale, or fact sheet, section headed, “METALS & TOXICS”.

The evaluation indicates that volatile organic, acid extractable, and base neutral compounds and antimony, arsenic, beryllium, selenium, and thallium do not exhibit the potential to violate water quality criteria and thus will not be given effluent limitations and monitoring requirements in the permit.

6.8. OVERFLOW AND BYPASS REPORTING

For the purposes of demonstrating proper operation of the collection, transmission, and treatment system, the permit defines overflow as any release of sewage other than through permitted outfalls. This definition includes, but is not necessarily limited to, sanitary sewer overflows and dry weather overflows as defined. For example, a collection system blockage or hydraulic overload that causes backup and release of sewage into a building during a wet weather event may not clearly fit either the definition of a sanitary sewer overflow or a dry weather overflow. Still, any unpermitted release potentially warrants permittee mitigation of human health and/or water quality impacts via direct or indirect contact and demonstrates a hydraulic

problem in the system that warrants permittee consideration as part of proper operation and maintenance of the system.

However, for the more typical, unpermitted, releases into the environment, this permit intends interchangeable use of the terms, “overflow” and “sanitary sewer overflow” for compliance reporting purposes.

7. OTHER REQUIREMENTS AND CONDITIONS

7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

The waste treatment facilities shall be operated under the supervision of a certified wastewater treatment operator in accordance with the Water Environmental Health Act of 1984.

7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

The collection system shall be operated under the supervision of a certified collection system operator in accordance with the Water Environmental Health Act of 1984.

7.3. PRETREATMENT PROGRAM

The Bruceton Wastewater Lagoon has an approved pretreatment program. An updated Industrial Waste Survey must be completed within 120 days of the effective date of the permit, unless such a survey has been submitted within 3 years of the effective date. Semi-annual report data was not reviewed since the pretreatment program was reactivated only in the last year.

7.4. PERMIT TERM

This permit is being reissued for 5 years in order to coordinate its reissuance with other permits located within the Tennessee Western Valley (Kentucky Lake) Watershed.

8. ANTIDEGRADATION STATEMENT/WATER QUALITY STATUS

Tennessee’s Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.06. It is the purpose of Tennessee’s standards to fully protect existing uses of all surface waters as established under the Act.

Stream determinations for this permit action are associated with the waterbody segment identified by the division as segment ID#TN06040005027_1000. The division has made a determination of the receiving waters associated with the subject discharge(s) and has found the receiving stream to be an available conditions water. Additionally, this water is fully supporting of its designated uses. The Department has maintained, and shall continue to assess, the water quality of the stream to assure that the water quality is adequate to protect the existing uses of

the stream fully, and to assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

APPENDIX 1
PREVIOUS PERMIT LIMITS

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MINIMUM PERCENT REMOVAL	MEASUREMENT FREQUENCY
BOD_5	45	215	50	239	65	310	1/week
Total Suspended Solids	100	477	110	525	120	572	1/week
Dissolved Oxygen (mg/l)	1.0 (daily minimum) instantaneous	—	—	—	—	—	5/week
Total Chlorine Residual (mg/l)	—	—	—	—	0.8 (daily maximum)	—	5/week
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	1/week
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	2/week
pH (standard units)	6.0-9.0	—	—	—	—	—	5/week
Flow (MGD):							
Influent	Report	—	—	—	Report	—	7/week
Effluent	Report	—	—	—	Report	—	7/week
Metals & Toxics:							
Sanitary Sewer Overflows, Total Occurrences			Report				continuous
Dry Weather Overflows, Total Occurrences			Report				continuous
Bypass of Treatment, Total Occurrences			Report				continuous

APPENDIX 2
Discharge Monitoring Report Summary

	Overflow		Bypass	Flow				BOD					
				Influent		Effluent		Monthly				Daily	
Date	# (Wet)	# (Dry)	# of Bypass	Monthly Average	Daily Max.	Monthly Average	Daily Max.	Influent Conc.	Effluent Conc.	Percent Removal	Average Amount	Influent Conc.	Effluent Conc.
				MGD	MGD	MGD	MGD	mg/L	mg/L	%	lb/day	mg/L	mg/L
10/31/2008	0	0	0	0.086	0.152	0.212	0.738		39	72	69	143	42
11/30/2008	0	0	0	0.094	0.165	0.167	0.919		28	73	53	144	44
12/31/2008	0	0	0	0.164	0.971	0.319	1.581		19	85	158	121	23
01/31/2009	3	3	0	0.167	0.497	0.297	1.357		30	76	74	132	32
02/28/2009	0	0	0	0.118	0.169	0.207	0.424	119	26	78	45		33
03/31/2009	0	0	0	0.167	0.834	0.320	1.035	128	23	82	61		29
04/30/2009	0	0	0	0.147	0.555	0.252	0.657		25	78	52	119	34
05/31/2009	0	0	0	0.231	0.787	0.264	0.570		26	75	57	110	33
06/30/2009	0	0	0	0.125	0.224	0.060	0.253		28	78	14	128	28
07/31/2009	2	2	0	0.122	0.392	0.098	1.216		32	77	26	138	32
08/31/2009	0	0	0	0.102	0.200	0.318	0.998		28	76	74	128	32
09/30/2009	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
10/31/2009	0	0	0	0.176	0.937	0.248	0.793		28	79	58	132	33
11/30/2009	0	0	0	0.142	0.499	0.129	0.446		24	80	26	125	36
12/31/2009	0	0	0	0.185	0.935	0.150	0.364		19	83	24	122	25
01/31/2010				0.162	0.274	0.160	0.349	125	20	84	27	151	24
02/28/2010	0	0	0	0.174	0.324	0.154	0.257	137	30	77	38	150	41
03/31/2010	0	0	0	0.150	0.276	0.126	0.262	130	26	79	27	147	36
04/30/2010	0	0	0	0.140	0.535	0.110	0.293	113	16	86	15	129	18
05/31/2010	0	0	0	0.280	1.307	0.439	1.616	163	15	85	54	193	26
06/30/2010	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
07/31/2010	0	0	0	0.069	0.302	0.152	0.620	101	24	76	30	120	32
08/31/2010	0	0	0	0.112	0.289	0.062	0.880	67	22	67	11	67	22
09/30/2010	0	0	0	0.082	0.105	0.165	0.727	130	20	84	27	150	23
10/31/2010	0	0	0	0.096	0.427	0.121	0.280	135	22	83	22	144	32
11/30/2010	0	0	0	0.097	0.196	0.189	0.508	127	20	84	32	131	26
12/31/2010	0	0	0	0.115	0.221	0.185	0.419	136	16	88	24	152	21
01/31/2011	0	0	0	0.107	0.134	0.158	0.271	138	11	91	14	153	15
02/28/2011	0	0	0	0.160	0.935	0.206	0.482	256	12	93	21	431	21
03/31/2011	0	0	0	0.155	0.599	0.291	0.628	128	8	94	19	140	12
04/30/2011	0	0	0	0.179	1.089	0.166	0.377	164	8	95	11	185	12
05/31/2011	0	0	0	0.366	2.162	0.285	0.511	126	7	94	17	135	9
06/30/2011	0	0	0	0.129	0.278	0.054	0.305	316	8	97	4	392	10
07/31/2011	0	0	0	0.183	0.801	0.099	0.531	135	14	89	11	135	15
08/31/2011	0	0	0	0.100	0.208	0.139	0.601	148	35	76	40	163	47
09/30/2011	0	0	0	0.100	0.276	0.159	1.745	146	31	78	41	151	33
10/31/2011	0	0	0	0.062	0.088	0.159	0.728	135	28	79	37	145	32
11/30/2011	0	0	0	0.141	0.485	0.321	0.826	137	20	85	53	148	27
12/31/2011	0	0	0	0.220	1.272	0.494	2.743	126	26	79	107	131	33
01/31/2012	0	0	0	0.158	0.468	0.240	0.466	145	23	86	46	158	37
02/29/2012	0	0	0	0.160	0.440	0.184	0.266	165	8	95	12	204	11
03/31/2012	0	0	0	0.122	0.522	0.210	0.451	159	20	87	35	189	27
04/30/2012	0	0	0	0.071	0.110	0.088	0.141	134	24	81	18	137	32
05/31/2012	0	0	0	0.066	0.203	0.034	0.162	144	26	82	7	144	26
06/30/2012	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
07/31/2012	0	0	0	0.051	0.142	0.051	0.615	155	12	92	5	155	12
08/31/2012	0	0	0	0.047	0.065	0.137	0.844	239	27	88	31	309	35
09/30/2012	0	0	0	0.071	0.105	0.142	0.345	201	24	87	28	227	27
10/31/2012	0	0	0	0.081	0.141	0.170	0.318	236	25	89	35	287	28
11/30/2012	0	0	0	0.073	0.094	0.119	0.196	198	21	89	21	213	32
12/31/2012	0	0	0	0.099	0.226	0.223	0.461	205	18	90	33	264	24
01/31/2013	0	0	0	0.306	2.340	0.236	1.015	193	14	92	27	222	21
02/28/2013	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
03/31/2013	0	0	0	0.185	0.332	0.327	0.709	160	29	81	79	220	32
04/30/2013	0	0	0	0.197	0.864	0.223	0.746	134	26	80	48	141	31
05/31/2013	0	0	0	0.210	0.996	0.196	0.541	136	27	80	44	144	32
Standard Dev.	**0.500**	**0.500**	**0.000**	**0.064**	**0.482**	**0.095**	**0.475**	**46**	**7**	**7**	**27**	**67**	**9**
Minimum	**0.00**	**0.00**	**0.00**	**0.047**	**0.065**	**0.034**	**0.141**	**67**	**7.0**	**67**	**4**	**67**	**9**
Maximum	**3.00**	**3.00**	**0.00**	**0.366**	**2.340**	**0.494**	**2.743**	**316**	**39**	**97**	**158**	**431**	**47**
Average	**0.10**	**0.10**	**0.00**	**0.140**	**0.518**	**0.193**	**0.665**	**154**	**22**	**83**	**37**	**168**	**28**
Permit Limit	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**45**	**65%**	**215**	**Report**	**65**
Count	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**46**	**56**	**56**	**56**	**54**	**56**

	Total Suspended Solids			E.coli		Settleable Solids	Dissolved Oxygen	Total Residual Chlorine	pH	
	Monthly		Daily							
Date	Effluent Conc.	Average Amount	Effluent Conc.	Monthly Average Conc.	Daily Max. Conc.	Daily Max. Conc.	Daily Min. Conc.	Daily Max. Conc.	Daily Min. Conc.	Daily Max. Conc.
	mg/L	lb/day	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	SU	SU
10/31/2008	24	42	31	47	66	0.1	4.2	0.2	7.8	8.8
11/30/2008	30	42	34	88	99	0.1	**0.8**	0.2	7.5	8.0
12/31/2008	17	45	18	67	119	0.1	6.0	0.1	7.4	7.8
01/31/2009	24	59	31	65	101	0.1	5.8	0.2	7.4	7.8
02/28/2009	27	46	34	70	79	0.1	5.5	0.1	7.6	8.2
03/31/2009	26	69	33	14	21	0.1	8.4	0.2	8.2	8.6
04/30/2009	22	46	33	39	73	0.1	1.5	0.3	8.0	8.7
05/31/2009	21	46	24	70	95	0.1	1.8	0.1	8.0	8.5
06/30/2009	19	9.5	19	96	96	0.1	**0.9**	0.2	8.0	8.4
07/31/2009	21	17	21	62	62	0.1	2.8	0.1	8.4	8.6
08/31/2009	27	72	31	49	62	0.1	1.0	0.2	7.4	8.2
09/30/2009	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
10/31/2009	26	54	31	61	89	0.1	5.2	0.2	7.8	8.8
11/30/2009	21	22	28	52	95	0.1	2.9	0.3	7.3	8.0
12/31/2009	15	18	23	29	53	0.1	6.7	0.2	7.2	7.6
01/31/2010	18	24	28	30	40	0.1	9.2	0.4	7.3	**11.6**
02/28/2010	22	28	27	27	52	0.1	9.1		7.0	8.6
03/31/2010	20	20	26	13	28	0.1	1.5	0.2	7.0	8.0
04/30/2010	18	16	23	12	18	0.1	1.3	0.2	7.2	7.6
05/31/2010	12	44	16	6.2	17	0.1	2.6	0.2	73.0	9.0
06/30/2010	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
07/31/2010	23	29	31	41	55	0.1	1.0	0.3	7.4	7.8
08/31/2010	29	15	29	29	29	0.1	**0.6**	0.3	7.1	7.8
09/30/2010	26	36	29	29	53	0.1	1.2	0.2	7.3	8.2
10/31/2010	27	27	39	11	27	0.1	1.8	0.3	7.8	9.0
11/30/2010	18	28	27	20	38	0.1	4.0	0.3	7.5	7.8
12/31/2010	15	23	23	10	20	0.1	4.2	0.2	7.4	7.6
01/31/2011	16	21	21	12	20	0.1	4.0	0.1	7.3	7.6
02/28/2011	17	29	27	11	19	0.1	2.6	0.1	7.3	7.4
03/31/2011	17	41	20	14	21	0.1	2.4	0.0	7.3	7.5
04/30/2011	18	25	21	19	29	0.1	2.8	0.1	7.4	7.5
05/31/2011	19	45	24	20	34	0.1	3.8	0.2	7.4	7.5
06/30/2011	17	8	19	13	20	0.1	1.4	0.2	7.8	8.0
07/31/2011	17	14	19	17	27	0.1	1.0	0.2	7.2	7.6
08/31/2011	15	17	16	23	29	0.1	1.0	0.1	7.2	8.8
09/30/2011	21	28	22	24	42	0.1	5.2	0.1	7.6	8.7
10/31/2011	19	25	22	19	35	0.1	4.0	0.2	8.0	8.4
11/30/2011	19	49	24	19	32	0.1	4.8	0.0	7.3	8.0
12/31/2011	16	66	21	17	33	0.1	4.2	0.0	7.2	7.8
01/31/2012	16	32	21	17	38	0.1	4.1	0.1	7.2	7.5
02/29/2012	15	23	20	18	25	0.1	3.8	0.0	7.2	7.6
03/31/2012	21	37	26	15	33	0.1	2.6	0.0	7.4	7.5
04/30/2012	19	14	25	19	40	0.1	1.7	0.0	7.5	8.9
05/31/2012	18	5	18		12	0.1	1.5	0.1	8.6	8.9
06/30/2012	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
07/31/2012	19	8	19	27	27	0.1	1.5	0.0	8.6	8.9
08/31/2012	22	25	28	23	34	0.1	2.0	0.0	7.5	8.9
09/30/2012	20	24	24	25	53	0.1	1.2	0.1	7.5	8.8
10/31/2012	22	31	24	26	44	0.1	2.0	0.0	7.0	8.2
11/30/2012	22	22	27	30	48	0.1	4.4	0.4	7.4	7.5
12/31/2012	23	43	28	25	37	0.1	2.8	0.1	7.2	7.6
01/31/2013	20	39	24	14	22	0.1	5.4	0.0	7.4	7.6
02/28/2013	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.	No Dis.
03/31/2013	17	46	23	23	43	0.1	9.8	0.1	7.6	7.9
04/30/2013	22	41	26	23	35	0.1	7.6	0.0	7.2	8.0
05/31/2013	20	32	26	19	34	0.1	2.6	0.1	7.2	8.4
Standard Dev.	**4**	**16**	**5**	**21**	**26**	**0.00**	**2.4**	**0.1**	**9.1**	**0.7**
Minimum	**12**	**5.0**	**16**	**6**	**12**	**0.10**	**0.6**	**0.0**	**7.0**	
Maximum	**30**	**72**	**39**	**96**	**119**	**0.10**	**9.8**	**0.4**		**11.6**
Average	**20**	**32**	**25**	**30**	**45**	**0.10**	**3.5**	**0.1**	**8.8**	**8.2**
Permit Limit	**100**	**477**	**120**	**126/100 ml**	**941/100 ml**	**1.0 ml/L**	**1.0 mg/L**	**0.80**	**6.0**	**9.0**
Count	**56**	**56**	**56**	**55**	**56**	**56**	**56**	**56**	**56**	**56**

APPENDIX 3
Metal and Toxic Parameter Calculations

The following procedure is used to calculate the allowable instream concentrations for pass-through guidelines and permit limitations.

a. The most recent background conditions of the receiving stream segment are compiled. This information includes:

   * 7Q10 of receiving stream (23.4 MGD, USGS)
   * Calcium hardness (25 mg/l, default)
   * Total suspended solids (10 mg/l, default)
   * Background metals concentrations
   * Other dischargers impacting this segment (none)
   * Downstream water supplies, if applicable

b. The chronic water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel and zinc. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions.

c. The acute water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel, zinc and silver. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions for the following metals: cadmium, copper, lead, nickel and silver.

d. The resulting allowable trivalent and hexavalent chromium concentrations are compared with the effluent values characterized as total chromium on permit applications. If reported total chromium exceeds an allowable trivalent or hexavalent chromium value, then the calculated value will be applied in the permit for that form of chromium unless additional effluent characterization is received to demonstrate reasonable potential does not exist to violate the applicable state water quality criteria for chromium.

e. A standard mass balance equation determines the total allowable concentration (permit limit) for each pollutant. This equation also includes a percent stream allocation of no more than 90%.

The following formulas are used to evaluate water quality protection:

$$Cm = \frac{QsCs + QwCw}{Qs + Qw}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow
Qs = stream low flow

to protect water quality:

$$Cw \leq \frac{(S_A)\,[Cm\,(Qs + Qw) - QsCs]}{Qw}$$

where (S_A) is the percent “Stream Allocation”.

Calculations for this permit have been done using a standardized spreadsheet, titled "Water Quality Based Effluent Calculations." Division policy dictates the following procedures in establishing these permit limits:

1. The critical low flow values are determined using USGS data:

   Fish and Aquatic Life Protection
   7Q10 - Low flow under natural conditions
   1Q10 - Regulated low flow conditions

   Other than Fish and Aquatic Life Protection
   30Q2 - Low flow under natural conditions

2. Fish & Aquatic Life water quality criteria for certain Metals are developed through application of hardness dependent equations. These criteria are combined with dissolved fraction methodologies in order to formulate the final effluent concentrations.

3. For criteria that are hardness dependent, chronic and acute concentrations are based on a Hardness of 25 mg/L and Total Suspended Solids (TSS) of 10 mg/L unless STORET or Water Supply intake data substantiate a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively. The minimum limit on the TSS value used for water quality calculations is 10 mg/L.

4. Background concentrations are determined from the division database, results of sampling obtained from the permittee, and/or obtained from nearby stream sampling data. If this background data is not sufficient, one-half of the chronic “In-stream Allowable” water quality criteria for fish and aquatic life is used. If the measured background concentration is greater than the chronic “In-stream Allowable” water quality criteria, then the measured background concentration is used in lieu of the chronic “In-stream Allowable” water quality criteria for the purpose of calculating the appropriate effluent limitation (Cw). Under these circumstances, and in the event the “stream allocation” is less than 100%, the calculated chronic effluent limitation for fish and aquatic life should be equal to the chronic “In-stream Allowable” water quality criteria. These guidelines should be strictly followed where the industrial source water is not the receiving stream.

Where the industrial source water is the receiving stream, and the measured background concentration is greater than the chronic “In-stream Allowable” water quality criteria, consideration may be given as to the degree to which the permittee should be required to meet the requirements of the water quality criteria in view of the nature and characteristics of the receiving stream.

The spreadsheet has fifteen (15) data columns, all of which may not be applicable to any particular characteristic constituent of the discharge. A description of each column is as follows:

Column 1: The "Stream Background" concentrations of the effluent characteristics.

Column 2: The "Chronic" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Continuous Concentration (CCC) is calculated using the equation:

$$CCC = (\exp \{ m_C [\ln (\text{stream hardness})] + b_C \}) (CCF)$$

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 1200-4-3-.03 and the EPA guidance contained *in The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent; no chronic criterion exists for silver. Published criteria are used for non-metal parameters.

Column 3: The "Acute" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, silver, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Maximum Concentration (CMC) is calculated using the equation:

$$CMC = (\exp \{ m_A [\ln (\text{stream hardness})] + b_A \}) (ACF)$$

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 1200-4-3-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent. Published criteria are used for non-metal parameters.

Column 4: The “Fraction Dissolved” converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated

using the linear partition coefficients found in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

$$\frac{C_{diss}}{C_{total}} = \frac{1}{1 + \{ [K_{po}] [ss^{(1+a)}] [10^{-6}] \}}$$

ss = in-stream suspended solids concentration [mg/l]

Linear partition coefficients for streams are used for unregulated (7Q10) receiving waters, and linear partition coefficients for lakes are used for regulated (1Q10) receiving waters. For those parameters not in the dissolved form in columns 2 & 3 (and all non-metal parameters), a Translator of 1 is used.

Column 5: The "Chronic" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 2 by the value in column 4.

Column 6: The "Acute" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 3 by the value in column 4.

Column 7: The "Chronic" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the chronic limit.

Column 8: The "Acute" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the acute limit.

Column 9: The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Organism Consumption (Recreation).

Column 10: The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Water and Organism Consumption. These criteria are only to be applied when the stream use classification for the receiving stream includes both “Recreation” and “Domestic Water Supply.”

Column 11: The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Domestic Water Supply.

Column 12: The Calculated Effluent Concentration associated with Organism Consumption.

Column 13: The Calculated Effluent Concentration associated with Water and Organism Consumption.

Column 14: The Calculated Effluent Concentration associated with Domestic Water Supply.

Column 15: The Effluent Limited criteria. This upper level of allowable pollutant loading is established if (a) the calculated water quality value is greater than accepted removal efficiency values, (b) the treatment facility is properly operated, and (c) full compliance with the pretreatment program is demonstrated. This upper level limit is based upon EPA's 40 POTW Survey on levels of metals that should be discharged from a POTW with a properly enforced pretreatment program and considering normal coincidental removals.

The most stringent water quality effluent concentration from Columns 7, 8, 12, 13, 14, and 15 is applied if the receiving stream is designated for domestic water supply. Otherwise, the most stringent effluent concentration is chosen from columns 7, 8, 12, and 15 only.

WQ Based Effluent Calculations

WATER QUALITY BASED CALCULATIONS FOR METALS AND OTHER TOXIC SUBSTANCES
OUTFALL 001

FACILITY: Bruceton STP
PERMIT #: TN0062014

Stream (7Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Stream Allocation
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
23.4	28.7	0.572	10	25	50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Stream	Fish/Aqua. Life		Effluent	Fish & Aquatic Life Water Quality Criteria (7Q10)				Human Health Water Quality Criteria (30Q5)							
	Bckgrnd.	Water Quality Criteria		Fraction	In-Stream Allowable		Calc. Effluent Concentration		In-Stream Criteria			Calc. Effluent Concentration				
EFFLUENT	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	Average	Maximum
CHARACTERISTIC	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]
Cadmium *	0.047	0.094	0.522	0.252	0.371	2.068	**6.8**	**42.4**	NA			**NA**			0.12	0.12
Copper *	1.300	2.739	3.640	0.348	7.881	10.472	**138.5**	**192.8**	NA			**NA**			1.84	2.71
Lead *	0.270	0.541	13.882	0.184	2.942	75.487	**56.1**	**1576.3**	NA			**NA**			4.74	6.66
Nickel *	8.048	16.096	144.918	0.432	37.231	335.209	**615.5**	**6859.5**	4600.0			**117500.2**			0.28	0.28
Silver *	0.148	NA	0.296	1.000	NA	0.296	**N/A**	**3.2**	NA			**NA**			0.2	0.2
Zinc *	6.000	36.498	36.202	0.288	126.733	125.705	**2532.9**	**2511.4**	NA			**NA**			4	7
Mercury, (T) **	0.026	0.770	1.400	1.000	0.770	1.400	**15.61**	**28.8**	0.051			**0.7**			0.00396	0.00515
Chromium III	1.000	23.813	183.066	0.202	117.733	905	**2446.6**	**18945**	NA			**NA**			0.582	0.69
Chromium VI	1.000	11.000	16.000	1.000	11.000	16.00	**210.0**	**315**	NA			**NA**			0.582	0.69
Cyanide (T) **	2.600	5.200	22.000	1.000	5.200	22.000	**55.8**	**407.8**	140.0			**3517.0**			5	5
Toluene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	15000.0			**383811.2**			5	5
Benzene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	510.0			**13049.6**			1	1
1,1,1 Trichloroethane	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	NA			**NA**			1	1
Ethylbenzene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	2100.0			**53733.6**			1	1
Carbon Tetrachloride	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	16.0			**409.4**			1	1
Chloroform	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	4700.0			**120260.8**			3	3
Tetrachloroethylene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	33.0			**844.4**			5	5
Trichloroethylene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	300.0			**7676.2**			2	2
1,2, trans Dichloroethylene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	10000.0			**255874.1**			1	1
Methylene Chloride	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	5900.0			**150965.7**			5	5
Total Phenols	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	1700000.0			**NA**			13	36.9
Napthalene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**	NA			**NA**			1	1

* Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness. The Fish & Aquatic Life criteria for this metal are in the dissolved form at laboratory conditions. The in-stream allowable criteria and calculated effluent concentrations are in the total recoverable form.

** The criteria for these parameters are in the total form.

NOTE: Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q5 flow.

APPENDIX 4
WQ Based Effluent Calculations- Other Compounds

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Bruceton STP
PERMIT: TN0062014
DATE: 8/9/2013

Stream (7Q10) [MGD]	Stream (30Q5) [MGD]	Waste Flow [MGD]	Ttl. Susp. Solids [mg/l]	Hardness (as CaCO3) [mg/l]	Margin of Safety [%]
23.4	28.7	0.572	10	25	50

	1	2	3	5	6	7	8	9	10	11	12	13	14	15
	Stream	Dectection Levels		Fish/Aqua. Life Water Quality Criteria		Calculated Effluent Concentration		Human Health Water Quality Criteria (30Q5)						Avg. daily effluent
	Bckgrnd.	Scan	WQC RDL					In-Stream Criteria			Calculated Effluent Concentration			
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
ANTIMONY		3.8	3.0					640.0	5.6	5.0	16375.9	143.3	114.5	<0.8
ARSENIC	1.3	1.0	1.0	150.0	340.0	3116.6	7098.0	10.0			223.3			<2.4
BERYLLIUM		2.0	1.0							4.0			102.3	<0.08
SELENIUM		5.0	2.0	5.0	20.0	104.8	419.1							<3.2
THALLIUM		5.0	*					0.47	0.24	2.0	12.0	6.1	51.2	<0.4
ACROLEIN	0.0	50.0	1.0					290.0			7420.3			<20
ACRYLONITRILE	0.0	50.0	1.0					2.5	0.58		64.0	14.9		<5
BENZENE	0.0	1.0	1.0					510.0			13049.6			<1
BROMOFORM	0.0	1.0	1.0					1400.0	43.0		35822.4	1100.3		<5
CARBON TETRACHLORIDE	0.0	1.0	1.0					16.0			409.4			<1
CHLOROBENZENE	0.0	1.0	*					1600.0	130.0		40939.9	3326.4		<5
CHLORODIBROMO-METHANE	0.0	1.0	*					130.0			3326.4			<5
CHLOROETHANE	0.0	1.0	*											<1
2-CHLORO-ETHYLVINYL ETHER	0.0	1.0	*											<25
CHLOROFORM	0.0	5.0	0.5					4700.0	57.0		120260.8	1458.5		<3
DICHLOROBROMO-METHANE	0.0	1.0	1.0					170.0			4349.9			<5
1,1-DICHLOROETHANE	0.0	1.0	1.0					NA	NA	NA	NA	NA	NA	<2
1,2-DICHLOROETHANE	0.0	1.0	1.0					370.0			9467.3			<5
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*					10000	140.0	100.0	255874.1	3582.2	2558.7	<1
1,1-DICHLOROETHYLENE	0.0	1.0	1.0											<1
1,2-DICHLOROPROPANE	0.0	1.0	*					150.0	5.0	5.0	3838.1	127.9	127.9	<5
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0					210.0	3.4		5373.4			<5
ETHYLBENZENE	0.0	1.0	1.0					2100	530.0	700.0	53733.6	13561.3	17911.2	<1
METHYL BROMIDE	0.0	1.0	*					1500.0			38381.1			<5
METHYL CHLORIDE	0.0	1.0	1.0											<5
METHYLENE CHLORIDE	0.0	5.0	1.0					5900.0			150965.7			<5
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5					40.0	1.7		1023.5	43.5		<5
TETRACHLORO-ETHYLENE	0.0	1.0	0.5					33.0			844.4			<5
TOLUENE	0.0	1.0	1.0					15000	1300.0	1000.0	383811.2	33263.6	25587.4	<5
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0											<1
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2					160.0	5.9	5.0	4094.0	151.0	127.9	<5
TRICHLORETHYLENE	0.0	1.0	1.0					300.0			7676.2			<2
VINYL CHLORIDE	0.0	1.0	2.0					24.0	0.25	2.0	614.1	6.4	51.2	<1
P-CHLORO-M-CRESOL	0.0	10.0	*											<10
2-CHLOROPHENOL	0.0	10.0	*					150.0	81.0		3838.1	2072.6		<5
2,4-DICHLOROPHENOL	0.0	10.0	*					290.0			7420.3			<5
2,4-DIMETHYLPHENOL	0.0	10.0	*					850.0	380.0		21749.3	9723.2		<10
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0					280.0			7164.5			<10
2,4-DINITROPHENOL	0.0	10.0	42.0					5300.0	69.0		135613.3	1765.8		<5
2-NITROPHENOL	0.0	10.0	*											<5
4-NITROPHENOL	0.0	10.0	*											<10
PENTACHLOROPHENOL	0.0	10.0	5.0	15	19	314.3	398.1	30.0			767.6			<5
PHENOL	0.0	10.0	*					1700000	21000.0		43498601.4	537318.7		<5
2,4,6-TRICHLOROPHENOL	0.0	10.0	2.7					24.0			614.1			<2
ACENAPHTHENE	0.0	10.0	*					990.0	670.0		25331.5	17143.6		<1
ACENAPHTHYLENE	0.0	10.0	2.3											<1
ANTHRACENE	0.0	10.0	0.7					40000	8300.0		1023496.5	212378.3		<1

a. Columns 7-8, and 12-14 are the effluent concentrations allowable to prevent exceedence of water quality criteria.
b. Potential to exceed criteria exists if the measured quantity in column 15 exceeds, or could exceed, the calculated allowable concentrations in columns 7-8, and 12-14.
c. Additional testing is required if the detection level used in the scan is higher than the state RDL and/or the MDL of the approved EPA scan method and industry is known to have that pollutant.
d. All background concentrations for these volatile organic, acid-extractable, and base-neutral compounds are assumed zero in the absence of supporting monitoring data.
e. Other metals for which data were provided on the application are evaluated on the Metals & Toxics spreadsheet.
f. Reasonable potential does not exist for the following reason(s):
The required MDL has been used and resulted in non-detection (BDL) or the contributing industrial processes are NOT likely to contain them.

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Bruceton STP
PERMIT: TN0062014
DATE: 8/9/2013

Stream (7Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
23.4	28.7	0.572	10	25	50

	1	2	3	5	6	7	8	9	10	11	12	13	14	15
	Stream	Dectection Levels		Fish/Aqua. Life		Calculated Effluent		Human Health Water Quality Criteria (30Q5)						Avg. daily
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria		Concentration		In-Stream Criteria			Calculated Effluent Concentration			effluent
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
ANTIMONY		3.8	3.0					640.0	5.6	6.0	16375.9	143.3	153.5	<0.8
ARSENIC	1.3	1.0	1.0	150.0	340.0	3116.6	7098.0	10.0			223.3			<2.4
BERYLLIUM		2.0	1.0							4.0			102.3	<0.08
SELENIUM		5.0	2.0	5.0	20.0	104.8	419.1							<3.2
THALLIUM		5.0	*					0.47	0.24	2.0	12.0	6.1	51.2	<0.4
ACROLEIN	0.0	50.0	1.0					290.0			7420.3			<20
ACRYLONITRILE	0.0	50.0	1.0					2.5	0.51		64.0	13.0		<5
BENZENE	0.0	1.0	1.0					510.0			13049.6			<1
BROMOFORM	0.0	1.0	1.0					1400.0	43.0		35822.4	1100.3		<5
CARBON TETRACHLORIDE	0.0	1.0	1.0					16.0			409.4			<1
CHLOROBENZENE	0.0	1.0	*					1600.0	130.0		40939.9	3326.4		<5
CHLORODIBROMO-METHANE	0.0	1.0	*					130.0			3326.4			<5
CHLOROETHANE	0.0	1.0	*											<1
2-CHLORO-ETHYLVINYL ETHER	0.0	1.0	*											<25
CHLOROFORM	0.0	5.0	0.5					4700.0	57.0		120260.8	1458.5		<3
DICHLOROBROMO-METHANE	0.0	1.0	1.0					170.0			4349.9			<5
1,1-DICHLOROETHANE	0.0	1.0	1.0					NA	NA	NA	NA	NA	NA	<2
1,2-DICHLOROETHANE	0.0	1.0	1.0					370.0			9467.3			<5
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*					10000	140.0	100.0	255874.1	3582.2	2558.7	<1
1,1-DICHLOROETHYLENE	0.0	1.0	1.0											<1
1,2-DICHLOROPROPANE	0.0	1.0	*					150.0	5.0	5.0	3838.1	127.9	127.9	<5
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0					210.0	3.4		5373.4			<5
ETHYLBENZENE	0.0	1.0	1.0					2100	530.0	700.0	53733.6	13561.3	17911.2	<1
METHYL BROMIDE	0.0	1.0	*					1500.0			38381.1			<5
METHYL CHLORIDE	0.0	1.0	1.0											<5
METHYLENE CHLORIDE	0.0	5.0	1.0					5900.0			150965.7			<5
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5					40.0	1.7		1023.5	43.5		<5
TETRACHLORO-ETHYLENE	0.0	1.0	0.5					33.0			844.4			<5
TOLUENE	0.0	1.0	1.0					15000	1300.0	1000.0	383811.2	33262.8	25587.4	<5
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0											<1
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2					160.0	5.9	5.0	4094.0	151.0	127.9	<5
TRICHLORETHYLENE	0.0	1.0	1.0					300.0			7676.2			<2
VINYL CHLORIDE	0.0	1.0	2.0					24.0	0.25	2.0	614.1	6.4	51.2	<1
P-CHLORO-M-CRESOL	0.0	10.0	*											<10
2-CHLOROPHENOL	0.0	10.0	*					150.0	81.0		3838.1	2072.6		<5
2,4-DICHLOROPHENOL	0.0	10.0	*					290.0			7420.3			<5
2,4-DIMETHYLPHENOL	0.0	10.0	*					850.0	380.0		21749.3	9723.2		<10
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0					280.0			7164.5			<10
2,4-DINITROPHENOL	0.0	10.0	42.0					5300.0	69.0		135613.3	1765.5		<5
2-NITROPHENOL	0.0	10.0	*											<5
4-NITROPHENOL	0.0	10.0	*											<10
PENTACHLOROPHENOL	0.0	10.0	5.0	15	19	314.3	398.1	30.0			767.6			<5
PHENOL	0.0	10.0	*					1700000	21000.0		43498601.4	537438.7		<5
2,4,6-TRICHLOROPHENOL	0.0	10.0	2.7					24.0			614.1			<2
ACENAPHTHENE	0.0	10.0	*					990.0	670.0		25331.5	17145.6		<1
ACENAPHTHYLENE	0.0	10.0	2.3											<1
ANTHRACENE	0.0	10.0	0.7					40000	8300.0		1023496.5	212378.5		<1

a. Columns 7-8, and 12-14 are the effluent concentrations allowable to prevent exceedence of water quality criteria.
b. Potential to exceed criteria exists if the measured quantity in column 15 exceeds, or could exceed, the calculated allowable concentrations in columns 7-8, and 12-14.
c. Additional testing is required if the detection level used in the scan is higher than the state RDL and/or the MDL of the approved EPA scan method and industry is known to have that pollutant.
d. All background concentrations for these volatile organic, acid-extractable, and base-neutral compounds are assumed zero in the absence of supporting monitoring data.
e. Other metals for which data were provided on the application are evaluated on the Metals & Toxics spreadsheet.
f. Reasonable potential does not exist for the following reason(s):
The required MDL has been used and resulted in non-detection (BDL) or the contributing industrial processes are NOT likely to contain them.