STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Davy Crockett Tower, 9th Floor
James Robertson Parkway
Nashville, Tennessee 37243

May 17, 2024

Honorable Dennis Deal
Mayor
City of Church Hill
e-copy: mayor@churchhilltn.gov
P.O. Box 366
Church Hill, TN 37642

Subject: **NPDES Permit No. TN0021253**
City of Church Hill
Church Hill, Hawkins County, Tennessee

Dear Mayor Deal:

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.

The Division amends Page 29 of the permit at issue to reflect Church Hill's biosolids land disposal activity. Additionally, the Division makes a couple of corrections in the rationale dated April 16, 2024, on R-5 with the edits noted by highlighting.

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.

TDEC has activated a new email address to accept appeals electronically. If you wish to file an appeal, you may do so by emailing the appeal and any attachments to TDEC.Appeals@tn.gov. If you file an appeal electronically, you do not have to send a paper copy. If you have questions about your electronic filing, you can call (615) 532-0131. Electronic filing is encouraged, but not required.

If you have questions, please contact the Johnson City EFO at 1-888-891-TDEC; or, at this office, please contact Mr. Wade Murphy at (615) 532-0666 or by E-mail at *Wade.Murphy@tn.gov*.

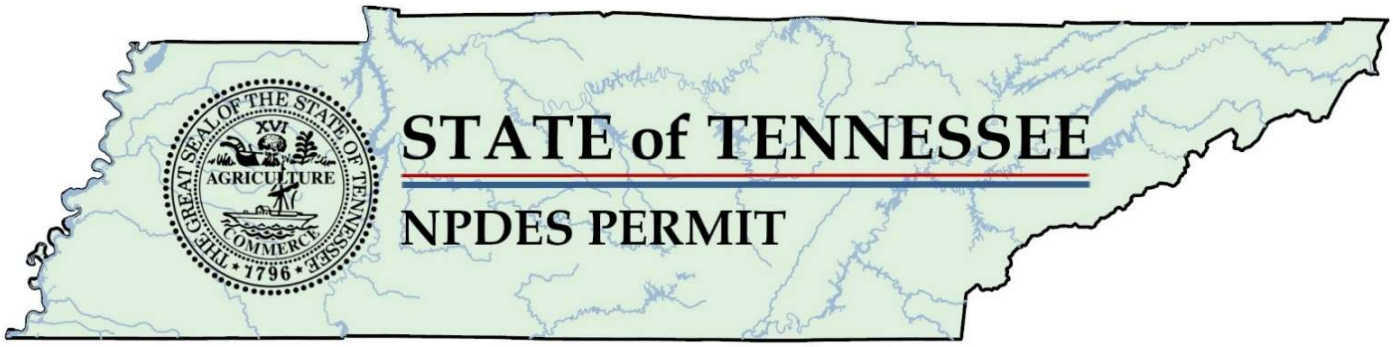
Sincerely,

Wade Murphy /for

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Mr. Jerry Simpson, Wastewater Superintendent, City of Church Hill, chwwtp@churchhilltn.gov
Ms. Sandy Renner, Pretreatment Coordinator, City of Church Hill, skrenner2001@yahoo.com
Ms. Kimberly Dobbs, Administration Staff, City of Church Hill, cityrecorder@churchhilltn.gov
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
EFO-Johnson City-DWR, sandra.vance@tn.gov
DWR-C&E Unit, sarah.elias@tn.gov
Permit Fil



Authorization to Discharge Under the National Pollutant Discharge Elimination System (NPDES) Permit Number TN0021253

Issued by

Department of Environment and Conservation
Division of Water Resources
Davy Crockett Tower, 9th Floor
500 James Robertson Parkway
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.)

Permittee: **City of Church Hill**
Church Hill WWTP

is authorized to discharge: treated domestic, commercial, and industrial wastewaters from Outfall 001

from a facility located at: VFW Road, Church Hill, Hawkins County, Tennessee

to receiving waters named: Holston River at mile 136.5

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

This permit shall become effective on: **June 01, 2024**

This permit shall expire on: **May 31, 2029**

Issuance date: **May 17, 2024**

Wade Murphy /for

for April Grippo
Interim Director

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PART 1

1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

1.1.1. Numeric Limitations

City of Church Hill is authorized to discharge treated municipal wastewater from Outfall 001 to Holston River at mile 136.5 from a treatment facility with a design capacity of 2.5 MGD. Discharge from Outfall 001 shall be limited and monitored by the permittee as specified below:

External Outfall, Number: 001, Monitoring: Effluent Gross, Season: All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00300	Oxygen, dissolved (DO)	>=	1.0	mg/L	Grab	Five Per Week	Instantaneous Minimum
00400	pH	>=	6.0	SU	Grab	Five Per Week	Minimum
00400	pH	<=	9.0	SU	Grab	Five Per Week	Maximum
00530	Total Suspended Solids (TSS)	<=	30	mg/L	Composite	Weekly	Monthly Average
00530	Total Suspended Solids (TSS)	<=	40	mg/L	Composite	Weekly	Weekly Average
00530	Total Suspended Solids (TSS)	<=	45	mg/L	Composite	Weekly	Daily Maximum
00530	Total Suspended Solids (TSS)	<=	626	lb/d	Composite	Weekly	Monthly Average
00530	Total Suspended Solids (TSS)	<=	834	lb/d	Composite	Weekly	Daily Maximum
00545	Settleable Solids	<=	1.0	mL/L	Grab	Five Per Week	Daily Maximum
00600	Nitrogen, total (as N)	Report	-	mg/L	Composite	Quarterly	Quarterly Average
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Quarterly Average
00610	Nitrogen, Ammonia total (as N)	<=	15	mg/L	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	20	mg/L	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	25	mg/L	Composite	Weekly	Daily Maximum
00610	Nitrogen, Ammonia total (as N)	<=	313	lb/d	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	417	lb/d	Composite	Weekly	Weekly Average
00665	Phosphorus, total (as P)	Report	-	mg/L	Composite	Quarterly	Quarterly Average
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Quarterly	Quarterly Average
50050	Flow	Report	-	MGD	Continuous	Daily	Daily Maximum
50050	Flow	Report	-	MGD	Continuous	Daily	Monthly Average
51040	E. coli	<=	126	#/100mL	Grab	Weekly	Monthly Geometric Mean
51040	E. coli	<=	410	#/100mL	Grab	Weekly	Daily Maximum
80082	CBOD, 5-day, 20 C	<=	25	mg/L	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	<=	35	mg/L	Composite	Weekly	Weekly Average
80082	CBOD, 5-day, 20 C	<=	40	mg/L	Composite	Weekly	Daily Maximum
80082	CBOD, 5-day, 20 C	<=	521	lb/d	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	<=	730	lb/d	Composite	Weekly	Weekly Average

TAA3B	LC50 Static 48Hr Acute Ceriodaphnia Dubia	>	1.4	%	Grab	Annual	Minimum
TAA6C	LC50 Static 48Hr Acute Pimephales Promelas	>	1.4	%	Grab	Annual	Minimum

Outfall, Number: 001, Monitoring: Percent Removal, Season: All Year, Limit Set Status: Active							
Code	**Parameter**	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Monitoring Frequency**	**Statistical Base**
80358	CBOD, 5-day, 20 C, % removal	>=	85	%	Composite	Weekly	Monthly Average Minimum
80358	CBOD, 5-day, 20 C, % removal	>=	40	%	Composite	Weekly	Daily Minimum
81011	TSS, % removal	>=	85	%	Composite	Weekly	Monthly Average Minimum
81011	TSS, % removal	>=	40	%	Composite	Weekly	Daily Minimum

Influent Structure, Number: INF1, Monitoring: Raw Sewage Influent, Season: All Year							
Code	**Parameter**	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Monitoring Frequency**	**Statistical Base**
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Weekly	Monthly Average
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Weekly	Daily Maximum
50050	Flow	Report	-	MGD	Continuous	Daily	Monthly Average
50050	Flow	Report	-	MGD	Continuous	Daily	Daily Maximum
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Daily Maximum

General MyTDEC Forms Report Requirements*	
Bypass of Treatment Facility	See Section 1.3.5.1. and 2.3.5.
Anticipated Bypass of Treatment Facility	See Section 1.3.5.1. and 2.3.5.
Five-day Follow-up Noncompliance Report	See Sections 1.3.5.1. and 2.3.1.a.
Scheduled Reporting	See Section 2.3.1.b.

* Each event shall be reported via MyTDEC Forms.

Notes:

The permittee shall achieve 85 % removal of $CBOD_5$ and TSS on a monthly average basis. The permittee shall report all instances of releases, sanitary sewer overflows and/or bypasses. See **Part 2.3.2(a)** for the definition of sanitary sewer overflow and **Part 1.3.5** for reporting requirements.

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.
See **Part 1.2.3** for test procedures.

See **Part 3.4** for biomonitoring test and reporting requirements.

See below for percent removal calculations.

The permittee may collect more samples than specified as the monitoring frequency in the permit. 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 1 per 100 mL shall be considered as having a concentration of 1 per 100 mL. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount.

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 § 136 as amended, so long as the requirements of Tennessee Rule 0400-40-03-.05(8) are met. The method detection limit (MDL) should be determined in accordance with 40 CFR § 136 as amended, Appendix B. The 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 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.

For $CBOD_5$ and TSS, the treatment facility shall demonstrate a minimum of 85% 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:

$$\left(1 - \frac{average\ of\ daily\ effluent\ concentrations}{average\ of\ daily\ influent\ concentrations}\right) * 100\% = \%\ removal$$

This treatment facility will also demonstrate 40% daily minimum removal of $CBOD_5$ and TSS based on each daily composite sample. The formula for this calculation is as follows:

$$\left(1 - \frac{daily\ effluent\ concentration}{daily\ influent\ concentration}\right) * 100\% = \%\ removal$$

Each daily load is calculated by multiplying the day's sample concentration (mg/L) by the effluent flow rate (MGD) for the day the sample was collected and the conversion factor 8.34 lbs/gal.

$$Load = \left(\begin{matrix}Effluent\\Concentration\end{matrix}\right) * \left(\begin{matrix}Effluent\ flow\ for\ the\ day\ the\\day\ the\ sample\ was\ collected\end{matrix}\right) * (8.34)$$

1.1.2. Collection System Requirements

City of Church Hill is authorized to operate a sewage collection system. Operation and discharges from the collection system shall be limited and monitored by the permittee as specified below:

Code	Monitoring	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
51925	Dry Weather	SSO, Dry Weather	<=	0	occur/mo	Occurrences	Continuous	Monthly Total
51926	Wet Weather	SSO, Wet Weather	<=	0	occur/mo	Occurrences	Continuous	Monthly Total

Report via NetDMR. See sections **1.3.1.** and **1.3.5.2.**

Collection System MyTDEC Forms Report Requirements*	
Sanitary Sewer Overflow (SSO, Dry Weather)	See Section 1.3.5.1.
Sanitary Sewer Overflow (SSO, Wet Weather)	See Section 1.3.5.1.
Release (Dry Weather)	See Section 1.3.5.1.
Release (Wet Weather)	See Section 1.3.5.1.
Five-day Follow-up Noncompliance Report	See Sections 1.3.5.1. and 2.3.1.

* Each event shall be reported via MyTDEC Forms.

1.1.3. Narrative Conditions

The permittee shall submit a written technical evaluation of the need to revise local limits within 120 days of the effective date of this permit to the state pretreatment program coordinator. The evaluation shall include the most recent pass-through limits proposed by the Division and should be submitted to the following email address: DWRWaterCompliance@tn.gov.

The permittee shall submit the results of an Industrial Waste Survey (IWS) to the Division of Water Resources, Pretreatment Section within 120 days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date. If an IWS has been submitted within the past 3 years, the permittee shall notify the Division of the date when the IWS was previously submitted to the Division. The IWS shall be submitted to the following email address: DWRWater.Compliance@tn.gov.

The authorized discharge shall not:

- Result in distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits, or sludge banks of such size or character as may be detrimental to fish and aquatic life.
- Result in total suspended solids, turbidity, or color in such amounts or character that will result in any objectionable appearance to the receiving water, considering the nature and location of the water.
- 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, Tennessee Code Annotated (Tenn. Code Ann.) §68-31-101 et seq. and the Tennessee Hazardous Waste Management Act, Tenn. Code Ann. §68-46-101 et. seq.

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

Samples and measurements taken in compliance with the monitoring requirements specified herein shall be representative of the volume and nature of the monitored discharge and shall be taken after treatment and prior to mixing with uncontaminated stormwater runoff or the receiving stream. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed and calibrated by a qualified source at least once every 12 months[1], and maintained to ensure 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 plus or minus 10% from the true discharge rates throughout the range of expected discharge volumes.

Composite samples must be proportioned by flow at the time of sampling. Aliquots may be collected manually or automatically. The sample aliquots must be maintained at ≤ 6°C during the compositing period, or as otherwise specified in 40 CFR §136 or in the method.

[1] The Division expects for permittees to meet EPA's guidance on proper operation and maintenance of flow measurement devices, as stated in the NPDES Compliance Inspection Manual.

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 changes. Specifically:

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 completion of disinfection and the actual discharge.

c) The dissolved oxygen (DO) can drop in the outfall line; therefore, DO 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, DO must be measured after this step and as close to the end of the outfall line as possible.

d) Total suspended solids (TSS) 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

The permittee should report “No Discharge” on Discharge Monitoring Reports (DMRs) only if a permitted outfall does not discharge at any time during the monitoring period. If the outfall discharges effluent at any time during the monitoring period, the permittee must provide at least one sampling result from the effluent of that outfall.

If the required monitoring frequency is once per month or 1/month, the monitoring period is one month. If the discharge occurs during only one day in that period, 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 using sufficiently sensitive methods in Title 40 CFR § 136, as amended, and promulgated pursuant to Section 304 (h) of the Act. The chosen methods must be sufficiently sensitive as required in state rule 0400-40-03-.05(8).

c) If the minimum level of quantification (ML) for all methods available in accordance with 40 CFR § 136 are above the stated permit limit or applicable water quality criteria for that parameter, then the method with the lowest ML shall be used.

d) Where the analytical results are below the method detection limit (MDL), the permittee shall report the actual laboratory MDL and ML values. See **Section 1.3.6.** for instructions regarding reporting less than detection.

e) When there is no analytical method that has been approved under 40 CFR §136 or required under 40 CFR chapter I, subchapter N or O, and a specific method is not otherwise required by the Director, the permittee may use any suitable method but shall provide a description of the method. When selecting a suitable method, factors such as a method's precision, accuracy, or resolution must be considered when assessing the performance of the method.

f) All sampling for total mercury at the municipal wastewater plant (including 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:

i. The date, exact place, and time of sampling or measurements;
ii. The individual(s) who performed the sampling or measurements;
iii. The date analyses were performed;
iv. The individual(s) who performed the analyses;
v. The laboratory where the analyses were performed;
vi. The analytical techniques or methods used; and
vii. The results of such analyses.

1.2.5. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

1.3. REPORTING

1.3.1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly on Discharge Monitoring Reports (DMRs) using EPA's NetDMR website. The first DMR is due on the 15th of the month following permit effectiveness. Subsequent DMRs shall be submitted through NetDMR no later than 15 days after the completion of the reporting period. In compliance with the Federal NPDES Electronic Reporting Rule, DMRs may not be submitted via email under any circumstances.

Discharge Monitoring Reports and any other information or report must be signed and certified by a responsible corporate officer as defined in Tennessee Rules, Chapter 0400-40-05-.07(2)(i), a general partner or proprietor, a principal municipal executive officer or ranking elected official, or his or her duly authorized representative. Such authorization must be submitted in writing and must explain the duties and responsibilities of the authorized representative.

In the event that electronic reporting is unavailable, the permittee shall comply with reporting conditions provided in **Section 1.7**.

1.3.2. Additional Monitoring by Permittee

If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR § 136, or as specified in the permit, the results of this monitoring shall be included in the calculation and

reporting of the data submitted in the DMR or other reporting form specified by the Commissioner. Such increased frequency shall also be indicated.

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 § 69-3-115 of the Tennessee Water Quality Control Act.

1.3.4. Monthly Report of Operation

Monthly Operational Reports (MORs) shall be submitted by the 15th day of the month following data collection. Reports shall be submitted by one of the following methods, presented below in order of preference:

1) Using MyTDEC Forms, if available.

2) Submitting both a signed and certified copy in pdf format, uploaded as an attachment to NetDMR, *and* a copy of the native format spreadsheet file emailed to DWRWW.Report@tn.gov and the Johnson City EFO:

Chattanooga	TDEC.Chattanooga.EFO@tn.gov
Columbia	TDEC.Columbia.EFO@tn.gov
Cookeville	TDEC.Cookeville.EFO@tn.gov
Jackson	TDEC.Jackson@tn.gov
Johnson City	TDEC.JohnsonCity.EFO@tn.gov
Knoxville	TDEC.KEFO.DWRPermits@tn.gov
Memphis	TDEC.Memphis.EFO@tn.gov
Nashville	DWR.NEFO@tn.gov

3) Submitting signed and certified forms to the EFO at the following address:

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Johnson City Environmental Field Office
2305 Silverdale Road
Johnson City, Tennessee 37601

1.3.5. Sanitary Sewer Overflow, Release, and Bypass Reporting

1.3.5.1. Event Report Requirements

For the purpose of this section, "events" are known as instances of sanitary sewer overflows, releases, upsets, and bypasses. These events shall be reported through MyTDEC Forms according to the following conditions:

a) Events that are not a threat to human health and the environment shall be reported using MyTDEC Forms no later than 15 days following the completion of the DMR reporting period.

b) Events that could cause a threat to human health or the environment, as defined in **Section 2.3.1.a**., shall be reported using MyTDEC Forms no later than 5 days after becoming aware of the non-compliance.

In both cases, the event report must contain the following:

i. Start date;
ii. Estimated duration in hours;
iii. Estimated volume in gallons;
iv. Type of event;
v. Type of structure (e.g., manhole);
vi. Types of human health and environmental impacts;
vii. Location (i.e., latitude and longitude);
viii. The name of receiving water (if applicable);
ix. Description of the cause;
x. The steps being taken to correct, reduce, eliminate, and prevent recurrence of the noncompliance; and
xi. The next downstream pump/lift station using the permittee's naming conventions.

In the event that MyTDEC Forms is not functioning, the permittee shall comply with reporting conditions provided in **Section 1.7**.

1.3.5.2. DMR Report Requirements

On the DMR, the permittee must separately report:

i. The total number of wet-weather sanitary sewer overflows for the reporting month; and
ii. The total number of dry-weather sanitary sewer overflows for the reporting month.

On the DMR, sanitary sewer overflows are coded “SSO, Dry Weather” and “SSO, Wet Weather”. Each discrete location of a sanitary sewer overflow shall be reported as a separate value.

1.3.6. Reporting Less Than Detection; Reporting Significant Figures

For the purpose of evaluating compliance with the permit limits established herein, where certain limits are below the minimum level (ML) of 40 CFR § 136 approved analytical methods, compliance will be demonstrated when a non-detect result is obtained using the most sensitive method available. The results of non-detect analyses, in this case, shall be reported as Below Detection Limit (BDL) or “NODI = B” in NetDMR. Reporting examples are provided below.

Reporting Example 1: If the permit limit is 0.02 mg/L with a method detection limit (MDL) of 0.05 mg/L and no detection is shown, the permittee must report “BDL” or “NODI = B” on DMRs in NetDMR. Whenever “BDL” or “NODI = B” is reported, the actual MDL must be reported in the DMR comments or in an attachment submitted in NetDMR.

Reporting Example 2: If the permit limit is 0.02 mg/L with an MDL of 0.05 mg/L and detection is shown, the actual detected value must be reported.

Reporting Example 3: If the permit limit is 0.02 mg/L with an MDL of 0.01 mg/L and no detection is shown, the permittee must report less than MDL (<0.01 mg/L in this case).

For purposes of calculating averages, zero may be assigned for values less than the MDL, the numeric value of the MDL may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the permittee must report “less than {numeric value of the MDL}" and if the average value is less than the ML, the permittee must report "less than {numeric value of the ML}.” If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the compliance level, the ML, in assessing compliance.

Reported results are to correspond to the number of significant figures (decimal places) set forth in the permit conditions. The permittee shall round values, if allowed by the method of sample analysis, using a uniform rounding convention adopted by the permittee.

1.3.7. Outlier Data

Outlier data include analytical results that are probably false. The validity of results is based on operational knowledge and a properly implemented quality assurance program. False results may include laboratory artifacts, potential sample tampering, broken or suspect sample containers, sample contamination or similar demonstrated quality control flaw.

Outlier data are identified through a properly implemented quality assurance program, and according to ASTM standards (e.g. Grubbs Test, 'h' and 'k' statistics). Furthermore, outliers should be verified, corrected, or removed based on further inquiries into the matter. If an outlier was verified (through repeated testing and/or analysis), it should remain in the preliminary data set. If an outlier resulted from a transcription or similar clerical error, it should be corrected and subsequently reported.

Therefore, only if an outlier was associated with problems in the collection or analysis of the samples and as such does not conform with the Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR §136), can it be removed from the data set and not reported on DMRs. Otherwise, all results (including monitoring of pollutants more frequently than required at the location(s) designated, using approved analytical methods as specified in the permit) should be included in the calculation and reporting of the values required in the DMR form. The permittee should use the "comment" section in NetDMR to explain any potential outliers or dubious results.

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.

1.6. SCHEDULE OF COMPLIANCE

Full compliance and operational levels shall be attained from the effective date of this permit, except for conditions under compliance schedules. See **Section 1.1.** for numeric and narrative requirements.

1.7. ELECTRONIC REPORTING

This permit requires the submission of forms developed by the Director in order for a person to comply with certain requirements, including, but not limited to, making reports, submitting monitoring results, and applying for permits. The Director may make these forms available electronically and, if submitted electronically, then that electronic submission shall comply with the requirements of Chapter 0400-01-40. Electronic submission is required when available unless waived by the Commissioner in accordance with 40 C.F.R. § 127.15.

In the event of large-scale emergencies and/or prolonged electronic reporting system outages, an episodic electronic reporting waiver may be granted by the Commissioner in accordance with 40 CFR § 127.15. A request for a deadline extension or episodic electronic reporting waiver should be submitted to DWRWater.Compliance@tn.gov, in compliance with the Federal NPDES Electronic Reporting Rule.

If an episodic electronic reporting waiver is granted, reports with wet-ink original signatures shall be mailed to the following address:

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
COMPLIANCE & ENFORCEMENT UNIT
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243

For purposes of determining compliance with this permit, data provided to the Division electronically is legally equivalent to data submitted on signed and certified forms. A copy must be retained for the permittee's files.

PART 2

2. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Comply

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

2.1.2. Duty to Reapply

The 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 Division Director no later than 180 days prior to the expiration date. Such forms shall be properly signed and certified.

2.1.3. Proper Operation and Maintenance

a) The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances, including but not limited to collection and conveyance systems) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Low pressure pumps, low pressure tanks, septic tank effluent pumps (STEP), STEP tanks, and septic tank effluent gravity tanks are integral to the treatment and conveyance of sewage in a low-pressure system design, and shall be owned or under control of the municipality, other body of government, public utility district, or a privately-owned public utility demonstrating lawful jurisdiction over the service area. Proper operation and maintenance also includes adequate laboratory 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.

b) Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT, or other technology based effluent limitations such as those established in Tennessee Rule 0400-40-05-.09.

2.1.4. Duty to Provide Information

The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

2.1.5. 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, to:

a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records shall be kept under the conditions of this permit;

b) Have access to and copy, at reasonable times, any records that shall be kept under the conditions of this permit;

c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d) Sample or monitor at reasonable times for the purposes of assuring permit compliance or as otherwise authorized by the Director.

2.1.6. 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 Division's offices or via the Department's dataviewer webpage. As required by the Federal Act, effluent data shall not be considered confidential.

2.1.7. 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.

2.1.8. 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.

2.1.9. 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.

2.1.10. 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 as defined in Rule 0400-40-05-.02;

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); or

c) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices.

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. Causes for such permit action include but are not limited to the following:

    i. Violation of any terms or conditions of the permit;

ii. Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; and

iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

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.

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 for 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

Except as provided in Tennessee Rule Chapter 0400-40-05-.06(5)(a) or (b), 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 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 permittee shall provide the following information to the Director in the permittee's formal notice of intent to transfer ownership:

i. The permit number of the subject permit;
ii. The effective date of the proposed transfer;
iii. The name, address, and contact information of the transferor;
iv. The name, address, and contact information of the transferee;
v. The names of the responsible parties for both the transferor and transferee;
vi. A statement that the transferee assumes responsibility for the subject permit;
vii. A statement that the transferor relinquishes responsibility for the subject permit;
viii. The signatures of the responsible parties for both the transferor and transferee pursuant to the signatory requirements of subparagraph (i) of Rule 0400-40-05-.07(2); and
ix. 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. Reporting of Noncompliance

a) 24-hour Reporting:

In the case of any noncompliance, or any release (whether or not caused by improper operation and maintenance), which could cause a threat to human health or the environment, the permittee shall:

i. Report the noncompliance or release to the Commissioner within 24 hours from the time the permittee becomes aware of the circumstances. Such noncompliance or release includes, but is not limited to, any unanticipated bypass exceeding any effluent limitation, any upset exceeding any effluent limitation, and violations of any maximum daily effluent limitation identified in the permit as requiring 24-hour reporting. (The EFO should be contacted for names and phone numbers of the environmental response team.)

ii. Submit a written report within five days of the time the permittee becomes aware of the noncompliance. The permittee shall provide the following information:

1. A description of and the cause of the noncompliance or release;

2. The period of noncompliance or release, including start and end dates and times i.e. duration or, if not corrected, the anticipated time the noncompliance or release is expected to continue;

3. The steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance or release; and

4. For POTWs or domestic wastewater treatment plants, reporting any dry weather overflow, wet weather overflow, dry weather release, wet weather release, combined sewer overflow, or bypass, this written report must also include the following:

I. Type of event;
II. Type of sanitary sewer overflow, release, or bypass structure (e.g., manhole, combined sewer overflow outfall);
III. Estimated volume (gallons);
IV. Types of human health and environmental impacts;
V. Location (latitude and longitude);
VI. Estimated duration (hours);
VII. The next downstream pump station (for sanitary sewer overflows and releases only); and
VIII. The name of receiving water (if applicable).

iii. Industrial dischargers that do not treat domestic waste shall comply with subpart a) ii. 4. of this subparagraph with respect to bypasses only.

iv. For sanitary sewer overflows, releases, bypasses, upsets and washouts, the report required by a) ii. Shall be submitted electronically via MyTDEC Forms.

b) Other Noncompliance.

i. All permittees shall report each instance of noncompliance or any release (whether or not caused by improper operation and maintenance), not reported under sub-part a) at the time of submitting the next routine

monitoring report, including all information required by sub-parts a) ii. 1-3.

ii. In addition to the information required by part i of this sub-part, POTWs and domestic wastewater treatment plants shall submit a written report containing the information required by sub-part a) ii. 4. If these events are caused by an extreme weather event, the Commissioner may provide a written waiver of some or all of these reporting requirements.

iii. In addition to the information required by sub-part i, industrial dischargers shall submit a written report of bypasses containing the information required by sub-part a) i. 4. This part does not relieve industrial dischargers from any applicable reporting requirements of 40 C.F.R. Part 117 (2021) and 40 C.F.R. Part 302 (2021).

2.3.2. Sanitary Sewer Overflows and Releases

a) For publicly owned treatment works (POTW) or domestic wastewater treatment plants, sanitary sewer overflows, including dry-weather overflows and wet weather overflows, are prohibited.

b) Releases caused by improper operation and maintenance, which is to be determined by the Commissioner based on the totality of the circumstances, are prohibited.

c) The permittee shall operate the collection, transmission, and treatment system so as to avoid sanitary sewer overflows and releases due to improper operation or maintenance. A “release” may be due to improper operation or maintenance of the collection system or may be due to other cause(s).

d) The permittee shall take all reasonable steps to minimize any adverse impact associated with sanitary sewer overflows and releases.

e) No new or additional flows shall be added upstream of any point in the collection, transmission, or treatment system that experiences greater than 5 sanitary sewer overflows and/or releases per year[2] or would otherwise

[2] This includes dry weather overflows, wet weather overflows, dry weather releases and wet weather releases.

overload any portion of the system. 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 sanitary sewer overflow or release point are less than or proportional to the amount of inflow and infiltration removal documented upstream from 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 the permittee's DMR and uploaded to NetDMR. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

f) In the event that chronic sanitary sewer overflows or releases have occurred from a single point in the collection system for reasons that may not warrant the self-imposed moratorium of the actions identified in this paragraph, the permittee may request a meeting with Division EFO staff to petition for a waiver based on mitigating evidence.

g) For industrial dischargers, the discharge of pollutants from any location other than a permitted outfall is prohibited.

2.3.3. Upset

a) An upset shall constitute an affirmative defense to an action brought for noncompliance with 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".

b) In any enforcement proceeding, the permittee seeking to establish the affirmative defense of an upset has the burden of proof.

2.3.4. 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.

2.3.5. Bypass

a) Bypasses (see subpart 4.1) are prohibited unless all the following 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 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; and

   a. For anticipated bypass, the permittee submits prior notice, if possible at least ten days before the date of the bypass, or

   b. For unanticipated bypass, the permittee submits notice of an unanticipated bypass within 24 hours from the time that the permittee becomes aware of the bypass.

b) Bypasses that do not cause effluent limitations to be exceeded may be allowed only if the bypass is necessary for essential maintenance to assure efficient operation. The permittee must sample and report the discharge during each

bypass to demonstrate that the bypass does not cause effluent limitations to be exceeded.

2.3.6. 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 decreases due to solids wasting to the sludge disposal system. A washout can be caused by improper operation or from peak flows due to inflow and infiltration.

b) A washout is prohibited. If a washout occurs the permittee must report the incident to the Division in the appropriate EFO within 24 hours by telephone. A written submission must be provided within five days. The washout must be noted on that month's DMR. 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 "*Bypass*" (**Section 2.3.5**), "*Sanitary sewer overflows and Releases*" (**Section 2.3.2**), and "*Upset*" (**Section 2.3.3**), 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.

PART 3

3. 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 permittee has been delegated the primary responsibility and therefore becomes the "Control Authority" for enforcing the 40 CFR § 403 General Pretreatment Regulations. Where multiple plants are concerned the permittee is responsible for the Pretreatment Program for all plants within its jurisdiction. The permittee shall implement and enforce the Industrial Pretreatment Program in accordance with the Tennessee Water Quality Control Act § 69-3-123 through 69-3-128, Rule 0400-40-14, and the legal authorities, policies, procedures, and financial provisions contained in its approved Pretreatment Program, except to the extent this permit imposed stricter requirements. Such implementation shall require but not limit the permittee to do the following:

i. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user (IU), whether the IU is in compliance with the pretreatment standards;
ii. Require development, as necessary, of compliance schedules for each IU for the installation of control technologies to meet applicable pretreatment standards;
iii. Require all industrial users to comply with all applicable monitoring and reporting requirements outlined in the approved pretreatment program and IU permit;
iv. Maintain and update, as necessary, records identifying the nature and character of industrial user discharges, and retain such records for a minimum of three (3) years;

v. Obtain appropriate remedies for noncompliance by an IU with any pretreatment standard and/or requirement;
vi. Publish annually, pursuant to Rule 0400-40-14-.08(6)(b)8, a list of industrial users that have significantly violated pretreatment requirements and standards during the previous twelve-month period;
vii. Maintain an adequate revenue structure for continued operation of the pretreatment program;
viii. Update its Industrial Waste Survey at least once every five years. Results of this update shall be submitted to the Division of Water Resources, Pretreatment Section within 120 days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date; and
ix. Submit a written technical evaluation of the need to revise local limits within 120 days of the effective date of this permit to the state pretreatment program coordinator. The evaluation shall include the most recent pass-through limits proposed by the Division. The technical evaluation shall be based on practical and specialized knowledge of the local program and not be limited by a specified written format.

b) The permittee shall enforce Rule 0400-40-14-.05, "prohibited discharges". Pollutants introduced into the POTW by a non-domestic source shall not cause pass through or interference as defined in Rule 0400-40-14-.03. 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 into the POTW:

i. Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140°F or 60°C using the test methods specified in 40 CFR § 261.21;
ii. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0 unless the system is specifically designed to accommodate such discharges;
iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW 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 POTW;
v. Heat in amounts which will inhibit biological activity in the POTW resulting in interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40°C (104°F) unless the Division, upon request of the POTW, approves alternate temperature limits;
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; or
ix. Any trucked or hauled pollutants, except at discharge points designated by the POTW.

c) The permittee shall notify the Division 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; or
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 this permit is issued.

This notice will include information on the quantity and quality of the wastewater introduced by the new source into the POTW, 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.

d) Reporting Requirements:

Upon notification, all semi-annual must be submitted electronically through MyTDEC Forms portal. Prior to electronic reporting approval, the report shall

be submitted to the Division's Central Office and a copy to the appropriate EFO no later than the 28th day of the month following each reporting period. Large programs with more than 20 SIUs will be granted an additional 15 days for report submittal.

The permittee shall provide a semiannual report briefly describing the permittee's pretreatment program activities over the previous six-month period. Reporting periods shall end on the last day of the months of March and September. For Control Authorities with multiple STPs, one report should be submitted with a separate Form 1 for each STP. Prior to approval of electronic reporting, each report shall conform to the format set forth in the State POTW Pretreatment Semiannual (or Annual) Report Package which contains information regarding:

i. An updated listing of the permittee's industrial users;
ii. Results of sampling of the influent and effluent of the wastewater treatment plant. At least once each reporting period, the permittee shall analyze the wastewater treatment plant influent and effluent for the following pollutants, using the prescribed sample types:

Pollutant	Sample Type
chromium (III)	24-hour composite
chromium (VI)	Per method requirements [3]
copper	24-hour composite
lead	24-hour composite
nickel	24-hour composite
zinc	24-hour composite
cadmium	24-hour composite
mercury	Per method requirements [3]
silver	24-hour composite
total phenols	grab
cyanide	grab

If any particular pollutant is analyzed more frequently than is required, the permittee shall report the maximum and average values on the semiannual or annual report. All upsets, interferences, and pass-through violations must also be reported on the semiannual or annual report, along with the actions that were taken to determine the causes of the incidents and the steps that have been taken to prevent the incidents from recurring.

[3] When a composite sample would compromise sample integrity, refer to 40 CFR § 136.3 Table II, including footnotes.

At least once during the term of this permit, the permittee shall analyze the effluent from the STP (and report the results in the next regularly scheduled report) for the following pollutants:

chromium III	cyanide	phthalates, sum of the following:
chromium VI	silver	bis (2-ethylhexyl) phthalate
copper	benzene	butyl benzylphthalate
lead	carbon tetrachloride	di-n-butylphthalate
nickel	chloroform	diethyl phthalate
zinc	ethylbenzene	1,2 trans-dichloroethylene
cadmium	methylene chloride	tetrachloroethylene
mercury	naphthalene	toluene
phenols, total	1,1,1 trichloroethane	trichloroethylene

iii. Compliance with categorical and local standards, and review of industrial compliance, which includes a summary of the compliance status for all permitted industries. Also included is information on the number and type of major violations of pretreatment regulations, and the actions taken by the POTW to obtain compliance. The effluent from all significant industrial users must be analyzed for the appropriate pollutants at least once every 12 months;

iv. A list of industries in significant non-compliance as published in local newspapers in accordance with the requirements set forth in Rule 0400-40-14-.08(6)(b)8;

v. A description of all substantive changes made to the permittee's pretreatment program. Any such changes shall receive prior approval. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure, local limits, or a change in the method of funding the program; and

vi. A summary of the permittee's industrial user inspections, which includes information on the number and type of industry inspected. All significant industrial users must be inspected at least once every twelve months.

3.3. BIOSOLIDS MANAGEMENT PRACTICES

All sludge and/or biosolids use or disposal must comply with 40 CFR § 503 *et seq*. Biosolids shall be sampled and analyzed at a frequency dependent on the amount used annually.

Any facility that land applies non-exceptional quality biosolids must obtain an appropriate permit from the Division in accordance with Chapter 0400-40-15.

a) Reopener: If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated under Section 405(d)(2) of the Clean Water Act, as amended by the Water Quality Act of 1987, is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not limited in this permit, this permit shall be promptly modified or revoked and reissued to conform to the requirements promulgated under Section 405(d)(2). The permittee shall comply with the limitations by no later than the compliance deadline specified in the applicable regulations as required by Section 405(d)(2) of the Clean Water Act.

b) Notice of change in sludge disposal practice: The permittee shall give prior notice to the Director of any change planned in the permittee's sludge disposal practice. If land application activities are suspended permanently and 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.

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF SOLID WASTE MANAGEMENT
Johnson City Environmental Field Office
2305 Silverdale Road
Johnson City, Tennessee 37601
(423)854-5400

Sludge disposal in a municipal solid waste landfill is controlled by the rules of the Tennessee Division of Solid Waste Management (DSWM) and Federal Regulations at 40 CFR § 258. A copy of any results of pollutant analyses required by the Tennessee Division of Solid Waste Management (DSWM) and/or 40 CFR § 258 shall be submitted to the Division of Water Resources.

3.4. BIOMONITORING REQUIREMENTS, ACUTE

The permittee shall conduct a 48-hour static acute toxicity test on two test species on samples of final effluent from Outfall 001. The test species to be used are Water Fleas (*Ceriodaphnia dubia*) and Fathead Minnows (*Pimephales promelas*).

The measured endpoint for toxicity will be the concentration causing 50% lethality (LC_{50}) of the test organisms. The LC_{50} shall be determined based on a 50% lethality as compared to the controls, and as derived from linear interpolation.

Tests shall be conducted and results reported based on appropriate replicates of a total of five serial dilutions and a control, using the percent effluent dilutions as presented in the following table:

Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
4 X PL	**2 X PL**	**Permit Limit (PL)**	**0.50 X PL**	**0.25 X PL**	**Control**
% effluent					
5.6	**2.8**	**1.4**	**0.7**	**0.35**	**0**

The dilution/control water used will be moderately hard water as described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*, EPA-821-R-02-012 (or the most current edition). An acute standard reference toxicant quality assurance test shall be conducted with each species used in the toxicity tests and the results submitted with the discharge monitoring report. Additionally, the analysis of this multi-concentration test shall include review of the concentration-response relationship to ensure that calculated test results are interpreted appropriately.

Toxicity will be demonstrated if the LC_{50} is less than or equal to the permit limit indicated for each outfall in the above table(s).

All tests will be conducted using four separate grab samples of final effluent, to be used in four separate tests, and shall be collected at evenly spaced (6-hour) intervals over a 24-hour period. If in any control, more than 10% of the test organisms die in 48 hours, the test (control and effluent) is considered invalid and the test shall be repeated within two (2) weeks. Furthermore, if the results do not meet the acceptability criteria in the above-referenced *Methods for Measuring the Acute Toxicity* document, or if the required concentration-response review fails to yield a valid relationship per guidance contained in Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing, EPA-821-B-00-004 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

The toxicity tests specified herein shall be conducted yearly (1/yr) for Outfall 001 and begin no later than 270 days from the effective date of this permit.

In the event of a test failure, the permittee must start a follow-up test within 2 weeks and submit results from a follow-up test within 30 days from obtaining initial WET testing results. The follow-up test must be conducted using the same serial dilutions as presented in the corresponding table(s) above. The follow-up test will not negate an initial failed test. In addition, the failure of a follow-up test will constitute a separate permit violation.

In the event of 2 consecutive test failures or 3 test failures within a 12-month period for the same outfall, the permittee must initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days and so notify the Division by letter. This notification shall include a schedule of activities for the initial investigation of that outfall. During the term of the TIE/TRE study, the frequency of biomonitoring shall be once every three months. Additionally, the permittee shall submit progress reports once every three months throughout the term of the TIE/TRE study. The toxicity must be reduced to allowable limits for that outfall within 2 years of initiation of the TIE/TRE study. Subsequent to the results obtained from the TIE/TRE studies, the permittee may request an extension of the TIE/TRE study period if necessary, to conduct further analyses. The final determination of any extension period will be made at the discretion of the Division.

The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive tests (for the same outfall) demonstrating compliance. Following the completion of TIE/TRE study, the frequency of monitoring will return to a regular schedule, as defined previously in this section as well in Part I of the permit. During the course of the TIE/TRE study, the permittee will continue to conduct toxicity testing of the outfall being investigated at the frequency of once every three months but will not be required to perform follow-up tests for that outfall during the period of TIE/TRE study.

Test procedures, quality assurance practices and determination of effluent lethality values will be made in accordance with *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*, EPA-821-R-02-012, or the most current edition. Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analysis shall be compiled in a report also written in accordance with the *Methods for Measuring the Acute Toxicity* document above.

A copy of the biomonitoring report (including any follow-up reports) shall be submitted to the Division as an attachment to the monthly DMR in NetDMR.

3.5. PLACEMENT OF SIGNS

The permittee shall place and maintain a sign at each outfall and any sanitary sewer overflow/release point in the collection system or the nearest publicly accessible location. For the purposes of this requirement, any point that has had a total of 5 or more overflows plus releases in the previous 12 months must be so posted. Signs at locations that are posted at the permit effective date must be maintained. Signs for locations identified during the permit term must be placed within 60 days of the event triggering the requirement.

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 are given as examples of the minimal amount of information that must be included on the signs:

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
City of Church Hill
Church Hill WWTP
(423) 357-6161
NPDES Permit NO. TN0021253
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Johnson City

Unpermitted release/sanitary sewer overflow point:

UNTREATED WASTEWATER DISCHARGE POINT
City of Church Hill
Church Hill WWTP
(423) 357-6161
NPDES Permit No. TN0021253
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Johnson City

The permittee may request the removal of signs for unpermitted release/sanitary sewer overflows points only. This request should be sent to Division EFO staff detailing the work that has been completed to rectify the cause(s) contributing to sanitary sewer overflows and releases at that location. In no case will approval to remove the signs be granted if either a sanitary sewer overflow or release has occurred at that location in the previous 12 months.

3.6. PUMP/LIFT STATION INSPECTION

All pump/lift stations ≥ 100 gpm must be inspected five (5) days a week. In populated areas, all stations < 300 gpm may alternately be equipped with alarms, lights and/or horns. In populated areas, all stations ≥ 300 gpm may alternately be equipped with true remote sensing telemetry systems. All stations < 100 gpm must be inspected as necessary to ensure proper operation. The inspector shall note the date, time and inspector initials in a bound log notebook or electronically.

PART 4

4. DEFINITIONS AND ACRONYMS

All terminology not specifically defined herein shall be defined in accordance with the Water Quality Control Act of 1977, T.C.A. Title 69, Chapter 3, Part 1 and Tennessee Rule 0400-40-05. The following terms have the meanings given below unless otherwise specified.

4.1. DEFINITIONS

For the purposes of this permit, ***annually*** is defined as a monitoring frequency of once every 12 months beginning with the effective date of this permit, so long as the following set of measurements for a given 12 month period are made approximately 12 months subsequent to that time.

Biosolids are treated sewage sludge that have contaminant concentrations less than or equal to the contaminant concentrations listed in Table 1 of subparagraph (3)(b) of Rule 0400-40-15-.02, meet any one of the ten vector attraction reduction options listed in part (4)(b)1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of Rule 0400-40-15-.04, and meet either one of the six pathogen reduction alternatives for Class A listed in part (3)(a)3, 4, 5, 6, 7, or 8, or one of the three pathogen reduction alternatives for Class B listed in part (3)(b)2, 3, or 4 of Rule 0400- 40-15-.04.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

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

Combined sewer overflow or "CSO" means a discharge from a combined sewer system (CSS) at a point prior to the publicly owned treatment works (POTW) treatment plant headworks.

Combined sewer system or "CSS" means a wastewater collection system owned by a State or municipality which was originally designed to convey sanitary wastewaters (domestic, commercial, and industrial wastewaters) and stormwater through a single-pipe system into a publicly owned treatment works (POTW) treatment plant headworks.

A ***composite sample*** means a combination of not less than eight influent or effluent portions (aliquots), collected over a 24-hour period. Under certain circumstances a lesser time period may be allowed, but in no case less than eight hours. A sufficient volume of sample to perform all required analyses plus any additional amount for quality control must be obtained. For automatic samplers that use a peristaltic pump, a minimum 100 ml aliquot must be obtained.

The ***daily maximum amount*** means the total amount of any pollutant in the discharge by weight during any calendar day.

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 maximum concentration is the concentration of that 24-hour composite; when other sampling means are used, the daily maximum concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period.

Degradation means the alteration of the properties of waters by the addition of pollutants, withdrawal of water, or removal of habitat, except those alterations of a short duration.

De Minimis is degradation of a small magnitude, as provided in this paragraph:

(a) Discharges and withdrawals:

1. Subject to the limitation in part 3 of this subparagraph, a single discharge other than those from new domestic wastewater sources will be considered de minimis if it uses less than five percent of the available assimilative capacity for the substance being discharged.

   (Note: Consistent with T.C.A. § 69-3-108, special consideration will be given to bioaccumulative substances to confirm the effect is de minimis, even if they are less than five percent of the available assimilative capacity.)

2. Subject to the limitation in part 3 of this subparagraph, a single water withdrawal will be considered de minimis if it removes less than five percent of the 7Q10 flow of the stream.
3. If more than one activity described in part 1 or 2 of this subparagraph has been authorized in a segment and the total of the authorized and proposed impacts uses no more than 10% of the assimilative capacity, or 7Q10 low flow, they are presumed to be de minimis. Where the total of

the authorized and proposed impacts uses 10% of the assimilative capacity, or 7Q10 low flow, additional degradation may only be treated as de minimis if the Division finds on a scientific basis that the additional degradation has an insignificant effect on the resource.

(b) Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the Division finds that the impacts, individually and cumulatively, are offset by impact minimization and/or in-system mitigation, provided however, in Outstanding National Resource Waters (ONRWs) the mitigation must occur within the ONRW.

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

A ***dry weather overflow*** means a sanitary sewer overflow that is not directly related to a rainfall event.

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 means 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 shall be considered to be one.

A ***grab sample*** means a single sample collected at a particular time.

IC_{25} means the inhibition concentration in which at least a 25% reduction in reproduction and/or growth in test organisms occurs.

Industrial discharger means those industries identified in the standard industrial classification manual, Bureau of the Budget, 1987, as amended and supplemented, under the category "Division D - Manufacturing" and such other classes of significant waste producers as the Board or Commissioner deems appropriate.

Industrial wastes means any liquid, solid, or gaseous substance, or combination thereof, or form of energy including heat, resulting from any process of industry, manufacture, trade, or business or from the development of any natural resource.

The ***instantaneous maximum concentration*** means the concentration, in units of mass per volume, of any pollutant parameter in a grab sample taken at any point in time.

The ***instantaneous minimum concentration*** means the minimum concentration, in units of mass per volume, of a pollutant parameter in a grab sample taken at any point in time.

LC_{50} means the concentration that causes at least 50% lethality of the test organisms.

Major facility means a municipal or domestic wastewater treatment plant with a design capacity of one million gallons per day or greater; or any other facility or activity classified as such by the Commissioner.

Minor facility means any facility that is not a major facility.

The ***monthly average amount*** means the arithmetic mean of all the measured daily discharges by weight during the calendar month when the measurements were made.

The ***monthly average concentration***, means the arithmetic mean of all samples collected in a one calendar-month period, expressed in units of mass per volume of any pollutant other than bacteria.

National Pollutant Discharge Elimination System or ***NPDES*** means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the federal CWA. The term includes an "approved program."

New or increased discharge is a new discharge of pollutants to waters of the state or an increase in the authorized loading of a pollutant above either (1) numeric effluent limitations established in a National Pollutant Discharge Elimination System permit for that discharge, or (2) if no such limitations exist, the actual discharges of that pollutant.

New source means any building, structure, facility, area, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced after the publication of state or federal regulations prescribing a standard of performance.

Nitrate (as N) means nitrate reported as nitrogen.

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

Owner or ***operator*** means any person who owns, leases, operates, controls, or supervises a source.

Person means an individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof.

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant means sewage, industrial wastes, or other wastes.

Pollution means such alteration of the physical, chemical, biological, bacteriological, or radiological properties of the waters of this state including, but not limited to, changes in temperature, taste, color, turbidity, or odor of the waters that will:

(a) Result or will likely result in harm, potential harm, or detriment to the public health, safety, or welfare;

(b) Result or will likely result in harm, potential harm, or detriment to the health of animals, birds, fish, or aquatic life;

(c) Render or will likely render the waters substantially less useful for domestic, municipal, industrial, agricultural, recreational, or other reasonable uses; or

(d) Leave or likely leave the waters in such condition as to violate any standards of water quality established by the Board.

Quarter means 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.

Rainfall event means 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.

Rationale or ***fact sheet*** means 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 the 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.

Release means the flow of sewage from any portion of the collection or transmission system owned or operated by a publicly owned treatment works (POTW) or a domestic wastewater treatment plant, other than through permitted outfalls, that does not reach waters. In addition, a "release" includes a backup into a building or private property that is caused by blockages, flow conditions, or other malfunctions originating in the collection or transmission system owned or operated by the permittee. A "release" does not include:

(a) Backups into a building or private property caused by blockages or other malfunctions originating in a private lateral;

(b) Events caused by vandalism;

(c) Events caused by lightning strike;

(d) Events caused by damage due to third parties working on other utilities in the right of way, e.g., cross bore from telecommunications line; or

(e) Events that are directly incidental to planned, preventative, or predictive maintenance provided the site is under the direct control of a certified operator or contractor, public access is restricted, and the site is disinfected.

Sanitary sewer overflow or SSO means an unpermitted discharge of wastewater from the collection or treatment system of a publicly owned treatment works

(POTW) or a domestic wastewater treatment plant other than through a permitted outfall.

Schedule of compliance means a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, condition of a permit, other limitation, prohibition, standard, or regulation. This term includes, but is not limited to, schedules authorized by national effluent limitations guidelines or by Tennessee's water quality standards.

The term ***semi-annually,*** for the purposes of this permit, means the same as once every 6 months. Measurements of the limited effluent parameters may be made any time during a 6 month period beginning from the effective date of this permit, so long as the second set of measurements for a given 12 month period are made approximately 6 months subsequent to that time, if feasible.

Severe property damage, when used to consider the allowance of a bypass, means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

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

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.

Sludge or ***sewage sludge*** is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

Source means any activity, operation, construction, building, structure, facility, or installation from which there is or may be the discharge of pollutants.

Standard of performance means a standard for the control of the discharge of pollutants that reflects the greatest degree of effluent reduction that the Commissioner determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

Stream means a surface water that is not a wet weather conveyance.

Subecoregion is a smaller, more homogenous area that has been delineated within an ecoregion.

Total dissolved solids or ***TDS*** means nonfilterable residue.

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 domestic wastewater activated sludge plants and means a 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.

Watercourse means a man-made or natural hydrologic feature with a defined linear channel that discretely conveys flowing water, as opposed to sheet-flow.

Weekly average amount means the arithmetic mean of all the measured daily discharges by weight during the calendar week when the measurements were made.

Weekly average concentration means the arithmetic mean of all the concentrations expressed in units of mass per volume of any pollutant measured in a calendar week.

Wet weather conveyance means, notwithstanding any other law or rule to the contrary, man-made or natural watercourses, including natural watercourses that have been modified by channelization:

(a) That flow only in direct response to precipitation runoff in their immediate locality;

(b) Whose channels are at all times above the groundwater table;

(c) That are not suitable for drinking water supplies; and

(d) In which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months.

Wet weather overflow means a sanitary sewer overflow that is directly related to a specific rainfall event.

Wet weather release means a release that is directly related to a specific rainfall event.

4.2. ACRONYMS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval
30Q5 – 30-day minimum, 5-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 limit
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*
EPA – Environmental Protection Agency
EFO – environmental field office
GPM – gallons per minute
IC_{25} – inhibition concentration causing 25% reduction in survival, reproduction, and growth of the test organisms
IU – industrial user
IWS – industrial waste survey
LB (lb) – pound
LC_{50} – acute test causing 50% lethality
MDL – method detection limit
MGD – million gallons per day
mg/L – milligrams per liter
ML – minimum level of quantification
mL – milliliter
MLSS – mixed liquor suspended solids
MOR – monthly operating report
NODI – no discharge code in NetDMR
NPDES – national pollutant discharge elimination system
PL – permit limit
POTW – publicly owned treatment works
SAR – semi-annual report [pretreatment program]
SIU – significant industrial user
SSO – sanitary sewer overflow
STP – sewage treatment plant
TBEL – technology-based effluent limit
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

4.3. RESOURCES, HYPERLINKS, AND WEB PAGES

Clean Water Act NPDES Electronic Reporting (eReporting) Information
https://www.epa.gov/compliance/npdes-ereporting

Electronic Code of Federal Regulations (eCFR), Title 40 (40 CFR § 1 through § 1099)
https://www.ecfr.gov/cgi-bin/text-idx?SID=75202eb5d09974cab585afeea981220b&mc=true&tpl=/ecfrbrowse/Title40/40chaptI.tpl

Electronic Reporting (NetDMR) Waiver Request
https://www.tn.gov/content/dam/tn/environment/water/documents/wr_ereporting_waiver.pdf

Low Flow Statistics Tools: A How-To Handbook for NPDES Permit Writers (EPA)
https://www.epa.gov/sites/production/files/2018-11/documents/low_flow_stats_tools_handbook.pdf

Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (EPA)
https://www.epa.gov/sites/production/files/2015-08/documents/acute-freshwater-and-marine-wet-manual_2002.pdf

NetDMR Login
https://cdxnodengn.epa.gov/net-netdmr/

NetDMR, MyTDEC Forms, & Electronic Reporting Information
https://www.tn.gov/environment/program-areas/wr-water-resources/netdmr-and-electronic-reporting.html

NPDES Compliance Inspection Manual (EPA)
https://www.epa.gov/sites/production/files/2017-01/documents/npdesinspect.pdf

NPDES Electronic Reporting Rule
https://www.federalregister.gov/documents/2015/10/22/2015-24954/national-pollutant-discharge-elimination-system-npdes-electronic-reporting-rule

Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys (QSSOP)
https://www.tn.gov/content/dam/tn/environment/water/documents/DWR-PAS-P-01-Quality_System_SOP_for_Macroinvertebrate_Stream_Surveys-081117.pdf

Rules of the TN Department of Environment and Conservation, Chapter 0400-40
https://publications.tnsosfiles.com/rules/0400/0400-40/0400-40.htm

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA)
https://www.epa.gov/sites/production/files/2015-08/documents/short-term-chronic-freshwater-wet-manual_2002.pdf

TDEC Water Quality Rules, Reports, and Publications
https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html

Technical Support Document for Water Quality-based Toxics Control (EPA)
https://www3.epa.gov/npdes/pubs/owm0264.pdf

Tennessee Nutrient Reduction Framework
https://www.tn.gov/content/dam/tn/environment/water/tmdl-program/wr-ws_tennessee-draft-nutrient-reduction-framework_030315.pdf

Tennessee Plant Optimization Program (TNPOP)
https://www.tn.gov/environment/program-areas/wr-water-resources/tn-plant-optimization-programs/tnpop.html

Tennessee Water Resources Data and Map Viewers
https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-resources-data-map-viewers.html

USGS StreamStats
https://www.usgs.gov/mission-areas/water-resources/science/streamstats-streamflow-statistics-and-spatial-analysis-tools?qt-science_center_objects=0#qt-science_center_objects

USGS Hydrologic Toolbox
https://pubs.usgs.gov/publication/tm4D3

RATIONALE

City of Church Hill
Church Hill WWTP
NPDES Permit No. TN0021253
Permit Writer: Wade Murphy
April 16, 2024 (with highlighted corrections on May 17, 2024)

1. PERMIT STATUS & PUBLIC PARTICIPATION

Permit Type:	Municipal
Classification:	Major
Previous Issuance Date:	01-MAY-19
Previous Expiration Date:	31-MAY-24
Previous Effective Date:	01-JUN-19

As provided under Rule 0400-40-05-.06, this permit allows 30 days for public comment on the proposed permit. The 30-day public comment period begins the date this permit is placed on public notice. The public notice document for this permit can be found at the Division's Water Notices and Hearings website under "Permit Public Notices".

Public Notice Date:	April 16, 2024
Comment Period Ends:	May 16, 2024

Those wishing to make a formal comment on the proposed permit may submit comments electronically to Water.Permits@tn.gov, or by mail to:

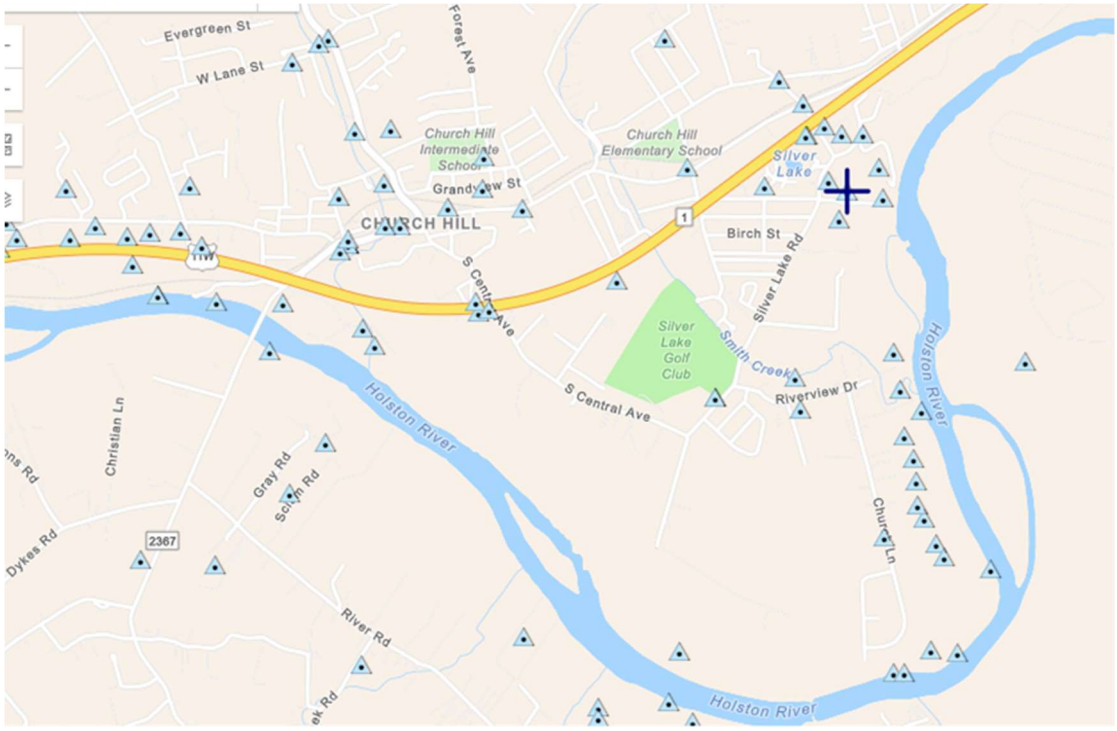
Division of Water Resources - Water Based Systems Unit
William R. Snodgrass Tennessee Tower
500 James Robertson Parkway, 9th Floor
Nashville, TN 37243

The public may also request a public hearing on a proposed permit by submitting such a request in writing during the public comment period specified above. The request should indicate the interest of the party filing it and the reasons why a hearing is warranted. A request for public hearing should be submitted as soon as practicable to the addresses provided above. Questions regarding the draft permit may be directed to 1-888-891-TDEC.

2. FACILITY INFORMATION

Permittee Name:	**City of Church Hill**
Project Name:	**Church Hill WWTP**
Location:	VFW Road (STP) 300 East Main Blvd(City Hall), Church Hill, Hawkins County, Tennessee
Contact:	Honorable Dennis Deal - Mayor (423) 357-6161 mayor@churchhilltn.gov
Design Flow Rate:	2.5 MGD
Percentage Industrial Flow:	≈ 16% of actual POTW flow of 0.774 MGD
Certified Operator Grades:	STP: III; CS: I; Date Rated: 08/17/99
Treatment Description:	Oxidation ditch activated sludge preceded by rotary drum screening and grit removal and followed by secondary clarifiers and ultraviolet disinfection. Sludge is treated by aerobic digestion and pressed by a sludge filter press prior to disposal by land application.

The plus sign indicates the location of the POTW:



3. RECEIVING STREAM INFORMATION

Receiving Waterbody:	**Holston River at mile 136.5**
Watershed Group:	Holston
Hydrocode:	06010104
Low Flow:	1Q10 = 587.2 MGD (908.98 CFS); 30Q5 = 791.8 MGD (1225.7 CFS)
Low Flow Reference:	The flow calculation is the sum of regulated and unregulated flows in the South Fork Holston and Holston Rivers respectively.

Stream Designated Uses:

Domestic Water Supply	*Industrial*	*Fish & Aquatic Life*	*Recreation*
		X	**X**
Livestock & Wildlife	*Irrigation*	*Navigation*	*Trout*
X	**X**		

This permit uses the same low river flow in the Holston River at Church Hill that is calculated for the BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, at river mile 136.5. The flow calculation is the sum of regulated and unregulated flows in the South Fork Holston and Holston Rivers respectively. Appendix 5 details the factors used in this estimation.

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

a) The units for *E. coli* have been standardized to number per 100 mL (#/100 mL). Previously, the Division used either MPN/100 mL or CFU/100 mL. The identification of one of these two units indirectly created a requirement for a specific type of testing methodology. By utilizing #/100 mL unit, permittees are provided the flexibility to select the 40 CFR § 136 method that is most suitable for their operations. The limit value (number) will remain the same as the limit units are functionally equivalent. Moreover, the daily maximum limit for *E. coli* has been changed to 410 #/100 mL as a result of updated water quality criteria in Rule 0400-40-03-.03 for the protection of the recreation designated use.

Language throughout the permit has been updated to reflect the eReporting phase 2 requirements in 40 CFR § 127. This includes (but is not limited to) detailing specific data elements that are required to be reported for sanitary

sewer overflows, releases and bypasses as well as pretreatment program information.

This permit removes the influent monitoring requirement for ammonia as nitrogen. Refer to Section 6.4 below. (The effluent limiting and monitoring remain.)

This permit reduces the daily maximum limit on *E. coli* to comply with new state water quality criteria. Refer to Section 6.7 below.

This permit removes monitoring and reporting of total phenols from the limit table in Part 1 of the permit. Refer to Section 6.9 and Appendix 3 below.

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.
Bypass and Sanitary sewer overflow and Release Report	1.3.5.1.
Industrial Waste Survey Report within 120 days of the effective permit date	3.2.
Technical review of the need to recalculate local limits within 120 days of the permit effective date	3.2.
Annual Biomonitoring Report beginning within 270 days of the effective permit date	3.4.

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

5. PERMIT HISTORY

5.1. PREVIOUS PERMIT TERM REVIEW

A review of the permittee's Discharge Monitoring Reports (DMRs) from September 2020 through December 2023 reveals that the permittee has operated the treatment plant consistently within permit limits with a few bypasses of treatment and a few collection system overflows. A summary of data reported on DMRs during the previous permit term is located in Appendix 2.

During the previous permit term, Division personnel from the Johnson City Environmental Field Office performed a Compliance Evaluation Inspection (CEI) of

the permittee's facility. The CEI was performed by Sandra Vance, Brianne Begley and Corey Click on March 23 and April 6, 2022. The permittee was found to be out of compliance. The inspection report dated January 19, 2023, reports that the treatment facility is generally well maintained but that the site bears evidence of treatment unit bypasses. The treated effluent was clear. The Division noted no deficiencies in the flow measurement and biosolids management practices. The Division found much improvement needed in the laboratory controls and quality assurance procedures. The Division additionally made several recommendations based on facts presenting during the inspection. Additionally, the Division staff devoted time for several pretreatment program related inspections during the permit term and noted need for improvements. The attention to the pretreatment program is warranted given the relatively large contribution into the treatment plant from 11 industrial sources.

5.2. PERMIT TIMELINE

Date	Permit Activity
11/01/1994	DWR issued planning standards for a 2.5 MGD discharge to RM 136.5; Expanded treatment capacity was needed to meet the wastewater treatment needs of Form Rite, Inc., expanding in Phipps Bend. Cormix 3 model predicts only 3 fold dilution in the near-field approximating 57 feet; S-P modeling predicted ammonia would need to be limited to 15 to protect D.O.
01/31/2000	Permit issued with expanded design capacity from 0.71 MGD to 2.5 MGD
CBOD5	The 2.5 MGD permit began limiting in terms of CBOD5 (25 mg/L) versus BOD5 (30 mg/L)
Ammonia as N	The 2.5 MGD permit began limiting ammonia year-round (MA of 15 mg/L) based on the EPA document, Ambient Water Quality Criteria for Ammonia - 1984 (tables revised July 1992)
WET	The permit began including acute whole effluent toxicity monitoring
01/31/2008	Permit modified
Fecal Coliform	Removed monitoring and reporting for fecal coliform pursuant Tennessee's removal of fecal coliform as a WQS in January 2004 and the permittee request for permit modification of October 19, 2007
09/30/2009	Permit Reissued
Nutrients	Quarterly monitoring for Total Nitrogen and Total Phosphorous is imposed in support of the joint

	State/Federal Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico.
06/01/2015	Permit Reissued
Monitoring Frequency Reduction	The permittee qualified for monitoring reduction frequency based on their treatment performance. Using state and EPA guidance, the required monitoring frequencies for CBOD5, ammonia, TSS, E. coli, and suspended solids were reduced from three per week to weekly.

6. PROPOSED EFFLUENT LIMITS AND 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
$CBOD_5$	25	521	35	730	40	40	D.O. protection and Rule 0400-40-05-.09, Refer to 6.1 below
NH_3-N	15	313	20	417	25	—	D.O. protection, Refer to 6.4 below
Total Suspended Solids	30	626	40	834	45	40	Rule 0400-40-05-.09
Dissolved Oxygen	1.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Nitrogen	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.6 below
Total Phosphorus	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.6 below
E. coli (#/100mL)	126/100 mL	—	—	—	410/100 mL	—	Rule 0400-40-03-.03, Refer to 6.7 below
Settleable Solids (mL/L)		—	—	—	1.0	—	Rule 0400-40-05-.09
pH (standard units)	6.0 - 9.0	—	—	—	—	—	Rule 0400-40-03-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
48 hour LC_{50}	1.4% per sample	—	—	—	—	—	Refer to 6.8 below

	Monthly Total		Refer to 7 below
Dry Weather	Sanitary sewer overflows	0	Refer to 7 below
Wet Weather	Sanitary sewer overflows	0	Refer to 7 below

Note: Weekly limitations on $CBOD_5$ and TSS concentrations are given as required per 40 CFR 133.102(a)(2) or 133.102(a)(4)(2) & 133.102 (b)(2) respectively; daily $CBOD_5$ and TSS limitations are authorized by T.C.A. 0400-40-05-.09; monthly and weekly 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 $CBOD_5$ and TSS are required per 40 CFR 133.102(a)(3) or 133.102(a)(4)(iii) and 133.102 (b)(3) respectively. A minimum 40% daily removal rate is required as equivalent to a daily mass load limitation.

6.1. CONVENTIONAL PARAMETERS

6.1.1. $CBOD_5$ and Dissolved Oxygen

Streeter-Phelps modeling was performed during a previous issuance of this permit at various conditions to determine allowable organic loadings. The monthly average limits for $CBOD_5$ (25 mg/L, NH_3-N (15 mg/L), and D.O. (1.0 mg/L) still apply and are considered sufficient to result in an instream dissolved oxygen concentration that remains above the required minimum of 5.0 mg/L. Modeling results are located in the permit file administrative record.

In addition to $CBOD_5$, NH_3-N undergoes biological oxidation in a receiving stream thereby utilizing in stream oxygen and potentially reducing oxygen levels below water quality standards. Ammonia as N is also a pollutant that exhibits toxicity to fish and other aquatic life. The two effects are analyzed separately, and the Division imposes the most stringent limit in the permit.

The dissolved oxygen effluent limitation of 1.0 mg/L is also 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 treatment system to prevent nuisance conditions associated with anaerobic environments.

6.1.2. Total Suspended Solids (TSS)

Total Suspended Solids is a general indicator of the quality of a wastewater and will be limited in this permit. The technology-based TSS limit for conventional treatment plants is provided in Tennessee Rule 0400-40-05-.09(1)(a).

TSS - Conventional Secondary Treatment Plants			
Monthly Average	*Weekly Average*	*Daily Maximum*	*Monthly Average*
30 mg/L	40 mg/L	45 mg/L	85 % Removal

6.1.3. Percent Removal

The treatment facility is required to remove 85 % of the $CBOD_5$ and TSS 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 (CFR) 40 § 133.102. The reasons stated by the EPA for these requirements are to achieve these two basic objectives:

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

The treatment facility is required to remove 40 % of the $CBOD_5$ and TSS that enter the facility on a daily basis. This percent removal will be calculated one time per week and recorded on the Monthly Operation Report. The number of excursions (days when $CBOD_5$ and/or TSS removal is less than 40%) will be reported on the Discharge Monitoring Report.

6.1.4. Settleable Solids

The settleable solids limit of 1.0 ml/L is a technology-based limit established in Rule 0400-40-05-.09.

6.2. FLOW

Monitoring of flow quantifies the load of pollutants to the stream. Flow shall be reported in million gallons per day (MGD) and monitored at the time of sample collection.

6.3. PH

According to the State of Tennessee Water Quality Standards [Chapter 0400-40-03-.03(3) (b)], the pH for the protection of Fish and Aquatic Life shall not fluctuate more than 1.0 unit over a period of 24 hours and shall not be outside the following ranges: 6.0 – 9.0 standard units (SU) in wadeable streams and 6.5 – 9.0 SU in larger rivers, lakes, reservoirs, and wetlands. Considering that the receiving stream will provide some buffering capacity, effluent limitation for pH will be retained in a range 6.0 to 9.0. The sample type will be grab.

6.4. AMMONIA (NH_3-N)

To assess ammonia toxicity impacts, the state utilizes Tennessee Rules, Chapter 0400-40-03-.03-3(3)(j), dated September 11, 2019, to derive allowable instream protection values protective of chronic and acute exposures to a continuous discharge. A mass balance equation with the treatment facility, stream flows, and these allowable values determines the monthly average and daily maximum permit limits.

The temperature used in calculations is determined based on measured ambient instream temperature or is estimated according to Tennessee's Three Grand Divisions as follows: East (winter 15°C, summer 25°C), Middle (winter 17°C,

summer 27°C), and West (winter 20°C, summer 30°C). This calculation uses an ambient pH value of 8.0 SU because ambient monitoring at River Mile 131.5 average 8.0 SU, and the pH values upstream of the outfall average 7.6 SU.

Using temperature and pH values, the criterion continuous concentration (CCC) and criterion maximum concentration (CMC) values are calculated using the following equations:

$$CCC = 0.8876 * \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) * \left(2.126 * 10^{0.028*(20-MAX(T,7))}\right)$$

and

$$CMC = MIN\left\{\begin{array}{c}\left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}\right), \\ \left(0.7249 * \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}}\right) * \left(23.12 * 10^{0.036*(20-T)}\right)\right)\end{array}\right\}$$

The determined CCC and CMC values are then used in the mass balance equation as follows:

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

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)

In consideration of the Cormix modeling done in the 1990's that estimated only a 3 fold dilution in the zone of immediate mixing, the Division evaluated reasonable potential for chronic toxicity on the basis of the low river flow and for acute toxicity on a dilution ratio of 3:1. See below for calculations:

CCC Calculation: Chronic Limits

Winter		Summer	
Temp (°C)=	15	Temp (°C)=	25
pH=	8	pH=	8
MAX Expression	15.0000	MAX Expression	25.0000
Winter CCC=	**1.07**	Summer CCC=	**0.56**

CCC - Continuous Chronic Criterion Allowable instream NH3 concentration [mg/l]

$$CCC = \frac{(\text{Critical Low Flow [MGD]} * \text{Background Ammonia [mg/L]}) + (\text{Design Flow [MGD]} * \textbf{Effluent Concentration [mg/L]})}{(\text{Critical Low Flow [MGD]} + \text{Design Flow [MGD]})}$$

where:	587.2	Critical Low Flow [MGD] (7Q10 value)
	0.04	Background Ammonia Concentration [mg/L] *
	14.7	WWTP Design Flow or long-term average flow [MGD]

Therefore, the Allowable **Effluent Concentrations** and corresponding **Amounts** in winter and summer are:

Winter		Summer	
42.32	Concentration [mg/L]	**21.451**	Concentration [mg/L]
5188.6	Amount [lb/day]	**2629.9**	Amount [lb/day]

* In the absence of measured data, an assumed background concentration of 0.1 mg/L is used based on an Agreed Wasteload Allocation Modeling Methodology between the EPA and State of TN

CMC Calculation: Acute Limits

Winter			Summer	
Temp (°C)=	15		Temp (°C)=	25
pH=	8		pH=	8
MAX Expression	15.0000		MAX Expression	25.0000
Winter CMC=	**5.62**		Summer CMC=	**2.58**

CMC - Continuous Maximum Criterion Allowable instream NH3 concentration [mg/l]

$$CMC = \frac{(\text{Critical Low Flow [MGD]} * \text{Background Ammonia [mg/L]}) + (\text{Design Flow [MGD]} * \textbf{Effluent Concentration [mg/L]})}{(\text{Critical Low Flow [MGD]} + \text{Design Flow [MGD]})}$$

where:	3	Critical Low Flow [MGD] (7Q10 value)	
	0.04	Background Ammonia Concentration [mg/L]	
	1	WWTP Design Flow or long-term average flow [MGD]	

Therefore, the Allowable **Effluent Concentrations** and corresponding **Amounts** in winter and summer are:

Winter		Summer	
22.34	Concentration [mg/L]	**10.198**	Concentration [mg/L]
186.3	Amount [lb/day]	**85.1**	Amount [lb/day]

* In the absence of measured data, an assumed background concentration of 0.1 mg/L is used based on an Agreed Wasteload Allocation Modeling Methodology between the EPA and State of TN

The calculated acute and chronic toxicity values above are compared to ammonia limits previously imposed to prevent ammonia toxicity or calculated to protect ambient dissolved oxygen levels. The analysis compares the calculated chronic ammonia value (CCC) with a **monthly average limit** previously imposed to protect dissolved oxygen or to prevent toxicity. The analysis compares the calculated acute ammonia value (CMC) with the previously imposed **daily maximum value** to protect dissolved oxygen or to prevent toxicity. Generally, water quality models have predicted the monthly average ammonia limit to

protect dissolved oxygen. The Division has historically developed a companion daily maximum value to protect dissolved oxygen by multiplying the monthly average limit by two. Empirical data supports the factor of two developed in consideration of the natural variation in biological pollutant removal and the design basis for treatment unit sizing.

Because the NH_3-N concentration limits calculated to protect dissolved oxygen are more restrictive than the toxicity limits calculated above, the Division continues to apply the previously established limits for NH_3-N (15 mg/L monthly average and 25 mg/L daily maximum) in the permit.

The previous permit imposed influent monitoring and reporting of ammonia. That permit did not detail the purpose of that monitoring, so the Division proposes to remove the influent monitoring and reporting of ammonia as nitrogen from this permit. The permittee is welcome to continue sampling influent ammonia at its own discretion and need for operational control.

6.5. CHLORINATION

The facility disinfects with ultraviolet light. In the event that chlorine would be used for disinfecting, the total residual chlorine (TRC) limit is derived using the mass balance formula and the EPA acute instream protection value of 0.019 mg/L for fish and aquatic life. Applying this formula yields the following calculation for the TRC daily maximum limit:

$$\frac{0.019\ (Qd + Qs)}{Qd} = Limit\ (mg/L) = \frac{0.019(1+3)}{1} = 0.076\,mg/L \approx 0.08\,mg/L$$

Where:

0.019 mg/L	=	acute instream protection value
3:1	=	Dilution ratio predicted by Cormix modeling in 1994

6.6. TOTAL NITROGEN AND TOTAL PHOSPHORUS

Nutrients are naturally occurring and essential components of healthy aquatic systems. Excessive amounts of nutrients, however, can impact water quality. The enrichment of a waterbody with nutrients, called eutrophication, can result in dense, rapidly multiplying growths, or blooms, of algal species and other nuisance aquatic plants. These have potential for negatively impacting the habitat for fish and aquatic life and degrading the water quality for drinking water supply and recreation uses. These impacts can present both locally from an individual activity and much further downstream from the cumulative impact of multiple activities. The Division has therefore developed and begun to implement a strategy to

accomplish long-term nutrient reduction in Tennessee waters. The strategy, referred to as the Tennessee Nutrient Reduction Framework (NRF), contains proposed rationale and the methodology for implementing the strategy within a watershed area. Consequently, the Framework considers impacts from both point and non-point sources of nutrients and recommends possible reduction goals for both point and non-point sources. The NRF approach to nutrient reduction is intended to utilize an adaptive management approach in consideration of the facts presenting within a watershed and reevaluation of the effectiveness of progress being made. Regular reassessments of goals and action plans will be conducted by reviewing monitoring data, modeling results and other measures of success. As additional data becomes available (such as WWTP effluent characterization and instream water quality data), model results can be re-evaluated.

Therefore, for purposes of implementing this strategy, the Division continues imposing a minimum of quarterly effluent characterization for total nitrogen and total phosphorus on all discharges of treated domestic wastewater. These values will be used to reevaluate the nutrient loads from discharges within a watershed over time for comparison with those loads from non-point sources. The table below summarizes the results collected in the previous permit term:

Mo/Year	Total Nitrogen				Total Phosphorus			
10/31/2020	15.21	lb/d	3.28	mg/L	16.79	lb/d	3.62	mg/L
01/31/2021	47.81	lb/d	9.46	mg/L	7.88	lb/d	1.56	mg/L
04/30/2021	36.37	lb/d	6.46	mg/L	19.6	lb/d	3.48	mg/L
07/31/2021	9.25	lb/d	2.3	mg/L	24.5	lb/d	6.1	mg/L
10/31/2021	5.41	lb/d	1.45	mg/L	20.85	lb/d	5.24	mg/L
01/31/2022	30.56	lb/d	6.9	mg/L	7.09	lb/d	1.6	mg/L
04/30/2022	67.3	lb/d	15	mg/L	9.11	lb/d	2.03	mg/L
08/31/2022	8.9	lb/d	1.76	mg/L	20.1	lb/d	3.97	mg/L
10/31/2022	25.9	lb/d	6.26	mg/L	29.6	lb/d	7.16	mg/L
01/31/2023	17.92	lb/d	2.01	mg/L	10.97	lb/d	1.23	mg/L
04/30/2023	13.62	lb/d	3.01	mg/L	5.42	lb/d	1.2	mg/L
07/31/2023	7.17	lb/d	1.15	mg/L	29.2	lb/d	4.68	mg/L
10/31/2023	62.37	lb/d	12.3	mg/L	27.99	lb/d	5.52	mg/L
Average	26.8		5.5		17.6		3.6	

In coordination with the NRF and in recognition that meeting nutrient limits may require changes in plant operations, the Division has created the Tennessee Plant Optimization Program (TNPOP), which is a free program created to provide technical assistance and other resources to participating wastewater treatment plants. TNPOP can help wastewater treatment plants optimize energy use and nutrient removal, which can result in cost and energy savings. Interested facilities should visit the Division's TNPOP website for a program description, frequently asked questions, and information on how to apply.

6.7. *E. COLI*

Disinfection of wastewater is required to protect the receiving stream from pathogenic microorganisms. *E. coli* is used as an indicator organism as a measure of the bacteriological health of a receiving stream and the effectiveness of disinfection. Both the geometric mean and daily maximum are limited for *E. coli* in accordance with Rule 0400-40-03-.03. While the Rule retains the geometric mean for *E. coli* of 126 cfu/100 mL, the maximum has been changed. Formerly, the *E. coli* daily maximum limit of 487 colony forming units (cfu) per 100 mL applied to lakes and exceptional Tennessee waters, while a daily maximum limit of 941 cfu/100 mL applied to all other recreational waters.

In November 2022, the Tennessee Board of Water Quality, Oil, and Gas adopted a new maximum criterion to align with U.S. Environmental Protection Agency national recommended criteria. That criterion will apply to Tennessee waters to protect the recreation use designation effective March 17, 2024. EPA established a statistical relationship between number of colony forming units and percent of time when such numbers were observed in any 30-day period. The new criterion of 410 cfu/100 mL corresponds to no exceedances in more than 10% of samples during any 30-day interval for all receiving waters.

Tennessee has historically applied water quality standards for pathogens at the outfall of POTWs so that a discharger can demonstrate that it is not contributing to any violation of the criterion in the receiving waterbody. The Division therefore proposes to apply the new criterion as a daily maximum of 410 cfu/100 mL in accordance with EPA guidance and retains the monthly geometric mean for E. coli of 126 cfu/100 mL.

The units for *E. coli* have been standardized to #/100 mL, which is functionally equivalent to colony forming units.

6.8. 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:

i. Toxicity is suspected or demonstrated;
ii. A pretreatment program is required; or
iii. The design capacity of the facility is greater than 1.0 MGD.

In cases where a discharger has characterized its effluent via toxicity test methods acceptable to the Division, reasonable potential to exceed the criterion is evaluated using the following rationale.

EPA's Technical Support Document for Water Quality Based Toxics Control (TSD) recommends that the evaluation of both acute and chronic toxicity be based on the number of observations in the data set, the coefficient of variation and an uncertainty factor. The uncertainty factor value is taken from a chart in the technical support document and the coefficient of variation (C.V.) is based on the following numbers:

Less than ten observations: C.V. = 0.6
More than ten observations: C.V. = Standard Deviation / Mean

The result of each biomonitoring test is converted to toxic units using the equations listed below:

Acute biomonitoring: $TUa = 100 / LC_{50}$
Chronic biomonitoring: $TUc = 100 / IC_{25}$

The highest numerical value of the acute data set (in TUa) is multiplied by the uncertainty factor (U.F.) and the dilution factor to derive the final acute value. The highest numerical value of the chronic data set (in TUc) is also multiplied by the uncertainty factor and the dilution factor to derive the final chronic value.

Dilution Ratio (DR) = Design Flow / 7Q10
Final Acute Value = TUa * Uncertainty Factor * Dilution Ratio
Final Chronic Value = TUc * Uncertainty Factor * Dilution Ratio

The final acute value is compared to the criteria maximum concentration (CMC) for acute toxicity (CMC = 0.3 TUa). The CMC is defined as the highest instream concentration of an effluent to which organisms can be exposed to for a brief period of time without causing an acute effect. The final chronic value is compared to the criteria continuous concentration (CCC) for chronic toxicity (CCC = 1.0 TUc). The CCC is defined as the highest instream concentration of an effluent to which organisms can be exposed indefinitely without causing an unacceptable effect. In the absence of chronic data, an acute to chronic ratio (ACR) of 4.4 is assumed (TSD Appendix A.3).

In this case, 12 observations of acute are available. Each test passed with results higher than the largest serial dilution meaning that the effluent itself had no

reasonable potential for toxicity when completely mixed with the river. However, the pretreatment program and design flow greater than 1.0 MGD still apply, so the permit continues to impose acute whole effluent toxicity annually.

Since the receiving stream is the facility's water source, the following equations are used to determine whole effluent toxicity limits.

The following calculation is the required dilution at which acute toxicity testing must meet permit requirements:

$$Dilution\ Factor = \frac{Stream\ Low\ Flow}{Design\ Flow} = \frac{587.2}{2.5} = 234.9$$

$$LC_{50}\ \% \geq \frac{100\%}{0.3 * Dilution\ Factor} \geq \frac{100\%}{0.3 * 234.9} \geq 1.4\%$$

Where:

587.2	= 1Q10 Low Flow (MGD)
2.5	= Design Flow Capacity (MGD)
0.3	= Conversion factor to toxic units, acute
LC_{50}	= Lethality concentration to 50% of organisms

The acute toxicity endpoint (LC_{50}) is a *calculated* effluent concentration based on the dilution afforded to the effluent by the receiving stream at an assumed, worst-case condition (facility design flow discharging into the stream low flow). The calculated endpoint is taken to be an effluent concentration having the reasonable potential to cause acute toxicity when mixed into the receiving stream at its low flow. Because the low flow condition provides the least amount of effluent dilution, the endpoint based on it will be the *highest* concentration of an effluent ever *available* to provide acutely toxic exposure. Therefore, to demonstrate the *absence* of acutely toxic exposure, an effluent solution causing lethality in 50% or more of the organisms in a laboratory test must require an effluent concentration *in excess* of the acutely toxic concentration *available* at the condition of least dilution. Reasonable potential for toxicity will be demonstrated if the LC_{50} established in the laboratory is *less than or equal to* the endpoint.

6.9. METALS AND TOXICS

Pass-through limitations for heavy metals and other toxic substances have been recalculated as part of the permit issuance process and/or due to changes in industrial waste contribution to the POTW. 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.

A summary of the semi-annual report data below does not indicate that the potential exists for the water quality criteria for any parameter to be exceeded.

	PTL	85% PTL	PTL	Oct-23	Apr-23	Oct-22	Apr-22	Oct-21	Apr-21	Oct-20	Apr-20	Oct-19	Apr-19
TN0021253	4/15/2019		4/5/2024										
COPPER	**0.08000**	**0.06800**	**0.08000**	0.00270	0.00250	0.00250	0.00302	0.00188	0.00357	0.00260	0.00294	0.01131	0.01172
CHROMIUM, III	**Report**	**N/A**	**Report**	0.00050	0.00050	0.00050	0.00500	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
CHROMIUM, VI	**Report**	**N/A**	**Report**	0.00050	0.00050	0.00050	0.00500	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
CHROMIUM, TOTAL	**0.06000**	**n/a**	**n/a**	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.00100	0.00100	0.00100
NICKEL	**0.18000**	**0.15300**	**0.18000**	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00118	0.00144	0.00100
CADMIUM	**0.00500**	**0.00425**	**0.00500**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
LEAD	**0.04500**	**0.03825**	**0.04500**	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00100	0.00100	0.00100
MERCURY	**0.00040**	**0.00034**	**0.00040**	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00030	0.00020	0.00020	0.00020
SILVER	**0.00500**	**0.00425**	**0.00500**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
ZINC	**0.20000**	**0.17000**	**0.20000**	0.04170	0.05880	0.05100	0.06360	0.06600	0.06600	0.05345	0.05310	0.03690	0.00595
CYANIDE	**0.16048**	**0.09042**	**0.10638**	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00682
TOLUENE	**0.01500**	**0.01275**	**0.01500**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.01000	0.01000	0.00100	0.00100
BENZENE	**0.00300**	**0.00255**	**0.00300**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
1,1,1 TRICHLOROETHANE	**0.03000**	**0.02550**	**0.03000**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
ETHYLBENZENE	**0.00400**	**0.00340**	**0.00400**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
CARBON TETRACHLORIDE	**0.01500**	**0.01275**	**0.01500**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
CHLOROFORM	**0.08500**	**0.07225**	**0.08500**	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
TETRACHLOROETHYLENE	**0.02500**	**0.02125**	**0.02500**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
TRICHLOROETHYLENE	**0.01000**	**0.00850**	**0.01000**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
1,2 TRANSDICHLOROETHYL	**0.00150**	**0.00128**	**0.00150**	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
METHYLENE CHLORIDE	**0.05000**	**0.04250**	**0.05000**	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
TOTAL PHENOLS	**0.05000**	**0.04250**	**0.05000**	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	**0.13300**	0.04000	0.04000	0.04000
NAPHTHALENE	**0.00100**	**0.00085**	**0.00100**	**0.00100**	**0.00100**	**0.00100**	**0.00100**	**0.00100**	**0.00100**	**0.00139**	**0.00139**	**0.00100**	**0.00100**
TOTAL PHTHALATES	**0.06450**	**0.05483**	**0.06450**	0.01200	0.01200	0.01200	0.01200	**0.12000**	0.01200	0.01560	0.01560	0.01200	0.01200

Bolded in effluent data exceed 85% of proposed PTLs
Shaded means detection level

Appendix 3 lists the metal and toxic parameter calculations and the procedure used to derive the results.

6.10. 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 instream 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: $Ca = \frac{(S_A)[Cm(Qs+\quad)-QsCs]}{Qw}$

Ca	=	STP allowable effluent concentration
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. Due to the volatility and reactivity of volatile compounds, the background concentrations used for reasonable potential calculations is always assumed to be below detection.

b) The stream allocation, S_A, is determined based on the size of a receiving stream in accordance with guidance provided in the Division's Reasonable Potential Analysis Procedures and is shown on the Reasonable Potential Spreadsheet in the Appendices.

c) A mass balance equation 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 detection limits 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 available analysis results were not performed using sufficiently sensitive methods as required by state rule 0400-40-03-.05(8).

ii. If sufficiently sensitive methods have been used with no detection shown 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 AND 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.

7. COLLECTION SYSTEMS

7.1. COLLECTION SYSTEM CERTIFIED OPERATOR

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

7.2. COLLECTION SYSTEM OPERATION

For the purposes of demonstrating proper operation of the collection, transmission and treatment system, the permit treats releases separately from sanitary sewer overflows and bypass. State regulations at 0400-40-05-.07(2) establish “standard conditions”. These standard conditions include 0400-40-05-.07(2)(n) that sets forth specific language prohibiting sanitary sewer overflows (defined in the regulations as a “discharge”) and standard conditions in 0400-40-05-.07(2)(l) and (m) pertaining to bypass. While the regulations prohibit sanitary sewer overflow (*i.e.*, discharges that reach or are likely to reach receiving waters) it does not prohibit “releases” that do not reach or are not likely to reach receiving waters. However, releases that do not reach receiving waters may be indicative of other problems, such as improper operation and maintenance of the sewer system. Whether another violation occurs or whether, for example, there is an unavoidable accident (see, e.g., § 69-3-114(a)), will involve case-specific evaluations. Regardless, the permit assures, without waiving rights to pursue

other violations associated with a release, as applicable, that the permittee would, at a minimum be reporting and responding to releases. Any release potentially warrants permittee mitigation of human health risks via direct or indirect contact and may demonstrate a hydraulic problem in the system that warrants permittee consideration as part of proper operation and maintenance of the system.

Proper operation and maintenance of the collection system may include, but is not limited to:

1. A comprehensive collection system map showing all drainage areas, manholes, pump stations (number and size of pumps), flow meters, chronic sanitary sewer overflow and release locations, miles of collection system, material and diameter of construction, and other relevant system elements.
2. Rainfall data at location(s) using method(s) representative of precipitation within the collection system area.
3. Flow meters at locations in the collection system that would enable drainage area analysis and prioritization based on the amount of inflow and infiltration (I/I) observed.
4. A collection system hydraulic model that predicts I/I problems in response to rainfall events and the effects of new conditions.

When determining if a location experiences chronic sanitary sewer overflows or releases, the term "event(s)" includes dry weather overflows, wet weather overflows, dry weather releases and wet weather releases.

7.3. LOW PRESSURE SYSTEM OWNERSHIP/CONTROL

On May 15, 2022, Tennessee Rule 0400-40-05 became effective. In those rules, clarifying language was added regarding low pressure systems. The Board received a comment during the rulemaking process noting that the inclusion of ownership or control of low pressure systems in Tennessee Rule 0400-40-06 governing land based disposal systems should be included Tennessee Rule 0400-40-05 which governs discharging systems. The response to that comment is included below to provide direction to municipal agencies in implementing this condition of the permit.

> *The Board agrees, and has added the following to Rule 0400-40-05-.07(2)(c) concerning proper operation and maintenance, "Low pressure pumps, low pressure tanks, septic tank effluent pumps (STEP), STEP tanks, and septic tank effluent gravity tanks are integral to the treatment and conveyance of sewage in a low-pressure system design, and shall be owned or under control of the*

municipality, other body of government, public utility district, or a privately-owned public utility demonstrating lawful jurisdiction over the service area." This permit condition is not applicable to pumps and appurtenances that are service lines to other than a low-pressure public system. This condition applies to sewer projects or extensions that are approved for construction after the effective date of the permit.

While the Board encourages direct ownership of the low pressure pumps and tanks, it does recognize that in some cases, operational control without direct asset ownership may suffice. The Board acknowledges that operational control may be implemented collectively by multiple local agencies. Operational control for privately-owned low pressure pumps and appurtenances appropriately includes the following:

- *Legal mechanism e.g. local regulations, ordinance, plumbing codes, resolution etc. that provides the authority to:*
  - *Deny the use of low pressure pumps and tanks*
  - *Establish and enforce design standards*
  - *Access the site and equipment (including inspection)*
  - *Obtain remedies for non-compliance*
  - *Conduct an emergency response*
- *Plans review process to ensure compliance with the locally established design standards (including inspection of installation)*
- *Construction, inspection, and approval process*
- *Preventative and emergency maintenance program*

In addition, all components of the sewerage system must be owned by a municipality, other body of government, public utility district, or a privately-owned public utility demonstrating lawful jurisdiction over the service area in accordance with Rule 0400-40-16-.02(8).

8. OTHER PERMIT REQUIREMENTS AND CONDITIONS

8.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

The waste treatment facilities shall be operated under the supervision of a Grade III certified wastewater treatment operator in accordance with the Water Environmental Health Act of 1984. Operator grades are under jurisdiction of the Water and Wastewater Operators Certification Board. This NPDES permit is under jurisdiction of the Tennessee Board of Water Quality, Oil and Gas. Operator grades are rated and recommended by the Division of Water Resources pursuant to Rule 0400-49-01 and are included in this fact sheet for reference. The grades are intentionally not specified in the permit so that the operation certification board can authorize changes in grade without conflicting with this permit.

8.2. PRETREATMENT PROGRAM

The City of Church Hill has an approved pretreatment program.

At least once each reporting period, all permittees with approved pretreatment programs are required to analyze the STP influent and effluent for the following pollutant parameters: chromium (III), chromium (VI), copper, lead, nickel, zinc, silver, cadmium, mercury, total phenols, and cyanide. These pollutants were selected because, historically, they are the ones that tend to be predominant in industrial wastewaters. Other pollutants may be added to the list, as required.

During preparation of this permit, data from ten previous semiannual reports were analyzed. If any particular value of a pollutant equals or exceeds 85% of the pass-through limit, the pollutant was added to the list of those that are required to be sampled. Based on our review of the semiannual reports and other documents, sampling for additional pollutants is not required at this time.

Narrative conditions will be included for conducting and submitting an industrial waste survey and the local limits evaluation. The drafted permit will include a due date for these reports based on the anticipated effective date. If permit issuance is delayed, these dates will be adjusted accordingly.

8.3. BIOSOLIDS MANAGEMENT PRACTICES

The Clean Water Act (CWA) requires that any NPDES permit issued to a publicly owned treatment works or any other treatment works treating domestic sewage shall comply with 40 CFR § 503, the federal regulation governing the use and disposal of sewage sludge. It is important to note that “biosolids” are sewage sludge that have been treated to a level so that they can be land applied.

The language in **section 3.3.** of the permit, relative to biosolids management, a CWA requirement, allows the “permitting authority” under 40 CFR § 503.9(p) to be able to enforce the provisions of § 503. The “permitting authority” relative to Part 503 is either a state that has been delegated biosolids management authority or the applicable EPA Region; for Tennessee it is EPA Region 4.

Tennessee regulates the land application of non-exceptional quality biosolids under state rules, Chapter 0400-40-15. The state rules became effective on June 30, 2013. Under these state rules, all facilities that land apply non-exceptional quality biosolids must obtain a biosolids permit from the division. The land application of non-exceptional quality biosolids under state rules is regulated through either a general permit or by an individual permit. Questions about the

division's biosolids regulations and permitting program should be directed to the State Biosolids Coordinator at:

Division of Water Resources
State Biosolids Coordinator
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243
615-532-0625

8.4. PERMIT TERM

In order to meet the target reissuance date for the Holston watershed and following the directives for the Watershed Management Program initiated in January 1996, the permit will be issued to expire in 2029.

8.5. ELECTRONIC REPORTING

The NPDES Electronic Reporting Rule (eRule), which became effective on December 21, 2016, replaces most paper-based reporting requirements with electronic reporting requirements. NetDMR allows NPDES permittees to submit DMRs electronically to EPA through a secure internet application and has been approved by Tennessee as the official electronic reporting tool for DMRs. The permittee has been approved to report electronically via NetDMR since June 2016.

Monitoring results shall be recorded monthly and submitted monthly using Discharge Monitoring Reports (DMRs) based on the effluent limits in **section 1.1** of the permit. DMRs and DMR attachments, including laboratory data and sanitary sewer overflow reports, shall be submitted electronically in NetDMR or other electronic reporting tool approved by the State, no later than the 15th of the month following the end of the monitoring period. All NPDES program reports must be signed and certified by a responsible official or a duly authorized representative, as defined in 40 CFR § 122.22.

According to 40 CFR § 127.15, states have the flexibility to grant temporary or episodic waivers from electronic reporting to NPDES permittees who are unable to meet the electronic reporting requirements. To obtain an electronic reporting waiver, an electronic reporting waiver request must be submitted by email to DWRwater.compliance@tn.gov or by mail to the following address:

Division of Water Resources
Compliance and Enforcement Unit – NetDMR Waivers
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, TN 37243

For contact and training information about NetDMR electronic reporting, visit the Division's website here.

The permit language has been modified to accommodate the implementation of the MyTDEC Forms electronic reporting tool. For more information, visit EPA's website on eReporting requirements.

8.6. ANTIDEGRADATION STATEMENT / WATER QUALITY STATUS

Tennessee's Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.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# TN06010104011_2000.

The Division has made a water quality assessment of the receiving waters associated with the subject discharge(s) and has found the receiving stream to be neither an exceptional nor outstanding national resource water. Additionally, the Division assesses the quality of the water from River Mile 106 through River Mile 142 as not supporting its recreational designated use due to level of mercury in fish tissue measured by TVA at its fish station at River Mile 118.

The Division does not have any approved Total Maximum Daily Loads (TMDLs) applicable to this reach of the Holston River.

This facility reports mercury below detection in its permit application and its metal finishing, glass fabrication, glass etching, and iron and steel industries are not likely sources of mercury.

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
$CBOD_5$	25	521	35	730	40	40	1/week
NH_3-N	15	313	20	417	25	—	1/week
Total Suspended Solids	30	626	40	834	45	40	1/week
Dissolved Oxygen (mg/L)	1.0 (daily minimum) instantaneous	—	—	—	—	—	5/week
Total Nitrogen	—	—	—	—	Report	Report	1/quarter
Total Phosphorus	—	—	—	—	Report	Report	1/quarter
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	1/week
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	5/week
pH (standard units)	6.0-9.0	—	—	—	—	—	5/week
Flow (MGD):							
Influent	Report	—	—	—	Report	—	7/week
Effluent	Report	—	—	—	Report	—	7/week
Whole Effluent Toxicity:							
48 hour LC_{50}	1.4% per sample	—	—	—	—	—	1/year
Metals & Toxics:							
Phenols, total					Report		1/quarter
Sanitary Sewer Overflows, Total Occurrences			Report				continuous
Dry Weather Overflows, Total Occurrences			Report				continuous
Bypass of Treatment, Total Occurrences			Report				continuous

APPENDIX 2 – DMR SUMMARY

	Flow (MGD)		CBOD5				Suspended Solids				Effluent (mg/l)									Overflow and Bypass
			Influent	Effluent (mg/l)		%	Influent	Effluent (mg/l)		%	Settleable	pH		NH3-N	Ammonia		D.O.	E. coli		
	Monthly Average	Daily Max	(mg/l)	Monthly Average	Weekly Averag	Removal	(mg/l)	Monthly Average	Daily Max	Removal	Solids (ml/l)	(std. units) Min	Max	Influent Average	Monthly Average	Daily Max	Daily Min	Monthly Average	Daily Max	
Limits	Report	Report	Report			85	Report			85	1.0	6.0	9.0				1.0	126	941	
Summer				25	35			30	45					Rpt	15.0	25.0				
Winter				25	35			30	45					Rpt	15.0	25.0				
Average	0.671	1.600	951	2	2	99	269.5	3	5	99	0.2	7.5	8.0	27.52	2.3	5.1	6.9	55	143	
Maximum	1.320	5.350	29193	3	8	100	381.5	4	11	100	0.4	7.8	8.7	40.42	11.5	16.9	8.3	109	288	
Minimum	0.460	0.570	163.1	1	1	99	154.9	2	3	98	0.1	7.2	7.8	16.54	0.1	0.1	5.3	15	41	
+ = Exceedence																				17
Date																				
Sep/20	0.560	1.340	240.44	1.5	1.7	99.37	284.14	3	5	98.97		7.6	7.9	28.21	0.14	0.62	5.9	98.53	135	
Oct/20	0.560	1.870	216.98	1.2	1.7	99.46	249.46	2	4	99.14		7.5	7.9	31.55	0.10	0.10	6.7	87.13	129	
Nov/20	0.530	0.970	248.13	1.2	1.6	99.51	269.83	3	4	99.01		7.5	7.8	33.50	0.59	1.96	7.1	108.7	146	
Dec/20	0.650	1.210	243.39	1.6	1.7	99.35	237.67	2	4	98.96	0.2	7.5	7.8	28.83	1.69	6.04	7.3	54.09	151	
Jan/21	0.730	1.630	223.41	1.7	2.4	99.25	258.83	2	4	99.22	0.4	7.5	7.8	25.46	11.49	16.90	7.0	45.61	136	
Feb/21	0.980	2.010	209.32	1.8	2.2	99.17	256	2	3	99.25	0.1	7.4	7.8	22.41	10.89	13.50	7.8	15.68	135	1
Mar/21	1.320	5.350	171.3	1.9	2.1	98.91	206.36	3	5	98.79	0.3	7.5	7.9	18.21	6.37	13.00	7.8	35.31	133	4
Apr/21	0.790	1.850	202.71	1.8	2.0	99.14	189	2	3	99.1		7.4	7.9	20.84	3.27	6.54	7.3	22.25	109	
May/21	0.520	0.740	232.42	2.7	3.1	98.86	241.92	4	6	98.45		7.3	7.8	28.11	4.51	13.90	6.1	59.75	180	1
Jun/21	0.470	0.820	238.08	3.0	3.2	98.73	280.77	3	5	98.9	0.1	7.6	7.8	29.07	2.36	6.00	6.0	89.17	152	
Jul/21	0.500	0.870	222.63	2.2	7.9	99.01	267.15	3	6	98.93		7.5	7.8	28.13	1.17	4.00	5.3	75.22	122	
Aug/21	0.560	1.380	202.81	1.6	2.3	99.57	293	3	5	99.47	0.1	7.5	7.8	25.96	1.30	4.62	6.0	53.99	128	
Sep/21	0.500	0.870	224.57	1.0	1.3	99.54	296.29	2	4	99.23		7.7	7.9	28.13	0.29	0.56	6.2	58.31	95	1
Oct/21	0.490	0.680	225.48	1.0	1.4	99.57	272.83	3	4	99.08		7.7	7.8	30.47	0.25	0.25	6.9	41.68	95	
Nov/21	0.470	0.570	241.68	1.0	1.2	99.59	296.31	2	4	99.25		7.5	7.8	34.70	0.25	0.25	7.6	41.97	89	
Dec/21	0.490	0.990	277.54	1.0	1.1	99.64	274.43	2	3	99.43	0.1	7.4	7.8	40.42	1.68	4.27	7.1	42.52	136	
Jan/22	0.720	2.360	210.06	1.2	1.3	99.44	195.25	2	5	98.93		7.5	7.8	22.45	4.10	9.89	8.2	26.2	105	2
Feb/22	1.060	3.820	208.96	1.3	1.8	99.38	208.36	2	4	98.87	0.2	7.3	7.8	25.71	5.25	14.40	8.3	60.56	106	1
Mar/22	0.760	2.140	163.1	1.7	2.0	98.96	154.86	2	5	98.62	0.3	7.2	8.0	21.00	1.36	3.98	7.7	44.06	199	
Apr/22	0.570	0.960	252.54	2.6	2.9	98.97	253.75	2	5	99.05		7.7	8.1	28.38	8.50	12.40	6.7	45.81	138	
May/22	0.590	1.610	224.2	1.4	1.8	99.39	252.92	2	3	99.24	0.4	7.5	8.2	30.43	0.37	0.83	7.0	22.22	41	
Jun/22	0.460	0.580	234.22	1.2	1.3	99.51	274.38	2	8	99.24		7.4	8.1	26.86	0.22	0.25	6.8	57.44	199	
Jul/22	0.590	1.320	188.53	0.9	1.1	99.51	207.67	3	10	98.48	0.3	7.6	8.1	24.83	0.23	0.25	6.5	72.94	123	1
Aug/22	0.600	1.240	208.79	1.3	2.5	99.38	243.07	3	11	98.68	0.1	7.8	8.2	25.96	1.81	5.80	6.4	52.51	135	
Sep/22	0.490	0.750	225.45	1.5	1.7	99.35	213.31	3	5	98.74	0.1	7.6	8.2	29.50	1.74	5.22	6.4	71.78	283	
Oct/22	0.470	0.570	254.13	1.5	2.1	99.4	245	3	6	98.78		7.6	8.5	34.82	0.32	0.60	6.9	81.89	134	
Nov/22	0.540	0.930	251.63	1.1	1.4	99.56	301	2	6	99.28	0.1	7.5	8.4	34.71	0.54	2.68	7.1	78.61	288	
Dec/22	0.740	1.820	223.44	1.2	1.4	99.48	279.69	3	7	99.09		7.3	8.7	23.32	0.36	1.62	6.3	90.74	201	
Jan/23	0.920	1.500	216.26	1.7	2.1	99.22	278.25	3	6	98.92	0.1	7.3	7.9	21.72	1.72	7.89	7.8	89.68	167	
Feb/23	1.160	3.720	182.2	2.2	2.2	98.8	273.17	3	6	99.05	0.2	7.6	8.3	16.54	4.88	9.04	7.8	89.98	285	1
Mar/23	0.920	3.400	201.55	1.8	2.2	99.09	256.46	2	6	99.04	0.2	7.7	8.5	21.30	2.23	6.18	7.4	43.91	110	
Apr/23	0.600	0.800	225.06	2.7	3.6	98.8	256.46	3	6	98.91	0.2	7.5	7.8	21.30	2.23	6.18	6.7	52.76	136	
May/23	0.600	1.280	249.07	2.1	3.1	99.18	342.31	4	7	98.83		7.5	7.9	33.47	2.01	4.95	6.6	67.22	128	
Jun/23	0.540	0.680	265.12	1.1	1.7	99.61	381.54	2	4	99.4		7.7	7.9	32.51	0.25	0.25	6.7	30.84	99	
Jul/23	0.800	3.440	266.04	1.1	1.4	99.59	363.08	2	3	99.5		7.6	7.8	30.87	0.25	0.25	6.5	44.01	167	
Aug/23	1.040	3.460	215.63	1.0	1.1	99.55	325.82	3	5	99.19	0.4	7.5	7.9	19.31	0.25	0.25	6.4	64.52	153	2
Sep/23	0.680	1.320	235.12	1.6	2.7	99.31	311.92	2	4	99.28		7.6	7.9	31.47	0.25	0.25	6.3	24.31	180	1
Oct/23	0.620	0.770	29193	1.6	2.3	99.46	348.31	3	4	99.28		7.5	7.9	32.28	6.02	16.10	6.8	15.39	101	1
Nov/23	0.620	0.850	268.04	1.1	1.8	99.58	330.92	3	5	99.21		7.6	7.8	33.62	0.45	2.79	7.3	26.01	81	
Dec/23	0.610	1.520	274.25	1.0	1.5	99.63	310.17	3	5	99.19		7.4	7.8	24.24	0.25	0.25	7.7	19.22	80	1

APPENDIX 3 – METALS & TOXICS 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:

- 1Q10 of receiving stream (587.2 MGD, USGS and StreatStats)
- Calcium hardness (135 mg/L, ambient)
- Total suspended solids (12 mg/L, ambient)
- Background metals concentrations (ambient)
- Other dischargers impacting this segment (Town of Mt. Carmel (0.475 MGD) and BAE Ordnance Systems, Outfall 020; (11.765 MGD))
- 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 instream 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:

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

Where: S_A = 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:
   30Q5 – Low flow under natural conditions

2) Fish and 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 available ambient monitoring information substantiates 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 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:

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

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.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:

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

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.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:

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

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 (Metals and Toxics): 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.

Column 15 (Other Compounds): The average effluent values provided in the application.

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. Column 15 is only applicable to the metal and toxics determination.

Water Quality Based Effluent Calculations (Metals and Toxics):

2019 WQC

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

FACILITY: Church Hill **PERMIT #: TN0021253** **DATE: 4/6/24** **CALC BY: WDM**

regulated stream worksheet (1Q10)

Stream (1Q10) [MGD]	Stream (30Q5) [MGD]	Waste Flow [MGD]	Ttl. Susp. Solids [mg/l]	Hardness (as CaCO3) [mg/l]	Margin of Safety [%]
587.20	**791.80**	**14.70**	**12**	**135**	**50**

Note: Waste Flow is Sum of NPDES Discharges between RM 131.5 and 141.5: Church Hill at 2.5 MGD, BAE @ 11.7 MGD for Outfall 020 and Mt. Carmel @ 0.475 MGD.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Stream	Fish/Aqua. Life (F & AL) WQC			F & AL- instream allowable		Calc. Effluent Concentration		Human Health Water Quality Criteria *						effluent	
	Bckgrnd.	lab conditions		Fraction	ambient conditions (Tot)		based on F & AL		In-Stream Criteria			Calc. Effluent Concentration **			limited	
	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	case	
PARAMETER	[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	**PARAMETER**
Copper (a,b)	1.900	11.574	17.831	0.215	53.863	82.984	**1064.79**	**1660.96**	N/A	N/A	N/A	**NA**	NA	NA	**80.0**	**Copper (a,b)**
Chromium III	1.400	94.765	728.514	0.069	1368.296	10518.924	**27984.87**	**215323.76**	N/A	N/A	N/A	**NA**	NA	NA	**Report**	**Chromium III**
Chromium VI	1.400	11.000	16.000	1.000	11.000	16.000	**197.24**	**299.60**	N/A	N/A	N/A	**NA**	NA	NA	**Report**	**Chromium VI**
Chromium, Total	1.400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.0	**NA**	NA	2705.49	**NA**	**Chromium, Total**
Nickel (a,b)	6.000	67.038	603.569	0.199	337.490	3038.558	**6789.52**	**62087.91**	4600.0	610.0	100.0	**126025.48**	16571.91	2581.61	**180.0**	**Nickel (a,b)**
Cadmium (a,b)	0.250	0.900	2.385	0.191	4.721	12.510	**91.65**	**251.12**	N/A	N/A	5.0	**NA**	NA	130.43	**5.0**	**Cadmium (a,b)**
Lead (a,b)	0.700	3.484	89.397	0.136	25.680	659.005	**511.77**	**13477.70**	N/A	N/A	5.0	**NA**	NA	118.31	**45.0**	**Lead (a,b)**
Mercury (T) (c)	0.034	0.770	1.400	1.000	0.770	1.400	**15.08**	**27.98**	0.051	0.05	2.0	**0.48**	0.46	53.95	**0.4**	**Mercury (T) (c)**
Silver (a,b,e)	0.200	N/A	5.390	1.000	NA	5.390	**N/A**	**106.35**	N/A	N/A	N/A	**NA**	NA	NA	**5.0**	**Silver (a,b, e)**
Zinc (a,b)	6.000	152.344	151.108	0.119	1282.672	1272.265	**26140.04**	**25926.97**	26000.0	7400.0	N/A	**713069.70**	202835.01	NA	**200.0**	**Zinc (a,b)**
Cyanide (d)	0.004	5.200	22.000	1.000	5.200	22.000	**106.38**	**450.32**	140.0	140.0	200.0	**3840.37**	3840.37	5486.29	**230.0**	**Cyanide (d)**
Toluene									15000.0	1300.0	1000.0	**411479.59**	35661.56	27431.97	**15.0**	**Toluene**
Benzene									510.0	22.0	5.0	**13990.31**	603.50	137.16	**3.0**	**Benzene**
1,1,1 Trichloroethane									N/A	N/A	200.0	**NA**	NA	5486.39	**30.0**	**1,1,1 Trichloroethane**
Ethylbenzene									2100.0	530.0	700.0	**57607.14**	14538.95	19202.38	**4.0**	**Ethylbenzene**
Carbon Tetrachloride									16.0	2.3	5.0	**438.91**	63.09	137.16	**15.0**	**Carbon Tetrachloride**
Chloroform									4700.0	57.0	N/A	**128930.27**	1563.62	NA	**85.0**	**Chloroform**
Tetrachloroethylene									33.0	6.9	5.0	**905.26**	189.28	137.16	**25.0**	**Tetrachloroethylene**
Trichloroethylene									300.0	25.0	5.0	**8229.59**	685.80	137.16	**10.0**	**Trichloroethylene**
1,2 trans Dichloroethylene									10000.0	140.0	100.0	**NA**	3840.48	2743.20	**1.5**	**1,2 trans Dichloroethylene**
Methylene Chloride									5900.0	46.0	5.0	**161848.64**	1261.87	NA	**50.0**	**Methylene Chloride**
Total Phenols									860000.0	10000.0	N/A	**23591496.60**	274319.73	NA	**50.0**	**Total Phenols**
Naphthalene									N/A	N/A	N/A	**NA**	NA	NA	**1.0**	**Naphthalene**
Total Phthalates									N/A	N/A	N/A	**NA**	NA	NA	**64.5**	**Total Phthalates**
Chlorine (T. Res.)	0.000	11.000	19.000	1.000	11.000	19.000	**450.40**	**777.97**	NA	NA	NA	**NA**	NA	NA	**n/a**	**Chlorine (T. Res.)**

a Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness.
b The criteria for this metal is in the dissolved form at lab conditions. The calculated effluent concentration is in the total recoverable form.
c The chronic criteria for mercury is not converted to dissolved, since it is based on fish tissue data rather than toxicity.
d The criteria for this parameter is in the total form.
e Silver limit is daily max if column 8 is most stringent.
f When columns 7 or 8 result in a negative number, use results from columns 5 or 6, respectively.
g When columns 12, 13 or 14 result in a negative number, use results from columns 9, 10 or 11, respectively, as applicable.

* Domestic supply included in river use so pick from columns 7,8,12,13,14,15 or Domestic supply not included in river use so pick from columns 7, 8, 12 or 15.
** Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q5 flow.

Note: A copy of this spreadsheet can be found on h:\mfs\pretreat\Pass-through Limits\Spreadsheets**name of Control Authority**.xls

APPENDIX 4 – WATER QUALITY BASED EFFLUENT CALCULATIONS (OTHER COMPOUNDS)

2019 WQC

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Church Hill POTW
PERMIT: TN0021253
DATE: April 16, 2024

Stream (1Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
587.20	791.80	14.70	12	135	50

	1	2	3	5		6	7		8	9	10	11	12	13	14	15	
	Stream	Dectection Levels		Fish/Aqua. Life			Calculated Effluent Concentration			Human Health Water Quality Criteria (30Q5)						Avg. daily	
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria						In-Stream Criteria			Calculated Effluent Concentration			effluent	
	Conc.	MDL	*EPA MDL	Chronic		Acute	Chronic		Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS		
PARAMETER	[µg/l]	[µg/l]	[µg/l]	[µg/l]		[µg/l]	[µg/l]		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	ug/l	PARAMETER
ANTIMONY	320	3.8	3.0							640.0	5.6	6.0	8938.2			<5	ANTIMONY
ARSENIC	0.9	1.0	1.0	150.0		340.0	3052.9		6942.8	10.0	10.0	10.0	250.1	250.1	250.1	<1	ARSENIC
BERYLLIUM		2.0	1.0									4.0			109.7	<1	BERYLLIUM
SELENIUM (f)	1.5	5.0	2.0	1.5	3.1	20.0	0.8	33.5	379.5	4200.0	170.0	50.0	115173.9	4623.0	1331.2	<2	SELENIUM
THALLIUM	0.235	5.0	*							0.47	0.24	2.0	6.6	0.3	48.5	<1	THALLIUM
ACROLEIN	0.0	50.0	1.0	3.000		3.000	61.4		61.4	9.0	6.0		246.9	164.6		<50	ACROLEIN
ACRYLONITRILE	0.0	50.0	1.0							2.5	0.51		68.6	14.0		<10	ACRYLONITRILE
BENZENE	0.0	1.0	1.0							510.0	22.0	5.0	13990.3	603.5	137.2	<1	BENZENE
BROMOFORM	0.0	1.0	1.0							1400.0	43.0		38404.8	1179.6		<1	BROMOFORM
CARBON TETRACHLORIDE	0.0	1.0	1.0							16.0	2.3	5.0	438.9	63.1	137.2	<1	CARBON TETRACHLORIDE
CHLOROBENZENE	0.0	1.0	*							1600.0	130.0	100.0	43891.2	3566.2	2743.2	<1	CLOROBENZENE
CHLORODIBROMO-METHANE	0.0	1.0	*							130.0	4.0		3566.2	109.7		<1	CHLORODIBROMO-METHANE
CHLOROETHANE	0.0	1.0	*													<5	CHLOROETHANE
2-CHLORO-ETHYLVINYL ETHER	0.0	1.0	*													<50	2-CHLORO-ETHYLVINYL ETHER
CHLOROFORM	0.0	5.0	0.5							4700.0	57.0		128930.3	1563.6		<5	CHLOROFORM
DICHLOROBROMO-METHANE	0.0	1.0	1.0							170.0	5.5		4663.4	150.9		<5	DICHLOROBROMO-METHANE
1,1-DICHLOROETHANE	0.0	1.0	1.0							NA	NA	NA	NA	NA	NA	<1	1,1-DICHLOROETHANE
1,2-DICHLOROETHANE	0.0	1.0	1.0							370.0	3.8	5.0	10149.8	104.2	137.2	<1	1,2-DICHLOROETHANE
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*							10000	140.0	100.0	274319.7	3840.5	2743.2	<1	TRANS 1,2-DICHLORO-ETHYLENE
1,1-DICHLOROETHYLENE	0.0	1.0	1.0							7100.0	300.0	7.0	194767.0	8229.6	192.0	<1	1,1-DICHLOROETHYLENE
1,2-DICHLOROPROPANE	0.0	1.0	*							150.0	5.0	5.0	4114.8	137.2	137.2	<1	1,2-DICHLOROPROPANE
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0							210.0	3.4		5760.7	93.3		<1	1,3-DICHLORO-PROPYLENE
ETHYLBENZENE	0.0	1.0	1.0							2100	530.0	700.0	57607.1	14538.9	19202.4	<1	ETHYLBENZENE
METHYL BROMIDE	0.0	1.0	*							1500.0	47.0		41148.0	1289.3		<1	METHYL BROMIDE
METHYL CHLORIDE	0.0	1.0	1.0													<5	METHYL CHLORIDE
METHYLENE CHLORIDE	0.0	5.0	1.0							5900.0	46.0	5.0	161848.6	1261.9	137.2	<5	METHYLENE CHLORIDE
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5							40.0	1.7		1097.3	46.6		<1	1,1,2,2-TETRACHLORO-ETHANE
TETRACHLORO-ETHYLENE	0.0	1.0	0.5							33.0	6.9	5.0	905.3	189.3	137.2	<1	TETRACHLORO-ETHYLENE
TOLUENE	0.0	1.0	1.0							15000	1300.0	1000.0	411479.6	35661.6	27432.0	<1	TOLUENE
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0									200.0			5486.4	<1	1,1,1-TRICHLOROETHANE
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2							160.0	5.9	5.0	4389.1	161.8	137.2	<1	1,1,2-TRICHLOROETHANE
TRICHLORETHYLENE	0.0	1.0	1.0							300.0	25.0	5.0	8229.6	685.8	137.2	<1	TRICHLORETHYLENE
VINYL CHLORIDE	0.0	1.0	2.0							24.0	0.25	2.0	658.4	6.9	54.9	<1	VINYL CHLORIDE
P-CHLORO-M-CRESOL	0.0	10.0	*													<10	P-CHLORO-M-CRESOL
2-CHLOROPHENOL	0.0	10.0	*							150.0	81.0		4114.8	2222.0		<10	2-CHLOROPHENOL
2,4-DICHLOROPHENOL	0.0	10.0	*							290.0	77.0		7955.3	2112.3		<10	2,4-DICHLOROPHENOL
2,4-DIMETHYLPHENOL	0.0	10.0	*							850.0	380.0		23317.2	10424.1		<10	2,4-DIMETHYLPHENOL
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0							280.0	13.0		7681.0	356.6		<10	4,6-DINITRO-O-CRESOL
2,4-DINITROPHENOL	0.0	10.0	42.0							5300.0	69.0		145389.5	1892.8		<10	2,4-DINITROPHENOL
2-NITROPHENOL	0.0	10.0	*													<10	2-NITROPHENOL
4-NITROPHENOL	0.0	10.0	*													<10	4-NITROPHENOL
PENTACHLOROPHENOL	0.0	10.0	5.0	15		19	307.1		389.0	30.0	2.7	1.0	823.0	74.1	27.4	<10	PENTACHLOROPHENOL
PHENOL	0.0	10.0	*							860000	10000.0		23591496.6	274319.7		<10	PHENOL
2,4,6-TRICHLOROPHENOL	0.0	10.0	2.7							24.0	14.0		658.4	384.0		<10	2,4,6-TRICHLOROPHENOL

ACENAPHTHENE	0.0	10.0	*					990.0	670.0		27157.7	18379.4		<1	ACENAPHTHENE
ACENAPHTHYLENE	0.0	10.0	2.3											<1	ACENAPHTHYLENE
ANTHRACENE	0.0	10.0	0.7					40000	8300.0		1097278.9	227685.4		<1	ANTHRACENE
BENZIDINE	0.0	50.0	*					0.0020	0.0009		0.055	0.0		<10	BENZIDINE
BENZO(A)ANTHRACENE	0.0	10.0	0.3					0.18	0.038		4.9	1.0		<1	BENZO(A)ANTHRACENE
BENZO(A)PYRENE	0.0	10.0	0.3					0.18	0.038	0.2	4.9	1.0	5.5	<1	BENZO(A)PYRENE
3,4 BENZO-FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		4.9	1.0		<1	3,4 BENZO-FLUORANTHENE
BENZO(GHI)PERYLENE	0.0	10.0	*											<1	BENZO(GHI)PERYLENE
BENZO(K)FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		4.9	1.0		<1	BENZO(K)FLUORANTHENE
BIS (2-CHLOROETHOXY) METHANE	0.0	10.0	*											<10	BIS (2-CHLOROETHOXY) METHANE
BIS (2-CHLOROETHYL)-ETHER	0.0	10.0	1.0					5.3	0.30		145.4	8.2		<10	BIS (2-CHLOROETHYL)-ETHER
BIS (2-CHLOROISO-PROPYL) ETHER	0.0	10.0	*					65000	1400.0		1783078.2	38404.8		<10	BIS (2-CHLOROISO-PROPYL) ETHER
BIS (2-ETHYLHEXYL) PHTHALATE	0.0	10.0	2.5					22.0	12.0	6.0	603.5	329.2	164.6	<3	BIS (2-ETHYLHEXYL) PHTHALATE
4-BROMOPHENYL PHENYL ETHER	0.0	10.0	*											<10	4-BROMOPHENYL PHENYL ETHER
BUTYL BENZYL PHTHALATE	0.0	10.0	*					1900.0	1500.0		52120.7	41148.0		<3	BUTYL BENZYL PHTHALATE
2-CHLORONAPHTHALENE	0.0	10.0	*					1600.0	1000.0		43891.2	27432.0		<1	2-CHLORONAPHTHALENE
4-CHLORPHENYL PHENYL ETHER	0.0	10.0	*											<10	4-CHLORPHENYL PHENYL ETHER
CHRYSENE	0.0	10.0	2.5					0.18	0.038		4.9	1.0		<1	CHRYSENE
DI-N-BUTYL PHTHALATE	0.0	10.0	2.5					4500.0	2000.0		123443.9	54863.9		<3	DI-N-BUTYL PHTHALATE
DI-N-OCTYL PHTHALATE	0.0	10.0	*											<3	DI-N-OCTYL PHTHALATE
DIBENZO(A,H) ANTHRACENE	0.0	10.0	*					0.18	0.038		4.9	1.0		<1	DIBENZO(A,H) ANTHRACENE
1,2-DICHLOROBENZENE	0.0	1.0	2.0					1300.0	420.0		35661.6	11521.4		<10	1,2-DICHLOROBENZENE
1,3-DICHLOROBENZENE	0.0	5.0	2.0					960.0	320.0		26334.7	8778.2		<10	1,3-DICHLOROBENZENE
1,4-DICHLOROBENZENE	0.0	5.0	2.0					190.0	63.0		5212.1	1728.2		<10	1,4-DICHLOROBENZENE
3,3-DICHLOROBENZIDINE	0.0	10.0	*					0.28	0.2		7.7	5.8		<10	3,3-DICHLOROBENZIDINE
DIETHYL PHTHALATE	0.0	10.0	1.9					44000	17000.0		1207006.8	466343.5		<3	DIETHYL PHTHALATE
DIMETHYL PHTHALATE	0.0	10.0	1.6					1100000	270000.0		30175170.1	7406632.7		<3	DIMETHYL PHTHALATE
Di-n-butyl phthalate (84-74-2) (g)	0.0	10.0						4500	2000.0		123443.9	54863.9			Di-n-butyl phthalate (84-74-2)
2,4-DINITROTOLUENE	0.0	10.0	1.0					34.0	1.1		932.7	30.2		<10	2,4-DINITROTOLUENE
2,6-DINITROTOLUENE	0.0	10.0	*											<10	2,6-DINITROTOLUENE
Di-n-octyl phthalate (117-84-0) (g)	0.0	10.0													Di-n-octyl phthalate (117-84-0)
1,2 DIPHENYLHYDRAZINE	0.0	10.0	*					2.0	0.4		54.9	9.9		<10	1,2 DIPHENYLHYDRAZINE
FLUORANTHENE	0.0	10.0	2.2					140.0	130.0		3840.5	3566.2		<1	FLUORANTHENE
FLUORENE	0.0	10.0	0.3					5300.0	1100.0		145389.5	30175.2		<1	FLUORENE
HEXACHLOROBENZENE	0.0	10.0	1.9					0.0029	0.0028	1.0	0.080	0.1	27.4	<1	HEXACHLOROBENZENE
HEXACHLOROBUTADIENE	0.0	10.0	5.0					180.0	4.4		4937.8	120.7		<10	HEXACHLOROBUTADIENE
HEXACHLOROCYCLO-PENTADIENE	0.0	10.0	*					1100.0	40.0	50.0	30175.2	1097.3	1371.6	<1	HEXACHLOROCYCLO-PENTADIENE
HEXACHLOROETHANE	0.0	10.0	0.5					33.0	14.0		905.3	384.0		<10	HEXACHLOROETHANE
INDENO(1,2,3-CD)PYRENE	0.0	10.0	*					0.18	0.038		4.9	1.0		<1	INDENO(1,2,3-CD)PYRENE
ISOPHORONE	0.0	10.0	*					9600	350.0		263346.9	9601.2		<10	ISOPHORONE
NAPHTHALENE	0.0	10.0	*											<1	NAPHTHALENE
NITROBENZENE	0.0	10.0	10.0					690.0	17.0		18928.1	466.3		<10	NITROBENZENE
N-NITROSODI-N-PROPYLAMINE	0.0	10.0	*					5.1	0.050		139.9	1.4		<10	N-NITROSODI-N-PROPYLAMINE
N-NITROSODI- METHYLAMINE	0.0	10.0	*					30.0	0.0069		823.0	0.2		<10	N-NITROSODI- METHYLAMINE
N-NITROSODI-PHENYLAMINE	0.0	10.0	*					60.0	33.0		1645.9	905.3		<10	N-NITROSODI-PHENYLAMINE
PHENANTHRENE	0.0	10.0	0.7											<1	PHENANTHRENE
PYRENE	0.0	10.0	0.3					4000.0	830.0		109727.9	22768.5		<10	PYRENE
1,2,4-TRICHLOROBENZENE	0.0		*					70.0	35.0	70.0	1920.2	960.1	1920.2	<10	1,2,4-TRICHLOROBENZENE

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. The Water Quality Criteria CCC Value for Selenium is 1.5 µg/l (lentic - Still water aquatic ecosystems such as ponds, lakes, or reservoirs **) and 3.1 µg/l (lotic -** Flowing water aquatic ecosystems such as streams and rivers **).**
g. Form 2C only
f. Reasonable potential does not exist for the following reason(s): The reported effluent results are non-detect, and of the three pollutants where the detection level is not low enough to demonstrate absence of reasonable potential: TThe industrial sources do not appear likely to utilize hexachlorobenzene (fungicide banned in the U.S.), 3,3-dichlorobenzidine (used in yellow pigments and inks), and there is not reasonble potential for the BDL effluent results to exceed the lotic calculated value which applies to the river.

APPENDIX 5 – RECEIVING STREAM LOW FLOW DETERMINATION

This permit uses the same low river flow in the Holston River at Church Hill that is calculated for the BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, at river mile 136.5. The flow calculation is the sum of regulated and unregulated flows in the South Fork Holston and Holston Rivers respectively.

Regulated flows

Fort Patrick Henry Dam maintains an agreement with downstream industries to provide a minimum low flow on the South Fork Holston River year round. The current low flow of 517 MGD was confirmed in an email from TVA River Operations dated February 26, 2019, and is used as the South Fork Holston 1Q10 for permit calculations.

The 30Q5 was calculated using daily discharge data provided by TVA and analyzing it using USGS SW Toolbox. Because the river operations of the dam changed in 2012, only flow data from January 2012 to December 2018 was used, and this yielded a 30Q5 of 676 MGD. The data output from SW Toolbox is in units of CFS (below).

Unregulated flows

After the dam on the South Fork Holston, the North Fork Holston makes the next largest contribution of flow to the Holston at the point of discharge. USGS Station 3490000 on the North Fork Holston has produced 20,705 daily discharge measurements from 1931-2018. Based on this data, USGS has published 1Q10 and 30Q5 statistics on the online StreamStats Data-Collection Station Report for 03490000.[d] These values were multiplied by the ratio between the remaining "post-dam" drainage area[a] and the drainage area at the gage station[b] (889[a] mi^2/672[9] mi^2), to account for the contribution of unregulated flows to the flow at the point of discharge.

```
Program SWStat          U.S. GEOLOGICAL SURVEY              Seq 00001
Ver. 5.0      Log-Pearson & Pearson Type III Statistics     Run Date / Time
03/13/2018            based on USGS Program A193            3/13/2019 12:47 PM

 Notice -- Log-Pearson Type III or Pearson Type III distributions are used
           for these computations. Users are responsible for assessment
           and interpretation.


      Description:  N/A
   Year Boundaries:  January  1 - December 31
  Period in report:  January  1, 2013 - December 31, 2018
        Parameter:  30-day low
    Non-zero values:     7
        Zero values:     0
    Negative values:     0  (ignored)

Input time series (zero and negative values not included in listing.)

  1482.800  2044.300   940.660  1287.700   951.290  1313.500  1508.800


  LOG PEARSON TYPE III Frequency Curve Parameters
  (based on logs of the non-zero values)

  Mean (logs)                                    3.120
  Variance (logs)                                0.014
  Standard Deviation (logs)                      0.118
  Skewness (logs)                                0.176
  Standard Error of Skewness (logs)              0.794
  Serial Correlation Coefficient (logs)         -0.194
  Coefficient of Variation (logs)                0.038


Frequency Curve - Parameter values at selected probabilities

   Non-                                  Variance    95-Pct Confidence
 exceedance     Recurrence  Parameter       of          Intervals
 Probability     Interval     Value     Estimate    Lower      Upper
 -----------    ----------  ---------   --------  ---------  ---------
      0.2000          5.00    1046.100      1.028    751.590   1310.700
```

Therefore, the low flow values at the point of discharge were calculated by:

1. determining the regulated flow coming from the Fort Patrick Henry Dam,
2. calculating the unregulated flow from the ensuing watershed and the North Fork Holston River,
3. and summing these regulated and unregulated 1Q10/30Q5 flow values.

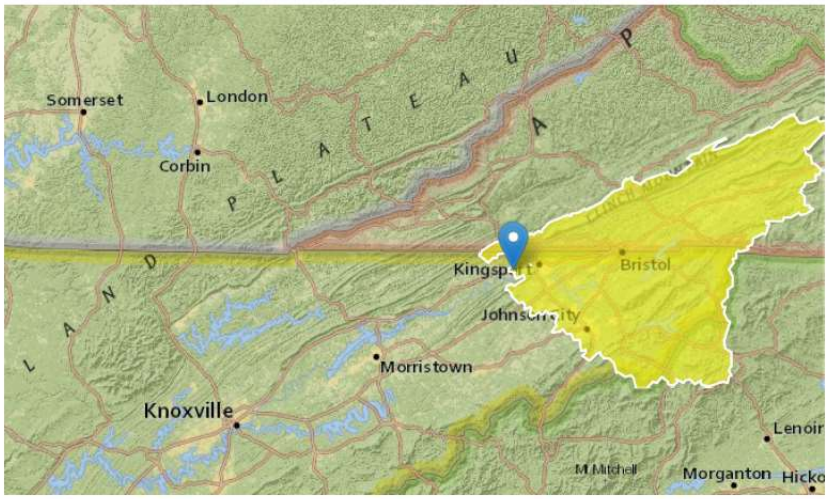
The results are summarized in the following table:

Location	Drainage area (Sq. mi.)	1Q10 (MGD)	30Q5 MGD
Fort Patrick Henry Dam (South Fork Holston)	1902[4]	517.0[5]	676[6]
(USGS Station 3490000 (North Fork Holston))	(672[7])	(53.1[d])	(87.5[d])
Holston River at RM 136.5 (proportioned on DA)	889[a]	70.2	115.8
Holston River at RM 136.5 (incl. SF Holston flows)	**2791**	**587.2**	**791.8**

Total drainage

StreamStats Report

Region ID: TN
Workspace ID: TN20190221201056139000
Clicked Point (Latitude, Longitude): 36.52323, -82.68116
Time: 2019-02-21 14:11:11 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2791.49	square miles

Law, G.S., Tasker, G.D., and Ladd, D.E.,2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009–5159, 212 p., 1 pl.

[4] Delineated by USGS Streamstats online application: https://streamstats.usgs.gov/ss/
[5] Minimum flow is by TVA and available in the permit record.
[6] 30Q5 from the dam calculated using USGS SW Toolbox to analyze TVA daily discharge data from 2012-2018.
[7] Provided by USGS Streamstats gauge page and Data-Collection Station Report: https://nwis.waterdata.usgs.gov/nwis/inventory/?site_no=03490000&agency_cd=USGS https://streamstatsags.cr.usgs.gov/gagepages/html/03490000.htm