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

March 10, 2017

Mr. Mike Ward
Wastewater Treatment Facility Supervisor
e-copy: mward@clevelandutilities.com
Cleveland Wastewater Treatment Facility
PO Box 2730
2450 Guthrie Drive NW
Cleveland, TN 37320

Subject: **Draft of NPDES Permit No. TN0024121**
Cleveland Utilities
Cleveland, Bradley County, Tennessee

Dear Mr. Ward:

Enclosed please find a draft copy of the NPDES Permit No. TN0024121, which the Division of Water Resources proposes to issue. This draft copy is furnished to you solely for your review of its provisions. No wastewater discharges are authorized by this modified permit. The issuance of an official modified permit is contingent upon your meeting all of the requirements of the Tennessee Water Quality Control Act and the Rules and Regulations of the Tennessee Water Quality, Oil and Gas Board.

Also enclosed is a copy of the public notice that announces our intent to issue this permit. The notice affords the public an opportunity to review the draft permit and, if necessary, request a public hearing on this issuance process. If you disagree with the provisions and requirements contained in the draft permit, you have thirty (30) days from the date of this correspondence to notify the division of your objections. If your objections cannot be resolved, you may appeal this permit upon issuance. This appeal should be filed in accordance with Section 69-3-110 of the Tennessee Code Annotated.

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

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit Section File
Chattanooga Environmental Field Office
Mr. Kevin S. Young, P.E., Senior Vice President, J.R. Wauford & Company Consulting Engineers, Inc., kyoung@tntech.edu
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
Mr. Mark Lyles, Chief Operator, Cleveland Utilities, mlyles@clevelandutilities.com
Mr. Greg Clark, P.E., Cleveland Utilities, gclark@clevelandutilities.com
Mr. Steve Barger, Director of Environmental/Regulatory Compliance, , sbarger@clevelandutilities.com

STATE OF TENNESSEE

NPDES PERMIT

No. TN0024121

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

Issued By

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

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

Discharger: **Cleveland Utilities STP**

is authorized to discharge: **treated municipal wastewater from Outfall 001**

from a facility located: **in Cleveland, Bradley County, Tennessee**

to receiving waters named: **Hiwassee River Mile 15.4**

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

This permit shall become effective on:

This permit shall expire on:

Issuance date:

Draft

for Tisha Calabrese Benton
Director

CN-0759 RDA 2366

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JAH
TN0024121PMT.DOC

1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The City of Cleveland is authorized to discharge treated municipal wastewater from Outfall 001 to the Hiwassee River Mile 15.4. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of 21.6 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

Description : External Outfall, Number : 001, Monitoring : All Weather, Season : All Year							
Code	**Parameter**	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Frequency**	**Statistical Base**
80998	Bypass of Treatment	Report	-	occur/mo	Occurrences	Continuous	Monthly Total
Description : External Outfall, Number : 001, Monitoring : Dry Weather, Season : All Year							
Code	**Parameter**	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Frequency**	**Statistical Base**
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total
Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year							
Code	**Parameter**	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Frequency**	**Statistical Base**
00300	Oxygen, dissolved (DO)	>=	1.0	mg/L	Grab	Daily	Instantaneous Minimum
00400	pH	>=	6.0	SU	Grab	Daily	Minimum
00400	pH	<=	9.0	SU	Grab	Daily	Maximum
00530	Total Suspended Solids (TSS)	<=	45	mg/L	Composite	Five Per Week	Daily Maximum
00530	Total Suspended Solids (TSS)	<=	40	mg/L	Composite	Five Per Week	Weekly Average
00530	Total Suspended Solids (TSS)	<=	7206	lb/d	Composite	Five Per Week	Weekly Average
00530	Total Suspended Solids (TSS)	<=	5404	lb/d	Composite	Five Per Week	Monthly Average
00530	Total Suspended Solids (TSS)	<=	30	mg/L	Composite	Five Per Week	Monthly Average
00545	Settleable Solids	<=	1.0	mL/L	Grab	Five Per Week	Daily Maximum

00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Quarterly Average
00600	Nitrogen, total (as N)	Report	-	mg/L	Composite	Quarterly	Quarterly Average
00610	Nitrogen, Ammonia total (as N)	<=	2702	lb/d	Composite	Five Per Week	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	1801	lb/d	Composite	Five Per Week	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	20	mg/L	Composite	Five Per Week	Daily Maximum
00610	Nitrogen, Ammonia total (as N)	<=	15	mg/L	Composite	Five Per Week	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	10	mg/L	Composite	Five Per Week	Monthly 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	-	Mgal/d	Continuous	Daily	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
50060	Chlorine, total residual (TRC)	<=	0.22	mg/L	Grab	Daily	Daily Maximum
51040	E. coli	<=	487	#/100mL	Grab	Daily	Daily Maximum
51040	E. coli	<=	126	#/100mL	Grab	Daily	Monthly Geometric Mean
80082	CBOD, 5-day, 20 C	<=	4504	lb/d	Composite	Five Per Week	Monthly Average
80082	CBOD, 5-day, 20 C	<=	35	mg/L	Composite	Five Per Week	Weekly Average
80082	CBOD, 5-day, 20 C	<=	40	mg/L	Composite	Five Per Week	Daily Maximum
80082	CBOD, 5-day, 20 C	<=	6305	lb/d	Composite	Five Per Week	Weekly Average
80082	CBOD, 5-day, 20 C	<=	25	mg/L	Composite	Five Per	Monthly Average

						Week	
TRP3B	IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>	8.7	%	Composite	Semiannual	Minimum
TRP6C	IC25 Static Renewal 7 Day Chronic Pimephales	>	8.7	%	Composite	Semiannual	Minimum

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

Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
80358	CBOD, 5-day, 20 C, % removal	>=	40	%	Calculated	Five Per Week	Daily Minimum
80358	CBOD, 5-day, 20 C, % removal	>=	85	%	Calculated	Five Per Week	Monthly Average Minimum
81011	TSS, % removal	>=	40	%	Calculated	Five Per Week	Daily Minimum
81011	TSS, % removal	>=	85	%	Calculated	Five Per Week	Monthly Average Minimum

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

Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Five Per Week	Daily Maximum
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Five Per Week	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Five Per Week	Daily Maximum
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Five Per Week	Monthly Average

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

Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Notes: The permittee shall achieve 85% removal of $CBOD_5$ and TSS on a monthly average basis. The permittee shall report all instances of overflow and/or bypasses. See Part 2.3.3.a for the definition of overflow and Part 1.3.5.1 for reporting requirements.

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

See Part 1.2.3 for test procedures.

See Part 3.4 for biomonitoring test and reporting requirements. See next page for percent removal calculations.

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

The wastewater discharge must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

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

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

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

Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act. (40 C.F.R. 125.98(b)(1))

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

For $CBOD_5$ 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:

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

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

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

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

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

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

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

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

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

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

c. The dissolved oxygen can drop in the outfall line; therefore, D.O. measurements are required at the discharge end of outfall lines greater than one mile long.

Systems with outfall lines less than one mile may measure dissolved oxygen as the wastewater leaves the treatment facility. For systems with dechlorination, dissolved oxygen must be measured after this step and as close to the end of the outfall line as possible.

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

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

1.2.2. Sampling Frequency

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

1.2.3. Test Procedures

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

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

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

d. In instances where permit limits established through implementation of applicable water criteria are below analytical capabilities, compliance with those limits will be determined using the detection limits described in the TN Rules, Chapter 0400-40-03-.05(8).

e. All sampling for total mercury at the municipal wastewater plant (application, pretreatment, etc.) shall use Methods 1631, 245.7 or any additional method in 40 CFR 136 with a maximum detection limit of 5 ng/L. For test methods requiring collection of a grab sample, the analysis may be conducted on a single grab or on a set of grabs composited in the testing lab in compliance with the quality control procedures prescribed by the method for each grab sample. When a single grab sample is analyzed, it shall be collected at such time that the treatment plant effluent would be expected to include the most likely sources of mercury in the municipal system.

1.2.4. Recording of Results

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

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

b. The exact person(s) collecting samples;

c. The dates and times the analyses were performed;

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

e. The analytical techniques or methods used, and;

f. The results of all required analyses.

1.2.5. Records Retention

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

1.3. REPORTING

1.3.1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly using NETDMR. Submittals shall be no later than 15 days after the completion of the reporting period. If NETDMR is not functioning, a completed DMR with an original signature shall be submitted to the following address::

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

If NETDMR is not functioning, a copy of the completed and signed DMR shall be mailed to the Chattanooga Environmental Field Office (EFO) at the following address:

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

Chattanooga Environmental Field Office
1301 Riverfront Parkway, Suite 206
Chattanooga, Tennessee 37402

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

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

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

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

1.3.2. Additional Monitoring by Permittee

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

1.3.3. Falsifying Results and/or Reports

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

1.3.4. Monthly Report of Operation

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

1.3.5. Bypass and Overflow Reporting

1.3.5.1. Report Requirements

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

overflow and/or bypassing and the estimated quantity of wastewater released and/or bypassed.

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

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

1.3.5.2. Anticipated Bypass Notification

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

1.3.6. Reporting Less Than Detection; Reporting Significant Figures

A permit limit may be less than the accepted detection level. If the samples are below the detection level, then report “BDL” or “NODI =B” on the DMRs. The permittee must use the correct detection levels in all analytical testing required in the permit. The required detection levels are listed in the Rules of the Department of Environment and Conservation, Division of Water Resources, Chapter 0400-40-03-.05(8).

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

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.

1.4. 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.

2.0. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information and forms as are required to the Director of the Division of Water Resources (the "director") no later than 180 days prior to the expiration date. Such forms shall be properly signed and certified.

2.1.2. Right of Entry

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

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

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

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

2.1.3. Availability of Reports

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

2.1.4. Proper Operation and Maintenance

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

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

2.1.5. Treatment Facility Failure (Industrial Sources)

The permittee, in order to maintain compliance with this permit, shall control production, all discharges, or both, upon reduction, loss, or failure of the treatment facility, until the facility is restored or an alternative method of treatment is provided. This requirement applies in such situations as the reduction, loss, or failure of the primary source of power.

2.1.6. Property Rights

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

2.1.7. Severability

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

2.1.8. Other Information

If the permittee becomes aware of failure to submit any relevant facts in a permit application, or of submission of incorrect information in a permit application or in any

report to the director, then the permittee shall promptly submit such facts or information.

2.2. CHANGES AFFECTING THE PERMIT

2.2.1. Planned Changes

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

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

2.2.2. Permit Modification, Revocation, or Termination

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

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

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

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

2.2.3. Change of Ownership

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

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

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

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

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

2.2.4. Change of Mailing Address

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

2.3. NONCOMPLIANCE

2.3.1. Effect of Noncompliance

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

2.3.2. Reporting of Noncompliance

a. 24-Hour Reporting

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

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

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

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

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

b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.3.2.a above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

2.3.3. Overflow

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

b. Overflows are prohibited.

c. The permittee shall operate the collection system so as to avoid overflows.

d. No new or additional flows shall be added upstream of any point in the collection system, which experiences chronic overflows (greater than 5 events per year) or would otherwise overload any portion of the system. Unless there is specific enforcement action to the contrary, the permittee is relieved of this requirement after: 1) an authorized representative of the Commissioner of the Department of Environment and Conservation has approved an engineering report and construction plans and specifications prepared in accordance with accepted

engineering practices for correction of the problem; 2) the correction work is underway; and 3) the cumulative, peak-design, flows potentially added from new connections and line extensions upstream of any chronic overflow point are less than or proportional to the amount of inflow and infiltration removal documented upstream of that point. The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to a Monthly Operating Report submitted to the local TDEC Environmental Field Office. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

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

2.3.4. Upset

a. "***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

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

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

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

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

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

2.3.5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such

accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2.3.6. Bypass

a. "***Bypass***" is the intentional diversion of waste streams from any portion of a treatment facility. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

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

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

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

   iii. The permittee submits notice of an unanticipated bypass to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours of becoming aware of the bypass (if this information is provided orally, a written submission must be provided within five days). When the need for the bypass is foreseeable, prior notification shall be submitted to the director, if possible, at least 10 days before the date of the bypass.

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

2.3.7. Washout

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

b. A washout is prohibited. If a washout occurs the permittee must report the incident to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours by telephone. A written submission must be provided

within five days. The washout must be noted on the discharge monitoring report. Each day of a washout is a separate violation.

2.4. LIABILITIES

2.4.1. Civil and Criminal Liability

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

2.4.2. Liability Under State Law

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

3.0. PERMIT SPECIFIC REQUIREMENTS

3.1. CERTIFIED OPERATOR

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

3.2. POTW PRETREATMENT PROGRAM GENERAL PROVISIONS

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

a. The 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 Section 403(b)(8) of the Clean Water Act, the Federal Pretreatment Regulations 40 CFR 403, Tennessee Water Quality Control Act

Part 69-3-123 through 69-3-128, 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 40 CFR 403.8 (f)(2)(viii), 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.

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 40 CFR 403.5, "prohibited discharges". Pollutants introduced into the POTW by a non-domestic source shall not cause pass through or interference as defined in 40 CFR Part 403.3. These general prohibitions and the specific prohibitions in this section apply to all non-domestic sources introducing pollutants into the POTW whether the source is subject to

other National Pretreatment Standards or any state or local pretreatment requirements.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This notice will include information on the quantity and quality of the wastewater introduced by the new source into the publicly owned treatment works, and on any anticipated impact on the effluent discharged from such works. If this discharge necessitates a revision of the current NPDES permit or pass-through guidelines, discharge by this source is prohibited until the Tennessee Division of Water Resources gives final authorization.

d. Reporting Requirements

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. The report shall be submitted to the Division of Water Resources, Central Office and a copy to the appropriate Environmental Field Office no later than the 28th day of the month following each reporting period. For control authorities with multiple STPs, one report should be submitted with a separate Form 1 for each STP. Each report shall conform to the format set forth in the State POTW Pretreatment Semiannual 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 sampling procedures:

Pollutant	**Sample Type**
chromium, trivalent	24-hour composite
chromium, hexavalent	24-hour composite
total chromium	24-hour composite
copper	24-hour composite
lead	24-hour composite
nickel	24-hour composite
zinc	24-hour composite
cadmium	24-hour composite
mercury	Per method requirements
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 report. All upsets, interferences, and pass-through violations must also be reported on the semiannual report, 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.

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

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 40 CFR 403.8(f)(2)(viii).

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.

vi. Summary of 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 per year.

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 (see table below):

Division of Solid Waste Management			
Office	**Location**	**Zip Code**	**Phone No.**
Chattanooga	1301 Riverfront Parkway, Suite 206	37402	(423) 634-5745
Jackson	1625 Hollywood Drive	38305	(731) 512-1300
Cookeville	1221 South Willow Avenue	38506	(931) 432-4015
Columbia	2484 Park Plus Drive	38401	(931) 380-3371
Johnson City	2305 Silverdale Road	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive, Bartlett	38133	(901) 371-3000
Nashville	711 R.S. Gass Boulevard	37243	(615) 687-7000

3.4. BIOMONITORING REQUIREMENTS, CHRONIC

The permittee shall conduct a 3-Brood *Ceriodaphnia dubia* Survival and Reproduction Test and a 7-Day Fathead Minnow *(Pimephales promelas)* Larval Survival and Growth Test on samples of final effluent from Outfall 001.

The measured endpoint for toxicity will be the inhibition concentration causing 25% reduction in survival, reproduction and growth (IC_{25}) of the test organisms. The IC_{25} shall be determined based on a 25% reduction as compared to the controls, and as derived from linear interpolation. The average reproduction and growth responses

will be determined based on the number of *Ceriodaphnia dubia* or *Pimephales promelas* larvae used to initiate the test.

Test shall be conducted and its 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					
34.8	**17.4**	**8.7**	**4.4**	**2.18**	**0**

The dilution/control water used will be moderately hard water as described in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013 (or the most current edition). A chronic 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 IC_{25} is less than or equal to the permit limit indicated for each outfall in the above table(s). Toxicity demonstrated by the tests specified herein constitutes a violation of this permit.

All tests will be conducted using a minimum of three 24-hour flow-proportionate composite samples of final effluent collected on days 1, 3 and 5. If, in any control more than 20% of the test organisms die in 7 days, 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 Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013 (or the most current edition), 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.

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, determinations of effluent survival/reproduction and survival/growth values, and report formats will be made in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013, or the most current edition.

Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analyses shall be compiled in a report. The report will be written in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013, or the most current edition.

Two copies of biomonitoring reports (including follow-up reports) shall be submitted to the division. One copy of the report shall be submitted along with the discharge monitoring report (DMR). The second copy shall be submitted to the local Division of Water Resources office address (see table below):

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

3.5. PLACEMENT OF SIGNS

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

The sign(s) are to provide notice to the public as to the nature of the discharge and, in the case of the permitted outfalls, that the discharge is regulated by the Tennessee Department of Environment and Conservation, Division of Water Resources. The following is given as an example of the minimal amount of information that must be included on the sign:

Permitted CSO or unpermitted bypass/overflow point:

UNTREATED WASTEWATER DISCHARGE POINT
Cleveland Utilities
Cleveland Utilities STP
(423) 336-6779
NPDES Permit NO. TN0024121
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Chattanooga

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
Cleveland Utilities
Cleveland Utilities STP
(423) 336-6779
NPDES Permit NO. TN0024121
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Chattanooga

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

3.6. ANTIDEGRADATION

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06, titled “Tennessee Antidegradation Statement,” which prohibits the degradation of exceptional Tennessee waters and the increased discharges of substances that cause or contribute to impairment, the permittee shall further be required, pursuant to the terms and conditions of this

permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other state or federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

4.0. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

"***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.

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

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

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

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

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

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

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

"***De Minimis***" - 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.
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 ONRWs the mitigation must occur within the ONRW.

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

The "***geometric mean***" of any set of values is the nth root of the product of the individual values where "n" is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

"***Severe property damage***" when used to consider the allowance of a bypass or SSO means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence

of a bypass or SSO. Severe property damage does not mean economic loss caused by delays in production.

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

"***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.

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

"***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

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

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

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

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

4.2. ACRONYMNS AND ABBREVIATIONS

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

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

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

BAT – best available technology economically achievable

BCT – best conventional pollutant control technology

BDL – below detection level

BOD_5 – five day biochemical oxygen demand

BPT – best practicable control technology currently available

$CBOD_5$ – five day carbonaceous biochemical oxygen demand

CEI – compliance evaluation inspection

CFR – code of federal regulations

CFS – cubic feet per second

CFU – colony forming units

CIU – categorical industrial user

CSO – combined sewer overflow

DMR – discharge monitoring report

D.O. – dissolved oxygen

E. coli – *Escherichia coli*

EFO – environmental field office

LB(lb) - pound

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

IU – industrial user

IWS – industrial waste survey

LC_{50} – acute test causing 50% lethality

MDL – method detection level

MGD – million gallons per day

MG/L(mg/l) – milligrams per liter

ML – minimum level of quantification

ml – milliliter

MLSS – mixed liquor suspended solids

MOR – monthly operating report

NODI – no discharge

NPDES – national pollutant discharge elimination system

PL – permit limit

POTW – publicly owned treatment works

RDL – required detection limit

SAR – semi-annual [pretreatment program] report

SIU – significant industrial user

SSO – sanitary sewer overflow

STP – sewage treatment plant

TCA – Tennessee code annotated

TDEC – Tennessee Department of Environment and Conservation

TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation

TMDL – total maximum daily load

TRC – total residual chlorine

TSS – total suspended solids

WQBEL – water quality based effluent limit

RATIONALE

Cleveland Utilities
Cleveland Utilities STP
NPDES Permit No. TN0024121
Date: March 10, 2017
Permit Writer: Julie Harse

1. FACILITY INFORMATION

Cleveland Utilities
Cleveland Utilities STP
Mr. Mike Ward - Wastewater Treatment Facility Supervisor
Cleveland, Bradley County, Tennessee
(423) 336-6779
Treatment Plant Average Design Flow: 21.6 MGD
Percentage Industrial Flow: 3.7%
Treatment Description: ICEAS$_{TM}$ activated sludge process preceded by mechanical bar screening and grit removal and followed by chlorination and dechlorination. Sludge is anaerobically digested, dewatered by centrifuge and land applied.
Certified Operator Grades: STP: 4; CS: 2; Date Rated: 7/28/03

2. RECEIVING STREAM INFORMATION

Hiwassee River Mile 15.4
Watershed Group: Hiwassee
Hydrocode: 06020002
Low Flow: 1Q10 = 228 MGD (352 CFS)
30Q5 = 701 MGD (1085 CFS)
Low Flow Reference:
2017 USGS Website Hiwassee River at Charleston, TN
Station #03566000

Stream Classification Categories:

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

Water Quality Assessment: Partially supporting

3. CURRENT PERMIT STATUS

Permit Type:	Municipal
Classification:	Major
Issuance Date:	29-FEB-12
Expiration Date:	31-MAR-17
Effective Date:	01-APR-12

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

a. Total nitrogen and total phosphorous quarterly influent and effluent monitoring have been added to this permit (See section 6.4).

b. Compliance Schedule Summary

Description of Report to be Submitted	Reference Section in Permit
Monthly Discharge Monitoring Reports	1.3.1
Monthly Operational Reports	1.3.4
Monthly Bypass and Overflow Summary Report	1.3.5.1
Industrial Waste Survey Report within 120 days of the effective permit date	3.2.a
Technical review of the need to recalculate local limits within 120 days of the permit effective date	3.2.a
Biomonitoring Report beginning within 90 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. PREVIOUS PERMIT DISCHARGE MONITORING REPORT REVIEW

The facility is currently on a watch list for the reported overflows. Permit exceedances and complete discharge monitoring report summary are located in Appendix 2. A copy of the inspection reports for this facility can be located on the division's public data viewer at the following link:

http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34051:::NO:34051:P34051_PERMIT_NUMBER:TN0024121

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	4504	35	6305	40	40	T.C.A. 0400-40-05-.09 (for $CBOD_5$)
NH_3-N	10	1801	15	2702	20	—	Ammonia Toxicity, Refer to 6.2 below
Total Suspended Solids	30	5404	40	7206	45	40	T.C.A. 0400-40-05-.09
Dissolved Oxygen (mg/l)	1.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Chlorine Residual (mg/l)	—	—	—	—	0.22 (daily maximum)	—	Refer to 6.3 below
Total Nitrogen	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.4 below
Total Phosphorous	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.4 below
E. coli (colonies/100ml)	126/100 ml	—	—	—	487/100 ml	—	T.C.A. 0400-40-03-.03, Refer to 6.5 below
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	T.C.A. 0400-40-05-.09
pH (standard units)	6.0-9.0	—	—	—	—	—	T.C.A. 0400-40-0 3-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
IC_{25}	8.7% per sample	—	—	—	—	—	Refer to 6.6 below
Sanitary Sewer Overflows, Total Occurrences			Report				Refer to 6.9 below
Dry Weather Overflows, Total Occurrences			Report				Refer to 6.9 below
Bypass of Treatment, Total Occurrences			Report				Refer to 6.9 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. 1200-4-5-.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. $CBOD_5$, DISSOLVED OXYGEN, AND PERCENT REMOVALS REQUIREMENTS

a. The facility discharges to the Hiwassee River whose flow rate is controlled by the Chickamauga Dam. During certain times of the year, the flow rate through the dam is significantly reduced. In response to the operational changes at the dam, the velocity of the Hiwassee River is reduced and the backflow can result in a reversal of stream flow direction. The USGS has a gage that measures the stream velocities every fifteen minutes. Modeling performed in a previous permit indicated that the dissolved oxygen permit limit of 1 mg/L would maintain an instream dissolved oxygen level above 5.0 mg/L. In addition to the modeling, the instream sampling data provided below indicates that the downstream dissolved oxygen concentration (RM 13.4) stays above with the fish and aquatic life standard of 5.0 mg/L. The facility's effluent has an average dissolved oxygen 7.0 mg/L. The previous permit limits will be retained in the new permit.

Date	D.O. Value	Unit
11-Jun-15	8.1	mg/l
21-Aug-14	7.6	mg/l
13-May-14	6.2	mg/l
12-Mar-14	9.7	mg/l
9-Oct-13	8.3	mg/l
13-May-13	10.4	mg/l
27-Feb-13	10.7	mg/l
12-Dec-12	9.2	mg/l
1-Aug-12	6.9	mg/l
9-May-12	7.0	mg/l
13-Mar-12	9.9	mg/l
12-Oct-11	8.0	mg/l
26-Jul-11	6.8	mg/l
17-May-11	7.3	mg/l
19-Oct-10	8.2	mg/l
27-Jul-10	7.1	mg/l
26-Aug-09	7.8	mg/l
15-Jun-09	9.9	mg/l
22-Apr-09	11.6	mg/l
30-Dec-08	10.6	mg/l
30-Sep-08	6.9	mg/l
28-May-08	6.5	mg/l
18-Mar-08	10.1	mg/l
14-Aug-07	7.5	mg/l
29-May-07	7.6	mg/l
14-Mar-07	8.3	mg/l
14-Nov-06	14.6	mg/l
25-Jul-06	7.5	mg/l
9-May-06	7.3	mg/l
9-May-06	7.3	mg/l
1-Feb-06	12.1	mg/l
9-Nov-05	8.8	mg/l
11-May-05	8.4	mg/l
23-Feb-05	11.3	mg/l
1-Dec-04	10.1	mg/l
7-Jul-04	7.2	mg/l
9-Mar-04	10.9	mg/l

b. 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 40 Part 133.102. The reasons stated by the U.S.E.P.A. for these requirements are to achieve these two basic objectives:

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

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 three times 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.

6.2. NH_3-N TOXICITY

To access toxicity impacts, the state utilizes the EPA document, 1999 Update to Ambient Water Quality Criteria for Ammonia, pursuant to 0400-40-03-.0-3(3)(j), and assumed stream temperatures of 25°C and 15°C and pH of 8.0 to derive an allowable instream protection value protective of chronic exposure to a continuous discharge. A mass balance equation with sewage treatment facility and stream flows and this allowable value determines the monthly average permit limit. The criteria document states that a 30Q5 flow value is protective in deriving allowable values. Where the division has 30Q5 flow values, the division may use them. Otherwise, the division utilizes the available 7Q10 or 1Q10 values that are generally more conservative. The criteria continuous concentrations (CCC) derived from assumed temperature and pH values are as follows:

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

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

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

The mass balance equation is as follows:

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

where:

CCC = Criteria continuous concentration (mg/l)
Q_S = 1Q10 flow of receiving stream (MGD)
Q_{STP} = Design flow of STP (MGD)
C_S = Assumed/Measured instream NH_3 (mg/l)
C_{STP} = Allowable STP discharge of NH_3 (mg/l)

$$C_{STP} = \frac{1.24\ (228\ \text{MGD} + 21.6\ \text{MGD}) - (228\ \text{MGD} \times 0.1\text{mg/l})}{21.6\ \text{MGD}} = 13.3\ \text{mg/l (summer)}$$

$$C_{STP} = \frac{2.36\ (228\ \text{MGD} + 21.6\ \text{MGD}) - (228\ \text{MGD} \times 0.1\text{mg/l})}{21.6\ \text{MGD}} = 26.2\ \text{mg/l (winter)}$$

Because the NH_3-N concentration limits calculated to protect dissolved oxygen are more restrictive than the toxicity limits calculated above, the monthly average limit of NH_3-N (10 mg/l) is applied to the permit.

6.3. CHLORINATION

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

$$\frac{0.019\ (Qd + Qs)}{Qd} = \text{Limit (mg/l)} = \frac{0.019(21.6 + 228)}{21.6} = 0.22\ \text{mg/l}$$

where:

0.019	=	instream protection value (acute)
21.6	=	Qd, design flow of STP (MGD)
228	=	Qs, 1Q10 flow of receiving stream (MGD)

The total residual chlorine limit is retained from the previous permit due to the anti-backsliding provision of 40 CFR 122.44(l) that requires a reissued permit to be as stringent as the previous permit.

6.4. TOTAL NITROGEN AND TOTAL PHOSPHOROUS MONITORING/REPORTING

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 document 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 potentially recommends 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 is 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 framework may be reviewed on the division's webpage at

http://www.tn.gov/environment/article/wr-ws-tennessee-nutrient-reduction-framework.

6.5. *E. COLI* REQUIREMENTS

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

6.6. BIOMONITORING

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

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

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

$$IC_{25}\ \% = \frac{\text{Design Flow}}{\text{Low Flow+ Design Flow}} * 100 \geq \frac{21.6}{228 + 21.6} * 100 > 8.7\%$$

where:

228	=	Low Flow - 1Q10 (MGD)
21.6	=	Design Flow Capacity (MGD)
IC_{25}	=	Concentration causing 25% reduction in survival, reproduction and growth of test organisms

6.7. 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, <u>or</u> (c) minimum information is lacking to accurately calculate water quality protection values, in which case additional stream monitoring may also be required. Appendix 3 lists the metal and toxic parameters calculations for this permit issuance.

In this permit issuance, the water quality calculations were initially done with the standard reasonable potential spreadsheet that allows a single effluent flow rate to be inputted. The background data was taken from RM 15.6 which is located immediately upstream of the facility. Parameters that did not have detectable background data utilized a value of one-half the water quality value. Additionally, the calculations incorporate a 50% reduction in remaining loading after the subtraction of the background amount. The initial results provided significantly more restrictive pass-through limits with silver and cyanide appearing to warrant limits in the NPDES permit. Since the background concentrations for silver and cyanide were not based on actual measured quantities of the parameters, the background concentrations were based on one half of the water quality criteria.

The initial results of the reasonable potential calculations warranted a more site specific calculation due to the complex nature of the multiple facilities located on this section of the Hiwassee River. The river contains one major municipal facility (Cleveland) and two significant industries with process wastewater (Resolute Products and Olin). This section of the river has a continuous USGS gaging station upstream of the facilities. Sampled data for the metals in the pass through limits has been collected at this upstream location. The site specific calculation utilized application data and permit limits from Resolute Products and Olin Corporation. The stream loadings for each facility were calculated based on actual sampled values and NDPES permit limits. The calculation did not demonstrate the reasonable potential to violate water quality. The pass-through limits were then calculated utilizing the exact loadings from the background values, Resolute Products, and Olin Corporation. The pass through concentration for Cleveland was calculated from the remaining loading up to a maximum 50% of the stream loading. The calculation did not demonstrate the reasonable potential to violate water quality. The pass-through limits were less restrictive than the initial calculation but lower than the 2012 PTLs except for cadmium. The new permit will not contain any new limits for metals.

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

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

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

where:

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

to protect water quality:

$$Cw \leq Ca$$

where:

Ca = STP effluent concentration allowable

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

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

The reasonable potential evaluation uses the following assumptions and procedures:

a. Stream background concentrations, Cs, for all volatile organic, acid-extractable, and base-neutral compounds equal zero unless actual stream data exists to show otherwise. Use of the effluent concentrations of such pollutants contributed by upstream dischargers as background is not justifiable due to the volatility and reactivity of these pollutants.

b. The stream allocation, S_A , is 50% and is used as a factor of safety.

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

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

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

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

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

6.9. OVERFLOW AND BYPASS REPORTING

For the purposes of demonstrating proper operation of the collection, transmission, and treatment system, the permit defines overflow as any release of sewage other than through permitted outfalls. This definition includes, but is not necessarily limited to, sanitary sewer overflows and dry weather overflows as defined. For example, a collection system blockage or hydraulic overload that causes backup and release of sewage into a building during a wet weather event may not clearly fit either the

definition of a sanitary sewer overflow or a dry weather overflow. Still, any unpermitted release potentially warrants permittee mitigation of human health and/or water quality impacts via direct or indirect contact and demonstrates a hydraulic problem in the system that warrants permittee consideration as part of proper operation and maintenance of the system.

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

7. OTHER PERMIT REQUIREMENTS AND CONDITIONS

7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

The waste treatment facilities shall be operated under the supervision of a Grade 4 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 (formerly 1200-05-03) 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.

7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

The collection system shall be operated under the supervision of a Grade 2 certified collection system operator in accordance with the Water Environmental Health Act of 1984.

7.3. PRETREATMENT PROGRAM

The Cleveland Utilities has an approved pretreatment program. An updated Industrial Waste Survey must be completed within 120 days of the effective date of the permit, unless such a survey has been submitted within 3 years of the effective date.

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 (trivalent and hexavalent and total if drinking water use applies), 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 nine previous semiannual reports were analyzed. Based on our review of the semiannual reports and other documents, sampling for additional pollutants is not required at this time.

7.4. BIOSOLIDS/SLUDGE MANAGEMENT

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 Part 503, the federal regulation governing the use and disposal of sewage sludge. It is important to note that "biosolids" are sewage sludge that has been treated to a level so that they can be land applied.

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

Tennessee regulates the land application of 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 biosolids must obtain a biosolids permit from the division. The land application of biosolids under state rules will be regulated through either a general permit or by an individual permit. It is anticipated that the permitting of biosolids land application will begin near the beginning of calendar year 2014. Questions about the division's biosolids regulations and permitting program should be directed to the division's Biosolids Coordinator at:

State of Tennessee
Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
(615) 532-0625

7.5. PERMIT TERM

This permit is being reissued for 5 years in order to coordinate its reissuance with other permits located within the Hiwassee Watershed.

7.6. ELECTRONIC REPORTING

Starting on December 21, 2016, all Individual NPDES Permit holders will be required to submit Discharge Monitoring Reports (DMRs) electronically through NetDMR. Prior to 21 December 2016, the permittee may elect to electronically submit DMRs instead of mailing paper DMRs.

EPA published the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, which will modernize Clean Water Act reporting for municipalities, industries and other facilities. The rule was published in the Federal Register on October 22, 2015 and became effective on December 22, 2015. The rule replaces most paper-based NPDES reporting requirements with electronic reporting.

More information is available at: http://www.tn.gov/environment/article/wr-netdmr-electronic-reporting:

- Getting Started on NetDMR,
- Electronic reporting schedule,
- Training Opportunities,
- NetDMR User Guide and other supporting information.

8. 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#TN06020002008_1000. 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. The Hiwassee River is partially supportive of its designated uses due to mercury in fish tissue from atmospheric deposition and an industrial point source. It is also partially impaired for E.coli from unknown sources. The facility samples for mercury in its application and pretreatment program. This permit continues to require mercury monitoring for application and pretreatment program purposes using test methods that will quantify the load at levels capable of being used in TMDL development. A TMDL has not been developed for the mercury impairment at the time of this permit draft. The facility is required to meet the instream coliform limit at the discharge point.

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	4504	35	6305	40	40	5/week
NH_3-N	10	1801	15	2702	20	—	5/week
Total Suspended Solids	30	5404	40	7206	45	40	5/week
Dissolved Oxygen (mg/l)	1.0 (daily minimum) instantaneous	—	—	—	—	—	7/week
Total Chlorine Residual (mg/l)	—	—	—	—	0.33 (daily maximum)	—	7/week
E. coli (colonies/100ml)	126/100 ml	—	—	—	487/100 ml	—	7/week
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	5/week
pH (standard units)	6.0-9.0	—	—	—	—	—	7/week
Flow (MGD):							
Influent	Report	—	—	—	Report	—	7/week
Effluent	Report	—	—	—	Report	—	7/week
Whole Effluent Toxicity:							
IC_{25}	6% per sample	—	—	—	—	—	2/year
Metals & Toxics:							
Sanitary Sewer Overflows, Total Occurrences			Report				continuous
Dry Weather Overflows, Total Occurrences			Report				continuous
Bypass of Treatment, Total Occurrences			Report				continuous

APPENDIX 2
Permit Exceedances and Discharge Monitoring Report Summary

NPDES ID(s): TN0024121
State: TN
Major/Minor Indicator:
Violation Date: 04/01/2012 -
Violation Type(s):

Environmental Protection Agency
Integrated Compliance Information System
Violations Report

Created Date: 09/15/2010
Refresh Date: 01/18/2017
't Version 1.5, Modified: 1/4/2017

TN0024121

Permittee Name: CLEVELAND UTILITIES STP
Permittee Address: 1860 OLD LOWER RIVER ROAD CLEVELAND, TN 37310
Major/Minor Indicator: Major
Compliance Track. Status: On
DMR Non Receipt Flag: On
RNC Tracking Flag: On

Primary SIC Code: 4952
Primary SIC Desc: Sewerage Systems
Primary NAICS
Primary NAICS Desc:
Cognizant Official: D. BYRON MAPLES, P. E.
Cognizant Offcl. Ph.: 423-479-0695
Receiving Body: HIAWASSE RIVER MI 15.4

Permit Issued: 02/29/2012
Permit Effective: 04/01/2012
Permit Expired: 03/01/2017
Permit Status: Effective

Facility Information

Facility Name: CLEVELAND UTILITIES STP
Facility Location: 1860 OLD LOWER RIVER ROAD CHARLESTON, TN 37310

County: Bradley
Region: 04
State-Region: 01

FRS ID: 110000543341
Federal Facility N
Type of Ownership: Municipal or Water District

Effluent Violations

Violation Code	Monitoring Period End Date	Limit Set	Parameter	Mon. Loc.	Seas. ID	SNC Group	EA Identifier	Value Type/ Stat. Base	Reported Value/Units	% Exceed.	Limit Value/Units	RNC Det. Code/ RNC Det. Date	RNC Res. Code/ RNC Res. Date
E90	11/30/2016	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	1,011 #/100ml	108%	<=487 #/100ml		
E90	10/31/2016	001-G	80082 - BOD, carbonaceous [5 day, 20 C]	1	0	1		C3 DAILY MX	65 mg/l	63%	<=40 mg/l		
E90	08/31/2016	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	613 #/100ml	26%	<=487 #/100ml		
E90	03/31/2016	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	1,733 #/100ml	256%	<=487 #/100ml		
E90	01/31/2016	001-G	81383 - Carbonaceous oxygen demand, % removal	K	0	1		C1 DAILY MN	%	67%	>=40 %		
E90	12/31/2015	001-G	81383 - Carbonaceous oxygen demand, % removal	K	0	1		C1 DAILY MN	25 %	25%	>=40 %		
E90	09/30/2015	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	1,120 #/100ml	130%	<=487 #/100ml		
E90	04/30/2014	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	1,414 #/100ml	190%	<=487 #/100ml		
E90	03/31/2014	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	2,420 #/100ml	397%	<=487 #/100ml		
E90	02/28/2014	001-G	81383 - Carbonaceous oxygen demand, % removal	K	0	1		C1 DAILY MN	36 %	7%	>=40 %		
E90	01/31/2014	001-G	31648 - E. coli, MTEC-MF	1	0			C3 DAILY MX	687 #/100ml	41%	<=487 #/100ml		

	Overflow		Bypass	Flow				CBOD						Total Suspended Solids					
				Influent		Effluent		Monthly				Daily		Monthly				Daily	
Date	# (Wet)	# (Dry)	# of Bypass	Monthly Average	Daily Max.	Monthly Average	Daily Max.	Influent Conc.	Effluent Conc.	Percent Removal	Average Amount	Influent Conc.	Effluent Conc.	Influent Conc.	Effluent Conc.	Percent Removal	Average Amount	Influent Conc.	Effluent Conc.
				MGD	MGD	MGD	MGD	mg/L	mg/L	%	lb/day	mg/L	mg/L	mg/L	mg/L	%	lb/day	mg/L	mg/L
04/30/2012	0	1	0	6.9	8.7	7.1	8.5	176	10	95	553	226	21	158	5	97	282	224	10
05/31/2012	0	5	0	6.2	8.8	6.4	9.8	210	9	96	468	400	15	168	3	98	162	250	5
06/30/2012	0	0	0	5.8	8.3	6.0	8.6	197	11	95	538	253	21	192	3	99	145	230	5
07/31/2012	0	3	0	6.9	13.4	7.4	14.3	183	7	96	402	248	22	214	3	99	183	533	12
08/31/2012	2	2	0	9.3	17.7	9.5	17.4	156	7	96	499	273	12	145	4	97	296	238	7
09/30/2012	11	0	0	8.4	25.2	8.5	24.9	147	6	96	475	258	11	151	3	98	286	242	8
10/31/2012	0	2	0	9.0	18.2	9.1	18.1	132	7	95	551	196	12	121	3	97	254	180	6
11/30/2012	3	3	0	6.5	9.4	6.3	8.9	185	5	99	310	242	13	171	2	99	137	324	4
12/31/2012	0	4	0	17.7	28.2	17.5	25.3	75	6	92	931	345	12	116	4	96	668	492	8
01/31/2013	29	2	0	16.1	29.8	15.0	28.5	73	5	93	768	138	9	89	4	95	692	160	9
02/28/2013	0	1	0	12.9	22.5	12.0	21.3	102	5	95	578	148	16	115	4	97	391	184	8
03/31/2013	0	2	0	11.9	21.2	11.8	21.3	104	5	95	553	178	11	121	4	97	456	268	9
04/30/2013	9	0	0	16.0	26.0	16.5	25.4	93	7	93	904	133	16	112	6	95	939	154	30
05/31/2013	20	6	0	13.8	29.8	14.8	29.9	100	5	95	591	206	9	118	4	97	534	180	8
06/30/2013	0	2	0	9.5	16.0	10.8	17.3	129	6	95	490	188	13	133	3	98	278	160	7
07/31/2013	28	1	0	14.5	29.4	15.9	31.0	110	6	95	699	217	10	117	3	97	470	206	6
08/31/2013	2	1	0	8.6	16.5	9.7	17.4	154	6	96	450	223	10	157	2	99	184	316	5
09/30/2013	0	1	0	6.8	11.0	7.9	12.0	185	5	97	290	255	7	170	3	98	157	22	4
10/31/2013	0	2	0	5.6	6.8	6.2	7.5	225	7	97	337	258	10	200	4	98	206	266	6
11/30/2013	2	3	0	6.7	23.2	6.9	23.0	203	9	96	641	285	19	178	8	95	579	250	21
12/31/2013	6	2	0	13.8	27.1	14.0	27.0	98	7	93	878	209	21	101	5	95	717	250	11
01/31/2014	0	0	0	10.9	22.4	10.9	21.9	98	9	91	733	170	24	111	6	95	514	168	12
02/28/2014	18	5	0	15.4	26.8	15.4	26.3	69	10	86	1263	134	17	100	6	94	854	188	14
03/31/2014	0	1	0	9.6	14.6	9.9	14.7	113	10	91	870	173	20	135	5	96	423	182	8
04/30/2014	13	4	0	11.0	25.7	11.6	25.9	123	10	92	1083	213	19	131	6	96	654	256	13
05/31/2014	0	0	0	8.6	13.4	9.6	14.5	136	8	94	643	198	16	134	4	97	280	180	6
06/30/2014	2	1	0	9.3	21.1	10.5	22.2	152	7	96	559	450	15	160	4	97	364	689	9
07/31/2014	0	3	0	8.0	15.0	9.1	15.3	147	6	96	374	328	10	141	3	98	227	288	6
08/31/2014	1	2	0	7.2	10.6	8.4	11.9	151	6	96	390	197	9	155	4	97	252	238	7
09/30/2014	0	3	0	7.1	11.8	8.2	12.9	167	5	97	308	287	8	165	3	98	160	276	5
10/31/2014	0	1	0	7.0	16.3	7.8	17.1	180	7	96	466	350	13	176	3	98	223	334	6
11/30/2014	0	4	0	7.1	14.6	7.3	14.5	176	6	97	420	263	12	182	4	98	286	274	9
12/31/2014	0	2	0	8.5	21.9	8.9	22.4	163	8	95	625	340	19	168	5	97	477	422	18
01/31/2015	4	2	0	10.8	24.1	10.9	24.2	121	7	94	620	203	18	128	5	96	485	196	11
02/28/2015	0	1	0	10.2	13.7	10.2	13.8	132	6	95	559	268	11	120	5	96	415	176	9
03/31/2015	4	4	0	14.0	26.1	14.4	24.9	93	7	92	889	166	14	128	6	95	746	336	10
04/30/2015	0	0	0	14.0	24.0	14.8	24.9	114	6	95	787	201	11	126	5	96	586	192	11
05/31/2015	0	1	0	6.8	8.7	7.9	10.6	189	8	96	549	242	22	195	4	98	287	344	7
06/30/2015	0	1	0	6.9	12.2	8.2	14.2	189	8	96	561	280	16	202	4	98	304	608	10
07/31/2015	8	1	0	12.7	26.9	14.3	28.5	116	7	94	828	293	14	134	4	97	528	238	11
08/31/2015	2	0	0	8.4	17.7	9.6	18.6	158	6	96	539	236	11	155	4	97	394	218	11
09/30/2015	0	0	0	6.7	11.8	7.5	12.0	183	7	96	445	263	12	171	4	98	228	278	6
10/31/2015	18	0	0	12.7	27.7	12.8	27.3	106	10	91	967	204	16	112	6	95	611	192	11
11/30/2015	5	1	0	12.1	27.3	11.7	27.2	114	7	94	721	214	19	121	4	97	458	186	9
12/31/2015	40	1	0	17.2	37.5	17.9	37.5	76	7	91	1117	148	16	90	5	95	806	136	10
01/31/2016	1	0	0	12.9	27.8	12.2	25.5	104	5	95	516	192	10	107	3	97	335	164	6
02/29/2016	25	1	0	16.4	29.4	16.2	29.6	89	8	91	1231	132	23	101	6	94	1051	138	15
03/31/2016	0	1	0	10.3	15.1	10.5	15.2	135	7	95	605	193	10	127	5	96	478	210	9
04/30/2016	0	1	0	8.5	13.8	9.0	14.9	218	6	97	446	420	17	246	4	98	277	865	7
05/31/2016	0	1	0	6.7	8.5	7.4	9.6	201	4	98	278	295	8	200	3	99	169	410	4
06/30/2016	0	0	0	6.2	7.0	7.2	7.9	225	7	97	419	460	10	210	4	98	217	452	6
07/31/2016	0	0	0	5.9	8.1	6.2	7.5	208	4	98	210	345	8	172	3	99	134	220	4
08/31/2016	0	0	0	6.8	8.4	5.8	7.4	239	4	98	184	420	7	196	2	99	121	360	11
09/30/2016	0	0	0	6.0	7.5	5.5	7.0	246	6	98	258	440	12	186	3	98	139	278	5
10/31/2016	0	0	0	5.5	6.9	5.1	5.9	278	12	96	530	610	65	215	5	98	228	628	31
Standard Dev.	**9**	**2**	**0**	**3.5**	**8.0**	**3.4**	**7.8**	**49.9**	**2**	**2**	**248**	**97**	**8**	**37**	**1**	**1.4**	**225**	**152**	**5**
Minimum	**0**	**0**	**0**	**5.5**	**6.8**	**5.1**	**5.9**	**69**	**4**	**86**	**184**	**132**	**7**	**89**	**2**	**94**	**121**	**22**	**4**
Maximum	**40**	**6**	**0**	**17.7**	**37.5**	**17.9**	**37.5**	**278**	**12**	**99**	**1263**	**610**	**65**	**246**	**8**	**99**	**1051**	**865**	**31**
Average	**5**	**2**	**0**	**9.8**	**18.2**	**10.2**	**18.4**	**150**	**7**	**95**	**598**	**258**	**15**	**150**	**4**	**97**	**395**	**281**	**9**
Permit Limit	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**25**	**85%**	**4504**	**Report**	**40**	**Report**	**30**	**85%**	**5404**	**Report**	**45**
Count	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**55**

	Ammonia as N			Ecoli		Settleable Solids	Dissolved Oxygen	Whole Effluent Toxicity (WET) Testing		Total Residual Chlorine	pH	
	Monthly		Daily									
Date	Average Conc.	Average Amount	Max Conc.	Monthly Average Conc.	Daily Max. Conc.	Daily Max. Conc.	Daily Min. Conc.	Ceriodaphnia	Pimephales	Daily Max. Conc.	Daily Min. Conc.	Daily Max. Conc.
	mg/L	lb/day	mg/L	mg/L	mg/L	mg/L	mg/L	%	%	mg/L	SU	SU
04/30/2012	3.9	223.0	10.6	1	5	0.2	7.4	20	20	0.09	6.8	7.2
05/31/2012	3.5	185.0	12.6	1	40	0.1	2.8			0.08	6.8	7.1
06/30/2012	1.3	66.0	4.1	1	20	0.1	6.5			0.07	6.7	7.0
07/31/2012	1.9	111.0	9.9	2	5	0.1	6.0			0.10	6.5	7.4
08/31/2012	3.7	247.0	12.3	3	52	0.1	6.4			0.10	6.3	7.2
09/30/2012	2.1	151.0	5.3	1	124	0.1	5.9			0.07	6.9	7.3
10/31/2012	1.5	119.0	4.2	2	17	0.1	6.2			0.15	7.0	7.3
11/30/2012	0.1	7.0	0.3	1	8	0.1	7.3			0.10	6.9	7.2
12/31/2012	1.5	224.0	7.2	3	22	0.1	7.4			0.15	6.8	7.2
01/31/2013	0.6	93.0	2.7	2	26	0.1	8.4			0.22	6.9	7.2
02/28/2013	0.6	73.0	3.4	2	261	0.1	7.5			0.18	7.0	7.5
03/31/2013	0.7	79.0	2.3	2	11	0.2	6.7			0.08	7.0	7.3
04/30/2013	1.5	200.0	3.5	2	35	0.7	6.2	24	24	0.10	6.9	7.2
05/31/2013	0.9	124.0	2.5	1	6	0.1	7.2			0.08	6.9	7.2
06/30/2013	1.6	129.0	7.5	1	12	0.1	4.6			0.09	6.8	7.2
07/31/2013	1.6	151.0	6.6	2	22	0.1	6.4			0.08	6.9	7.3
08/31/2013	2.0	153.0	7.9	1	6	0.1	6.3			0.10	6.8	7.4
09/30/2013	1.0	56.0	3.2	2	18	0.1	7.0			0.10	6.7	7.1
10/31/2013	1.6	82.0	6.3	3	64	0.1	6.4	20	20	0.06	6.6	7.1
11/30/2013	6.5	376.0	16.7	2	48	0.2	7.3			0.10	6.8	7.2
12/31/2013	1.4	183.0	3.2	3	21	0.1	7.8			0.12	6.8	7.2
01/31/2014	4.5	349.0	14.6	3	**687**	0.1	8.4			0.10	6.8	7.2
02/28/2014	4.3	554.0	6.8	3	135	0.1	8.1			0.10	6.9	7.2
03/31/2014	6.1	516.0	9.9	4	**2420**	0.1	8.1			0.10	6.8	7.3
04/30/2014	5.5	537.0	13.0	3	**1414**	0.1	8.2	24	24	0.14	6.8	7.1
05/31/2014	5.0	369.0	12.1	2	50	0.1	7.9			0.21	6.7	7.2
06/30/2014	3.3	270.0	7.1	2	68	0.2	6.1			0.15	6.6	6.9
07/31/2014	1.0	59.0	4.2	1	44	0.2	7.9			0.26	6.6	7.0
08/31/2014	2.4	152.0	8.2	1	197	0.1	7.5			0.15	6.6	6.9
09/30/2014	0.9	1801.0	2.7	1	50	0.1	7.5			0.10	6.2	6.9
10/31/2014	0.7	49.0	1.5	2	30	0.1	7.7	24	24	0.12	6.5	6.0
11/30/2014	1.6	119.0	4.5	2	16	0.1	7.7			0.12	6.5	6.9
12/31/2014	4.7	329.0	11.5	2	82	0.3	8.1			0.15	6.7	7.1
01/31/2015	0.9	83.0	2.8	3	291	0.1	9.0			0.14	6.6	7.0
02/28/2015	0.8	71.0	2.2	2	12	0.1	8.8			0.19	6.5	6.9
03/31/2015	1.6	208.0	4.2	2	40	0.1	5.0			0.19	6.6	7.1
04/30/2015	2.6	308.0	10.3	2	9	0.1	7.2	24	24	0.18	6.7	7.0
05/31/2015	5.5	363.0	12.5	1	21	0.1	3.4			0.15	6.5	7.0
06/30/2015	4.8	336.0	11.2	2	19	0.1	7.5			0.12	6.6	7.1
07/31/2015	3.1	418.0	12.9	3	105	0.1	6.2			0.15	6.7	7.0
08/31/2015	2.3	184.0	6.9	3	162	0.1	6.6			0.10	6.5	7.0
09/30/2015	2.0	133.0	7.5	4	**1120**	0.1	6.9			0.10	6.5	7.0
10/31/2015	5.4	456.0	16.1	2	63	0.1	7.1	24	24	0.10	6.6	7.1
11/30/2015	1.7	184.0	7.8	2	48	0.1	8.2			0.32	6.5	7.0
12/31/2015	1.6	279.0	3.9	3	155	0.1	7.9			0.17	6.7	7.1
01/31/2016	0.5	52.0	1.5	3	43	0.1	7.6			0.12	6.5	7.0
02/29/2016	1.7	301.0	5.6	3	87	0.1	6.9			0.20	6.8	7.1
03/31/2016	2.5	230.0	5.6	2	**1733**	0.1	8.5			0.12	6.8	7.2
04/30/2016	3.0	217.0	16.5	1	9	0.1	7.9	24	24	0.18	6.7	7.1
05/31/2016	0.6	41.0	3.2	2	14	0.4	7.8			0.15	6.5	7.1
06/30/2016	4.6	281.0	13.6	1	12	0.1	6.2			0.16	6.6	7.0
07/31/2016	2.0	105.0	5.5	3	77	0.1	7.4			0.12	6.5	7.0
08/31/2016	1.6	78.0	5.3	2	**613**	0.1	7.5			0.12	6.5	7.0
09/30/2016	3.4	161.0	8.7	1	8	0.1	1.1			0.10	6.4	6.9
10/31/2016	4.5	193.0	13.2	2	45	0.1	7.2			0.11	6.2	6.9
Standard Dev.	**2**	**253**	**4**	**1**	**456**	**0.10**	**1.4**	**2**	**2**	**0.05**	**0.2**	**0.2**
Minimum	**0**	**7**	**0**	**1**	**5**	**0.10**	**1.1**	**20**	**20**	**0.06**	**6.2**	
Maximum	**7**	**1801**	**17**	**4**	**2420**	**0.70**	**9.0**	**24**	**24**	**0.32**		**7.5**
Average	**2**	**233**	**7**	**2**	**195**	**0.13**	**7.0**	**23**	**23**	**0.13**	**6.7**	**7.1**
Permit Limit	**10**	**1801**	**20**	**126/100 ml**	**487/100 ml**	**1.0 ml/L**	**1.0**	**5**	**5**	**0.40**	**6.0**	**9.0**
Count	**55**	**55**	**55**	**55**	**55**	**55**	**55**	**8**	**8**	**55**	**55**	**55**

APPENDIX 3
Metal and Toxic Parameter Calculations

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

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

   * 1Q10 of receiving stream (228 MGD, USGS)
   * Calcium hardness
   * Total suspended solids
   * Background metals concentrations
   * Other dischargers impacting this segment (none)
   * Downstream water supplies, if applicable

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

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

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

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

The following formulas are used to evaluate water quality protection:

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

where:

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

to protect water quality:

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

where (S_A) is the percent "Stream Allocation".

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

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

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

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

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

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

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

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

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

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

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

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

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 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:

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

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:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WQ Based Effluent Calculations

Standard Reasonable Potential Calculations with Background Concentrations at RM 15.6

2013 WQC

PASS-THROUGH LIMITATIONS FOR METALS AND OTHER TOXIC SUBSTANCES
WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Cleveland STP **PERMIT #: TN0024121** **DATE: 1/18/2017** **CALC BY: JAH**

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 [%]
228	701	21.60	10	39	50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	Stream Bckgrnd. Conc.	Fish/Aqua. Life (F & AL) WQC lab conditions		Fraction Dissolved	F & AL- instream allowable ambient conditions (Tot)		Calc. Effluent Concentration based on F & AL		Human Health Water Quality Criteria *						effluent limited case	Average Conc.	Maximum Conc.	
									In-Stream Criteria			Calc. Effluent Concentration **						
		Chronic	Acute		Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS				
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	ug/L	ug/L	**PARAMETER**
Copper (a,b)	5.300	4.006	5.534	0.218	18.377	25.392	**78.21**	**118.73**	N/A	N/A	N/A	**NA**	NA	NA	**80.0**	**8.0**	**27.0**	**Copper (a,b)**
Chromium III	1.500	34.276	263.498	0.078	437.220	3361.175	**2518.24**	**19412.21**	N/A	N/A	N/A	**NA**	NA	NA		**2.0**	**4.0**	**Chromium III**
Chromium VI	1.500	11.000	16.000	1.000	11.000	16.000	**55.64**	**84.53**	N/A	N/A	N/A	**NA**	NA	NA		**2.0**	**4.0**	**Chromium VI**
Chromium, Total	1.500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.0	**NA**	NA	1648.34	**60.0**	**2.0**	**4.0**	**Chromium, Total**
Nickel (a,b)	9.500	23.448	211.108	0.206	113.956	1025.996	**608.28**	**5877.84**	4600.0	610.0	100.0	**76789.36**	10049.22	1518.53	**180.0**	**7.0**	**14.0**	**Nickel (a,b)**
Cadmium (a,b)	0.331	0.128	0.805	0.193	0.663	4.178	**2.08**	**22.39**	N/A	N/A	5.0	**NA**	NA	78.26	**5.0**	**<1**	**<1**	**Cadmium (a,b)**
Lead (a,b)	1.100	0.891	22.856	0.146	6.103	156.617	**29.46**	**899.09**	N/A	N/A	5.0	**NA**	NA	65.78	**45.0**	**4.0**	**11.0**	**Lead (a,b)**
Mercury (T) (c,e)	0.006	0.770	1.400	1.000	0.770	1.400	**4.42**	**8.06**	0.051	0.05	2.0	**0.76**	0.74	33.36	**0.4**	**0.002210**	**0.004070**	**Mercury (T) (c,e)**
Silver (a,b,f)	0.318	N/A	0.637	1.000	NA	0.637	**N/A**	**2.00**	N/A	N/A	N/A	**NA**	NA	NA	**5.0**	**1.0**	**2.0**	**Silver (a,b,f)**
Zinc (a,b)	29.600	53.199	52.767	0.125	425.461	422.009	**2302.00**	**2282.05**	26000.0	7400.0	N/A	**434417.83**	123298.39	NA	**200.0**	**57.0**	**110.0**	**Zinc (a,b)**
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	**16.32**	**113.39**	140.0	140.0	200.0	**2299.57**	2299.57	3303.18	**230.0**	**10.0**	**46.0**	**Cyanide (d)**
Toluene									15000.0	1300.0	1000.0	**250902.78**	21744.91	16726.85	**15.0**	**<5**	**<5**	**Toluene**
Benzene									510.0	22.0	5.0	**8530.69**	367.99	83.63	**3.0**	**<1**	**<1**	**Benzene**
1,1,1 Trichloroethane									N/A	N/A	200.0	**NA**	NA	3345.37	**30.0**	**<1**	**<1**	**1,1,1 Trichloroethane**
Ethylbenzene									2100.0	530.0	700.0	**35126.39**	8865.23	11708.80	**4.0**	**<1**	**<1**	**Ethylbenzene**
Carbon Tetrachloride									16.0	2.3	5.0	**267.63**	38.47	83.63	**15.0**	**<1**	**<1**	**Carbon Tetrachloride**
Chloroform									4700.0	57.0	N/A	**78616.20**	953.43	NA	**85.0**	**25.0**	**50.0**	**Chloroform**
Tetrachloroethylene									33.0	6.9	5.0	**551.99**	115.42	83.63	**25.0**	**2.0**	**3.0**	**Tetrachloroethylene**
Trichloroethylene									300.0	25.0	5.0	**5018.06**	418.17	83.63	**10.0**	**<1**	**<1**	**Trichloroethylene**
1,2 trans Dichloroethylene									10000.0	140.0	100.0	**NA**	2341.76	1672.69	**1.5**	**<1**	**<1**	**1,2 trans Dichloroethylene**
Methylene Chloride									5900.0	46.0	N/A	**98688.43**	769.44	NA	**50.0**	**<5**	**<5**	**Methylene Chloride**
Total Phenols									860000.0	10000.0	N/A	**14385092.59**	167268.52	NA	**50.0**	**<40**	**<40**	**Total Phenols**
Naphthalene									N/A	N/A	N/A	**NA**	NA	NA	**1.0**	**<1**	**<1**	**Naphthalene**
Total Phthalates									N/A	N/A	N/A	**NA**	NA	NA	**64.5**	**NA**	**NA**	**Total Phthalates**
Chlorine (T. Res.)	0.000	11.000	19.000	1.000	11.000	19.000	**127.11**	**219.56**	NA	NA	NA	**NA**	NA	NA	**n/a**	**NA**	**NA**	**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 Previously, the Division established that 0.006 ug/L would be maximum background default if no sample data available or if all samples were <RDL (<0.2 ug/L), based on reference stream monitoring by DOE.
f Silver limit is daily max if column 8 is most stringent.
g When columns 7 or 8 result in a negative number, use results from columns 5 or 6, respectively.
h 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 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

Site Specific Calculations with Background Data at USGS Gage Station RM 18.6
Resolute and Olin Corporation Data from NPDES Application and Permit Limits

Note: Pink shaded cells were non-detect values, Green shaded cells were actual measured amounts

2013 WQC

PASS-THROUGH LIMITATIONS FOR METALS AND OTHER TOXIC SUBSTANCES
WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Cleveland STP **PERMIT #: TN0024121** **DATE: 2/16/2017** **CALC BY: JAH**

regulated stream worksheet (1Q10)

Stream	Stream
(1Q10)	(30Q5)
[MGD]	[MGD]
228	701

Ttl. Susp.	Hardness
Solids	(as CaCO3)
[mg/l]	[mg/l]
10	39

Resolute	Cleveland	Olin
Waste Flow	Waste Flow	Waste Flow
[MGD]	[MGD]	[MGD]
40.50	21.60	1.31

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Stream	Fish/Aqua. Life (F & AL) WQC			F & AL- instream allowable		F & AL- instream allowable		Human Health Water Quality Criteria *						Resolute		Cleveland			Olin	
	Bckgrnd.	lab conditions		Fraction	ambient conditions (Tot)		ambient conditions (Tot)		In-Stream Criteria			In-Stream Criteria			Average	Maximum	effluent limited	Average	Maximum	Average	Maximum
	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	Conc.	Conc.	case	Conc.	Conc.	Conc.	Conc.
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[lb/day]	[lb/day]	[ug/l]	[ug/l]	[ug/l]	[lb/day]	[lb/day]	[lb/day]	ug/L	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L
Copper (a,b)	2.330	4.006	5.534	0.218	18.377	25.392	44.5	61.4	N/A	N/A	N/A	NA	NA	NA	200.0	200.0	80.0	8.0	27.0	10.0	10.0
Chromium III	0.500	34.276	263.498	0.078	437.220	3361.175	1057.8	8132.1	N/A	N/A	N/A	NA	NA	NA	4.0	4.0		2.0	4.0	25.0	25.0
Chromium VI	0.500	11.000	16.000	1.000	11.000	16.000	26.6	38.7	N/A	N/A	N/A	NA	NA	NA	4.0	4.0		2.0	4.0	25.0	25.0
Chromium, Total	0.500	N/A	N/A	N/A	N/A	N/A	NA	NA	N/A	N/A	100.0	NA	NA	636.43	4.0	4.0	60.0	2.0	4.0	25.0	25.0
Nickel (a,b)	5.000	23.448	211.108	0.206	113.956	1025.996	275.7	2482.3	4600.0	610.0	100.0	29275.57	3882.19	636.43	19.0	19.0	180.0	7.0	14.0	48.0	48.0
Cadmium (a,b)	0.331	0.128	0.805	0.193	0.663	4.178	1.6	10.1	N/A	N/A	5.0	NA	NA	31.82	1.0	1.0	5.0	1.0	1.0	0.5	0.5
Lead (a,b)	1.100	0.891	22.856	0.146	6.103	156.617	14.8	378.9	N/A	N/A	5.0	NA	NA	31.82	15.0	15.0	45.0	4.0	11.0	1.7	1.7
Mercury (T) (c,e)	0.006	0.770	1.400	1.000	0.770	1.400	1.9	3.4	0.051	0.05	2.0	0.32	0.32	12.73	0.400000	0.400000	0.4	0.002210	0.004070	2.4	13.0
Silver (a,b,f)	0.318	N/A	0.637	1.000	NA	0.637	NA	1.5	N/A	N/A	N/A	NA	NA	NA	1.0	1.0	5.0	1.0	2.0	1.6	1.6
Zinc (a,b)	28.300	53.199	52.767	0.125	425.461	422.009	1029.4	1021.0	26000.0	7400.0	N/A	165470.60	47095.48	NA	69.0	69.0	200.0	57.0	110.0	15.0	15.0
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	12.6	53.2	140.0	140.0	200.0	891.00	891.00	1272.85	10.0	10.0	230.0	10.0	46.0	9.5	9.5
Toluene	0.000								15000.0	1300.0	1000.0	95463.81	8273.53	6364.25	510.0	510.0	15.0	5.0	5.0	5.0	5.0
Benzene	0.000								510.0	22.0	5.0	3245.77	140.01	31.82	900.0	900.0	3.0	1.0	1.0	1.0	1.0
1,1,1 Trichloroethane	0.000								N/A	N/A	200.0	NA	NA	1272.85	650.0	650.0	30.0	1.0	1.0	1.0	1.0
Ethylbenzene	0.000								2100.0	530.0	700.0	13364.93	3373.05	4454.98	670.0	670.0	4.0	1.0	1.0	1.0	1.0
Carbon Tetrachloride	0.000								16.0	2.3	5.0	101.83	14.64	31.82	740.0	740.0	15.0	1.0	1.0	1.0	1.0
Chloroform	0.000								4700.0	57.0	N/A	29911.99	362.76	NA	3300.0	3300.0	85.0	25.0	50.0	5.0	5.0
Tetrachloroethylene	0.000								33.0	6.9	5.0	210.02	43.91	31.82	570.0	570.0	25.0	2.0	3.0	1.0	1.0
Trichloroethylene	0.000								300.0	25.0	5.0	1909.28	159.11	31.82	490.0	490.0	10.0	1.0	1.0	1.0	1.0
1,2 trans Dichloroethylene	0.000								10000.0	140.0	100.0	63642.54	891.00	636.43	440.0	440.0	1.5	1.0	1.0	1.0	1.0
Methylene Chloride	0.000								5900.0	46.0	N/A	37549.10	292.76	NA	0.6	0.6	50.0	5.0	5.0	5.0	5.0
Total Phenols	0.000								860000.0	10000.0	N/A	5473258.44	63642.54	NA	5700.0	5700.0	50.0	40.0	40.0	40.0	40.0
Naphthalene	0.000								N/A	N/A	N/A	NA	NA	NA	3900.0	3900.0	1.0	1.0	1.0	1.0	1.0
Total Phthalates	0.000								N/A	N/A	N/A	NA	NA	NA			64.5				

Loadings with Actual Sampling Data

	Hiwassee Water Total Stream Loading				Upstream Background Mass Allocation		Resolute Water Quality Allowance		Cleveland Water Quality Allowance			Olin Water Quality Allowance	
	Instream Effluent Conc.		Instream Effluent Mass										
EFFLUENT	Chronic	Acute	Chronic	Acute			Chronic	Acute	Pass Through	Chronic	Acute	Chronic	Acute
CHARACTERISTIC	ug/l	ug/l	lb/day	lb/day	ug/l	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Copper	18.4	25.4	44.5	61.4	2.330	4.43	4.800	4.80	14.41	0.690	2.57	0.102	0.102
Chromium III	437.2	3361.2	1057.8	8132.1	0.500	0.95	0.950	0.95	0.00	0.190	0.65	0.25	0.25
Chromium VI	11.0	16.0	26.6	38.7	0.500	0.95	0.950	0.95	0.00	0.190	0.65	0.25	0.25
Chromium, Total	100.0	100.0	636.4	636.4	0.500	0.95	0.950	0.95	10.81	0.190	0.65	0.25	0.25
Nickel	100.0	100.0	275.7	636.4	5.000	9.51	4.500	4.50	32.43	0.620	2.27	0.49	0.49
Cadmium	0.7	4.2	1.6	10.1	0.331	0.63	0.001	0.001	0.90	0.080	0.16	0.01	0.01
Lead	5.0	5.0	14.8	31.8	1.100	2.09	3.600	3.60	8.11	0.300	1.020	0.02	0.02
Mercury (T)	0.1	0.1	0.32	0.32	0.006	0.01	0.090	0.09	0.07	0.0002	0.0004	0.123	0.18
Silver		0.6		1.5	0.318	0.61	0.001	0.001	0.90	0.110	0.32	0.02	0.02
Zinc	425.5	422.0	1029.4	1021.0	28.300	53.81	16.400	16.40	36.03	4.250	6.93	0.15	0.15
Cyanide	5.2	22.0	12.6	53.2	2.600	4.94	0.010	0.01	41.43	0.860	3.49	0.097	0.097
Toluene	1000.0	1000.0	6364.3	6364.3	0.000	0.00	172.3	172.3	2.70	0.280	0.30	0.05	0.05
Benzene	5.0	5.0	31.8	31.8	0.000	0.00	304.0	304.0	0.54	0.060	0.06	0.01	0.01
1,1,1 Trichloroethane	200.0	200.0	1272.9	1272.9	0.000	0.00	219.6	219.6	5.40	0.060	0.06	0.01	0.01
Ethylbenzene	530.0	530.0	3373.1	3373.1	0.000	0.00	226.3	226.3	0.72	0.060	0.06	0.01	0.01
Carbon Tetrachloride	2.3	2.3	14.6	14.6	0.000	0.00	249.9	249.9	2.70	0.060	0.06	0.01	0.01
Chloroform	57.0	57.0	362.8	362.8	0.000	0.00	8.40	14.10	15.31	1.45	2.98	0.051	0.051
Tetrachloroethylene	5.0	5.0	31.8	31.8	0.000	0.00	192.5	192.5	4.50	0.09	0.17	0.01	0.01
Trichloroethylene	5.0	5.0	31.8	31.8	0.000	0.00	165.5	165.5	1.80	0.060	0.06	0.01	0.01
1,2 trans Dichloroethylene	100.0	100.0	636.4	636.4	0.000	0.00	148.6	148.6	0.27	0.060	0.06	0.01	0.01
Methylene Chloride	46.0	46.0	292.8	292.8	0.000	0.00	0.2	0.2	9.01	0.28	0.3	0.051	0.051
Total Phenols	10000.0	10000.0	63642.5	63642.5	0.000	0.00	1925.3	1925.3	9.01	3.23	6.49	0.407	0.407
Naphthalene					0.000	0.00	1317.3	1317.3	0.18	0.060	0.06	0.01	0.01
Total Phthalates					0.000	0.00							

Percentage of Stream Loadings with Actual Sampling Data

	Application/Sampled Data									
	Upstream Background Mass Allocation		Resolute Water Quality Allowance		Cleveland Water Quality Allowance		Olin Water Quality Allowance		Remaining Allowance	
EFFLUENT	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
CHARACTERISTIC	%	%	%	%	%	%	%	%	%	%
Copper	9.96	7.21	10.80	7.81	1.55	4.18	0.23	0.17	77.5	80.6
Chromium III	0.09	0.01	0.09	0.01	0.02	0.01	0.02	0.00	99.8	100.0
Chromium VI	3.57	2.46	3.57	2.45	0.71	1.68	0.95	0.66	91.2	92.8
Chromium, Total	0.15	0.15	0.15	0.15	0.03	0.10	0.04	0.04	99.6	99.6
Nickel	3.45	1.49	1.63	0.71	0.22	0.36	0.18	0.08	94.5	97.4
Cadmium	39.30	6.23	0.06	0.01	4.99	1.58	0.31	0.05	55.3	92.1
Lead	14.17	6.57	24.38	11.31	2.03	3.21	0.12	0.05	59.3	78.9
Mercury (T)	3.59	3.59	28.28	28.28	0.06	0.13	38.65	55.21	29.4	12.8
Silver		39.30		0.06		20.77		1.06		38.8
Zinc	5.23	5.27	1.59	1.61	0.41	0.68	0.01	0.01	92.8	92.4
Cyanide	39.30	9.29	0.08	0.02	6.84	6.56	0.77	0.18	53.0	84.0
Toluene	0.00	0.00	2.71	2.71	0.00	0.00	0.00	0.00	97.3	97.3
Benzene	0.00	0.00	955.31	955.31	0.19	0.19	0.03	0.03	-855.5	-855.5
1,1,1 Trichloroethane	0.00	0.00	17.25	17.25	0.00	0.00	0.00	0.00	82.7	82.7
Ethylbenzene	0.00	0.00	6.71	6.71	0.00	0.00	0.00	0.00	93.3	93.3
Carbon Tetrachloride	0.00	0.00	1707.57	1707.57	0.41	0.41	0.07	0.07	-1608.0	-1608.0
Chloroform	0.00	0.00	2.316	3.887	0.40	0.82	0.01	0.01	97.3	95.3
Tetrachloroethylene	0.00	0.00	605.03	605.03	0.28	0.53	0.03	0.03	-505.3	-505.6
Trichloroethylene	0.00	0.00	520.12	520.12	0.19	0.19	0.03	0.03	-420.3	-420.3
1,2 trans Dichloroethylene	0.00	0.00	23.35	23.35	0.01	0.01	0.00	0.00	76.6	76.6
Methylene Chloride	0.00	0.00	0.07	0.07	0.10	0.10	0.02	0.02	99.8	99.8
Total Phenols	0.00	0.00	3.03	3.03	0.01	0.01	0.00	0.00	97.0	97.0
Naphthalene										
Total Phthalates										

Calculation of Pass-Through Limits for 2017 permit

	Pass-Through Limits													
	Upstream Background Mass Allocation		Resolute Water Quality Allowance		Olin Water Quality Allowance		Cleveland Allowance						Remaining Allowance	
EFFLUENT	Chronic	Acute	Chronic	Acute	Chronic	Acute	Average	Maximum	Effluent Case	Pass Thorugh Limit	Chronic	Acute	Chronic	Acute
CHARACTERISTIC	%	%	%	%	%	%	ug/L	ug/L	ug/l	ug/l	%	%	%	%
Copper	9.96	7.21	10.80	7.81	0.23	0.17	123.41	170.51	80.0	80.00	32.4	23.5	46.60	61.35
Chromium III	0.09	0.01	0.09	0.01	0.02	0.00	2936.05	22571.23		2936.05	50.0	6.5	49.80	93.47
Chromium VI	3.57	2.46	3.57	2.45	0.95	0.66	73.87	107.44		73.87	50.0	34.4	41.90	60.06
Chromium, Total	0.15	0.15	0.15	0.15	0.04	0.04	1766.44	1766.44	60.0	60.00	1.7	1.7	97.96	97.96
Nickel	3.45	1.49	1.63	0.71	0.18	0.08	765.25	1766.44	180.0	180.00	11.8	5.1	82.98	92.63
Cadmium	39.30	6.23	0.00	0.00	0.00	0.00	4.45	28.06	5.0	4.45	50.0	7.9	10.70	85.84
Lead	14.17	6.57	24.38	11.31	0.12	0.05	40.98	88.32	45.0	40.98	50.0	23.2	11.34	58.86
Mercury (T)	3.59	3.59	28.28	28.28	38.65	55.21	0.52	0.23	0.4	0.228	12.92	12.92	16.56	0.000
Silver		39.30		0.00		1.06		4.28	5.0	4.28		50.0		9.65
Zinc	5.23	5.27	1.59	1.61	0.01	0.01	2857.09	2833.91	200.0	200.00	3.5	3.5	89.66	89.58
Cyanide	39.30	9.29	0.00	0.00	0.77	0.18	34.92	147.74	230.0	34.92	50.0	11.8	9.93	78.71
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	17664.35	17664.35	15.0	15.00	0.0	0.0	99.96	99.96
Benzene	0.00	0.00	0.00	0.00	0.00	0.00	88.32	88.32	3.0	3.00	1.7	1.7	98.30	98.30
1,1,1 Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	3532.87	3532.87	30.0	30.00	0.4	0.4	99.58	99.58
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	9362.11	9362.11	4.0	4.00	0.0	0.0	99.98	99.98
Carbon Tetrachloride	0.00	0.00	0.00	0.00	0.00	0.00	40.63	40.63	15.0	15.00	18.5	18.5	81.54	81.54
Chloroform	0.00	0.00	2.32	3.89	0.01	0.01	1006.87	1006.87	85.0	85.00	4.2	4.2	93.45	91.88
Tetrachloroethylene	0.00	0.00	0.00	0.00	0.00	0.00	88.32	88.32	25.0	25.00	14.2	14.2	85.85	85.85
Trichloroethylene	0.00	0.00	0.00	0.00	0.00	0.00	88.32	88.32	10.0	10.00	5.7	5.7	94.34	94.34
1,2 trans Dichloroethylene	0.00	0.00	0.00	0.00	0.00	0.00	1766.44	1766.44	1.5	1.50	0.0	0.0	99.96	99.96
Methylene Chloride	0.00	0.00	0.07	0.07	0.00	0.00	812.56	812.56	50.0	50.00	3.1	3.1	96.85	96.85
Total Phenols	0.00	0.00	0.00	0.00	0.00	0.00	176643.52	176643.52	50.0	50.00	0.0	0.0	99.99	99.99
Naphthalene									1.0	1.00				
Total Phthalates									64.5	64.50				

Comparison of Water Quality Calculations and Pass Through Limits

	2012 Permit		2017 Draft with Standard Spreadsheet		2017 Site Specific		Application	
	Chronic	Acute	Chronic	Acute	Chronic	Acute	Average Conc.	Maximum Conc.
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Copper (a,b)	127.1	193.8	78.21	118.73	123.41	170.51	**8.0**	**27.0**
Chromium III	4037.7	31122.5	2518.24	19412.21	2936.05	22571.23	**2.0**	**4.0**
Chromium VI	83.6	127.2	55.64	84.53	73.87	107.44	**2.0**	**4.0**
Chromium, Total		1618.7		1648.34		1766.44	**2.0**	**4.0**
Nickel (a,b)	979.6	1491.3	608.23	1518.53	765.25	1766.44	**7.0**	**14.0**
Cadmium (a,b)	3.2	36.3	2.08	22.39	4.45	28.06	**<1**	**<1**
Lead (a,b)	48.7	64.6	29.46	65.78	40.98	88.32	**4.0**	**11.0**
Mercury (T) (c,e)	0.4	0.4	0.74	0.74	0.52	0.23	**0.002210**	**0.004070**
Silver (a,b,f)		3.34		2		4.28	**1.0**	**2.0**
Zinc (a,b)	3706.1	3674.1	2302	2282.05	2857.09	2833.91	**57.0**	**110.0**
Cyanide (d)	24	170.4	16.32	113.39	34.92	147.74	**10.0**	**46.0**
Toluene	16425.9	16425.9	16726.85	16726.85	17664.35	17664.35	**<5**	**<5**
Benzene	82.1	82.1	83.63	83.63	88.32	88.32	**<1**	**<1**
1,1,1 Trichloroethane	3285.2	3285.2	3345.37	3345.37	3532.87	3532.87	**<1**	**<1**
Ethylbenzene	8705.7	8705.7	8865.23	8865.23	9362.11	9362.11	**<1**	**<1**
Carbon Tetrachloride	37.8	37.8	38.47	38.47	40.63	40.63	**<1**	**<1**
Chloroform	936.3	936.3	953.43	953.43	1006.87	1006.87	**25.0**	**50.0**
Tetrachloroethylene	82.1	82.1	83.63	83.63	88.32	88.32	**2.0**	**3.0**
Trichloroethylene	82.1	82.1	83.63	83.63	88.32	88.32	**<1**	**<1**
1,2 trans Dichloroethylene	1642.6	1642.6	1672.69	1672.69	1766.44	1766.44	**<1**	**<1**
Methylene Chloride	755.6	755.6	769.44	769.44	812.56	812.56	**<5**	**<5**
Total Phenols	344944.4	344944.4	167268.52	167268.52	176643.52	176643.52	**<40**	**<40**
Naphthalene							**<1**	**<1**
Total Phthalates								

	2012 Pass Through Limits	2017 Pass Through Limits
	ug/L	ug/L
Copper (a,b)	80	80
Chromium III	Report Only	2936.05
Chromium VI	87.05	73.87
Chromium, Total	60	60.00
Nickel (a,b)	180	180.00
Cadmium (a,b)	3.61	4.45
Lead (a,b)	45	40.98
Mercury (T) (c,e)	0.26	0.23
Silver (a,b,f)	4.4	4.28
Zinc (a,b)	200	200.00
Cyanide (d)	45.31	34.92
Toluene	15	15
Benzene	3	3
1,1,1 Trichloroethane	30	30
Ethylbenzene	4	4
Carbon Tetrachloride	15	15
Chloroform	85	85
Tetrachloroethylene	25	25
Trichloroethylene	10	10
1,2 trans Dichloroethylene	1.5	1.5
Methylene Chloride	50	50
Total Phenols	50	50
Naphthalene	1	1
Total Phthalates	64.5	64.5

SAR Summary

TN0024121	PTL 12/8/2008	85% PTL	PTL 12/21/2011	Apr-16	Oct-15	Apr-15	Oct-14	Apr-14	Oct-13	Apr-13	Oct-12	Apr-12
COPPER	**0.08**	**0.068**	**0.08**	0.01100	0.00700	0.00500	0.01100	0.00500	0.017	0.01300	0.01000	0.02400
CHROMIUM, III	**report**	**N/A**	**N/A**	0.01000	0.01000	0.01000	0.01000	0.01000	0.01	0.01000	0.00300	0.01000
CHROMIUM, VI	**N/A**	**0.073993**	**0.08705**	0.01000	0.01000	0.01000	0.01000	0.01000	0.01	0.01000	0.01000	0.01000
CHROMIUM	**0.06**	**0.051**	**0.06**	0.00200	0.00400	0.00400	0.00020	0.00200	0.002	0.00200	0.00300	0.00300
NICKEL	**0.18**	**0.153**	**0.18**	0.00300	0.01200	0.00800	0.00600	0.00600	0.006	0.00800	0.00500	0.01000
CADMIUM	**0.00372**	**0.003069**	**0.00361**	1.00000	0.00100	0.00100	0.00100	0.00100	0.001	0.00100	0.00100	0.00100
LEAD	**0.045**	**0.03825**	**0.045**	0.00400	0.00700	**DNS**	0.00400	0.00400	0.004	0.00500	0.00800	0.00800
MERCURY	**0.0004**	**0.000221**	**0.00026**	0.00000	0.00000	0.00000	4.07E-06	0.000003	2.02E-06	0.000009	0.000005	0.000002
SILVER	**0.0037**	**0.00374**	**0.0044**	0.00170	0.00150	0.00150	0.00200	0.00130	0.0013	0.00130	0.00130	0.00061
ZINC	**0.2**	**0.17**	**0.2**	0.06000	0.04500	0.04300	0.04000	0.03500	0.069	0.07100	0.05600	0.06000
CYANIDE	**0.02866**	**0.038514**	**0.04531**	0.00890	0.01300	0.01900	0.02600	0.00500	0.005	0.00700	0.00700	0.00600
TOLUENE	**0.015**	**0.01275**	**0.015**									
BENZENE	**0.003**	**0.00255**	**0.003**									
1,1,1 TRICHLOROETHANE	**0.03**	**0.0255**	**0.03**									
ETHYLBENZENE	**0.004**	**0.0034**	**0.004**									
CARBON TETRACHLORIDE	**0.015**	**0.01275**	**0.015**									
CHLOROFORM	**0.085**	**0.07225**	**0.085**									
TETRACHLOROETHYLENE	**0.025**	**0.02125**	**0.025**									
TRICHLOROETHYLENE	**0.01**	**0.0085**	**0.01**									
1,2 TRANSDICHLOROETHYL	**0.0015**	**0.001275**	**0.0015**									
METHYLENE CHLORIDE	**0.05**	**0.0425**	**0.05**									
TOTAL PHENOLS	**0.05**	**0.0425**	**0.05**	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000
NAPHTHALENE	**0.001**	**0.00085**	**0.001**									
TOTAL PHTHALATES	**0.0645**	**0.054825**	**0.0645**									

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

APPENDIX 4
WQ Based Effluent Calculations- Other Compounds

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Cleveland STP
PERMIT: TN0024121
DATE: 1/1/8/2017

Stream (1Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
228	701	21.60	10	39	50

	1	2	3	5	6	7	8	9	10	11	12	13	14	15
	Stream	Dectection Levels		Fish/Aqua. Life		Calculated Effluent		Human Health Water Quality Criteria (30Q5)						Avg. daily
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria		Concentration		In-Stream Criteria			Calculated Effluent Concentration			effluent
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
ANTIMONY		3.8	3.0					640.0	5.6	6.0	10705.2	93.7	100.4	10.0
ARSENIC		1.0	1.0	150.0	340.0	866.7	1964.4	10.0	10.0	10.0	167.3	167.3	167.3	<1
BERYLLIUM		2.0	1.0							4.0			66.9	<2
SELENIUM		5.0	2.0	5.0	20.0	28.9	115.6			50.0			836.3	2.0
THALLIUM		5.0	*					0.47	0.24	2.0	7.9	4.0	33.5	<1
ACROLEIN	0.0	50.0	1.0					290.0	190.0		4850.8	3178.1		<50
ACRYLONITRILE	0.0	50.0	1.0					2.5	0.51		41.8	8.5		<10
BENZENE	0.0	1.0	1.0					510.0	22.0	5.0	8530.7	368.0	83.6	<1
BROMOFORM	0.0	1.0	1.0					1400.0	43.0		23417.6	719.3		<1
CARBON TETRACHLORIDE	0.0	1.0	1.0					16.0	2.3	5.0	267.6	38.5	83.6	<1
CHLOROBENZENE	0.0	1.0	*					1600.0	130.0		26763.0	2174.5		<1
CHLORODIBROMO-METHANE	0.0	1.0	*					130.0	4.0		2174.5	66.9		2.0
CHLOROETHANE	0.0	1.0	*											<5
2-CHLORO-ETHYLVINYL ETHER	0.0	1.0	*											<50
CHLOROFORM	0.0	5.0	0.5					4700.0	57.0		78616.2	953.4		25.0
DICHLOROBROMO-METHANE	0.0	1.0	1.0					170.0	5.5		2843.6	92.0		6.0
1,1-DICHLOROETHANE	0.0	1.0	1.0					NA	NA	NA	NA	NA	NA	<1
1,2-DICHLOROETHANE	0.0	1.0	1.0					370.0	3.8	5.0	6188.9	63.6	83.6	<1
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*					10000	140.0	100.0	167268.5	2341.8	1672.7	<1
1,1-DICHLOROETHYLENE	0.0	1.0	1.0											<1
1,2-DICHLOROPROPANE	0.0	1.0	*					150.0	5.0	5.0	2509.0	83.6	83.6	<1
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0					210.0	3.4		3512.6	56.9		<1
ETHYLBENZENE	0.0	1.0	1.0					2100	530.0	700.0	35126.4	8865.2	11708.8	<1
METHYL BROMIDE	0.0	1.0	*					1500.0	47.0	*	25090.3	786.2		<5
METHYL CHLORIDE	0.0	1.0	1.0											<2.5
METHYLENE CHLORIDE	0.0	5.0	1.0					5900.0	46.0		98688.4	769.4		<5
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5					40.0	1.7		669.1	28.4		<1
TETRACHLORO-ETHYLENE	0.0	1.0	0.5					33.0	6.9	5.0	552.0	115.4	83.6	2.0
TOLUENE	0.0	1.0	1.0					15000	1300.0	1000.0	250902.8	21744.9	16726.9	<5
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0							200.0			3345.4	<1
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2					160.0	5.9	5.0	2676.3	98.7	83.6	<1
TRICHLORETHYLENE	0.0	1.0	1.0					300.0	25.0	5.0	5018.1	418.2	83.6	<1
VINYL CHLORIDE	0.0	1.0	2.0					24.0	0.25	2.0	401.4	4.2	33.5	<1
P-CHLORO-M-CRESOL	0.0	10.0	*											<10
2-CHLOROPHENOL	0.0	10.0	*					150.0	81.0		2509.0	1354.9		<10
2,4-DICHLOROPHENOL	0.0	10.0	*					290.0	77.0		4850.8	1288.0		<10
2,4-DIMETHYLPHENOL	0.0	10.0	*					850.0	380.0		14217.8	6356.2		<10
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0					280.0	13.0		4683.5	217.4		<10
2,4-DINITROPHENOL	0.0	10.0	42.0					5300.0	69.0		88652.3	1154.2		<10
2-NITROPHENOL	0.0	10.0	*											<10
4-NITROPHENOL	0.0	10.0	*											<10
PENTACHLOROPHENOL	0.0	10.0	5.0	15	19	86.7	109.8	30.0	2.7	1.0	501.8	45.2	16.7	<10
PHENOL	0.0	10.0	*					1700000	21000.0		28435648.1	351263.9		<10
2,4,6-TRICHLOROPHENOL	0.0	10.0	2.7					24.0	14.0		401.4	234.2		<10
ACENAPHTHENE	0.0	10.0	*					990.0	670.0		16559.6	11207.0		<1
ACENAPHTHYLENE	0.0	10.0	2.3											<1
ANTHRACENE	0.0	10.0	0.7					40000	8300.0		669074.1	138832.9		<1

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Cleveland STP
PERMIT: TN0024121
DATE: 1/1/8/2017

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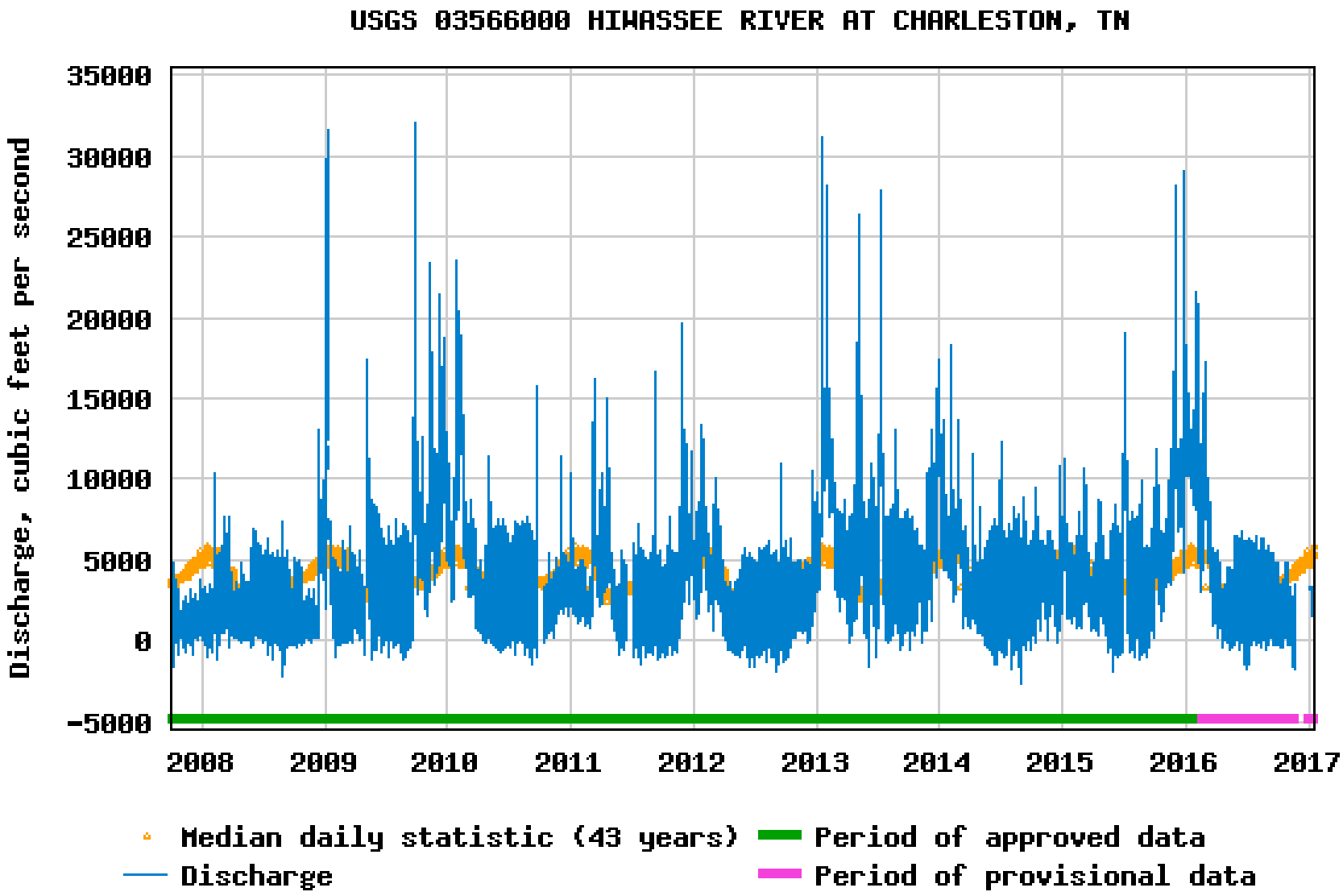
	Stream	Dectection Levels		Fish/Aqua. Life		Calculated Effluent		Human Health Water Quality Criteria (30Q5)						Avg. daily
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria		Concentration		In-Stream Criteria			Calculated Effluent Concentration			effluent
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
BENZIDINE	0.0	50.0	*					0.0020	0.0009		0.033	0.0		<10
BENZO(A)ANTHRACENE	0.0	10.0	0.3					0.18	0.038		3.0	0.6		<1
BENZO(A)PYRENE	0.0	10.0	0.3					0.18	0.038	0.2	3.0	0.6	3.3	<1
3,4 BENZO-FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		3.0	0.6		<1
BENZO(GHI)PERYLENE	0.0	10.0	*											<1
BENZO(K)FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		3.0	0.6		<1
BIS (2-CHLOROETHOXY) METHANE	0.0	10.0	*											<10
BIS (2-CHLOROETHYL)-ETHER	0.0	10.0	1.0					5.3	0.30		88.7	5.0		<10
BIS (2-CHLOROISO-PROPYL) ETHER	0.0	10.0	*					65000	1400.0		1087245.4	23417.6		<10
BIS (2-ETHYLHEXYL) PHTHALATE	0.0	10.0	2.5					22.0	12.0	6.0	368.0	200.7	100.4	<3
4-BROMOPHENYL PHENYL ETHER	0.0	10.0	*											<10
BUTYL BENZYL PHTHALATE	0.0	10.0	*					1900.0	1500.0		31781.0	25090.3		<3
2-CHLORONAPHTHALENE	0.0	10.0	*					1600.0	1000.0		26763.0	16726.9		<1
4-CHLORPHENYL PHENYL ETHER	0.0	10.0	*											<10
CHRYSENE	0.0	10.0	2.5					0.18	0.038		3.0	0.6		<1
DI-N-BUTYL PHTHALATE	0.0	10.0	2.5					4500.0	2000.0		75270.8	33453.7		<3
DI-N-OCTYL PHTHALATE	0.0	10.0	*											<3
DIBENZO(A,H) ANTHRACENE	0.0	10.0	*					0.18	0.038		3.0	0.6		<1
1,2-DICHLOROBENZENE	0.0	1.0	2.0					1300.0	420.0		21744.9	7025.3		<1
1,3-DICHLOROBENZENE	0.0	5.0	2.0					960.0	320.0		16057.8	5352.6		<1
1,4-DICHLOROBENZENE	0.0	5.0	2.0					190.0	63.0		3178.1	1053.8		<1
3,3-DICHLOROBENZIDINE	0.0	10.0	*					0.28	0.2		4.7	3.5		<10
DIETHYL PHTHALATE	0.0	10.0	1.9					44000	17000.0		735981.5	284356.5		<3
DIMETHYL PHTHALATE	0.0	10.0	1.6					1100000	270000.0		18399537.0	4516250.0		<3
2,4-DINITROTOLUENE	0.0	10.0	1.0					34.0	1.1		568.7	18.4		<10
2,6-DINITROTOLUENE	0.0	10.0	*											<10
1,2 DIPHENYLHYDRAZINE	0.0	10.0	*					2.0	0.4		33.5	6.0		<10
FLUORANTHENE	0.0	10.0	2.2					140.0	130.0		2341.8	2174.5		<1
FLUORENE	0.0	10.0	0.3					5300.0	1100.0		88652.3	18399.5		<1
HEXACHLOROBENZENE	0.0	10.0	1.9					0.0029	0.0028	1.0	0.049	0.0	16.7	<1
HEXACHLOROBUTADIENE	0.0	10.0	5.0					180.0	4.4		3010.8	73.6		<10
HEXACHLOROCYCLO-PENTADIENE	0.0	10.0	*					1100.0	40.0	50.0	18399.5	669.1	836.3	<10
HEXACHLOROETHANE	0.0	10.0	0.5					33.0	14.0		552.0	234.2		<10
INDENO(1,2,3-CD)PYRENE	0.0	10.0	*					0.18	0.038		3.0	0.6		<1
ISOPHORONE	0.0	10.0	*					9600	350.0		160577.8	5854.4		<10
NAPHTHALENE	0.0	10.0	*											<1
NITROBENZENE	0.0	10.0	10.0					690.0	17.0		11541.5	284.4		<10
N-NITROSODI-N-PROPYLAMINE	0.0	10.0	*					5.1	0.050		85.3	0.8		<10
N-NITROSODI- METHYLAMINE	0.0	10.0	*					30.0	0.0069		501.8	0.1		<10
N-NITROSODI-PHENYLAMINE	0.0	10.0	*					60.0	33.0		1003.6	552.0		<10
PHENANTHRENE	0.0	10.0	0.7											<1
PYRENE	0.0	10.0	0.3					4000.0	830.0		66907.4	13883.3		<1
1,2,4-TRICHLOROBENZENE	0.0		*					70.0	35.0	70.0	1170.9	585.4	1170.9	<10

APPENDIX 5
USGS Stream Flow Rates



Bradley County, Tennessee
Hydrologic Unit Code 06020002
Latitude 35°17'42.27", Longitude 84°45'36.05" NAD27
Drainage area 2,298 square miles
Gage datum 665.56 feet above NGVD29

Output formats

HTML table of all data
Tab-separated data
Reselect output format

00060, Discharge, cubic feet per second,

YEAR	Monthly mean in ft3/s (Calculation Period: 2011-01-01 -> 2016-01-31) Period-of-record for statistical calculation restricted by user											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	3,274	2,355	5,710	6,473	1,791	1,987	1,981	2,211	3,464	2,389	4,468	6,333
2012	6,431	4,421	4,275	1,085	1,211	1,624	1,501	1,837	2,468	2,780	2,805	3,685
2013	11,600	10,410	5,154	5,067	8,451	5,670	8,316	5,721	4,523	4,249	3,739	8,616
2014	7,150	7,268	4,179	3,425	2,505	3,439	3,466	3,617	3,464	4,025	4,005	3,867
2015	4,827	3,740	4,229	4,108	2,605	3,192	6,565	4,303	2,889	5,653	6,791	12,540
2016	12,420											
Mean of monthly Discharge	7,620	5,640	4,710	4,030	3,310	3,180	4,370	3,540	3,360	3,820	4,360	7,010

** No Incomplete data have been used for statistical calculation