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

April 28, 2022

Mr. Ken Collins
Senior Director, Site Leader
e-copy: Ken.Collins@wacker.com
PO Box 446
Charleston, TN 37310

Subject: **NPDES Permit No. TN0081311**
Wacker Polysilicon North America, LLC
Charleston, Bradley County, Tennessee

Dear Mr. Collins:

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

Please be advised that a petition for permit appeal may be filed, pursuant to T.C.A. Section 69-3-105, subsection (i), by the permit applicant or by any aggrieved person who participated in the public comment period or gave testimony at a formal public hearing whose appeal is based upon any of the issues that were provided to the commissioner in writing during the public comment period or in testimony at a formal public hearing on the permit application.

Additionally, for those permits for which the department gives public notice of a draft permit, any permit applicant or aggrieved person may base a permit appeal on any material change to conditions in the final permit from those in the draft, unless the material change has been subject to additional opportunity for public comment.

Any petition for permit appeal under this subsection (i) shall be filed with the Technical Secretary of the Water Quality, Oil and Gas Board within thirty (30) days after public notice of the commissioner's decision to issue or deny the permit. A copy of the filing should also be sent to TDEC's Office of General Counsel.

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

If you have questions, please contact the Chattanooga Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Mr. Courtland Vice at (615) 532-0625 or by E-mail at *Courtland.Vice@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Chattanooga Environmental Field Office
Mr. Howard Chu, VP Corporate Engineering & EHSS, Howard.Chu@wacker.com
Mr. Jeremy Copeland, Environmental Manager, jeremy.copeland@wacker.com
Mr. Joseph Shane Shane Geren, Environmental Engineer, Wacker Polysilicon North America, LLC, josephshane.geren@wacker.com

STATE of TENNESSEE

NPDES PERMIT

Authorization to Discharge Under the
National Pollutant Discharge Elimination System (NPDES)
Permit Number TN0081311

Issued by

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:	**Wacker Polysilicon North America, LLC**
is authorized to discharge:	process wastewater, non-contact cooling water and utility water from Outfall 001, return water from river water intake from Outfall 002, industrial stormwater, construction stormwater, utility water, and hydrostatic testing water from Outfall SW1, construction stormwater and utility water from Outfall SW2, construction stormwater and utility water and hydrostatic test water from Outfall SW2A, construction stormwater, hydrostatic test water and utility water from Outfall SW3, and industrial and construction stormwater runoff, utility water, and hydrostatic testing water from SW4; and to operate a cooling water intake structure
from a facility located at:	553 Wacker Boulevard, Charleston, Bradley County, Tennessee
to receiving waters named:	Hiwassee River Embayment of Chickamauga Reservoir at mile 15.9 (Outfall 001), mile 16.5 (Outfall 002), and South Mouse Creek at mile 1.7 (Outfall SW1), mile 1.4 (Outfall SW4), mile 2.0 (Outfall SW2), mile 2.5 (Outfall SW2A), and mile 2.75 (Outfall SW3)

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

This permit shall become effective on: **May 1, 2022**
This permit shall expire on: **March 31, 2027**
Issuance date: **April 28, 2022**

for Jennifer Dodd
Director

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PART 1

1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

Wacker Polysilicon North America, LLC (the permittee) is authorized to discharge process wastewater, non-contact cooling water and utility water from Outfall 001 (mile 15.9) and return water from river water intake from Outfall 002 (mile 16.5) to the Hiwassee River Embayment of Chickamauga Reservoir. The permittee is also authorized to discharge industrial stormwater, construction stormwater, utility water, and hydrostatic testing water from Outfall SW1 (mile 1.7, South Mouse Creek) and SW4 (mile 1.4, South Mouse Creek) to the Hiwassee River Embayment of Chickamauga Reservoir, and construction stormwater and utility water from Outfall SW2 (mile 2.0), construction stormwater, utility water, and hydrostatic test water from Outfall SW2A (mile 2.5), construction stormwater, hydrostatic test water, and utility water from Outfall SW3 (2.75) to the South Mouse Creek. The permittee also is authorized to operate a cooling water intake structure on the Hiwassee River Embayment of the Chickamauga Reservoir.

1.1.1. Numeric Effluent Limitations

Authorized discharges shall be limited and monitored by the permittee as specified below:

TIER 1 – 1.6 MGD
Description: External Outfall, Number: 001, Monitoring: Effluent Gross, Season: All Year

Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
pH	>=	6.0	SU	Grab	Daily	Daily Minimum
pH	<=	9.0	SU	Grab	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Monthly Average
Total Dissolved Solids (TDS)	<=	117,588	lb/d	Composite	Daily	Daily Maximum
LC50 Static 48Hr Acute Ceriodaphnia	>=	1.7	% mortality	Grab	Annual	Minimum
LC50 Static 48Hr Acute Pimephales promelas	>=	1.7	% mortality	Grab	Annual	Minimum

TIER 2 – 3.96 MGD Description: External Outfall, Number: 001, Monitoring: Effluent Gross, Season: All Year						
Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
pH	>=	6.0	SU	Grab	Daily	Daily Minimum
pH	<=	9.0	SU	Grab	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Monthly Average
Total Dissolved Solids (TDS)	<=	117,588	lb/d	Composite	Daily	Daily Maximum
IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>=	1.3	% mortality	Grab	Annual	Minimum
IC25 Static Renewal 7 Day Chronic Pimephales promelas	>=	1.3	% mortality	Grab	Annual	Minimum

TIER 3 – 6.34 MGD Description: External Outfall, Number: 001, Monitoring: Effluent Gross, Season: All Year						
Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
pH	>=	6.0	SU	Grab	Daily	Daily Minimum
pH	<=	9.0	SU	Grab	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Daily Maximum
Flow	Report	-	MGD	Continuous	Daily	Monthly Average
Total Dissolved Solids (TDS)	<=	117,588	lb/d	Composite	Daily	Daily Maximum
IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>=	2.0	% mortality	Grab	Annual	Minimum
IC25 Static Renewal 7 Day Chronic Pimephales promelas	>=	2.0	% mortality	Grab	Annual	Minimum

See **Part 1.2.3** for test procedures.

See **Part 3.2 and 3.3** for biomonitoring test and reporting requirements.

The permittee is authorized to discharge river water intake return water through Outfall 002 without limitations or monitoring requirements. The discharge shall not have any visible oil sheen and reasonable steps shall be taken to prevent the return of unsightly materials to the receiving waters. This discharge must result in no other materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

Description: External Outfall, Number: SW1 and SW4 Monitoring: Effluent Gross, Season: All Year

Parameter	Qualifier	Value*	Unit	Sample Type	Monitoring Frequency	Statistical Base
Nitrogen, Ammonia total (as N)	<=	4.0	mg/L	Grab	Annual	Daily Maximum
Nitrite plus Nitrate (as N)	<=	0.68	mg/L	Grab	Annual	Daily Maximum
Magnesium, total (as Mg)	<=	0.064	mg/L	Grab	Annual	Daily Maximum
Copper, total (as Cu)	<=	0.018	mg/L	Grab	Annual	Daily Maximum
Iron, total (as Fe)	<=	5.0	mg/L	Grab	Annual	Daily Maximum
Aluminum, total (as Al)	<=	0.75	mg/L	Grab	Annual	Daily Maximum
Flow	Report	-	MGD	Estimate	Annual	Daily Maximum

* Numeric values listed in the table are Benchmarks for Industrial Inorganic Chemicals Monitoring Requirements. The permittee shall evaluate the results obtained from sampling and monitoring pursuant to the table above. The evaluation should be done following the required annual sampling events to determine whether the facility is below, meets, or exceeds the monitoring benchmarks. If the results of annual stormwater runoff monitoring demonstrate that the facility has exceeded the benchmark(s), the permittee must inform the Chattanooga Environmental Field Office (EFO) in writing; within 30 days from the time stormwater monitoring results were received, describing the likely cause of the exceedance(s). Furthermore, within 60 days from the time stormwater monitoring results were received, the facility must:

- Review its SWPPP, make any modifications or additions to the SWPPP which would assist in reducing specific effluent concentrations which are equal to or less than the monitoring benchmarks for that facility, and
- Submit to the EFO a brief summary of the proposed SWPPP modifications (including a timetable for implementation).

Outfalls SW1, SW2A, SW3 and SW4 are also subject to the following requirements applicable to hydrostatic test water discharges:

Internal Monitoring Point: IMP1 (to SW1), IMP2A (to SW2A), IMP3 (to SW3) and IMP4 (to SW4) Monitoring: All Weather, Season: All Year						
Parameter	**Qualifier**	**Value**	**Unit**	**Sample Type**	**Monitoring Frequency**	**Statistical Base**
pH	>=	6.0	SU	Grab	Once Per Discharge	Daily Minimum
pH	<=	9.0	SU	Grab	Once Per Discharge	Daily Maximum
Flow	Report	-	MGD	Estimate	Once Per Discharge	Total
Oil and grease visual	Report	-	Y=1;N=0	Visual	Once Per Discharge	Value

a) Cleaning water; and pipe, equipment or vessel residuals may not be discharged as hydrostatic discharges; but must be treated if similar to facility wastewaters or disposed of according to all appropriate state and federal regulations;
b) The construction, transportation and storage of the vessels to be tested shall be done in such a way that prevents debris and materials from being deposited within the vessel where it may later be washed out by hydrostatic test water and released to surface or subsurface water;
c) The discharger shall use proper engineering practices and Best Management Practices (BMPs) to prevent contamination of hydrostatic test water by fuels, lubricants or waste materials. Used vessels or piping must be cleaned prior to testing.
d) Each hydrostatic discharge must be sampled at the point of discharge from the pipe, vessel or equipment being tested according to the Internal Monitoring Point table immediately above and reported on a Discharge Monitoring Report (DMR) form due on the date of the next process DMR form.

Outfalls SW1, SW2, SW2A, SW3 and SW4 are subject to the following requirements:

(a) Erosion and sediment controls. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:
    1. Control stormwater volume and velocity to minimize soil erosion in order to minimize pollutant discharges;
    2. Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points;
    3. Minimize the amount of soil exposed during construction activity;

4. Minimize the disturbance of steep slopes;
5. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
6. Provide and maintain natural buffers around waters of the United States, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible;
7. Minimize soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted; and
8. Unless infeasible, preserve topsoil. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.

(b) Soil stabilization. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have Wacker Polysilicon North America, LLC NPDES Permit TN0081311 Page 5 of 31 permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In arid, semiarid, and drought stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permitting authority. Stabilization must be completed within a period of time determined by the permitting authority. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.

(c) Dewatering. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

(d) Pollution prevention measures. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

1. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
2. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on

the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use); and

3. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

(e) Prohibited discharges. The following discharges are prohibited:

1. Wastewater from washout of concrete, unless managed by an appropriate control;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
4. Soaps or solvents used in vehicle and equipment washing.

(f) Surface outlets. When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Outfalls SW1, SW2, SW2A and SW4 are authorized to discharge utility water in the amount of approximately 500 gallons per month with only the general monitoring requirements and conditions required of all outfalls as listed below.

Additional monitoring requirements and conditions applicable to all outfalls include:

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, which 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.

Cooling Water Intake Section 316(b) Requirements

TDEC has determined that the cooling water intake structure used by the Wacker Polysilicon North America, LLC was designed to meet the best technology available (BTA) to minimize adverse environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326). The permittee was notified of this determination by letter from Mr. Vojin Janjic on March 8, 2013. The design data and any new pertinent information must be submitted with the application for renewal of this permit.

1.1.2. Narrative Conditions

Additional monitoring and reporting requirements and conditions include:

Due Date	Narrative Condition
30 days prior to Tier change	The permittee shall notify the Division in writing both to water.permits@tn.gov and as an attachment to a DMR in NetDMR of the permittee's intention to advance to a higher Tier. Notification must be at least 30 days prior to the anticipated Tier change.

The authorized discharge(s) shall not:

- Result in distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits, or sludge banks of such size or character as may be detrimental to fish and aquatic life.
- Result in total suspended solids, turbidity, or color in such amounts or character that will result in any objectionable appearance to the water, considering the nature and location of the water.
- Contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

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

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

Samples and measurements taken in compliance with the monitoring requirements specified herein shall be representative of the volume and nature

of the monitored discharge and shall be taken after treatment and prior to mixing with uncontaminated stormwater runoff or the receiving stream. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed and calibrated by a qualified source at least once every 12 months[1], and maintained to ensure that the accuracy of the measurements is consistent with accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of plus or minus 10% from the true discharge rates throughout the range of expected discharge volumes.

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

Samples and measurements taken in compliance with the monitoring requirements specified above shall be representative of the volume and nature of the monitored discharge. Samples must be representative of the effluent being discharged and collected prior to mixing with any other discharge or the receiving stream. This can be at a different point for different parameters but must be after all treatment for that parameter or all expected changes. Biomonitoring tests, if required, must be conducted on final effluent.

1.2.2. Sampling Frequency

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

If the required monitoring frequency is once per month or 1/month, the monitoring period is one month. If the discharge occurs during only one day in that period, the permittee must sample on that day and report the results of analyses accordingly.

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

1.2.3. Test Procedures

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

b) Unless otherwise noted in the permit, all pollutant parameters shall be determined using sufficiently sensitive methods in Title 40 CFR § 136, as amended, and promulgated pursuant to Section 304 (h) of the Act. The chosen methods must be sufficiently sensitive as required in state rule 0400-40-03-.05(8).

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

d) Where the analytical results are below the method detection limit (MDL), the permittee shall report the actual laboratory MDL and ML values. See **Section 1.3.4.** for instructions regarding reporting less than detection.

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

1.2.4. Recording of Results

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

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

1.2.5. Records Retention

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

1.3. REPORTING

1.3.1. Monitoring Results

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

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

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

1.3.2. Additional Monitoring by Permittee

If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR § 136, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or other reporting form specified by the Commissioner. Such increased frequency shall also be indicated.

1.3.3. Falsifying Results and/or Reports

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

1.3.4. Reporting Less Than Detection; Reporting Significant Figures

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

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

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

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

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

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

1.3.5. Outlier Data

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

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

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

1.4. COMPLIANCE WITH SECTION 208

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

1.5. REOPENER CLAUSE

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 307(a)(2), and 304(b)(2) of the Clean Water Act, as amended, if the effluent standard or limitation 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.

1.7. ELECTRONIC REPORTING

This permit requires the submission of forms developed by the Director in order for a person to comply with certain requirements, including, but not limited to, making reports, submitting monitoring results, and applying for permits. The Director may make these forms available electronically and, if submitted electronically, then that electronic submission shall comply with the requirements of Chapter 0400-01-40.

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

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

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

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

PART 2

2. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Comply

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

2.1.2. Duty to Reapply

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

2.1.3. Proper Operation and Maintenance

a) The permittee shall at all times properly operate and maintain all facilities and systems (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, or other technology based effluent limitations such as those established in Tennessee Rule 0400-40-05-.09.

2.1.4. Duty to Provide Information

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

2.1.5. Right of Entry

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

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

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

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

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

2.1.6. Availability of Reports

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

2.1.7. Treatment Facility Failure (Industrial Sources)

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

2.1.8. Property Rights

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

2.1.9. Severability

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

2.1.10. Other Information

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

2.2. CHANGES AFFECTING THE PERMIT

2.2.1. Planned Changes

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

a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as defined in Rule 0400-40-05-.02;

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

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

2.2.2. Permit Modification, Revocation, or Termination

a) This permit may be modified, revoked and reissued, or terminated for cause as described in 40 CFR § 122.62 and § 122.64, Federal Register, Volume 49, No. 188 (Wednesday, September 26, 1984), as amended. Causes for such permit action include but are not limited to the following:

   i. Violation of any terms or conditions of the permit;
   ii. Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; and
   iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

b) The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

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

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

2.2.3. Change of Ownership

Except as provided in Tennessee Rule Chapter 0400-40-05-.06(5)(a) or (b), this permit may be transferred to another party (provided there are neither modifications to the facility or its operations, nor any other changes which might affect permit limits and conditions contained in the permit) by the permittee if:

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

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

c) The permittee shall provide the following information to the Director in their formal notice of intent to transfer ownership:

i. The permit number of the subject permit;
ii. The effective date of the proposed transfer;
iii. The name, address, and contact information of the transferor;
iv. The name, address, and contact information of the transferee;

v. The names of the responsible parties for both the transferor and transferee;
vi. A statement that the transferee assumes responsibility for the subject permit;
vii. A statement that the transferor relinquishes responsibility for the subject permit;
viii. The signatures of the responsible parties for both the transferor and transferee pursuant to the signatory requirements of subparagraph (i) of Rule 0400-40-05-.07(2); and
ix. A statement regarding any proposed modifications to the facility, its operations, or any other changes, which might affect the permit, limits and conditions contained in the permit.

2.2.4. Change of Mailing Address

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

2.3. NONCOMPLIANCE

2.3.1. Reporting of Noncompliance

a) 24-hour Reporting:

In the case of any noncompliance 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 EFO within 24 hours from the time the permittee becomes aware of the circumstances. The EFO should be contacted for names and phone numbers of the environmental response team.

A written submission must be provided via MyTDEC Forms 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 do not cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the permittee shall report the noncompliance on the DMR. 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.

2.3.2. Overflows and Releases

a) Sanitary sewer overflows, including dry-weather overflows, are prohibited.

b) The permittee shall operate the collection, transmission, and treatment system so as to avoid sanitary sewer overflows and releases due to improper operation or maintenance. A "release" may be due to improper operation or maintenance of the collection system or may be due to other cause(s). Releases caused by improper operation or maintenance of the permittee's collection, transmission, and treatment system are prohibited.

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

d) No new or additional flows shall be added upstream of any point in the collection, transmission, or treatment system that experiences greater than 5 sanitary sewer overflows and/or releases per year[2] or would otherwise 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 or release point are less than or proportional to the amount of inflow and infiltration removal documented upstream from that point.

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

The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to the permittee's DMR and uploaded to NetDMR. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

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

f) Unpermitted discharges from the collection or treatment system of industrial facilities are prohibited.

2.3.3. Upset

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

2.3.4. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2.3.5. Bypass

a) "*Bypass*" means 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 the following conditions are met:

   i. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
   ii. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
   iii. For anticipated bypass, the permittee submits prior notice, if possible at least ten days before the date of the bypass, or for unanticipated bypass, the permittee submits notice of an unanticipated bypass within 24 hours from the time that the permittee becomes aware of the bypass.

c) Bypasses that do not cause effluent limitations to be exceeded may be allowed only if the bypass is necessary for essential maintenance to assure efficient operation and are not subject to the reporting requirements of part b)iii. above.

2.3.6. Washout

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

b) A washout is prohibited. If a washout occurs the permittee must report the incident to the Division in the appropriate EFO within 24 hours by telephone. A written submission must be provided within five days. The washout must be noted on that month's DMR. Each day of a washout is a separate violation.

2.4. LIABILITIES

2.4.1. Civil and Criminal Liability

Except as provided in permit conditions for "*Bypass*" (**Section 2.3.5**), "*Overflows and Releases*" (**Section 2.3.2**), and "*Upset*" (**Section 2.3.3**), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including, but not limited to, fish kills and losses of aquatic life and/or wildlife as a result of the discharge of wastewater to any surface or subsurface waters. Additionally, notwithstanding this permit, it shall be the responsibility of the permittee to conduct its wastewater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created.

2.4.2. Liability Under State Law

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

PART 3

3. PERMIT SPECIFIC REQUIREMENTS

3.1. TOXIC POLLUTANTS

The permittee shall notify the Division as soon as it knows or has reason to believe that:

a) Any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic substance(s) not limited in the permit (listed in 40 CFR 122, Appendix D, Table II and III), if that discharge will exceed the highest of the following "notification levels":

i. One hundred micrograms per liter (100 µg/L);
ii. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
iii. Five times the maximum concentration value reported for that pollutant(s) in the permit application in accordance with 40 CFR 122.21(g)(7); or
iv. The level established by the Director in accordance with 40 CFR 122.44(f).

b) Any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

i. Five hundred micrograms per liter (500 µg/L);
ii. One milligram per liter (1 mg/L) for antimony;
iii. Ten times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
iv. The level established by the Director in accordance with 40 CFR 122.44(f).

3.2. BIOMONITORING REQUIREMENTS, CHRONIC

For Tiers 2 and 3, 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.

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

Tier 2 Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
4 X PL	**2 X PL**	**Permit Limit (PL)**	**0.50 X PL**	**0.25 X PL**	**Control**
% effluent					
5.2	**2.6**	**1.3**	**0.7**	**0.33**	**0**

Tier 3 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					
8	**4**	**2.0**	**1**	**0.5**	**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).

All tests will be conducted using a minimum of three 24-hour, flow-proportionate composite samples of final effluent (*e.g.*, 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 the above-referenced *Short-term Methods* document, or if the required concentration-response review fails to yield a valid relationship per guidance contained in *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing*, EPA-821-B-00-004 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

The toxicity tests specified herein shall be conducted yearly (1/yr) for Outfall 001 and begin no later than 90 days from the effective date of this permit.

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

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

The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive tests (for the same outfall) demonstrating compliance. Following the completion of TIE/TRE study, the frequency of monitoring will return to a regular schedule, as defined previously in this section as well in Part I of the permit. During the course of the TIE/TRE study, the permittee

will continue to conduct toxicity testing of the outfall being investigated at the frequency of once every three months but will not be required to perform follow-up tests for that outfall during the period of TIE/TRE study.

Test procedures, quality assurance practices, 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 tests, reference toxicant information, copies of raw data sheets, statistical analysis, and chemical analyses shall be compiled in a report also written in accordance with the *Short-term Methods* document above.

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

3.3. BIOMONITORING REQUIREMENTS, ACUTE

For Tier 1, the permittee shall conduct a 48-hour static acute toxicity test on two test species on samples of final effluent from Outfall 001. The test species to be used are Water Fleas (*Ceriodaphnia dubia*) and Fathead Minnows (*Pimephales promelas*).

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

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

Tier 1 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					
6.8	**3.4**	**1.7**	**0.9**	**0.43**	**0**

The dilution/control water used will be moderately hard water as described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*, EPA-821-R-02-012 (or the most current edition). An acute standard reference toxicant quality assurance test shall be conducted with each species

used in the toxicity tests and the results submitted with the discharge monitoring report. Additionally, the analysis of this multi-concentration test shall include review of the concentration-response relationship to ensure that calculated test results are interpreted appropriately.

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

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

The toxicity tests specified herein shall be conducted annually (once per year) for Outfall 001 and begin no later than 180 days from the effective date of this permit.

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

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

The final determination of any extension period will be made at the discretion of the Division.

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

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

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

3.4. PLACEMENT OF SIGNS

Within sixty (60) days of the effective date of this permit, the permittee shall place and maintain a sign at each outfall or the nearest publicly accessible location. The sign(s) should be clearly visible to the public from the bank and the receiving stream. The minimum sign size should be two feet by two feet (2' x 2') with one-inch (1") letters. The sign should be made of durable material and have a white background with black letters.

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

Treated Industrial Wastewater:

TREATED INDUSTRIAL WASTEWATER
Wacker Polysilicon North America, LLC

(423) 780-8160
NPDES Permit No. TN0081311
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Chattanooga

Industrial Stormwater Runoff:

INDUSTRIAL STORMWATER RUNOFF
Wacker Polysilicon North America, LLC

(423) 780-8160
NPDES Permit No. TN0081311
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Chattanooga

3.5. PRIORITY POLLUTANTS

Within 6 months after the facility has reached design or long term production capacity (including the HDK process) and before the application for permit renewal deadline (180 days before expiration), the permittee shall submit to the Division of Water Resources a completed Application Form 2C - Wastewater Discharge Information, Consolidated Permits Program (EPA Form 3510-2C).

3.6. COMPLIANCE WITH CWA SECTION 316(B) – COOLING WATER INTAKE

Currently the permittee operates its cooling water intake structure below the threshold of 2 MGD and 25% cooling water use which would require compliance with CWA Section 316(b). If the permittee anticipates exceeding an intake of 2MGD during future permit cycles, it must submit to the Director the information required under 40 CFR 122.21(r), as outlined below. The permittee may request for the Division to grant a waiver to submit reduced application information in accordance with 40 CFR 125.95(c) at least two years, six months prior to permit expiration.

With each renewal application, the permittee must submit to the Division:

(r)(2) – Source water physical data;

(r)(3) – Cooling water intake structure data;

and applicable provisions of the paragraphs below:

(r)(4) – Source water baseline biological characterization data;
(r)(5) – Cooling water system data;
(r)(6) – Chosen method of compliance with impingement mortality standard;
(r)(7) – Entrainment performance studies; and
(r)(8) – Operational status.

In accordance with 40 CFR 125.98(b)(6), the above ensures that the Director will have all the information necessary to establish Best Technology Available (BTA) requirements for impingement mortality and entrainment in the subsequent permit. In the interim, based on an evaluation of available information on the facility's cooling water intake structure used by the permittee, the Division has determined, using Best Professional Judgment (BPJ) that the cooling water intake structure represents BTA to minimize adverse environmental impact in accordance with Section 316(b) of the CWA.

PART 4

4. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

Actual intake flow (AIF) means the average volume of water withdrawn on an annual basis by the cooling water intake structures over the past three years.

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

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.

Continuous monitoring, for the purposes of this permit, means the measurement of temperature or pH at a frequency that will accurately characterize the nature of discharges from the site and water in the receiving stream. Samples collected continuously shall be at a frequency of not less than once every 15 minutes for temperature.

Cooling water means water used for contact or non-contact cooling, including water used for equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The intended use of the cooling water is to absorb waste heat rejected from the process or processes used, or from auxiliary operations at the facility's premises.

Cooling water intake structure means the total physical structure and any associated constructed waterways used to withdraw cooling water form waters of the United States. The cooling water intake structure extends from the point at

which water is first withdrawn from waters of the United States up to, and including, the intake pumps.

The ***daily maximum amount*** is a limitation, measured in units of weight per time (*e.g.* pounds per day), on the total amount of any pollutant in the discharge during any calendar day.

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

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

Design intake flow (DIF) means the value assigned during the cooling water intake structure design to the maximum instantaneous rate of flow of water the cooling water intake system is capable of withdrawing from a source waterbody.

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

(a) Discharges and withdrawals:
   1. Subject to the limitation in part 3 of this subparagraph, a single discharge other than those from new domestic wastewater sources will be considered de minimis if it uses less than five percent of the available assimilative capacity for the substance being discharged.
   2. Subject to the limitation in part 3 of this subparagraph, a single water withdrawal will be considered de minimis if it removes less than five percent of the 7Q10 flow of the stream.
   3. If more than one activity described in part 1 or 2 of this subparagraph has been authorized in a segment and the total of the authorized and proposed impacts uses no more than 10% of the assimilative capacity, or 7Q10 low flow, they are presumed to be de minimis. Where the total of the authorized and proposed impacts uses 10% of the assimilative capacity, or 7Q10 low flow, additional degradation may only be treated as de minimis if the Division finds on a scientific basis that the additional degradation has an insignificant effect on the resource.

(b) Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the Division finds that the impacts, individually and

cumulatively, are offset by impact minimization and/or in-system mitigation, provided however, in Outstanding National Resource Waters (ONRWs) the mitigation must occur within the ONRW.

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

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

Entrainment means the incorporation of all life stages of fish and shellfish with intake water flow entering and passing through a cooling water intake structure and into a cooling water system.

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

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

The ***instantaneous maximum concentration*** is a limitation on the maximum concentration, in units of mass per volume (*e.g.* 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 units of mass per volume (*e.g.* 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*** is the arithmetic mean of all the measured daily discharges by weight during the calendar month when the measurements were made.

The ***monthly average concentration***, a limitation on the discharge concentration in units of mass per volume, of any pollutant, other than 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 weekly average 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 ***qualifying storm event*** is a storm event in which greater than 0.1 inches of rainfall occurs after a period of at least 72 hours following any previous storm event with rainfall of 0.1 inches or greater.

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 the least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.

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

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

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

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

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

Unpermitted discharge refers to the discharge of pollutants to waters not authorized by this permit.

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

The term ***washout*** is applicable to domestic wastewater activated sludge plants and 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*** is the sum 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 highest arithmetic mean of all the composite samples collected in a one-week period in a month.

Wet weather flow shall be construed to represent stormwater runoff which, in combination with all process and/or non-process wastewater discharges, as applicable, is discharged during a qualifying storm event.

4.2. ACRONYMS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval
30Q5 – 30-day minimum, 5-year recurrence interval
7Q10 – 7-day minimum, 10-year recurrence interval
BAT – best available technology economically achievable
BCT – best conventional pollutant control technology
BDL – below detection limit
BOD_5 – five-day biochemical oxygen demand
BPT – best practicable control technology currently available
$CBOD_5$ – five-day carbonaceous biochemical oxygen demand
CEI – compliance evaluation inspection
CFR – code of federal regulations
CFS – cubic feet per second
CFU – colony forming units
CIU – categorical industrial user
CSO – combined sewer overflow
DMR – discharge monitoring report
D.O. – dissolved oxygen
E. coli – *Escherichia coli*
EPA – Environmental Protection Agency
EFO – environmental field office
GPM – gallons per minute
IC_{25} – inhibition concentration causing 25% reduction in survival, reproduction, and growth of the test organisms
IU – industrial user
IWS – industrial waste survey
LB (lb) – pound
LC_{50} – acute test causing 50% lethality
MDL – method detection limit
MGD – million gallons per day
mg/L – milligrams per liter
ML – minimum level of quantification
mL – milliliter
MLSS – mixed liquor suspended solids
MOR – monthly operating report
NODI – no discharge code in NetDMR
NPDES – national pollutant discharge elimination system
PL – permit limit
POTW – publicly owned treatment works
SAR – semi-annual report [pretreatment program]

SIU – significant industrial user
SSO – sanitary sewer overflow
STP – sewage treatment plant
TBEL – technology-based effluent limit
TCA – Tennessee code annotated
TDEC – Tennessee Department of Environment and Conservation
TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation
TMDL – total maximum daily load
TRC – total residual chlorine
TSS – total suspended solids
WQBEL – water quality-based effluent limit

4.3. RESOURCES, HYPERLINKS, AND WEB PAGES

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

Clean Water Act Section 316(b) Cooling Water Intake Existing Facility Final Rule
https://www.federalregister.gov/documents/2014/08/15/2014-12164/national-pollutant-discharge-elimination-system-final-regulations-to-establish-requirements-for

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

USGS SWToolbox
https://www.usgs.gov/software/swtoolbox-software-information

PART 5

5. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

The discharger will develop, document, and maintain a stormwater pollution prevention plan (SWPPP) pursuant to the requirements as set forth in the Tennessee Multi-Sector General Permit for Industrial Activities, Sector C, "Stormwater Discharges Associated with Industrial Activity from Chemical and Allied Products Manufacturing Facilities", Part C, "Storm Water Pollution Prevention Plan Requirements", applicable to Chemical and Allied Products Manufacturing Facilities. The plan shall be signed by either a principal executive officer of a corporation, the owner or proprietor of a sole proprietorship, or a partner or general partner of a partnership. The SWPPP developed and implemented shall contain, in addition to the requirements listed in the Tennessee Multi-Sector SWPPP guidelines for Chemical and Allied Products Manufacturing Facilities, the following items:

5.1. PLAN IMPLEMENTATION

The plan should be developed and available for review within 30 days after permit coverage. Facilities should implement the management practices as soon as possible, but not later than one year after permit coverage. Where new construction is necessary to implement the management plan, a construction schedule should be included. Construction should be completed as soon as possible.

5.2. PLAN AVAILABILITY

The plan will be maintained by the discharger on the site or at a nearby office. Copies of the plan will be submitted to the Division within ten business days of any request.

5.3. PLAN MODIFICATION

The plan will be modified as required by the Division Director.

5.4. MONITORING PLAN

The stormwater discharges will be monitored as required in **Part 1.1.** of the permit, as applicable to stormwater outfalls. For each outfall monitored, the surface area and type of cover (*e.g.* roof, pavement, grassy areas, gravel) will be identified.

Sector C - SWPPP Requirements

Stormwater Pollution Prevention Plan Requirements

3.1 Deadlines for Plan Preparation and Compliance. There are no additional deadlines for plan preparation and compliance, other than those stated in subpart 4.1 of the TMSP.

3.2 Contents of Plan. The plan shall include, at a minimum, the following items:

3.2.1 Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a stormwater Pollution Prevention Team that are responsible for developing the stormwater pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's stormwater pollution prevention plan.

3.2.2 Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources that may reasonably be expected to add significant amounts of pollutants to stormwater discharges or that may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials that may potentially be significant pollutant sources. Each plan shall include, at a minimum:

3.2.2.1 Drainage. A site map indicating an outline of the portions of the drainage area of each stormwater outfall that are within the facility boundaries, each existing structural control measure to reduce pollutants in stormwater runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under 3.2.2.3 (spills and leaks) of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas including areas where raw materials, finished products and drums are stored. The map must indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls.

For each area of the facility that generates stormwater discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, the plan should include a prediction of the direction of flow, and an

identification of the types of pollutants that are likely to be present in stormwater discharges associated with industrial activity. Factors to consider include the toxicity of a chemical; quantity of chemicals used, produced or discharged; the likelihood of contact with stormwater; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified.

3.2.2.2 Inventory of Exposed Materials - An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to stormwater between the time of 3 years prior to the date of the submission of an NOI to be covered under this permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with stormwater runoff between the time of 3 years prior to the date of the submission of an NOI to be covered under this permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and a description of any treatment the stormwater receives.

3.2.2.3 Spills and Leaks - A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a stormwater conveyance at the facility after the date of 3 years prior to the date of the submission of an NOI to be covered under this permit. Such list shall be updated as appropriate during the term of the permit.

3.2.2.4 Sampling Data - A summary of existing discharge sampling data describing pollutants in stormwater discharges from the facility, including a summary of sampling data collected during the term of this permit.

3.2.2.5 Risk Identification and Summary of Potential Pollutant Sources - A narrative description of the potential pollutant sources from the following activities: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and onsite waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g., biochemical oxygen demand, etc.) of concern shall be identified.

3.2.3 Measures and Controls. Each facility covered by this permit shall develop a description of stormwater management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of

stormwater management controls shall address the following minimum components, including a schedule for implementing such controls:

3.2.3.1 Good Housekeeping - Good housekeeping requires the maintenance of areas that may contribute pollutants to stormwater discharges in a clean, orderly manner. Particular attention should be paid to areas where raw materials are stockpiled, material handling areas, storage areas, liquid storage tanks, material handling areas, and loading/unloading areas. The areas surrounding storm drain inlets and outfall points should also be free of material that could discharge off-site and contribute to pollutants in stormwater.

3.2.3.2 Preventive Maintenance - A preventive maintenance program shall involve timely inspection and maintenance of stormwater management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

3.2.3.3 Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater discharges can occur, and their accompanying drainage points shall be identified clearly in the stormwater pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean-up should be available to personnel.

3.2.3.4 Inspections - In addition to or as part of the comprehensive site evaluation required under this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the SWPPP. Material storage and handling areas, liquid storage tanks, hoppers or silos, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles, equipment and processing areas shall be inspected at least once per month as part of the maintenance program. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained as part of the SWPPP. The use of a checklist developed by the facility is encouraged.

Note that additional Stormwater Pollution Prevention Plan (SWPPP) requirements for discharges into waters with unavailable parameters or Exceptional Tennessee waters, as described in the subpart 4.6 of the TMSP may be applicable to your facility.

3.2.3.5 Employee Training - Employee training programs shall inform personnel responsible for implementing activities identified in the stormwater pollution prevention plan or otherwise responsible for stormwater management at all levels of responsibility of the components and goals of the stormwater pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify periodic dates for such training.

3.2.3.6 Recordkeeping and Internal Reporting Procedures - A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of stormwater discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

3.2.3.7 Non-stormwater Discharges

3.2.3.7.1 The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-stormwater discharges. The certification shall include the identification of potential significant sources of non-stormwater at the site, a description of the results of any test and/or evaluation for the presence of non-stormwater discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with subpart 7.7 of the TMSP. Such certification may not be feasible if the facility operating the stormwater discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit that receives the discharge. In such cases, the source identification section of the stormwater pollution prevention plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-stormwater at the site. A discharger that is unable to provide the certification required by this paragraph must notify the Division of Water Resources in accordance with paragraph 3.2.3.7.3 “Failure to Certify” (below).

3.2.3.7.2 Sources of non-stormwater that are combined with stormwater discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Any non-stormwater discharges that are not authorized under this permit or another NPDES permit should be brought to the attention of the division’s local Environmental Field Office (Chattanooga).

3.2.3.7.3 Failure to Certify - Any facility that is unable to provide the certification required (testing for non-stormwater discharges), must notify the Division of Water Resources not later than 180 days after submitting an NOI to be covered by this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-stormwater discharges; the results of such test or other relevant observations; potential sources of non-stormwater discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible. Non-stormwater discharges to waters of the state that are not authorized by an NPDES permit are unlawful, and must be terminated.

3.2.3.8 Sediment and Erosion Control - The plan shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

3.2.3.9 Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional stormwater management practices (practices other than those that control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage stormwater runoff in a manner that reduces pollutants in stormwater discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to stormwater discharges associated with industrial activity [see paragraph 3.2.2 of this section (Description of Potential Pollutant Sources)] shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: vegetated swales, reuse of collected stormwater (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), infiltration devices, and detention/retention basins or other equivalent measures.

3.2.4 Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the SWPPP, but in no case less than once a year. Evaluations shall be conducted at least once at portable plant locations that are not in operation for a complete year. Such evaluations shall provide:

3.2.4.1 Areas contributing to a stormwater discharge associated with industrial activity including; material storage and handling areas, liquid storage tanks, hoppers or silos, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles, equipment and processing areas, and areas where aggregate is stockpiled outdoors shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system (and potentially waters of the state). Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate

and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, (e.g., oil/water separators, detention ponds, sedimentation basins or equivalent measures) sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as dust collection equipment and spill response equipment, shall be made.

3.2.4.2 Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with 3.2.2 of this section (description of potential pollutant sources) and pollution prevention measures and controls identified in the plan in accordance with section 3.2.3 of this sector (measures and controls) shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case later than 12 weeks after the evaluation.

3.2.4.3 A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the stormwater pollution prevention plan, and actions taken in accordance with paragraph (4)(b) (above) of the permit shall be made and retained as part of the stormwater pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the stormwater pollution prevention plan and this permit. The report shall be signed in accordance with subpart 7.7 of the TMSP (Signatory Requirements).

3.2.4.4 Where compliance evaluation schedules overlap with inspections, the compliance evaluation may be conducted in place of one such inspection.

ADDENDUM TO RATIONALE

1. NPDES permit page 8, paragraph two states, "*Composite samples must be proportioned by flow at the time of sampling. Aliquots may be collected manually or automatically.*"
   NPDES permit page 31, section 4.1. Definitions, includes the following definition, "*A composite sample is a combination of not less than 8 influent or effluent portions, of at least 100mL, collected over a 24-hour period. Under certain circumstances a lesser time period may be allowed, but in no case less than 8 hours.*"

   Wacker's current practice for collection of wastewater effluent composite samples is that a 300 mL sample is collected every two hours by an automated, ISCO brand sampler. The site effluent flow rate is relatively stable and normally doesn't fluctuate greatly. With the current sampling practice above being used relative to the normal effluent discharge condition, Wacker's understanding is this practice meets the permit requirement. Wacker further understands the permit conditions do not require the ISCO sampler to receive a flow signal from the site effluent flow meter that then controls the pace of sampling for the flow proportion requirement to be met.

   Please comment on Wacker's interpretation of the composite sampling requirement relative to the permit condition and definition.

   1. The Division agrees that the permittee's current practice is in compliance with permit requirements.

2. NPDES permit rationale pages R-3 & 4, item 4. states, "*A review of the permittee's Discharge Monitoring Reports (DMRs) from 2017 to 2022 revealed that the permittee has not discharged due to plant expansion construction. Due to no discharge a summary of the DMR data will not be provided.*"

   As a point of clarification, Wacker has been discharging treated wastewater in compliance with the existing NPDES permit since its issuance in March 2017. That wastewater has been generated from the manufacturing of polysilicon, with the exception of a brief period of time in 2021 when amorphous silicon production did occur also, although not at full plant capacity quantity.

   2. The Division appreciates this notification regarding DMR reporting. The previous report that was reviewed was incorrect. After further review the correct DMR reports were reviewed and are summarized below.

Outfall 001	pH, SU		TSS, mg/L	Flow, MGD		Dissolved Solids, Total
Monitoring End Date	Daily Min	Daily Max	Daily Max	Monthly Average	Daily Max	lbs/Day Daily Max
Limit	6.0	9.0	Report	Report	Report	185468
04/30/2017	7.85	8.41	556.7	1.1	1.36	95064.93
05/31/2017	7.59	8.19	286.7	1.11	1.78	98901.76
06/30/2017	7.44	8.21	544	1.06	1.37	86297.01
07/31/2017	7.3	8.28	221	1.05	1.38	97437.59
08/31/2017	7.27	8.32	235	1	1.12	89323.34
09/30/2017	7.06	8.45	428	1.02	1.6	95552.84
10/31/2017	6.5	7.94	107.5	1.51	1.63	45045.42
11/30/2017	6.25	7.8	43.8	1.06	1.53	17581.45
12/31/2017	6.5	8.29	48.2	0.76	0.89	13147.26
01/31/2018	6.06	8.08	53.2	0.76	0.89	19869.46
02/28/2018	7.14	8.21	49.4	0.83	1.15	13823.94
03/31/2018	7.39	8.2	19.5	0.78	1.11	11550.14
04/30/2018	7.38	8.23	134	0.8	1.03	42590.85
05/31/2018	7.58	8.4	567	1.09	1.44	66187.32
06/30/2018	7.47	8.06	150	0.91	1.43	115248.11
07/31/2018	7.49	8.09	294.3	0.89	1.47	77866.57
08/31/2018	7.44	8.25	270	0.88	0.98	81415.67
09/30/2018	7.33	8.07	160	0.9	1.02	82453.8
10/31/2018	7.61	8.26	780	0.9	1.02	88229.45
11/30/2018	7.69	8.33	288	0.87	1.09	87390.22
12/31/2018	7.68	8.65	750	0.96	1.13	124097.22
01/31/2019	7.66	8.5	1078	0.89	1.02	120832.21
02/28/2019	7.49	8.28	277.2	0.87	0.96	88184.14
03/31/2019	7.21	8.18	654	0.87	0.97	92288.47
04/30/2019	7.62	8.39	862	0.9	1.11	96514.1
05/31/2019	7.4	8.13	102.9	0.88	0.96	87593.98
06/30/2019	7.52	8.17	1294	0.91	1.06	61904.03
07/31/2019	7.37	8.42	940	0.96	1.1	120005.83
08/31/2019	7.46	8.2	971.7	0.66	1.1	91690.5
09/30/2019	7.25	8.13	2295	0.78	0.96	63951.93
10/31/2019	7.72	8.18	239.8	0.72	0.84	51356.61
11/30/2019	7.01	8.46	89.4	0.72	0.81	49496.1
12/31/2019	7.25	8.25	103	0.78	0.99	47086.2
01/31/2020	7.35	8.31	338.5	0.73	0.96	63248.5
02/29/2020	6.9	8.49	581	0.79	1.02	70342.46
03/31/2020	7.05	8.51	613	0.74	0.84	103589.64
04/30/2020	7.74	8.36	331.5	0.79	0.92	105975.73
05/31/2020	7.14	8.32	1185	0.78	0.92	77008.99
06/30/2020	7.64	8.39	2487	0.81	0.92	81741.07
07/31/2020	7.17	8.48	549.4	0.75	0.83	63137.89
08/31/2020	7.46	8.46	922.9	0.75	0.84	72987.92
09/30/2020	7.69	8.31	3070.2	0.74	0.82	80342.01
10/31/2020	7.6	8.27	1789	0.68	0.77	62906.21
11/30/2020	7.75	8.5	911	0.63	0.76	95279.97
12/31/2020	7.42	8.23	1247	0.65	0.74	49366.19
01/31/2021	7.3	7.99	973	0.64	0.7	42940.05
02/28/2021	7.39	8.34	1218	0.62	0.7	94539.37
03/31/2021	7.42	8.24	1124	0.62	0.7	36937.65
04/30/2021	7.32	8.18	403	0.67	0.8	44570.59
05/31/2021	7.37	8.29	117	0.67	0.74	45191.17
06/30/2021	6.89	8.18	216	0.64	0.72	58480.42
07/31/2021	7.32	8.24	406	0.62	0.73	57010.78
08/31/2021	7.18	8.31	144	0.63	0.71	66239.94
09/30/2021	7.48	8.19	1398	0.67	0.72	56813.03
10/31/2021	7.37	8.02	101	0.68	0.71	62480.03
11/30/2021	6.72	8.34	2835	0.59	0.67	65959.99
12/31/2021	7.25	8.2	75	0.56	0.63	61533.32
01/31/2022	7.09	7.83	639	0.53	0.58	70055.02
02/28/2022	6.57	7.93	3102	0.58	0.74	57640.42
03/31/2022	7.16	7.94	865	0.6	0.67	54311.97

SW1 Stormwater Parameter	2017	2018	2019	2020	2021
Flow, MGD D, Max Report	0.55	0.55	0.73	2.75	0.73
Nitrogen Ammonia, N, mg/l Daily Max Benchmark 4	< 1	< 1	< 1	< 1	< 1
Nitrate + Nitrite, N, mg/l D, Max Benchmark 0.68	0.36	0.35	0.53	0.43	0.37
Magnesium, mg/l Daily Max Benchmark 0.064	10.4	7.7	5.88	6.5	4.6
Copper, mg/l Daily Max Benchmark 0.018	0.03	< .01	< .01	0.02	< .01
Iron, mg/l Daily Max Benchmark 5	8.72	0.19	0.2	2.66	0.18
Aluminum, mg/l Daily Max Benchmark 0.75	7.18	0.25	0.03	2.46	0.08

SW4 Stormwater Parameter	2017	2018	2019	2020	2021
Flow, MGD D, Max Report	0.03	0.03	0.03	0.16	0.04
Nitrogen Ammonia, N, mg/l Daily Max Benchmark 4	< 1	< 1	< 1	< 1	< 1
Nitrate + Nitrite, N, mg/l D, Max Benchmark 0.68	< .05	< .05	0.39	< .05	< .05
Magnesium, mg/l Daily Max Benchmark 0.064	4.86	4.45	8.84	3.54	3.91
Copper, mg/l Daily Max Benchmark 0.018	< .01	< .01	< .01	< .01	< .01
Iron, mg/l Daily Max Benchmark 5	1.5	0.15	3.02	0.42	0.36
Aluminum, mg/l Daily Max Benchmark 0.75	2.3	0.18	4.22	0.56	0.13

3. **The Division has added a narrative condition requiring the permittee to notify the Division prior to advancing to a higher tier.**

RATIONALE

Wacker Polysilicon North America, LLC
NPDES Permit Number TN0081311
Date: 3/8/2022
Permit Writer: Courtland Vice

1. FACILITY INFORMATION

Permittee Name:	**Wacker Polysilicon North America, LLC**
Location:	553 Wacker Boulevard, Charleston, Bradley County, Tennessee
Contact:	Mr. Jeremy Copeland - Environmental Manager (423) 780-7953 jeremy.copeland@wacker.com
Design Flow Rate:	1.6 MGD
Nature of Business:	discharges from production of polycrystalline silicon for photocells and fumed silica byproduct, SW discharges from construction and industrial activity, hydrostatic testing discharges, and identification of future phases of production capacity.
SIC Code(s):	2819
Industrial Classification:	Secondary Industry without ELGs
Discharger Rating:	Minor

1. FACILITY DISCHARGES AND RECEIVING STREAM INFORMATION

Receiving Waterbody:	**Hiwassee River Embayment of Chickamauga Reservoir at mile 15.9 (Outfall 001), Hiwassee River Embayment of Chickamauga Reservoir at mile 16.5 (Outfall 002), Hiwassee River Embayment of Chickamauga Reservoir (South Mouse Creek) at mile 1.7 (Outfall SW1) and Hiwassee River Embayment of Chickamauga Reservoir (South Mouse Creek) at mile 1.4 (Outfall SW4), South Mouse Creek at mile 2.0 Outfall SW2, South Mouse Creek at mile 2.5 Outfall SW2A, and South Mouse Creek at mile 2.75 (Outfall SW3);**
Watershed Group:	Hiwassee
Hydrocode:	06020002
Primary Outfall Latitude:	35.3144
Primary Outfall Longitude:	-84.7859
Low Flow:	1Q10 = 310.7 MGD (480 CFS)
Low Flow Reference:	USGS StreamStats/SW Toolbox, Gage Station 03566000

Stream Designated Uses:

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

Wacker manufactures hyper-pure polycrystalline silicon, SIC code 2819 for the photovoltaic industry. The process takes 98% pure Silicon and refines it until it is 99.999999999% pure Silicon. A byproduct, “wet silicon” is produced by the T3 filter press and sold to steel foundries. Personnel also stated that they plan to produce amorphous silica in a future expansion of the facility. Wacker is located on 535 acres in Bradley County, Tennessee. Industrial activity is confined to 155 acres. Wacker employs 602 persons and operates 24 hours per day, 7 days each week. A hydrogen plant operated by Linde Gas LLC, SIC code 2819 is also located on site.

The facility has added a new process known as HDK for the manufacture of amorphous hydrophilic silica. Wacker’s NPDES effluent limits were developed for three different levels of production capacity each with correspondingly larger volumes of water consumption known as Tier 1, 2, and 3, respectively. Tier 1 is for discharges at or below the design flow of 1.6 MGD, Tier 2 is for an anticipated discharge of 3.96 MGD, and Tier 3 is for an anticipated discharge of 6.34 MGD. Currently, the facility operates within the Tier 1 flow level.

Appendix 4 summarizes facility discharges and the receiving stream information for the relevant outfall(s).

The receiving stream low flow was recalculated as part of permit reissuance. This section of the Hiwassee River is considered part of the TVA Chickamauga Reservoir. In this permit, USGS Gage Station 03566000 – Hiwassee River at Charleston provides sufficient data to characterize the low flow of the receiving stream. The Tennessee Valley Authority (TVA), the water management authority of the Hiwassee River, advised the Division that a management policy change occurred in 2004 and recommended that, when possible, flow data after 2004 should be used in flow calculations. As recommended by the Environmental Protection Agency (EPA), gage data was analyzed with SWToolbox for a period of record of 2004 – 2018 to calculate the 1Q10 and 30Q5 flows. SWToolbox establishes a 1Q10 flow of 310.7 MGD (480.7 cfs) and a 30Q5 flow of 772.1 MGD (1194.7 cfs).

In this permit, USGS Gage Station 03566000 provides sufficient data to characterize the low flow of the receiving stream. Gage data was analyzed with SWToolbox and used to calculate the 1Q10 above. Appendix 4 details the Streamstats and SWToolbox outputs used for this calculation.

2. CURRENT PERMIT STATUS

Issuance Date:	March 31, 2017
Expiration Date:	March 31, 2022
Effective Date:	April 1, 2017

3. APPLICABLE EFFLUENT LIMITATIONS GUIDELINES

The Standard Industrial Classification (SIC) code for Wacker Polysilicon North America, LLC is 2819 (production of Inorganic Chemicals, NEC). There are no EPA effluent guidelines for the discharges from this facility. Standards of performance are therefore established in accordance with existing state regulations using available treatability information.

4. PREVIOUS PERMIT TERM REVIEW

A review of the permittee's Discharge Monitoring Reports (DMRs) from 2017 to 2022 revealed that the permittee has not discharged due to plant expansion

construction. Due to no discharge a summary of the DMR data will not be provided.

During the previous permit term, Division personnel from the Chattanooga Environmental Field Office performed a Compliance Evaluation Inspection (CEI) of the permittee's facility. The CEI was performed by Mr. Michael Bascom on September 17, 2020, and the permittee was found to be in compliance. The inspection report described all lab reports and files were easily accessible when requested calibrations were performed and stormwater outfalls were observably free of pollutants.

5. NEW PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

The proposed new permit limits have been selected by determining a technology-based limit and evaluating if that limit protects the water quality of the receiving stream. If the technology-based limit would cause violations of water quality, the water quality-based limit is chosen. The technology-based limit is determined from EPA effluent limitations guidelines if applicable (see Part 4 above) or from State of Tennessee maximum effluent limits for effluent limited segments per Rule 0400-40-05-.08. Note that in general, the term "anti-backsliding" refers to a statutory provision that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluents limits, permit conditions, or standards that are less stringent than those established in the previous permit.

a) Language throughout the permit has been updated to reflect the eReporting Phase 2 requirements in 40 CFR § 127.

b) For comparison, this rationale contains the previous permit limits and effluent monitoring requirements in Appendix 1.

c) The limits for biomonitoring are more stringent than the previous permit due to the updated receiving stream flow. See section 5.7 for more information.

5.1. FLOW

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

5.2. METALS AND TOXICS

Effluent permit limits for metals and toxics were calculated as shown in Appendix 3.

The previous permit Rationale contained an evaluation of toxic pollutants that were reasonably expected to be present in the process water discharges from the Wacker facility; copper, nickel, chromium VI, and zinc. Using estimated discharge data provided on the original application and stream background concentrations, water quality calculations were performed to check two conditions, the de minimis status of the metals discharge concentrations at Tier 1 production levels and reasonable potential of a water quality issue from metals at higher production rates (Tier 3).

As required in the previous permit, Wacker provided sampling data on these pollutants on EPA Form 2C with the permit application. This data was evaluated and the results may be found in Appendix 2A. There are two spreadsheets that use the allowable effluent concentrations (assimilative capacity for metals) that were calculated based on Tier 1 and Tier 3 flows and the actual effluent concentrations provided by the permittee. The calculations show that, in the case of both the Tier 1 and Tier 3 production rates, the metals are still a fraction of the de minimis level of 5% of assimilative capacity. It should be noted that the calculated effluent values for chromium are for chromium VI, the most toxic form of the pollutant. The permittee analyzed for total chromium, resulting in a worst case scenario by assuming that all the chromium is in the most toxic form. These results indicate that there is no reasonable potential for these trace metals to cause water quality issues. Even though these results indicate that the metals should not be a problem, Wacker has stated that the plant is still approaching the Tier 1 capacity.

Since this facility is not yet up to capacity and a new process (HDK fumed silica process) is currently under construction, it is possible that there may also be changes in the process water effluent. Therefore, this draft permit requires that EPA Form 2C sampling must be completed and reported with the application for renewal of the permit.

5.3. TOTAL SUSPENDED SOLIDS (TSS)

Total Suspended Solids is a general indicator of the quality of a wastewater and will be limited in this permit. Total Dissolved Solids (sometimes expressed as chlorides + sulfates) issues are related to aquatic toxicity as well as domestic and industrial water supply criteria.

The State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 0400-40-03-.03(3)(c)] state there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life in the receiving stream.

5.4. TOTAL DISSOLVED SOLIDS (TDS)

Water quality concerns for TDS are related to aquatic toxicity as well as compliance with drinking water standards. The applicable water quality standards are for protection of Domestic Water Supply (TN Rules, Chapter 1200-4-3-.03(1)(d)) and Industrial Water Supply (TN Rules, Chapter 1200-4-3.03(2)(d)), which state: "The total dissolved solids shall at no time exceed 500 mg/l."

The average value for TDS below the Hiwassee River mile marker 16.5 (discharge point) is 94 mg/L, calculated from the dataset presented in the table below.

Station ID	TDS [mg/L]
HIWAS002.0ME	120
HIWAS013.4MM	120
HIWAS013.4MM	140
HIWAS013.4MM	170
HIWAS013.4MM	84
HIWAS013.4MM	130
HIWAS013.4MM	65
HIWAS013.4MM	61
HIWAS013.4MM	120
HIWAS013.4MM	64
HIWAS013.4MM	85
HIWAS013.4MM	76
HIWAS013.4MM	150
HIWAS013.4MM	83
HIWAS013.4MM	64
HIWAS013.4MM	63
HIWAS013.4MM	169
HIWAS013.4MM	181
HIWAS013.4MM	134
HIWAS013.4MM	10
HIWAS013.4MM	150
HIWAS013.4MM	170
HIWAS013.4MM	75
HIWAS013.4MM	220
HIWAS015.6MM	77
HIWAS015.6MM	52
HIWAS015.6MM	81
HIWAS015.6MM	92
HIWAS015.6MM	54
HIWAS015.6MM	31
HIWAS015.6MM	132
HIWAS015.6MM	202
HIWAS015.6MM	66
HIWAS015.6MM	37
HIWAS015.6MM	47
HIWAS016.0MM	60
HIWAS016.0MM	38
HIWAS016.0MM	68
HIWAS016.0MM	85
HIWAS016.0MM	51
HIWAS016.0MM	41
HIWAS016.0MM	127
HIWAS016.0MM	117
HIWAS016.0MM	32
HIWAS016.0MM	94
HIWAS016.0MM	46
AVERAGE	94.2

Remaining assimilative capacity of Hiwassee River downstream of the proposed discharge can be now calculated:

(500 mg/L – 94.2 mg/L) * 772.1 MGD * 8.34 = 2,613,074 lb/day

Stream allocation for single point sources discharging to non-wadeable streams is 50%. However, in situations where more than one point source discharges into the same waterbody segment, and where TMDL for a pollutant of concern has not been developed, the stream allocation is 90% (10% reserve capacity). Therefore, the above calculated remaining assimilative capacity for TDS is:

2,613,073.6 lb/day * 0.9 = 2,351,766 lb/day

Proposed discharge loading is:

(3,000 for chlorides + 4,500 for sodium) mg/L* 1.56 MGD = 97,578 lb/day

Tennessee General Water Quality Criteria (TN Rules, Chapter 1200-4-3-.04(4) states, in part:

"De Minimis – Alterations, other than those resulting in the condition of pollution or new domestic wastewater discharges, that represent either a small magnitude or a short duration shall be considered a de minimis impact and will not be considered degradation for purposes of implementing the antidegradation policy. Discharges other than domestic wastewater will be considered de minimis if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged."

97,578 lb/day * 100 / 2,351,766 lb/day = 4.1%

The proposed discharge constitutes increase in loading to the receiving stream. Therefore, being less than five percent of the available assimilative capacity, the proposed discharge of TDS is considered de minimis. Permit limit will be established at exactly 5% of assimilative capacity, which is:

2,351,766 lb/day * 0.05 = 117,588 lb/day as a daily max

This limit will be implemented for all three tiers.

5.5. PH

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

provide some buffering capacity, effluent limitation for pH will be retained in a range 6.0 to 9.0.

5.6. AMMONIA (NH_3-N)

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

The temperature used in calculations is determined based on measured ambient instream temperature or is estimated according to Tennessee's Three Grand Divisions as follows: East (winter 15°C, summer 25°C), Middle (winter 17°C, summer 27°C), and West (winter 20°C, summer 30°C). A pH value of 8 (instead of historically used 7.5) is used because ambient monitoring in West Tennessee showed that pH often exceeds 7.5 and is sometimes as high as 8, and because this assumption is more conservative.

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

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

and

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

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

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

where:

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

See below for calculations:

CCC Calculation: Chronic Limits

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

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

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

where:	310.68	Critical Low Flow [MGD] (1Q10 value)
	0.1	Background Ammonia Concentration [mg/L] *
	1.6	WWTP Design Flow or long-term average flow [MGD]

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

Winter		Summer	
189.93	Concentration [mg/L]	**90.450**	Concentration [mg/L]
2534.4	Amount [lb/day]	**1207.0**	Amount [lb/day]

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

CMC Calculation: Acute Limits

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

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

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

where:	310.676	Critical Low Flow [MGD] (1Q10 value)
	0.1	Background Ammonia Concentration [mg/L]
	1.6	WWTP Design Flow or long-term average flow [MGD]

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

Winter		Summer	
1076.50	Concentration [mg/L]	**484.047**	Concentration [mg/L]
14364.8	Amount [lb/day]	**6459.1**	Amount [lb/day]

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

Comparing the applicant reported data submitted in the application of < 1 mg/L to the calculated limits above, ammonia limits will not be implemented in this permit. Even at tier 3 flow the chronic summer limit of 23.3 mg/L would be well above the reported application data.

5.7. BIOMONITORING

Wacker performed two biomonitoring tests on the discharge. Both indicated that the discharge was non-toxic at dilutions above the maximum dilution required. However, two results are not sufficient for a determination of reasonable potential. Therefore, the draft permit requires annual biomonitoring in order to acquire sufficient data for making a reasonable potential determination.

Based on new flow data and the different tiered wastewater flow rates, acute whole effluent toxicity (WET) testing will be implemented for tier 1 and chronic WET testing will be implemented for tiers 2 and 3. Chronic WET testing is being implemented due the dilution factor being between 0 and 100 for tiers 2 and 3.

The discharge of industrial wastewater from Outfall 001 may contain several different pollutants, the combined effect of which has a reasonable potential to be detrimental to fish and aquatic life. The Division evaluates all discharges for reasonable potential to exceed the narrative water quality criterion “no toxics in toxic amounts”.

Tier 1: Acute WET test
Since the receiving stream is the facility’s water source, the following equations are used to determine acute whole effluent toxicity limits.

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

$$Dilution\ Factor = \frac{Stream\ Low\ Flow}{Wastewater\ Flow} = \frac{310.7}{1.6} = 194.2$$

$$LC_{50}\ \% \geq \frac{100\%}{0.3 * Dilution\ Factor} \geq \frac{100\%}{0.3 * 194.2} \geq 1.7\%$$

Where:

310.7	= 1Q10 Low Flow (MGD)
1.6	= Tier 1 Flow (MGD)
0.3	= Conversion factor to toxic units, acute

LC_{50} = Lethality concentration to 50% of organisms

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

Tiers 2 and 3: Chronic WET test

Since the calculated dilution factor is less than 100:1, and assuming immediate and complete mixing, protection of the stream from chronic effects is required. Therefore, chronic whole effluent toxicity testing is required.

Even though the potential instream toxicity after mixing, expressed as TUa, exceeds the CMC, acute whole effluent toxicity testing is waived and replaced by a chronic IC_{25} test that is more stringent than the LC_{50} acute test.

Tier 2

$$Dilution\ Factor = \frac{Stream\ Low\ Flow + Wastewater\ Flow}{Wastewater\ Flow} = \frac{310.7 + 3.96}{3.96} = 79.5$$

$$IC_{25}\ \% \geq \frac{100\%}{Dilution\ Factor} \geq \frac{100\%}{79.5} \geq 1.3\%$$

Tier 3

$$Dilution\ Factor = \frac{Stream\ Low\ Flow + Wastewater\ Flow}{Wastewater\ Flow} = \frac{310.7 + 6.34}{6.34} = 50$$

$$IC_{25}\ \% \geq \frac{100\%}{Dilution\ Factor} \geq \frac{100\%}{50} \geq 2.0\%$$

Where:

310.7 = 1Q10 Low Flow (MGD)

3.96 and 6.34 = Wastewater Flow (MGD)
IC_{25} = Concentration causing 25% reduction in survival, growth, and reproduction of test organisms

5.8. INDUSTRIAL STORMWATER RUNOFF

This facility is one which has storm water runoff associated with industrial activity, as defined in 40 CFR 122.26 (b)(14) and was previously covered under the Tennessee Stormwater Multi-Sector General Permit for Industrial Activities (TMSP).

Stormwater runoff parameters to be monitored and reported were determined by comparing effluent limitations and monitoring requirements from the previous permit, the requirements from the Tennessee Storm Water Multi-Sector General Permit for Industrial Activities (TMSP), the data submitted on Discharge Monitoring Report (DMR) forms, and the data contained in the application 2F submitted by Wacker Polysilicon North America, LLC facility.

There are no effluent guidelines for storm water discharges from the Wacker Polysilicon North America, LLC facility. The application identified outfalls SW1, SW3 and SW4 as discharge points for industrial stormwater runoff discharge and requested that all industrial stormwater be covered under the individual permit.

The parameters of concern are the same as those under Sector C Table 3-C (included below for reference), applicable to SIC code 2819, Industrial Inorganic Chemicals, NEC. The Division is not assigning limits for these parameters at this time since it is the intent of the Division that the permittee institutes a Storm Water Pollution Prevention Plan (SWPPP) in order to minimize the discharge of these pollutants from storm water outfalls. It is the opinion of the Division that the best method for dealing with potential pollution associated with storm water discharges from the Wacker Polysilicon North America, LLC facility is through implementation of an aggressive SWPPP, coupled with discharge monitoring to verify SWPPP effectiveness.

In order to assist the permittee in the evaluation of the effectiveness of the SWPPP, benchmark values developed for the Tennessee Storm Water Multi-Sector General Permit for Industrial Activities are provided herein for comparison. These benchmark values (cut-off concentrations) were developed by the EPA and the State of Tennessee and are based on data submitted by similar industries for the development of the multi-sector general stormwater permit. The cut-off concentrations are target values and should not be construed to represent permit limits.

Table C-3. Benchmarks for Industrial Inorganic Chemicals Monitoring Requirements

Pollutants of Concern	Benchmark [mg/L]
Ammonia	4
Total Recoverable Aluminum	0.75
Total Recoverable Copper	0.018
Total Recoverable Magnesium	0.064
Total Recoverable Iron	5.
Nitrate plus Nitrite Nitrogen	0.68

Note: Cut-off (benchmark) concentrations are from the Tennessee Stormwater Multi-Sector General Permit for Industrial Activities (TMSP)

Another provision incorporated in the previous permit was a "composite" sample type required for analysis of BOD-5 day, TSS, Ammonia as Nitrogen, and Total Recoverable Zinc. According to the U.S. EPA *NPDES Permit Writer's Manual* (Office of Water, EPA-883-B-96-003, December 1996, Page 123), "grab" samples should be used when the quality and flow of the waste stream being sampled is not likely to change over time. Generally, for stormwater runoff samples, a grab sample is considered adequate for effluents from holding ponds or other impoundments with a retention period of greater than 24-hours (Instructions - EPA Form 3510-2F: Application for Permit to Discharge Storm Water Associated with Industrial Activity, General Instructions, p. 6 – 8).

Nevertheless, the Division recognizes that a "first flush" sample would be the most accurate representation of the maximum daily value for various pollutants in the stormwater runoff. Furthermore, stormwater sampling requirements included in the TMSP require analysis of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging. Therefore, the sample type for all stormwater runoff parameters in the new permit will be changed from "composite" to "grab." Every effort should be made to collect a "first flush" sample representative of the daily maximum values for sampled parameters.

The draft permit will contain a Storm Water Pollution Prevention Plan (SWPPP) developed to regulate stormwater runoff. This SWPPP is meant to ensure that runoff from the facility site is not a significant source of pollution to the receiving stream. The discharger will develop, document and maintain the SWPPP pursuant to the requirements as set forth in the Tennessee's Storm Water Multi-Sector

General Permit for Industrial Activities, Sector C, "*Storm Water Discharges Associated with Industrial Activity from Chemical and Allied Products Manufacturing Facilities*", Part C, "Storm Water Pollution Prevention Plan Requirements", applicable to Chemical and Allied Products Manufacturing Facilities. The effectiveness of this SWPPP will be investigated after the results of the stormwater runoff monitoring have been submitted. At that time, should the results so dictate, the Division maintains the authority to institute specific numeric limitations for the monitored parameters.

6. OTHER PERMIT REQUIREMENTS AND CONDITIONS

6.1. PERMIT TERM

In order to meet the target reissuance date for the Hiwassee watershed and following the directives for the Watershed Management Program initiated in January 1996, the permit will be issued to expire in 2027.

6.2. ELECTRONIC REPORTING

The NPDES Electronic Reporting Rule (eRule), which became effective on December 21, 2016, replaces most paper-based reporting requirements with electronic reporting requirements. NetDMR allows NPDES permittees to submit DMRs electronically to EPA through a secure internet application and has been approved by Tennessee as the official electronic reporting tool for DMRs. The permittee has been reporting electronically via NetDMR since April 30, 2015.

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

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

Division of Water Resources
Compliance and Enforcement Unit – NetDMR Waivers
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243-1102

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

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

6.3. 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 segments identified by the Division as segment ID numbers TN06020002008_2000 and TN06020002009_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.

Additionally, the Hiwassee Embayment partially supports designated uses due to high levels of mercury in fish tissue caused by atmospheric deposition and industrial point source(s). South Mouse Creek partially supports designated uses due to high levels of E. coli caused by sanitary sewer overflows (failure), discharges from MS4s, and grazing in riparian or shoreline areas. The discharges from this facility do not contain significant amounts of these effluent characteristics. The division, therefore, considers the potential for degradation to the receiving stream from these discharges to be negligible. There are no approved TMDLs applicable to this facility's discharges.

6.4. COMPLIANCE WITH CWA SECTION 316(B) – COOLING WATER INTAKE

Section 316(b) of the Clean Water Act requires that facilities minimize adverse environmental impacts resulting from the operation of cooling water intake structures (CWIS) by using the "best technology available" (BTA). Based on

information provided in the permit application and the discussion and analysis shown below, the Division has determined that the permittee's facility does not meet the applicable conditions in EPA rules at 40 CFR § 125, Subpart J. The discussion below provides the rationale for this determination. Because TDEC finds that the CWIS is not subject to requirements of §§ 125.94 through 125.99, this rationale includes a Best Professional Judgment analysis of requirements for Best Technology Available (BTA) under Section 316(b) in accordance with § 125.90(b):

"Cooling water intake structures not subject to requirements under §§ 125.94 through 125.99 or subparts I or N of this part must meet requirements under Section 316(b) of the CLA established by the Director on a case-by-case, best professional judgment (BPJ) basis."

The permittee's cooling water intake structure does not meet the applicability requirement for rules under CWA Section 316(b) because less than 25% of the actual intake flow is used exclusively for cooling and the actual intake flow is less than 2 MGD.

6.4.1. Background

The CWA Section 316(b) Existing Facility Final Rule applies to existing facilities that use cooling water intake structures (CWIS) to withdraw water from waters of the state and have or require a NPDES permit issued under the Tennessee Water Quality Control Act and Section 402 of the CWA. If a facility meets the conditions specified in 40 CFR § 125.91 as outlined below, it is subject to the rule.

The rule applies to owners and operators of existing facilities that meet all of the following criteria:

a) The facility is a point source;
b) The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow (DIF) of greater than 2 MGD to withdraw water from waters of the state; and
c) 25% or more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

If a facility has or requires a NPDES permit but does not meet the 2 MGD intake flow threshold, it is subject to permit conditions implementing CWA section 316(b) developed by the Director of the Division on a case-by-case basis using Best Professional Judgment (BPJ).

Generally, facilities that meet these criteria fall into two major categories: steam electric generating facilities and manufacturing facilities. The rule makes limited corrections to the requirements for Phase I facilities, or new facilities. The rule establishes national requirements applicable to the location, design, construction, and capacity of CWIS at existing facilities that reflect the best technology available (BTA) for minimizing the adverse environmental impacts of impingement and entrainment associated with the use of these structures. The rule requires several types of information collection as part of the NPDES permit application in order to identify if the facility is meeting the rule, or how the facility plans to meet the rule requirements.

6.4.2. Specific Data Requirements with Permit Applications

Specific data requirements that apply to all facilities are outlined below:

- *§122.21(r)(2) – Source water physical data* which shows the physical configuration of all source waterbodies used by the facility, identifies and characterizes the source waterbody's hydrological and geomorphological features, and provides location through maps.
- *§122.21(r)(3) – Cooling water intake structure data* which shows the configuration and location of CWIS, provides details on the design and operation of each CWIS, and diagrams showing flow distribution and water balance.
- *§122.21(r)(4) – Source water baseline biological characterization data* that characterizes the biological community in the vicinity of the CWIS and characterizes the operation of the CWIS.
- *§122.21(r)(5) – Cooling water system data* that, among other things, describes the operation of the cooling water system, its relationship to the CWIS, the proportion of the design intake flow used in the system, the number of days the cooling water system is operational and seasonal changes in operation, as well as design and engineering calculations to support these descriptions.
- *§122.21(r)(6) – Impingement mortality standards compliance* information that describes the facility's selected methods. The specific requirements vary depending on the compliance approach chosen by the facility. This information would be reflected in the facility's Impingement Technology Performance Optimization Study.
- *§122.21(r)(7) – Entrainment performance studies* provide a description of any existing studies of biological survival conducted at the facility and a summary of any conclusions of results.
- *§122.21(r)(8) – Operational status* data that describes the operational status of each generating, production, or process unit.

In addition to the above requirements, existing facilities with actual intake flows in excess of 125 MGD are required as part of the permit application process to submit an entrainment characterization study and related supporting information that has been peer reviewed. These requirements are outlined in § 122.21(r)(9) – (13) and summarized below. Facilities that withdraw less than 125 MGD actual intake flow do not have specific permit application requirements for entrainment, but the Director may require additional information on a site-specific basis.

- *§122.21(r)(9) – Entrainment characterization study* including a minimum of two years of entrainment data collection.
- *§122.21(r)(10) – Comprehensive Technical Feasibility and Cost Evaluation Study* which examines the feasibility of all technologies and includes engineering/social cost estimates.
- *§122.21(r)(11) – Benefits Valuation Study* which evaluates the benefits of potential entrainment reduction technologies.
- *§122.21(r)(12) – Non-water Quality Environmental and Other Impacts Study* discussing non-water quality impacts including changes to energy consumption, air pollutant emissions, noise, safety, and reliability.
- *§122.21(r)(13) – Peer review* of every study submitted by the permittee, to be performed by external peers approved in advance by the Director.

Under the Existing Facility Final Rule, a new unit at an existing facility that withdraws more than 2 MGD would have requirements similar to the requirements of a new facility in Phase I. A new unit (as defined by §125.92(u)) is required to reduce flow commensurate with closed-cycle cooling. Alternatively, a facility could demonstrate compliance with the entrainment control requirements by establishing reductions in entrainment mortality for the new unit that are 90% or greater of the reduction that could be achieved by closed-cycle cooling.

Finally, facilities are required to maintain records of all submitted documents, supporting materials, and monitoring results for at least five years. Depending on the compliance method chosen, facilities may also be required to perform compliance monitoring to demonstrate that their selected method of complying with the impingement mortality standard (*i.e.* screen velocity, actual intake flow, numeric impingement mortality performance) achieves the required performance.

6.4.3. Applicability

Significant factors in evaluating applicability of these rules to this permit include:

- 316(b) does not apply because the permittee has an intake of 1.6 MGD and only 8% of the intake is used for cooling purposes.

6.4.4. Best Professional Judgment and Determination of Best Technology Available

The Division has determined that the cooling water intake structure used by Wacker Polysilicon North America, LLC represents BTA to minimize adverse environmental impact associated with entrainment in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326).

APPENDIX 1 – PREVIOUS PERMIT LIMITS

TIER 1
Description : External Outfall, Number : 001
Monitoring: Effluent Gross
Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
LC50 Static 48Hr Acute Ceriodaphnia	>=	1.22	% mortality	Grab	Annual	Minimum
LC50 Static 48Hr Acute Pimephales	>=	1.22	% mortality	Grab	Annual	Minimum
Total Dissolved Solids (TDS)	<=	185,468	lb/d	Composite	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
pH	>=	6	SU	Grab	Daily	Daily Minimum
pH	<=	9	SU	Grab	Daily	Daily Maximum

TIER 2
Description: External Outfall, Number: 001
Monitoring: Effluent Gross
Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
LC50 Static 48Hr Acute Ceriodaphnia	>=	3	% mortality	Grab	Annual	Minimum
LC50 Static 48Hr Acute Pimephales	>=	3	% mortality	Grab	Annual	Minimum
Total Dissolved Solids (TDS)	<=	462,370	lb/d	Composite	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
pH	>=	6	SU	Grab	Daily	Daily Minimum
pH	<=	9	SU	Grab	Daily	Daily Maximum

TIER 3
Description: External Outfall, Number: 001
Monitoring: Effluent Gross
Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
LC50 Static 48Hr Acute Ceriodaphnia	>=	4.8	% mortality	Grab	Annual	Minimum
LC50 Static 48Hr Acute Pimephales	>=	4.8	% mortality	Grab	Annual	Minimum
Total Dissolved Solids (TDS)	<=	740,258	lb/d	Composite	Daily	Daily Maximum
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Daily	Daily Maximum
pH	>=	6	SU	Grab	Daily	Daily Minimum
pH	<=	9	SU	Grab	Daily	Daily Maximum

Description: External Outfall
Numbers: SW1 and SW4
Monitoring: Effluent Gross
Season: All Year

Parameter	Qualifier	Value*	Unit	Sample Type	Frequency	Statistical Base
Aluminum, total (as Al)	<=	0.75	mg/L	Grab	Annual	Daily Maximum
Copper, total (as Cu)	<=	0.018	mg/L	Grab	Annual	Daily Maximum
Flow	Report	-	Mgal/d	Estimate	Annual	Daily Maximum
Iron, total (as Fe)	<=	5	mg/L	Grab	Annual	Daily Maximum
Magnesium, total (as Mg)	<=	0.064	mg/L	Grab	Annual	Daily Maximum
Nitrite plus nitrate total (as N)	<=	0.68	mg/L	Grab	Annual	Daily Maximum
Nitrogen, Ammonia total (as N)	<=	4	mg/L	Grab	Annual	Daily Maximum

Internal Monitoring Point: IMP1 (to SW1) and IMP4 (to SW4)
Monitoring: All Weather
Season: All Year

Code	Parameter	Qualifier	Valu e	Unit	Sample Type	Frequency	Statistical Base
00400	pH	>=	6	SU	Grab	Once Per Discharge	Daily Minimum
00400	pH	<=	9	SU	Grab	Once Per Discharge	Daily Maximum
50050	Flow	Report	-	Mgal/d	Estimate	Once Per Discharge	Total
84066	Oil and grease visual	Report	-	Y=1;N=0	Visual	Once Per Discharge	Value

APPENDIX 2 – DMR SUMMARY

A review of the permittee's Discharge Monitoring Reports (DMRs) from 2017 to 2022 revealed that the permittee has not discharged due to plant expansion construction. Due to no discharge a summary of the DMR data will not be provided.

APPENDIX 3 –
METALS & TOXICS CALCULATIONS

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

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

- 1Q10 of receiving stream (310.7 MGD, USGS)
- Calcium hardness (25 mg/L, default)
- Total suspended solids (10 mg/L, default)
- Background metals concentrations (½ water quality criteria)
- Other dischargers impacting this segment (Olin, Resolute, Cleveland STP)
- Downstream water supplies, if applicable

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

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

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

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

The following formulas are used to evaluate water quality protection:

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

Where:

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

To protect water quality:

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

Where: S_A = the percent "Stream Allocation"

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

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

   Fish and Aquatic Life protection:
   7Q10 – Low flow under natural conditions
   1Q10 – Regulated low flow conditions

   Other than Fish and Aquatic Life protection:
   30Q5 – Low flow under natural conditions

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

3) For criteria that are hardness dependent, chronic and acute concentrations are based on a hardness of 25 mg/L and Total Suspended Solids (TSS) of 10 mg/L unless available ambient monitoring information substantiates a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25

mg/L and 400 mg/L respectively. The minimum limit on the TSS value used for water quality calculations is 10 mg/L.

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

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

Column 1: The "stream background" concentrations of the effluent characteristics.

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

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

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained *in The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent; no chronic criterion exists for silver. Published criteria are used for non-metal parameters.

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

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

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent. Published criteria are used for non-metal parameters.

Column 4: The "Fraction Dissolved" converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated using the linear partition coefficients found in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

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

ss = in-stream suspended solids concentration (mg/L)

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

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

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

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

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

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

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

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

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

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

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

Column 15: 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.

Water Quality Based Effluent Calculations:

2019 WQC

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

FACILITY: Wacker Polysilicon North America, LLC **PERMIT #:** TN0081311 2/24/2022 **CALC BY:** CLV

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 [%]
310.68	**772.13**	**1.60**	**10**	**25**	**90**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
	Stream	Fish/Aqua. Life (F & AL) WQC			F & AL- instream allowable		Calc. Effluent Concentration		Human Health Water Quality Criteria *						effluent		
	Bckgrnd.	lab conditions		Fraction	ambient conditions (Tot)		based on F & AL		In-Stream Criteria			Calc. Effluent Concentration **			limited	applicant	
	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	case	reported data	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l		**PARAMETER**
Copper (a,b)	6.284	2.739	3.640	0.218	12.568	16.700	**1109.46**	**1835.37**	N/A	N/A	N/A	**NA**	NA	NA	**80.0**	**20.0**	**Copper (a,b)**
Chromium III	151.880	23.813	183.066	0.078	303.760	2335.189	**26815.26**	**383646.95**	N/A	N/A	N/A	**NA**	NA	NA			**Chromium III**
Chromium VI	5.500	11.000	16.000	1.000	11.000	16.000	**971.06**	**1849.33**	N/A	N/A	N/A	**NA**	NA	NA			**Chromium VI**
Chromium, Total	#VALUE!	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.0	**NA**	NA	#VALUE!	**60.0**	**< 10**	**Chromium, Total**
Nickel (a,b)	39.113	16.096	144.918	0.206	78.227	704.307	**6905.68**	**116880.12**	4600.0	610.0	100.0	**1985050.35**	248499.74	26534.62	**180.0**	**500.0**	**Nickel (a,b)**
Cadmium (a,b)	0.656	0.253	0.492	0.193	1.312	2.550	**115.80**	**333.30**	N/A	N/A	5.0	**NA**	NA	1891.26	**5.0**	**<10**	**Cadmium (a,b)**
Lead (a,b)	1.853	0.541	13.882	0.146	3.707	95.125	**327.24**	**16385.41**	N/A	N/A	5.0	**NA**	NA	1371.13	**45.0**	**<10**	**Lead (a,b)**
Mercury (T) (c)	0.385	0.770	1.400	1.000	0.770	1.400	**67.97**	**178.64**	0.051	0.05	2.0	**-145.02**	-145.45	703.24	**0.4**	**<0.2**	**Mercury (T) (c)**
Silver (a,b,e)	0.148	N/A	0.296	1.000	NA	0.296	**N/A**	**26.17**	N/A	N/A	N/A	**NA**	NA	NA	**5.0**	**<10**	**Silver (a,b, e)**
Zinc (a,b)	144.763	36.498	36.202	0.125	291.894	289.526	**25974.68**	**25558.67**	26000.0	7400.0	N/A	**11252994.44**	3157796.09	NA	**200.0**	**440.0**	**Zinc (a,b)**
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	**459.04**	**3410.06**	140.0	140.0	200.0	**59802.35**	59802.35	85915.90	**230.0**		**Cyanide (d)**
Toluene									15000.0	1300.0	1000.0	**6528385.77**	565793.43	435225.72	**15.0**		**Toluene**
Benzene									510.0	22.0	5.0	**221965.12**	9574.97	2176.13	**3.0**		**Benzene**
1,1,1 Trichloroethane									N/A	N/A	200.0	**NA**	NA	87045.14	**30.0**		**1,1,1 Trichloroethane**
Ethylbenzene									2100.0	530.0	700.0	**913974.01**	230669.63	304658.00	**4.0**		**Ethylbenzene**
Carbon Tetrachloride									16.0	2.3	5.0	**6963.61**	1001.02	2176.13	**15.0**		**Carbon Tetrachloride**
Chloroform									4700.0	57.0	N/A	**2045560.88**	24807.87	NA	**85.0**		**Chloroform**
Tetrachloroethylene									33.0	6.9	5.0	**14362.45**	3003.06	2176.13	**25.0**		**Tetrachloroethylene**
Trichloroethylene									300.0	25.0	5.0	**130567.72**	10880.64	2176.13	**10.0**		**Trichloroethylene**
1,2 trans Dichloroethylene									10000.0	140.0	100.0	**NA**	60931.60	43522.57	**1.5**		**1,2 trans Dichloroethylene**
Methylene Chloride									5900.0	46.0	5.0	**2567831.74**	20020.38	NA	**50.0**		**Methylene Chloride**
Total Phenols									860000.0	10000.0	N/A	**374294117.59**	4352257.18	NA	**50.0**		**Total Phenols**
Naphthalene									N/A	N/A	N/A	**NA**	NA	NA	**1.0**		**Naphthalene**
Total Phthalates									N/A	N/A	N/A	**NA**	NA	NA	**64.5**		**Total Phthalates**
Chlorine (T. Res.)		11.000	19.000	1.000	11.000	19.000	**2146.90**	**3708.28**	NA	NA	NA	**NA**	NA	NA	**n/a**	**50**	**Chlorine (T. Res.)**

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

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

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

APPENDIX 4 –
FACILITY DISCHARGES AND LOW FLOW DETERMINATION

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL 001	
LONGITUDE	LATITUDE
-84.7859	35.3144

RECEIVING STREAM DISCHARGE ROUTE
Hiwassee River Embayment of Chickamauga Reservoir at mile 15.9

FLOW (MGD)	DISCHARGE SOURCE
1.6000	Process wastewater
1.6000	TOTAL DISCHARGE

STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)		480.70	1194.70
		310.68	772.13

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X		X	X	
INDUSTRIAL	NAVIGATION			
X	X			

Treatment: Chemical oxidation, chemical precipitation, sedimentation, aerated lagoons, flocculation, ammonia stripping

* Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Law and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee, 1996, p. xxx.

Also: 1Q10: Tennessee River and Reservoir System Operation and Planning Review, Final Environmental Impact Statement, Tennessee Valley Authority (TVA), TVA/GDG/EQS/-91/1, page xxx.

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL 002	
LONGITUDE	LATITUDE
-84.7821	35.3115

RECEIVING STREAM DISCHARGE ROUTE
Hiwassee River Embayment of Chickamauga Reservoir at mile 15.9

FLOW (MGD)	DISCHARGE SOURCE
0.0440	Return Water Intake - Return Water
0.0440	TOTAL DISCHARGE

STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)		480.70	1194.70
		310.68	772.13

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X		X	X	
INDUSTRIAL	NAVIGATION			
X	X			

Treatment: Chemical oxidation, chemical precipitation, sedimentation, aerated lagoons, flocculation, ammonia stripping

* Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Law and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee, 1996, p. xxx.

Also: 1Q10: Tennessee River and Reservoir System Operation and Planning Review, Final Environmental Impact Statement, Tennessee Valley Authority (TVA), TVA/GDG/EQS/-91/1, page xxx.

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL SW1	
LONGITUDE	LATITUDE
-84.7982	35.3056

FLOW (MGD)	DISCHARGE SOURCE
0.0025	Outfall SW1, utility water
varies	industrial stormwater,hydrostatic testing water
varies	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
Hiwassee River Embayment of Chickamauga Reservoir (South Mouse Creek) at mile 1.7			
STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)	NA	NA	NA
	NA	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X	X	X	X	
INDUSTRIAL	NAVIGATION			

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL SW2	
LONGITUDE	LATITUDE
-84.8044	35.2935

FLOW (MGD)	DISCHARGE SOURCE
varies	Outfall SW2, industrial & construction stormwater
varies	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
South Mouse Creek at mile 2.5			
STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)	NA	NA	NA
	NA	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X	X	X	X	
INDUSTRIAL	NAVIGATION			

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL SW2A	
LONGITUDE	LATITUDE
-84.8024	35.2932

FLOW gal/day	DISCHARGE SOURCE
500	Outfall SW2A,utility water
	discharged one day per month
NA	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
South Mouse Creek at mile 2.5			
STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)	NA	NA	NA
	NA	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X	X	X	X	
INDUSTRIAL	NAVIGATION			

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL SW3	
LONGITUDE	LATITUDE
-84.7975	35.294

RECEIVING STREAM DISCHARGE ROUTE			
South Mouse Creek at mile 2.55			
STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)	NA	NA	NA

FLOW gal/day	DISCHARGE SOURCE
varies	Outfall SW2, industrial & construction stormwater
varies	TOTAL DISCHARGE

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X	X	X	X	
INDUSTRIAL	NAVIGATION			

FACILITY DISCHARGES AND RECEIVING WATERS

OUTFALL SW4	
LONGITUDE	LATITUDE
-84.7982	35.3056

RECEIVING STREAM DISCHARGE ROUTE			
Hiwassee River Embayment of Chickamauga Reservoir (South Mouse Creek) at mile 1.7			
STREAM LOW FLOW (CFS) *	7Q10	1Q10	30Q5
(MGD)	NA	NA	NA

FLOW (MGD)	DISCHARGE SOURCE
0.0025	Outfall SW4, utility water
varies	industrial stormwater,hydrostatic testing water
varies	TOTAL DISCHARGE

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH & AQUATIC LIFE	RECREATION	IRRIGATION	LIVESTOCK & WILDLIFE	DOMESTIC WATER SUPPLY
X	X	X	X	
INDUSTRIAL	NAVIGATION			

SWTOOLBOX CALCULATIONS

1Q10:

```
Program SWStat          U.S. GEOLOGICAL SURVEY              Seq 00001
Ver. 5.0      Log-Pearson & Pearson Type III Statistics   Run Date / Time
03/13/2018            based on USGS Program A193          1/22/2020 1:28 PM

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


      Description:  03566000 HIWASSEE RIVER AT CHARLESTON, TN
   Year Boundaries:  April  1 - March 31
 Period in report:  April  1, 2003 - March 31, 2018
        Parameter:  1-day low
  Non-zero values:    15
      Zero values:     0
  Negative values:     0  (ignored)

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

  1490.000  1090.000   729.000   770.000   550.000   565.000   909.000  1290.000
   629.000   352.000  1210.000  1670.000  1240.000   679.000   658.000


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

 Mean (logs)                                2.928
 Variance (logs)                            0.036
 Standard Deviation (logs)                  0.189
 Skewness (logs)                           -0.193
 Standard Error of Skewness (logs)          0.580
 Serial Correlation Coefficient (logs)      0.263
 Coefficient of Variation (logs)            0.065

Frequency Curve - Parameter values at selected probabilities

   Non-                                    Variance    95-Pct Confidence
 exceedance    Recurrence  Parameter          of           Intervals
 Probability    Interval     Value         Estimate     Lower      Upper
 -----------   ----------  ---------      --------   ---------  ---------
      0.1000        10.00     480.710        1.007     289.350    626.300
      0.2000         5.00     589.730        1.030     400.700    756.100
```

30Q5:

```
      Description:  03566000 HIWASSEE RIVER AT CHARLESTON, TN
   Year Boundaries:  April  1 - March 31
 Period in report:  April  1, 2003 - March 31, 2018
        Parameter:  30-day low
  Non-zero values:    15
      Zero values:     0
  Negative values:     0  (ignored)

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

  3531.300  1528.000  2858.700  1536.900  1005.600  1852.200  2255.100  2204.000
  1420.100   911.430  3300.700  2474.000  2516.300   961.000  1645.600


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

 Mean (logs)                                3.239
 Variance (logs)                            0.037
 Standard Deviation (logs)                  0.192
 Skewness (logs)                            0.001
 Standard Error of Skewness (logs)          0.580
 Serial Correlation Coefficient (logs)     -0.009
 Coefficient of Variation (logs)            0.059

Frequency Curve - Parameter values at selected probabilities

   Non-                                    Variance    95-Pct Confidence
 exceedance    Recurrence  Parameter          of           Intervals
 Probability    Interval     Value         Estimate     Lower      Upper
 -----------   ----------  ---------      --------   ---------  ---------
      0.1000        10.00     984.100        1.010     632.540   1266.600
      0.2000         5.00    1194.700        1.060     862.050   1526.200
```