Exhibit 1

Permit Number: AR0037842
AFIN: 04-00107

AUTHORIZATION TO DISCHARGE WASTEWATER UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND THE ARKANSAS WATER AND AIR POLLUTION CONTROL ACT

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. 8-4-101 et seq.), and the Clean Water Act (33 U.S.C. § 1251 et seq.),

Southwestern Electric Power Company
Flint Creek Power Plant

is authorized to discharge once-through cooling water; low volume wastewater consisting of demineralizer process wastewater, lab drains, boiler blowdown, filter backwash, truck washwater, various plant washwaters, plant floor drains, stack seal water overflow, hydrovactor wastewater, and reclaim basin water; coal pile runoff; treated combustion residual leachate (ash landfill leachate); treated municipal wastewater from the City of Gentry; stormwater from various plant areas; and bottom ash transport water from a facility located as follows: 21797 SWEPCO Plant Road, Gentry, AR 72734, approximately 3 miles southwest of Gentry in Benton County, Arkansas.

Facility Coordinates: Latitude: 36° 15’ 24.703” N; Longitude: 94° 30’ 59.407” W

Discharge is to receiving waters named:

Outfall 001: Little Flint Creek, thence to Flint Creek in Segment 3J of the Arkansas River Basin.

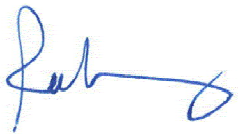
Outfalls 101 and 401: SWEPCO Reservoir, thence to Little Flint Creek, thence to Flint Creek in Segment 3J of the Arkansas River Basin.

The outfalls are located at the following coordinates:

Outfall 001: Latitude: 36° 14’ 0.366” N; Longitude: 94° 33’ 05.944” W
Outfall 101: Latitude: 36° 14’ 57.55” N; Longitude: 94° 31’ 34.79” W
Outfall 401: Latitude: 36° 15’ 26.97” N; Longitude: 94° 31’ 33.10” W

Discharge shall be in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit. Per Part III.D.10, the permittee must re-apply 180 days prior to the expiration date below for permit coverage to continue beyond the expiration date.

Effective Date: October 1, 2020
Expiration Date: September 30, 2025



8/18/2020
Issue Date

Robert E. Blanz, Ph.D., P.E.
Associate Director, Office of Water Quality
Arkansas Department of Energy and Environment
Division of Environmental Quality

PART I
PERMIT REQUIREMENTS

SECTION A1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 001 – reservoir discharge

During the period beginning on the effective date and lasting until the date of expiration, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below as well as Parts II and III. See Part IV for all definitions and calculations.

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.		
Flow[1]	N/A	N/A	Report, MGD	Report, MGD	continuous	record
Total Recoverable Mercury (Hg)[2]	N/A	N/A	Report	Report	once/month	composite
Total Recoverable Cyanide (CN)[2]	N/A	N/A	Report	Report	once/month	composite
pH	N/A	N/A	Minimum 6.0 s.u.	Maximum 9.0 s.u.	once/week	grab

[1] There shall be a daily average flow of at least 2 cfs (1.29 MGD) maintained through spillway overflow, seepage, or pumping into Little Flint Creek. See note below.
[2] See Part II.4 (Metals Condition).

Oil, grease, or petrochemical substances shall not be present in receiving waters to the extent that they produce globules or other residue or any visible, colored film on the surface or coat the banks and/or bottoms of the waterbody or adversely affect any of the associated biota. There shall be no visible sheen as defined in Part IV of this permit.

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. Samples for Mercury, Cyanide, and pH shall be taken at the discharge weir located at the property line in Little Flint Creek at the following monitoring coordinates: Latitude: 36° 14’ 0.366” N; Longitude: 94° 33’ 5.944” W. Monitoring of flow to verify the minimum 2 cfs flow in Little Flint Creek may be done at the above sampling location, or at the weir on the tributary to Little Flint Creek located at the following monitoring coordinates: Latitude: 36° 14’ 9.53” N; Longitude: 94° 32’ 46.70” W.

SECTION A2. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 101 – low volume wastewater consisting of demineralizer process wastewater, lab drains, boiler blowdown, filter backwash, truck washwater, various plant washwaters, plant floor drains, stack seal water overflow, hydrovactor wastewater, and reclaim basin water; coal pile runoff; treated combustion residual leachate (ash landfill leachate); treated municipal wastewater from the City of Gentry[1]; stormwater from various plant areas; and bottom ash transport water[2]

During the period beginning on the effective date, and lasting until December 30, 2023, the permittee is authorized to discharge from Outfall 101. Such discharges shall be limited and monitored by the permittee as specified below as well as Parts II and III. See Part IV for all definitions and calculations.

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.		
Flow	N/A	N/A	Report, MGD	Report, MGD	continuous	record
Total Suspended Solids (TSS)	N/A	N/A	31.8	92.6	once/week	grab
Total Recoverable Cyanide (CN)[3]	Report	Report	Report	Report	once/month	composite
Oil and Grease (O&G)	N/A	N/A	10	15	once/2 months	grab
pH	N/A	N/A	Minimum 6.0 s.u.	Maximum 9.0 s.u.	once/week	grab
Chronic WET Testing[4]						
***Pimephales promelas* (Chronic)[4]**	N/A		7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Growth (7-day NOEC) TGP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP6C			Report %		once/quarter	composite
Coefficient of Variation (Growth) TQP6C			Report %		once/quarter	composite
Growth (7-day NOEC) TPP6C			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22418			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 2 (7-day NOEC) 22419			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 3 (7-day NOEC) 51444			Report (Pass=0/Fail=1)		once/month[5]	composite
***Ceriodaphnia dubia* (Chronic)[4]**			7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Reproduction (7-day NOEC) TGP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP3B			Report %		once/quarter	composite
Coefficient of Variation (Reproduction) TQP3B			Report %		once/quarter	composite
Reproduction (7-day NOEC) TPP3B			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22415			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 2 (7-day NOEC) 22416			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 3 (7-day NOEC) 51443			Report (Pass=0/Fail=1)		once/month[5]	composite

[1] The City of Gentry discharges treated municipal effluent, subject to the limitations of its NPDES Permit No. AR0020184, into Flint Creek Power Plant's primary ash pond. Flint Creek Power Plant bears no responsibility for the quality of the City of Gentry's effluent or for any treatment of that effluent.

[2] See Part IB and II.23.

[3] See Part II.4 (Metals Condition).

[4] See Part II.6 (WET Testing Requirements).

[5] CONDITIONAL REPORTING: Use only if conducting retests due to a test failure (demonstration of significant toxic effects at or below the critical dilution). If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one routine toxicity test. If retests are not required, Report NODI=9 (Conditional Monitoring - Not Required This Period) under retest parameters (reported on a quarterly DMR). This condition applies to *P. promelas* and *C. dubia*.

Oil, grease, or petrochemical substances shall not be present in receiving waters to the extent that they produce globules or other residue or any visible, colored film on the surface or coat the banks and/or bottoms of the waterbody or adversely affect any of the associated biota. There shall be no visible sheen as defined in Part IV of this permit.

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. Samples shall be taken after the final treatment unit, prior to the receiving stream.

SECTION A3. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 101 – low volume wastewater consisting of demineralizer process wastewater, lab drains, boiler blowdown, filter backwash, truck washwater, various plant washwaters, plant floor drains, stack seal water overflow, hydrovactor wastewater, and reclaim basin water; coal pile runoff; treated combustion residual leachate (ash landfill leachate); treated municipal wastewater from the City of Gentry [1]; and stormwater from various plant areas[2]

During the period beginning December 31, 2023 and lasting until the date of expiration, the permittee is authorized to discharge from Outfall 101. Such discharges shall be limited and monitored by the permittee as specified below as well as Parts II and III. See Part IV for all definitions and calculations.

Effluent Characteristics	**Discharge Limitations**				**Monitoring Requirements**	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.		
Flow	N/A	N/A	Report, MGD	Report, MGD	continuous	record
Total Suspended Solids (TSS)	N/A	N/A	31.8	92.2	once/week	grab
Total Recoverable Cyanide (CN)[3]	Report	Report	Report	Report	once/month	composite
Oil and Grease (O&G)	N/A	N/A	10	15	once/2 months	grab
pH	N/A	N/A	Minimum 6.0 s.u.	Maximum 9.0 s.u.	once/week	grab
Chronic WET Testing[4]						
***Pimephales promelas* (Chronic)[4]**	N/A		7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Growth (7-day NOEC) TGP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP6C			Report %		once/quarter	composite
Coefficient of Variation (Growth) TQP6C			Report %		once/quarter	composite
Growth (7-day NOEC) TPP6C			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22418			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 2 (7-day NOEC) 22419			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 3 (7-day NOEC) 51444			Report (Pass=0/Fail=1)		once/month[5]	composite
***Ceriodaphnia dubia* (Chronic)[4]**			7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Reproduction (7-day NOEC) TGP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP3B			Report %		once/quarter	composite
Coefficient of Variation (Reproduction) TQP3B			Report %		once/quarter	composite
Reproduction (7-day NOEC) TPP3B			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22415			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 2 (7-day NOEC) 22416			Report (Pass=0/Fail=1)		once/month[5]	composite
Pass/Fail Retest 3 (7-day NOEC) 51443			Report (Pass=0/Fail=1)		once/month[5]	composite

[1] The City of Gentry discharges treated municipal effluent, subject to the limitations of its NPDES Permit No. AR0020184, into Flint Creek Power Plant's primary ash pond. Flint Creek Power Plant bears no responsibility for the quality of the City of Gentry's effluent or for any treatment of that effluent.

[2] See Part IB and II.23.

[3] See Part II.4 (Metals Condition).

[4] See Part II.6 (WET Testing Requirements).

[5] CONDITIONAL REPORTING: Use only if conducting retests due to a test failure (demonstration of significant toxic effects at or below the critical dilution). If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one routine toxicity test. If retests are not required, Report NODI=9 (Conditional Monitoring - Not Required This Period) under retest parameters (reported on a quarterly DMR). This condition applies to *P. promelas* and *C. dubia*.

Oil, grease, or petrochemical substances shall not be present in receiving waters to the extent that they produce globules or other residue or any visible, colored film on the surface or coat the banks and/or bottoms of the waterbody or adversely affect any of the associated biota. There shall be no visible sheen as defined in Part IV of this permit.

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. Samples shall be taken after the final treatment unit, prior to the receiving stream.

SECTION A4. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS: OUTFALL 401 – once-through cooling water

During the period beginning on the effective date and lasting until the date of expiration, the permittee is authorized to discharge from Outfall 401. Such discharges shall be limited and monitored by the permittee as specified below as well as Parts II and III. See Part IV for all definitions and calculations.

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Mass (lbs/day, unless otherwise specified)		Concentration (mg/l, unless otherwise specified)		Frequency	Sample Type
	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.		
Flow	N/A	N/A	450 MGD	450 MGD	continuous	record[1]
Free Available Chlorine[2]	62.6	156.4	0.2	0.5	twice/month	grab[3]
Total Residual Chlorine (TRC)[2]	N/A	62.6	N/A	0.2[3]	twice/month	grab[4]
Temperature[5]	N/A	N/A	N/A	129.2 ºF	continuous	record
pH	N/A	N/A	Minimum 6.0 s.u.	Maximum 9.0 s.u.	twice/month	grab
Chronic WET Testing[6]						
***Pimephales promelas* (Chronic)[6]**	N/A		7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Growth (7-day NOEC) TGP6C			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP6C			Report %		once/quarter	composite
Coefficient of Variation (Growth) TQP6C			Report %		once/quarter	composite
Growth (7-day NOEC) TPP6C			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22418			Report (Pass=0/Fail=1)		once/month[7]	composite
Pass/Fail Retest 2 (7-day NOEC) 22419			Report (Pass=0/Fail=1)		once/month[7]	composite
Pass/Fail Retest 3 (7-day NOEC) 51444			Report (Pass=0/Fail=1)		once/month[7]	composite
***Ceriodaphnia dubia* (Chronic)[6]**			7-Day Minimum			
Pass/Fail Lethality (7-day NOEC) TLP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Pass/Fail Reproduction (7-day NOEC) TGP3B			Report (Pass=0/Fail=1)		once/quarter	composite
Survival (7-day NOEC) TOP3B			Report %		once/quarter	composite
Coefficient of Variation (Reproduction) TQP3B			Report %		once/quarter	composite
Reproduction (7-day NOEC) TPP3B			Report %		once/quarter	composite
Pass/Fail Retest 1 (7-day NOEC) 22415			Report (Pass=0/Fail=1)		once/month[7]	composite
Pass/Fail Retest 2 (7-day NOEC) 22416			Report (Pass=0/Fail=1)		once/month[7]	composite
Pass/Fail Retest 3 (7-day NOEC) 51443			Report (Pass=0/Fail=1)		once/month[7]	composite

[1] Flow measurements may be calculated using pump records.
[2] Chlorine shall not be discharged from any single generating unit for more than 2 hours per day (see Part II.9).
[3] Chlorine shall be measured within fifteen (15) minutes of sampling.
[4] Sample must be representative of periods of chlorination.
[5] Temperature may be measured at the condenser discharge. Daily maximum temperature shall be the highest daily flow-weighted temperature calculated for the month (see Part II.22).
[6] See Part II.6 (WET Testing Requirements).
[7] CONDITIONAL REPORTING: Use only if conducting retests due to a test failure (demonstration of significant toxic effects at or below the critical dilution). If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one routine toxicity test. If retests are not required, Report NODI=9 (Conditional Monitoring - Not Required This Period) under retest parameters (reported on a quarterly DMR). This condition applies to *P. promelas* and *C. dubia*.

Oil, grease, or petrochemical substances shall not be present in receiving waters to the extent that they produce globules or other residue or any visible, colored film on the surface or coat the banks and/or bottoms of the waterbody or adversely affect any of the associated biota. There shall be no visible sheen as defined in Part IV of this permit.

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. Samples shall be taken prior to discharge to SWEPCO Reservoir at the following monitoring coordinates: Latitude: 36° 15’ 26.99” N; Longitude: 94° 31’ 32.99” W.

SECTION B. PERMIT COMPLIANCE SCHEDULE

Compliance with the requirement for no discharge of Bottom Ash Transport Water generated on and after December 31, 2023 is required by December 31, 2023. The permittee shall submit progress reports addressing the progress towards attaining the aforementioned requirement according to the following schedule:

ACTIVITY	DUE DATE
Progress Report[1, 2]	December 31, 2021
Progress Report[1, 3]	December 31, 2022
Achieve Final Compliance[1, 4]	December 31, 2023

All progress reports must be submitted to the Division at the following address:

Enforcement Branch
Office of Water Quality
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Information can also be submitted electronically via email at water-enforcement-report@adeq.state.ar.us.

[1] If the permittee is already in compliance with the requirement, only documentation demonstrating compliance with the requirement will be required for the progress report.

[2] If the permittee is not in compliance with the requirement by December 31, 2021, the initial Progress Report must detail how the permittee plans to come into compliance with the requirement within the remaining 2 years of the interim period. Options must be provided that were considered along with which option was selected.

[3] The second Progress Report must contain an update on the status of the chosen option from the initial Progress Report. If the facility is not meeting any of the milestones provided in the initial Progress Report, the facility must update the milestone schedule to show how the requirement will be met by the deadline.

A final Progress Report must be submitted no later than 30 days following the final compliance date and include a certification that the requirement was met on the effective date and is still being met.

PART II
OTHER CONDITIONS

1. The operator of this wastewater treatment facility shall hold an Advanced Industrial license from the State of Arkansas in accordance with APC&EC Rule 3.

2. In accordance with 40 CFR Parts 122.62 (a)(2) and 124.5, this permit may be reopened for modification or revocation and/or reissuance to require additional monitoring and/or effluent limitations when new information is received that was not available at the time of the permit issuance that would have justified the application of different permit conditions at the time of permit issuance. The new information includes (but is not limited to):

   a. Actual or potential exceedance of State water quality criteria and/or narrative criteria are determined to be the result of the permittee's discharge(s) to a relevant water body;
   b. A Total Maximum Daily Load (TMDL) is established or revised for the water body;
   c. Effluent limitation guidelines (ELGs) applicable to the facility are promulgated or are revised in a way to make reopening the permit necessary to address compliance.

3. Other Specified Monitoring Requirements

   The permittee may use alternative appropriate monitoring methods and analytical instruments other than as specified in Part I Section A of the permit without a major permit modification under the following conditions:

   - The monitoring and analytical instruments are consistent with accepted scientific practices.
   - The requests shall be submitted in writing to the Permits Branch of the Office of Water Quality of the DEQ for use of the alternate method or instrument.
   - The method and/or instrument is in compliance with 40 CFR Part 136 or approved in accordance with 40 CFR Part 136.5.
   - All associated devices are installed, calibrated, and maintained to ensure the accuracy of the measurements and are consistent with the accepted capability of that type of device. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

   Upon written approval of the alternative monitoring method and/or analytical instruments, these methods or instruments must be consistently utilized throughout the monitoring period. DEQ must be notified in writing and the permittee must receive written approval from DEQ if the permittee decides to return to the original permit monitoring requirements.

4. The permittee may use any EPA approved method based on 40 CFR Part 136 provided the minimum quantification level (MQL) for the chosen method is equal to or less than what has been specified in chart below:

Pollutant	MQL (µg/l)
Total Recoverable Mercury	0.005
Total Recoverable Cyanide	5

The permittee may develop a matrix specific method detection limit (MDL) in accordance with Appendix B of 40 CFR Part 136. For any pollutant for which the permittee determines a site specific MDL, the permittee shall send to DEQ, NPDES Permits Branch, a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that a site specific MDL was correctly calculated. A site specific MQL shall be determined in accordance with the following calculation:

$$MQL = 3.3 \times MDL$$

Upon written approval by Permits Branch, the site specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) calculations and reporting requirements.

5. [Reserved]

6. WHOLE EFFLUENT TOXICITY TESTING (7-DAY CHRONIC NOEC FRESHWATER)

A. SCOPE AND METHODOLOGY

i. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL: 101

REPORTED ON DMR AS FINAL OUTFALL: 101

CRITICAL DILUTION (%): 17

EFFLUENT DILUTION SERIES (%): 7, 10, 13, 17, 23

APPLICABLE TO FINAL OUTFALL: 401

REPORTED ON DMR AS FINAL OUTFALL: 401

CRITICAL DILUTION (%): 40

EFFLUENT DILUTION SERIES (%): 17, 23, 30, 40, 53

TESTING FREQUENCY: once/quarter

COMPOSITE SAMPLE TYPE: Defined in paragraph C.iv.a

TEST SPECIES/METHODS: 40 CFR Part 136

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA-821-R-02-013, or the most recent update thereof. This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (Fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA-821-R-02-013, or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

ii. The NOEC (No Observed Effect Concentration) is herein defined as the greatest effluent dilution at and below which toxicity (lethal or sub-lethal) that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution. Chronic sub-lethal test failure is defined as a demonstration of a statistically significant sub-lethal effect (i.e., growth or reproduction) at test completion to a test species at or below the critical dilution.

iii. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

B. PERSISTENT LETHAL and/or SUB-LETHAL EFFECTS

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal and/or sub-lethal effects at or below the critical dilution. The purpose of retests is to determine the duration of a toxic event. A test that meets all test acceptability criteria and demonstrates significant toxic effects does not need additional confirmation. Such testing cannot confirm or disprove a previous test result.

If a frequency reduction, as specified in Item F, has been granted and any valid test demonstrates significant lethal or sub-lethal effects to a test species at or below the critical dilution, the frequency of testing for that species is automatically increased to once per quarter for the life of the permit. In addition:

i. Part I Testing Frequency Other Than Monthly

a. The permittee shall conduct a total of three (3) retests for any species that demonstrates significant toxic effects at or below the critical dilution. The retests shall be conducted monthly during the next three consecutive months. If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one scheduled toxicity test. A full report shall be prepared for each test required by

this section in accordance with procedures outlined in Item D of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.

b. IF LETHAL EFFECTS HAVE BEEN DEMONSTRATED If any of the retests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item E of this section. The permittee shall notify DEQ in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest. A TRE may also be required due to a demonstration of intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests. A TRE required based on lethal effects should consider any sub-lethal effects as well.

c. IF SUB-LETHAL EFFECTS ONLY HAVE BEEN DEMONSTRATED If any two of the three retests demonstrates significant sub-lethal effects at 75% effluent or lower, the permittee shall initiate the Sub-Lethal Toxicity Reduction Evaluation (TRE_{SL}) requirements as specified in Item E of this section. The permittee shall notify DEQ in writing within 5 days of the failure of any retest, and the Sub-Lethal Effects TRE initiation date will be the test completion date of the first failed retest. A TRE may also be required for failure to perform the required retests.

d. The provisions of Item B.i.a are suspended upon submittal of the TRE Action Plan.

C. REQUIRED TOXICITY TESTING CONDITIONS

i. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

a. The toxicity test control (0% effluent) must have survival equal to or greater than 80%.

b. The mean number of *Ceriodaphnia dubia* neonates produced per surviving female in the control (0% effluent) must be 15 or more.

c. 60% of the surviving control females must produce three broods.

d. The mean dry weight of surviving Fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.

e. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the *Ceriodaphnia dubia* reproduction test; the growth and survival endpoints of the Fathead minnow test.

f. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or sub-lethal effects are exhibited for: the young of surviving females in the *Ceriodaphnia dubia* reproduction test; the growth and survival endpoints of the Fathead minnow test.

g. If a test passes, yet the percent coefficient of variation between replicates is greater than 40% in the control (0% effluent) and/or in the critical dilution for: the young of surviving females in the *Ceriodaphnia dubia* reproduction test; the growth and survival endpoints of the Fathead minnow test, the test is determined to be invalid. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

h. If a test fails, test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%.

i. A Percent Minimum Significant Difference (PMSD) range of 13 - 47 for *Ceriodaphnia dubia* reproduction;

j. A PMSD range of 12 - 30 for Fathead minnow growth.

ii. Statistical Interpretation

a. For the *Ceriodaphnia dubia* survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/821/R-02-013 or the most recent update thereof.

b. For the *Ceriodaphnia dubia* reproduction test and the Fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/821/R-02-013 or the most recent update thereof.

c. If the conditions of Test Acceptability are met in Item C.i above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report a survival NOEC of not less than the critical dilution for the DMR reporting requirements found in Item D below.

iii. Dilution Water

a. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

(1) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(2) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

b. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item C.i), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(1) a synthetic dilution water control which fulfills the test acceptance requirements of Item C.i was run concurrently with the receiving water control;

(2) the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);

(3) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item D below; and

(4) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

iv. Samples and Composites

a. The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item A.i above. Unless otherwise stated in this section, a composite sample for WET shall consist of a minimum of 12 subsamples gathered at equal time intervals during a 24-hour period.

b. The permittee shall collect second and third composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples, on use, are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on a regular or intermittent basis.

c. The permittee must collect all three flow-weighted composite samples within the monitoring period. Second and/or third composite samples shall not be collected into the next monitoring period; such tests will be determined to not meet either reporting period requirements. Monitoring period definitions are listed in Part IV.

d. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of

the first composite sample. Samples shall be chilled to between 0 and 6 degrees Centigrade during collection, shipping, and/or storage.

e. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must have collected an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item D of this section.

f. MULTIPLE OUTFALLS: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in Item A.i. above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.

g. If chlorination is part of the treatment process, the permittee shall not allow the sample to be dechlorinated at the laboratory. At the time of sample collection the permittee shall measure the TRC of the effluent. The measured concentration of TRC for each sample shall be included in the lab report submitted by the permittee.

D. REPORTING

i. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/821/R-02-013, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.7 of this permit. The permittee shall submit full reports. For any test or retest which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

ii. A valid test for each species must be reported on the DMR during each reporting period specified in PART I of this permit. The full reports for all valid tests, invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for Agency review.

iii. The permittee shall submit the results of each valid toxicity test and retest on the subsequent DMR for that reporting period in accordance with PART III.D.4 of this permit, as follows below. Only results of valid tests are to be reported on the DMR.

a. *Pimephales promelas* (Fathead minnow)

(1) If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP6C

(2) Report the NOEC value for survival, Parameter No. TOP6C

(3) Report the NOEC value for growth, Parameter No. TPP6C

(4) If the NOEC for growth is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP6C

(5) Report the highest (critical dilution or control) Coefficient of Variation for growth, Parameter No. TQP6C

(6) If conducting retests due to a test failure (demonstration of significant toxic effects at or below the critical dilution):

(A) Consecutive Monthly Retest 1: If the NOEC (lowest lethal or sub-lethal) for *P. promelas* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 22418 (reported on quarterly DMR);

(B) Consecutive Monthly Retest 2: If the NOEC (lowest lethal or sub-lethal) for *P. promelas* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 22419 (reported on quarterly DMR);

(C) Consecutive Monthly Retest 3: If the NOEC (lowest lethal or sub-lethal) for *P. promelas* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 51444 (reported on quarterly DMR);

(D) If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one scheduled toxicity test;

(E) If retests are not required, Report NODI=9 (Conditional Monitoring - Not Required This Period) under Parameter Nos. 22418, 22419, 51444 (reported on quarterly DMR)

b. *Ceriodaphnia dubia*

(1) If the NOEC for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP3B

(2) Report the NOEC value for survival, Parameter No. TOP3B

(3) Report the NOEC value for reproduction, Parameter No. TPP3B

(4) If the NOEC for reproduction is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP3B

(5) Report the higher (critical dilution or control) Coefficient of Variation for reproduction, Parameter No. TQP3B

(6) If conducting retests due to a test failure (demonstration of significant toxic effects at or below the critical dilution):

(A) Consecutive Monthly Retest 1: If the NOEC (lowest lethal or sub-lethal) for *C. dubia* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 22415 (reported on quarterly DMR);

(B) Consecutive Monthly Retest 2: If the NOEC (lowest lethal or sub-lethal) for *C. dubia* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 22416 (reported on quarterly DMR);

(C) Consecutive Monthly Retest 3: If the NOEC (lowest lethal or sub-lethal) for *C. dubia* is less than the critical dilution, enter a '1'; otherwise, enter a '0' under Parameter No. 51443 (reported on quarterly DMR);

(D) If testing on a quarterly basis, the permittee may substitute one of the retests in lieu of one scheduled toxicity test;

(E) If retests are not required, Report NODI=9 (Conditional Monitoring - Not Required This Period) under Parameter Nos. 22415, 22416, and 51443 (reported on quarterly DMR)

E. TOXICITY REDUCTION EVALUATIONS (TREs)

TREs for lethal and sub-lethal effects are performed in a very similar manner. EPA Region 6 is currently addressing TREs as follows: a sub-lethal TRE (TRE_{SL}) is triggered based on three sub-lethal test failures while a lethal effects TRE (TRE_L) is triggered based on only two test failures for lethality. In addition, EPA Region 6 will consider the magnitude of toxicity and use flexibility when considering a TRE_{SL} where there are no effects at effluent dilutions of 75% or lower.

i. Within ninety (90) days of confirming toxicity, as outlined above, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The goal of the TRE is to maximally reduce the toxic effects of effluent at the critical dilution and includes the following:

a. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents 'Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures' (EPA-600/6-91/003) and 'Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I' (EPA-600/6-91/005F), or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents 'Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity' (EPA/600/R-92/080) and 'Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity' (EPA/600/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

b. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

c. Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 48 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

d. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

e. Project Organization (e.g., project staff, project manager, consulting services, etc.).

ii. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.

iii. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:

a. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;

b. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and

c. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant toxicity at the critical dilution.

iv. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming toxicity in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant toxicity at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

v. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

F. MONITORING FREQUENCY REDUCTION

i. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters or first twelve consecutive months (in accordance with Item A.i.) of the current permit term of testing for one or both test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution. If granted, the monitoring frequency for that test species may be reduced to not less than once per year for the less sensitive species (usually the Fathead minnow) and not less than twice per year for the more sensitive test species (usually the *Ceriodaphnia dubia*).

ii. CERTIFICATION - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in Item C.i. above. In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub-lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the agency will issue a letter of confirmation of the monitoring frequency reduction. A copy of the letter will be forwarded to the agency's Permit Compliance System section to update the permit reporting requirements.

iii. SUB-LETHAL OR SURVIVAL FAILURES - If any test fails the lethal or sub-lethal endpoint at any time during the life of this permit, three consecutive monthly retests are required and the monitoring frequency for the affected test species may be increased to once per quarter until the permit is re-issued. Monthly retesting is not required if the permittee is performing a TRE.

iv. Any monitoring frequency reduction granted applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.

7. Stormwater runoff commingling with other process wastewater discharged from Outfall 101 shall be managed in accordance with the Best Management Practices (BMPs) in the form of a pollution prevention plan (SWPPP) required by the Arkansas Industrial Stormwater General Permit ARR000000 to control the quality of stormwater discharges associated with industrial activity based on 40 CFR 122.44(k).

8. There shall be no discharge of polychlorinated biphenyl transformer fluid.

9. The terms "Total Residual Chlorine" (TRC), and "Free Available Chlorine" (FAC), are defined as follows:

   a. TRC: the value obtained using any of the "chlorine—total residual" methods in Table IB in 40 CFR 136.3(a). [ref. 40 CFR 423.11(a)]

   b. FAC: the value obtained using any of the "chlorine—free available" methods in Table IB in 40 CFR 136.3(a) where the method has the capability of measuring free available chlorine. [ref. 40 CFR 423.11(l)]

   Chlorine may not be discharged from any unit for more than two hours per day in any one day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control.

10. The term "low volume waste sources" means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations or standards are otherwise established in 40 CFR Part 423. Low volume waste sources include, but are not limited to, the following: wastewaters from ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, recirculating house service water systems, and wet scrubber air pollution control systems whose primary purpose is particulate removal. Sanitary wastes, air conditioning wastes, and wastewater from carbon capture or sequestration systems are not included in this definition. [ref. 40 CFR 423.11(b)]

11. The term "bottom ash" means the ash, including boiler slag, which settles in the furnace or is dislodged from furnace walls. Economizer ash is included in this definition when it is collected with bottom ash. [ref. 40 CFR 423.11(f)]

12. The term “bottom ash transport water” means any wastewater that is used to convey bottom ash (as defined Part II.11), and has direct contact with the ash. Transport water does not include low volume, short duration discharges of wastewater from minor leaks (e.g., leaks from valve packing, pipe flanges, or piping) or minor maintenance events (e.g., replacement of valves or pipe sections). [ref. 40 CFR 423.11(p)]

13. The term “coal pile runoff” means the rainfall runoff from or through any coal storage pile. [ref. 40 CFR 423.11(m)]

14. The term “once through cooling water” means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat. [ref. 40 CFR 423.11(g)]

15. The term “combustion residual leachate” means leachate from landfills or surface impoundments containing combustion residuals. Leachate is composed of liquid, including any suspended or dissolved constituents in the liquid, that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (e.g., bottom, dikes, berms). Combustion residual leachate includes seepage and/or leakage from a combustion residual landfill or impoundment unit. Combustion residual leachate includes wastewater from landfills and surface impoundments located on non-adjoining property when under the operational control of the permitted facility. [ref. 40 CFR 423.11(r)]

16. <u>Cooling Water Intake Structure (CWIS) Flow Monitoring</u>

    A. The facility shall operate and maintain a closed-cycle recirculating cooling water system as defined in 40 CFR 125.92(c)(2) in accordance with Best Management Practices (BMPs) that will minimize any Adverse Environmental Impacts (AEI) from the cooling water intake structure (CWIS).

    B. The facility shall monitor the actual intake flows, in million gallons per day (MGD), at a minimum frequency of daily. The monitoring must be representative of normal operating conditions.

       Actual intake flows may be calculated using the pump run time and pump capacity. The actual intake flows determined under this condition will satisfy the monitoring requirements under this condition. The daily monitoring records shall be retained in accordance with Part III.C.7 of this permit.

    C. Pursuant to 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility’s compliance with the Endangered Species Act.

17. Cooling Water Intake Structure (CWIS) Annual Certification Statement and Report

An annual certification statement and report must be submitted to the Division each year by the anniversary date of the effective date of the permit. The certification statement and report must be signed by the Responsible Official for the permit.

A. The report must include a summary of any modifications to, or changes in the operation of, the CWIS at your facility that impacts cooling water withdrawals. In addition, any revisions to the information required in 40 CFR 122.21(r) must be submitted with the next permit renewal application.

B. If the information contained in the previous year's annual certification statement and report is still pertinent, a letter stating such, signed by the Responsible Official for the permit, may be submitted to the Division, along with any applicable data. The letter will meet the requirements of this part for an annual certification statement and report.

18. Visual inspections of the Cooling Water Intake Structure (CWIS)

Visual inspections of the CWIS shall be conducted during the period the CWIS is in operation. Inspections shall be conducted at least weekly to ensure that any technologies operated to comply with 40 CFR 125.94 are maintained and operated to function as designed. Records of the inspections shall be maintained on-site until the subsequent permit is issued.

19. Recordkeeping for the CWIS

A. Records must be kept of all submissions that are part of the permit application until the subsequent permit is issued to document compliance with the requirements of this permit.

B. All records supporting the Director's Determination of BTA for Entrainment under §125.98(f) must be retained until such time as the Director revises the Determination of BTA for Entrainment in the permit.

C. Discharge Monitoring Reports (DMRs), and results of all monitoring, demonstrations, and other information required by the permit sufficient to determine compliance with the permit conditions and requirements established under §125.94 shall be submitted to the Director. The daily intake flows, and the weekly visual inspections, shall be submitted to DEQ with each monthly DMR.

20. Contact Stormwater Pond

Any discharge of the stormwater contained in the contact water pond through the emergency spillway must be reported to the Enforcement Branch of the Office of Water Quality within 24 hours of the commencement of this discharge. Each discharge will be evaluated to determine if a violation occurred.

21. Leachate Pond

    Any discharge of leachate through the emergency spillway into the contact water pond is considered a violation of this NPDES permit. The Enforcement Branch of the Office of Water Quality must be notified of this event within 24 hours of the commencement of this event.

22. For the purpose of this permit, the daily maximum temperature discharged at Outfall 401 shall be calculated once per day as a flow weighted average temperature (FWAT). Each instantaneous flow and temperature shall be recorded each day at equal time intervals throughout the day at intervals not exceeding two hours. The FWAT shall be determined using the following formula:

$$\text{FWAT} = \frac{\sum (\text{Instantaneous Flow} \times \text{Instantaneous Temperature})}{\sum (\text{Instantaneous Flows})}$$

    The monthly average temperature discharged from Outfall 401 shall be determined by the arithmetic mean of all FWATs determined during the calendar month.

23. Bottom Ash Transport Water

    The discharge of bottom ash transport water generated on and after December 31, 2023 is prohibited.

PART III
STANDARD CONDITIONS

SECTION A – GENERAL CONDITIONS

1. **Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the federal Clean Water Act and the Arkansas Water and Air Pollution Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; and/or for denial of a permit renewal application. **Any values reported in the required Discharge Monitoring Report (DMR) which are in excess of an effluent limitation specified in Part I shall constitute evidence of violation of such effluent limitation and of this permit.**

2. **Penalties for Violations of Permit Conditions**

The Arkansas Water and Air Pollution Control Act provides that any person who violates any provisions of a permit issued under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year, or a fine of not more than twenty-five thousand dollars ($25,000) or by both such fine and imprisonment for each day of such violation. Any person who violates any provision of a permit issued under the Act may also be subject to civil penalty in such amount as the court shall find appropriate, not to exceed ten thousand dollars ($10,000) for each day of such violation. The fact that any such violation may constitute a misdemeanor shall not be a bar to the maintenance of such civil action.

3. **Permit Actions**

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:

A. Violation of any terms or conditions of this permit.
B. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts.
C. A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge.
D. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.
E. Failure of the permittee to comply with the provisions of APC&EC Rule 9 (Permit fees) as required by Part III.A.11 herein.

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

4. **Toxic Pollutants**

Notwithstanding Part III.A.3, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under APC&EC Rule 2, as amended, or Section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitations on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standards or prohibition and the permittee so notified.

The permittee shall comply with effluent standards, narrative criteria, or prohibitions established under APC&EC Rule 2, as amended, or Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

5. **Civil and Criminal Liability**

Except as provided in permit conditions for "Bypass of Treatment Facilities" (Part III.B.4), and "Upset" (Part III.B.5), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of this permit or applicable state and federal statues or regulations which defeats the regulatory purposes of the permit may subject the permittee to criminal enforcement pursuant to the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 et seq.).

6. **Oil and Hazardous Substance Liability**

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 to which the permittee is or may be subject to under Section 311 of the Clean Water Act.

7. **State Laws**

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 regulation under authority preserved by Section 510 of the Clean Water Act.

8. **Property Rights**

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize 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.

9. **Severability**

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

10. **Applicable Federal, State or Local Requirements**

Permittees are responsible for compliance with all applicable terms and conditions of this permit. Receipt of this permit does not relieve any operator of the responsibility to comply with any other applicable federal requirements such as endangered species, state or local statute, ordinance or regulation.

11. **Permit Fees**

The permittee shall comply with all applicable permit fee requirements (i.e., including annual permit fees following the initial permit fee that will be invoiced every year the permit is active) for wastewater discharge permits as described in APC&EC Rule 9 (Regulation for the Fee System for Environmental Permits). Failure to promptly remit all required fees shall be grounds for the Director to initiate action to terminate this permit under the provisions of 40 CFR Parts 122.64 and 124.5(d), as adopted in APC&EC Rule 6 and the provisions of APC&EC Rule 8.

SECTION B – OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. **Proper Operation and Maintenance**

A. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B. The permittee shall provide an adequate operating staff which is duly qualified to carryout operation, maintenance, and testing functions required to ensure compliance with the conditions of this permit.

2. **Need to Halt or Reduce not a Defense**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control

production or discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power for the treatment facility is reduced, is lost, or alternate power supply fails.

3. **Duty to Mitigate**

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

4. **Bypass of Treatment Facilities**

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility, as defined at 40 CFR 122.41(m)(1)(i).

A. Bypass not exceeding limitation

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts III.B.4.B and 4.C.

B. Notice

1. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
2. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part III.D.6 (24-hour notice).

C. Prohibition of bypass

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

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.
(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal or preventive maintenance.
(c) The permittee submitted notices as required by Part III.B.4.B.

2. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Part III.B.4.C(1).

5. **Upset Conditions**

A. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Part III.B.5.B of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

B. Conditions necessary for demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the permittee can identify the specific cause(s) of the upset.
2. The permitted facility was at the time being properly operated.
3. The permittee submitted notice of the upset as required by Part III.D.6.
4. The permittee complied with any remedial measures required by Part III.B.3.

C. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. **Removed Substances**

A. Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State. The Permittee must comply with all applicable state and Federal regulations governing the disposal of sludge, including but not limited to 40 CFR Part 503, 40 CFR Part 257, and 40 CFR Part 258.

B. Any changes to the permittee's disposal practices described in the Fact Sheet, as derived from the permit application, will require at least 180 days prior notice to the Director to allow time for additional permitting. Please note that the 180 day notification requirement may be waived if additional permitting is not required for the change.

7. **Power Failure**

The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators, or retention of inadequately treated effluent.

SECTION C – MONITORING AND RECORDS

1. **Representative Sampling**

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified,

before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director. Intermittent discharge shall be monitored.

2. **Flow Measurement**

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, calibrated, and maintained to ensure the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than +/- 10% from true discharge rates throughout the range of expected discharge volumes and shall be installed at the monitoring point of the discharge.

Calculated Flow Measurement

For calculated flow measurements that are performed in accordance with either the permit requirements or a Division approved method (i.e., as allowed under Part II.3), the +/- 10% accuracy requirement described above is waived. This waiver is only applicable when the method used for calculation of the flow has been reviewed and approved by the Division.

3. **Monitoring Procedures**

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals frequent enough to ensure accuracy of measurements and shall ensure that both calibration and maintenance activities will be conducted. An adequate analytical quality control program, including the analysis of sufficient standards, spikes, and duplicate samples to ensure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory. At a minimum, spikes and duplicate samples are to be analyzed on 10% of the samples.

4. **Penalties for Tampering**

The Arkansas Water and Air Pollution Control Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year or a fine of not more than ten thousand dollars ($10,000) or by both such fine and imprisonment.

5. **Reporting of Monitoring Results**

40 CFR 127.11(a)(1) and 40 CFR 127.16(a) require that monitoring reports must be reported on a Discharge Monitoring Reports (DMR) and filed electronically. Signatory Authorities must initially request access for a NetDMR account. Once a NetDMR account is established,

access to electronic filing should use the following link https://cdx.epa.gov. Permittees who are unable to file electronically may request a waiver from the Director in accordance with 40 CFR 127.15. Monitoring results obtained during the previous monitoring period shall be summarized and reported on a DMR dated and submitted no later than the 25th day of the month, following the completed reporting period beginning on the effective date of the permit.

6. **Additional Monitoring by the Permittee**

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

7. **Retention of Records**

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.

8. **Record Contents**

Records and monitoring information shall include:

A. The date, exact place, time and methods of sampling or measurements, and preservatives used, if any.
B. The individual(s) who performed the sampling or measurements.
C. The date(s) and time analyses were performed.
D. The individual(s) who performed the analyses.
E. The analytical techniques or methods used.
F. The measurements and results of such analyses.

9. **Inspection and Entry**

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.
B. Have access to and copy, at reasonable times, any records that must 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.

D. Sample, inspect, or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION D – REPORTING REQUIREMENTS

1. **Planned Changes**

The Permittee shall give notice to the Director as soon as possible but no later than 180 days prior to any planned physical alterations or additions to the permitted facility [40 CFR 122.41(l)]. Notice is required only when:

A. The alteration or addition to a permitted facility may meet one of the criteria for new sources at 40 CFR 122.29(b).
B. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants subject to effluent limitations in the permit, or to the notification requirements under 40 CFR 122.42(b).

2. **Anticipated Noncompliance**

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. **Transfers**

The permit is nontransferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. **Monitoring Reports**

Monitoring results shall be reported at the intervals and in the form specified in Part III.C.5. **Discharge Monitoring Reports must be submitted even when no discharge occurs during the reporting period.**

5. **Compliance Schedule**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

6. **Twenty-four Hour Report**

A. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain the following information:

1. A description of the noncompliance and its cause.
2. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue.
3. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

B. The following shall be included as information which must be reported within 24 hours:

1. Any unanticipated bypass which exceeds any effluent limitation in the permit.
2. Any upset which exceeds any effluent limitation in the permit.
3. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part I of the permit to be reported within 24 hours to the Enforcement Branch of the Office of Water Quality of the DEQ.

C. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours to the Enforcement Branch of the Office of Water Quality of the DEQ.

7. **Other Noncompliance**

The permittee shall report all instances of noncompliance not reported under Parts III.D.4, 5, and 6, at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.6.

8. **Changes in Discharge of Toxic Substances for Industrial Dischargers**

The Director shall be notified as soon as the permittee knows or has reason to believe:

A. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" described in 40 CFR Part 122.42(a)(1).

B. That 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 "notification levels" described in 40 CFR Part 122.42(a)(2).

9. **Duty to Provide Information**

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

10. **Duty to Reapply**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The complete application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be implemented through procedures outlined by APC&EC Rule 6.

11. **Signatory Requirements**

All applications, reports, or information submitted to the Director shall be signed and certified as follows:

A. All **permit applications** shall be signed as follows:

1. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

   (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation.
   (b) The manager of one or more manufacturing, production, or operation facilities, provided: the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: by a general partner or proprietor, respectively.

3. For a municipality, State, Federal, or other public agency, by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

   (a) The chief executive officer of the agency.
   (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

B. All **reports** required by the permit and **other information** requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   1. The authorization is made in writing by a person described above.
   2. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).
   3. The written authorization is submitted to the Director.

C. Certification. Any person signing a document under this section shall make the following certification:

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

12. **Availability of Reports**

Except for data determined to be confidential under 40 CFR Part 2 and APC&EC Rule 6, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division of Environmental Quality. As required by the Regulations, the name and address of any permit applicant or permittee, permit applications, permits, and effluent data shall not be considered confidential.

13. **Penalties for Falsification of Reports**

The Arkansas Air and Water Pollution Control Act provides that any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this permit shall be subject

to civil penalties specified in Part III.A.2 and/or criminal penalties under the authority of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 et seq.).

14. **Other Information**

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

PART IV
DEFINITIONS

All definitions contained in Section 502 of the Clean Water Act and 40 CFR 122.2 shall apply to this permit and are incorporated herein by reference. Additional definitions of words or phrases used in this permit are as follows:

1. **"7-Day Average"** also known as "average weekly," means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. The 7-Day Average for Fecal Coliform Bacteria (FCB) or *E. coli* is the geometric mean of the "daily discharges" of all effluent samples collected during a calendar week in colonies per 100 ml.
2. **"Act"** means the Clean Water Act, Public Law 95-217 (33.U.S.C. 1251 et seq.) as amended.
3. **"Administrator"** means the Administrator of the U.S. Environmental Protection Agency.
4. **"APC&EC"** means the Arkansas Pollution Control and Ecology Commission.
5. **"Applicable effluent standards and limitations"** means all State and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards of performance, toxic effluent standards and prohibitions, and pretreatment standards.
6. **"Applicable water quality standards"** means all water quality standards to which a discharge is subject under the federal Clean Water Act and which has been (a) approved or permitted to remain in effect by the Administrator following submission to the Administrator pursuant to Section 303(a) of the Act, or (b) promulgated by the Director pursuant to Section 303(b) or 303(c) of the Act, and standards promulgated under (APC&EC) Rule 2, as amended.
7. **"Best Management Practices (BMPs)"** are activities, practices, maintenance procedures, and other management practices designed to prevent or reduce the pollution of waters of the State. BMPs also include treatment technologies, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw sewage. BMPs may include structural devices or nonstructural practices.
8. **"Bypass"** means the intentional diversion of waste streams from any portion of a treatment facility, as defined at 40 CFR 122.41(m)(1)(i).
9. **"Composite sample"** is a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of 4 effluent portions collected at equal time intervals (but not closer than one hour apart) during operational hours, within the 24-hour period, and combined proportional to flow or a sample collected at more frequent intervals proportional to flow over the 24-hour period.
10. **"Daily Discharge"** means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.
    A. **Mass Calculations:** For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of pollutant discharged over the sampling day.
    B. **Concentration Calculations:** For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.
11. **"Daily Maximum"** discharge limitation means the highest allowable "daily discharge" during the calendar month.

12. **"Director"** means the Director of the Division of Environmental Quality.
13. **"Dissolved oxygen limit"** shall be defined as follows:
    A. When limited in the permit as a minimum monthly average, shall mean the lowest acceptable monthly average value, determined by averaging all samples taken during the calendar month.
    B. When limited in the permit as an instantaneous minimum value, shall mean that no value measured during the reporting period may fall below the stated value.
14. **"Division"** means the Division of Environmental Quality (**DEQ**).
15. **"*E. coli*"** a sample consists of one effluent grab portion collected during a 24-hour period at peak loads. For *E. coli*, report the Daily Maximum as the highest "daily discharge" during the calendar month and the Monthly Average as the geometric mean of all "daily discharges" within a calendar month, in colonies per 100 ml.
16. **"Fecal Coliform Bacteria (FCB)"** a sample consists of one effluent grab portion collected during a 24-hour period at peak loads. For FCB, report the Daily Maximum as the highest "daily discharge" during the calendar month and the Monthly Average as the geometric mean of all "daily discharges" within a calendar month, in colonies per 100 ml.
17. **"Grab sample"** means an individual sample collected in less than 15 minutes in conjunction with an instantaneous flow measurement.
18. **"Industrial User"** means a nondomestic discharger, as identified in 40 CFR Part 403, introducing pollutants to a POTW.
19. **"Instantaneous flow measurement"** means the flow measured during the minimum time required for the flow-measuring device or method to produce a result in that instance. To the extent practical, instantaneous flow measurements coincide with the collection of any grab samples required for the same sampling period so that together the samples and flow are representative of the discharge during that sampling period.
20. **"Instantaneous Maximum"** when limited in the permit as an instantaneous maximum value, shall mean that no value measured during the reporting period may fall above the stated value.
21. **"Instantaneous Minimum"** an instantaneous minimum value, shall mean that no value measured during the reporting period may fall below the stated value.
22. **"Monitoring and Reporting"**
    When a permit becomes effective, monitoring requirements are of the immediate period of the permit effective date. Where the monitoring requirement for an effluent characteristic is monthly or more frequently, the Discharge Monitoring Report (DMR) shall be submitted by the 25th of the month following the sampling. Where the monitoring requirement for an effluent characteristic is Quarterly, Semi-Annual, Annual, or Yearly, the DMR shall be submitted by the 25th of the month following the monitoring period end date.
    A. **MONTHLY:**
       is defined as a calendar month or any portion of a calendar month for monitoring requirement frequency of once/month or more frequently.
    B. **BI-MONTHLY:**
       is defined as two (2) calendar months or any portion of 2 calendar months for monitoring requirement frequency of once/2 months or more frequently.
    C. **QUARTERLY:**
       1. is defined as a **fixed calendar quarter** or any part of the fixed calendar quarter for a non-seasonal effluent characteristic with a measurement frequency of once/quarter.

Fixed calendar quarters are: January through March, April through June, July through September, and October through December.

2. is defined as a **fixed three month period** (or any part of the fixed three month period) of or dependent upon the seasons specified in the permit for a seasonal effluent characteristic with a monitoring requirement frequency of once/quarter that does not coincide with the fixed calendar quarter. Seasonal calendar quarters are: May through July, August through October, November through January, and February through April.

D. **SEMI-ANNUAL:**
is defined as the fixed time periods January through June, and July through December (or any portion thereof) for an effluent characteristic with a measurement frequency of once/6 months or twice/year.

E. **ANNUAL or YEARLY:**
is defined as a fixed calendar year or any portion of the fixed calendar year for an effluent characteristic or parameter with a measurement frequency of once/year. A calendar year is January through December, or any portion thereof.

23. **"Monthly Average"** means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. For Fecal Coliform Bacteria (FCB) or *E. coli*, report the Monthly Average as the geometric mean of all "daily discharges" within a calendar month.
24. **"National Pollutant Discharge Elimination System"** means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under Sections 307, 402, 318, and 405 of the Clean Water Act.
25. **"POTW"** means Publicly Owned Treatment Works;
26. **"Reduction of $CBOD_5$/BOD_5 and TSS in mg/l Formula"**
[(Influent – Effluent) / Influent] × 100
27. **"Severe property damage"** means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in products.
28. **"Sewage sludge"** means the solids, residues, and precipitate separated from or created in sewage by the unit processes at a POTW. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and stormwater runoff that are discharged to or otherwise enter a POTW.
29. **"Treatment works"** means any devices and systems used in storage, treatment, recycling, and reclamation of municipal sewage and industrial wastes, of a liquid nature to implement section 201 of the Act, or necessary to recycle reuse water at the most economic cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities, and any works, including site acquisition of the land that will be an integral part of the treatment process or is used for ultimate disposal of residues resulting from such treatment.
30. **Units of Measure:**
"MGD" shall mean million gallons per day.

"mg/l" shall mean milligrams per liter or parts per million (ppm).
"µg/l" shall mean micrograms per liter or parts per billion (ppb).
"cfs" shall mean cubic feet per second.
"ppm" shall mean parts per million.
"s.u." shall mean standard units.

31. **"Upset"** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. Any upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventive maintenance, or careless of improper operations.
32. **"Visible sheen"** means the presence of a film or sheen upon or a discoloration of the surface of the discharge. A sheen can also be from a thin glistening layer of oil on the surface of the discharge.
33. **"Weekday"** means Monday – Friday.

Final Fact Sheet

This Fact Sheet is for information and justification of the permit requirements only. Please note that it is not enforceable. This permitting decision is for the renewal of discharge Permit Number AR0037842 with Arkansas Department of Energy and Environment – Division of Environmental Quality (DEQ) Arkansas Facility Identification Number (AFIN) 04-00107 to discharge to Waters of the State.

1. PERMITTING AUTHORITY

The issuing office is:

Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT

The applicant's mailing address, and the facility address, is:

Southwestern Electric Power Company - Flint Creek Power Plant
21797 SWEPCO Road
Gentry, AR 72734

3. PREPARED BY

The permit was prepared by:

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4. PERMIT ACTIVITY

Previous Permit Effective Date:	January 1, 2013
Previous Permit Modification Date:	July 1, 2015
Previous Permit Expiration Date:	December 31, 2017

The permittee submitted a permit renewal application on June 29, 2017, and all additional information was received by March 15, 2020. The current discharge permit is reissued for a 5-year term in accordance with regulations promulgated at 40 CFR Part 122.46(a).

DOCUMENT ABBREVIATIONS

In the document that follows, various abbreviations are used. They are as follows:

APC&EC - Arkansas Pollution Control and Ecology Commission
BAT - best available technology economically achievable
BCT - best conventional pollutant control technology
BMP - best management practice
BOD_5 - five-day biochemical oxygen demand
BPJ - best professional judgment
BPT - best practicable control technology currently available
$CBOD_5$ - carbonaceous biochemical oxygen demand
CD - critical dilution
CFR - Code of Federal Regulations
cfs - cubic feet per second
COD - chemical oxygen demand
COE - United States Corp of Engineers
CPP - continuing planning process
CWA - Clean Water Act
CWIS - Cooling Water Intake Structure
DMR - discharge monitoring report
DO - dissolved oxygen
ELG - effluent limitation guidelines
EPA - United States Environmental Protection Agency
ESA - Endangered Species Act
FCB - fecal coliform bacteria
gpm - gallons per minute
MGD - million gallons per day
MQL - minimum quantification level
NAICS - North American Industry Classification System
NH_3-N - ammonia nitrogen
$NO_3 + NO_2$-N - nitrate + nitrite nitrogen
NPDES - National Pollutant Discharge Elimination System
O&G - oil and grease
Rule 2 - APC&EC Rule 2
Rule 6 - APC&EC Rule 6
Rule 8 - APC&EC Rule 8
Rule 9 - APC&EC Rule 9
RP - reasonable potential
SIC - standard industrial classification
TDS - total dissolved solids
TMDL - total maximum daily load
TP - total phosphorus
TRC - total residual chlorine
TSS - total suspended solids
UAA - use attainability analysis
USF&WS - United States Fish and Wildlife Service

USGS - United States Geological Survey
WET - whole effluent toxicity
WQMP - water quality management plan
WQS - Water Quality standards
WWTP - wastewater treatment plant

Compliance and Enforcement History:

The compliance and enforcement history for this facility can be reviewed by using the following web link:

https://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/AR0037842_Compliance%20Review_20190318.pdf

5. SIGNIFICANT CHANGES FROM THE PREVIOUSLY ISSUED PERMIT

The permittee is responsible for carefully reading the permit in detail and becoming familiar with all of the changes therein:

1. The coordinates for Outfall 101 and Outfall 401 have been revised for accuracy.
2. An alternate flow monitoring location has been included in Part IA Section A1 for Outfall 001 for verification of the minimum 2 cfs flow in Little Flint Creek.
3. The discharge description has been revised for accuracy, based on the Water Flow Diagram submitted as part of the permit application.
4. Permit Requirements for Outfall 101 in Part IA of the permit have been included as "Interim" requirements in Part IA Section A2, and "Final" requirements in Section A3.
5. The prohibition of the discharge of bottom ash transport water generated on and after December 31, 2023 has been included as Part II.23 of the permit, and "bottom ash transport water" is not included in the discharge description in Part IA Section A3 of the permit, in accordance with the requirements of 40 CFR 423.13(k)(1)(i). See Section 11.E.9 below for details.
6. Monitoring and reporting of Mercury and Cyanide concentrations in the discharge through Outfall 001 has been included in Part IA, Section A1 of the permit. See Section 11.F below for details.
7. The monitoring and reporting requirements for Selenium have been deleted from Part II.4 of the permit.
8. Part II.5 of the previous permit has been deleted because the requirement was fulfilled. It has been replaced with [Reserved] to maintain the number scheme of Part II.
9. Monitoring and reporting of Cyanide in the discharge through Outfall 101 has been included in Part IA, Sections A2 and A3 of the permit. See Section 11.F below for details.
10. TSS and O&G limitations for Outfall 101 have been revised. Limits in Part IA Section A2 are based on calculations that take into account bottom ash transport water in the discharge. Limits in Part IA Section A3 are based on calculations that take into account no bottom ash transport water in the discharge. See Section 11.E.8 for details.
11. Free Available Chlorine (FAC) limitations for Outfall 401 have been included in the permit. See Sections 11.A and 11.E.6 below for details.

12. Part II.1 of the permit now requires an Advanced Industrial operator license.
13. The reopener language in Part II.2 has been revised. See Section 11.E below for details.
14. Part III.C.5 of the permit now requires that DMRs be submitted electronically via NetDMR.
15. The definition of "low volume waste sources" in Part II.10 of the permit has been revised to match the revised definition in 40 CFR 423.11(b).
16. The definition of "bottom ash" in Part II.11 of the permit has been revised to match the revised definition in 40 CFR 423.11(f).
17. The definition of "bottom ash transport water" has been added as Part II.12 of the permit.
18. The definition of "coal pile runoff" in Part II.13 of the permit has been revised to match the revised definition in 40 CFR 423.11(m).
19. The definition of "combustion residual leachate" from 40 CFR 423.11(r) has been added as Part II.15.
20. Parts II.15 and II.16 of the previous permit have been renumbered as II.20 and II.21, respectively, so the CWIS requirements will be grouped together.
21. Part II.16 (Part II.14 of the previous permit) has been revised, and Parts II.17, II.18,and II.19 have been added to fully implement the requirements for CWIS. See Section 11.E.3 below for details.
22. Part II.22 has been added to clarify the definition of "Flow Weighted Average Temperature".
23. The maximum dilution in the dilution series for Outfall 401 in Part II.6 has been revised to 53%.

6. RECEIVING STREAM SEGMENT AND DISCHARGE LOCATION

The outfalls are located at the following coordinates based on Google Earth using WGS84.

Outfall 001: Latitude: 36° 14' 0.366"; Longitude: 94° 33' 05.944"
Outfall 101: Latitude: 36° 14' 57.55" N; Longitude: 94° 31' 34.79" W
Outfall 401: Latitude: 36° 15' 26.97" N; Longitude: 94° 31' 33.10" W

The receiving waters named:

Outfall 001: Little Flint Creek, thence to Flint Creek in Segment 3J of the Arkansas River Basin.

Outfalls 101 and 401: SWEPCO Reservoir, thence to Little Flint Creek, thence to Flint Creek in Segment 3J of the Arkansas River Basin.

The receiving streams (SWEPCO Reservoir and Little Flint Creek) do not have assigned reach numbers. Flow discharged through Outfall 001 reaches Flint Creek within Reach #031 of USGS Hydrologic Unit Code (H.U.C.) 11110103. The receiving stream is a Water of the State classified for primary and secondary contact recreation, raw water source for domestic (public and private), industrial, and agricultural water supplies, propagation of desirable species of fish and other aquatic life, and other compatible uses.

7. 303(d) LIST, TOTAL MAXIMUM DAILY LOADS, ENDANGERED SPECIES, AND ANTI-DEGRADATION CONSIDERATIONS

A. 303(d) List

The receiving stream is not on the 2018 303(d) list.

B. Applicable Total Maximum Daily Load (TMDL) Reports

There are no applicable TMDLs for the receiving stream. Therefore, the effluent limitations and monitoring requirements in the proposed permit are based on current technology and water quality standards requirements and are protective of the stream designated uses.

C. Endangered Species

Comments on the application were received from the USF&WS during the 60-day review period required by 40 CFR 125.98(h). The USF&WS identified the following species and critical habitats during their 60-day early review period in accordance with Subpart J – Requirements applicable to CWIS for Existing Facilities under Section 316(b) of the CWA. The listed species with potential to occur in Benton County include: Indiana Bat, Northern Long-eared Bat, Ozark Big-eared Bat, Gray Bat, Ozark Cavefish, Neosho Mucket, Rabbitsfoot, and Missouri Bladderpod. The comment also noted the project occurs in designated critical habitat for Neosho Mucket.

The USF&WS Environmental Conservation Online System (ECOS) identifies the critical habitat for the Neosho Mucket as the Illinois River, and not SWEPCO Reservoir. The USF&WS had no recommendations for any additional control measures that would minimize any incidental take of listed species, avoid likely jeopardy to a listed species, or destruction or adverse modification of critical habitat.

The limits in the permit are designed to protect all beneficial uses of the receiving waters, including propagation of desirable species of fish and other aquatic life, as well as other species which are directly, or indirectly, affected by the receiving waters, which includes the above species of concern. Therefore, DEQ has determined that the final permit limits will serve to help protect the species of concern identified above.

The draft permit and Fact Sheet were sent to the USF&WS for review during the public comment period.

D. Anti-Degradation

The limitations and requirements set forth in this permit for discharge into waters of the State are consistent with the Anti-degradation Policy and all other applicable water quality standards found in APC&EC Rule 2.

8. OUTFALL, TREATMENT PROCESS DESCRIPTION, AND FACILITY CONSTRUCTION

The following is a description of the facility described in the application:

A. Average Flow (based on DMR data from October 2016 through September 2018):

Outfall 001: 9.37 MGD
Outfall 101: 8.41 MGD
Outfall 401: 406.08 MGD

B. Type of Treatment:

Outfall 001: None. SWEPCO Reservoir, which is an impoundment of Little Flint Creek, is a water of the state. Any treatment of any process wastewater generated at this facility takes place before any discharges from Outfalls 101 and 401 reach the Reservoir.

Outfall 101: settling and neutralization of all wastestreams except ash landfill leachate; ash landfill leachate treatment (Advanced Biological Metals removal system - ABMet®)

Outfall 401: chlorination (optional)

C. Discharge Description:

Outfall 001: discharge from SWEPCO Reservoir

This outfall is a stream monitoring station established to assure a daily average release of at least 2 cfs (1.29 MGD) flow through the spillway, overflow, seepage, or pumping into Little Flint Creek.

Outfall 101: low volume wastewater consisting of demineralizer process wastewater, lab drains, boiler blowdown, filter backwash, truck washwater, various plant washwaters, plant floor drains, stack seal water overflow, hydrovactor wastewater, and reclaim basin water; coal pile runoff; treated combustion residual leachate (ash landfill leachate); treated municipal wastewater from the City of Gentry; stormwater from various plant areas; and bottom ash transport water

It should be noted that the discharge of bottom ash transport water through Outfall 101 is only allowed prior to December 31, 2023. See Section 11.E.9 below for details.

The City of Gentry operates under NPDES permit No. AR0020184.

Outfall 401: once through cooling water

D. Facility Status: This facility was evaluated using the NPDES Permit Rating Worksheet (MRAT) to determine the correct permitting status. Since the facility's MRAT score of 600 is greater than 80, this facility is classified as a major industrial.

E. Facility Construction: This permit does not authorize or approve the construction or modification of any part of the treatment system or facilities. Approval for such construction must be by permit issued under Rule 6.202.

9. **ACTIVITY**

Under the Standard Industrial Classification (SIC) code of 4911 or North American Industry Classification System (NAICS) code of 221112, the applicant's activities are the operation of a steam electric power generating plant.

10. **SOLIDS PRACTICES**

Solids are retained in the ash ponds. The solids in the primary pond are periodically removed into a dewatering cell which is located within the footprint of the primary pond. Typically, three to six months are required for the dredging operation. As ash is dredged into the dewatering cell, the sluice water is drained via gravity back into the primary pond through two standpipes. The dredged ash is hauled to the Flint Creek Power Plant Class 3N Landfill for disposal, or as a substitute for sand in landfill construction activities. Alternatively it is sold as a product.

It should be noted that discharge of sluice water (bottom ash transport water) generated on or after December 31, 2023 is prohibited. See Section 11.E.9 below.

11. **DEVELOPMENT AND BASIS FOR PERMIT CONDITIONS**

The Arkansas Division of Environmental Quality has determined to issue a permit for the discharge described in the application. Permit requirements are based on federal regulations (40 CFR Parts 122, 124, and Subchapter N), and regulations promulgated pursuant to the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. 8-4-101 et seq.). All of the information contained in the application, including all of the submitted effluent testing data, was reviewed to determine the need for effluent limits and other permit requirements.

The following is an explanation of the derivation of the conditions of the permit and the reasons for them or, in the case of notices of intent to deny or terminate, reasons suggesting the decisions as required under 40 CFR Part 124.7.

Technology-Based Versus Water Quality-Based Effluent Limitations and Conditions

Following regulations promulgated at 40 CFR Part 122.44, the permit limits are based on either technology-based effluent limits pursuant to 40 CFR Part 122.44(a) or on State water quality standards and requirements pursuant to 40 CFR Part 122.44(d), whichever are more stringent as follows:

Parameter	Water Quality-Based		Technology-Based		Previous Permit		Final Permit	
	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l	Monthly Avg. mg/l	Daily Max. mg/l
Outfall 001								
Total Recoverable Mercury	N/A	N/A	Report	Report	N/A	N/A	Report	Report
Total Recoverable Cyanide	N/A	N/A	Report	Report	N/A	N/A	Report	Report
pH	6.0-9.0 s.u.		N/A		6.0-9.0 s.u.		6.0-9.0 s.u.	
Outfall 101								
TSS	N/A	N/A	31.8	92.2	25	43	31.8	92.2
Total Recoverable Cyanide	N/A	N/A	Report	Report	N/A	N/A	Report	Report
O&G	10	15	13.4	18.0	6	8	10	15
pH	6.0-9.0 s.u.		6.0-9.0 s.u.		6.0-9.0 s.u.		6.0-9.0 s.u.	
Outfall 401								
Flow	N/A	N/A	450 MGD	450 MGD	450 MGD	450 MGD	450 MGD	450 MGD
FAC*	N/A	N/A	0.2	0.5	N/A	N/A	0.2	0.5
TRC*	N/A	N/A	N/A	0.2	N/A	0.2	N/A	0.2
Temperature	N/A	129.2ºF	N/A	N/A	N/A	129.2ºF	N/A	129.2ºF
pH	6.0-9.0 s.u.		6.0-9.0 s.u.		6.0-9.0 s.u.		6.0-9.0 s.u.	

* See Section 11.G. for discussion regarding Water Quality evaluation of the ELG limitations

A. Justification for Limitations and Conditions of the Final Permit

Parameter	Water Quality or Technology	Justification
Outfall 001		
Total Recoverable Mercury	Technology	Rule 2.508, and best engineering judgment of the permit writer
Total Recoverable Cyanide	Technology	Rule 2.508, and best engineering judgment of the permit writer
pH	Water Quality	Rule 2.504, CWA § 402(o), and previous permit

Parameter	Water Quality or Technology	Justification
Outfall 101		
TSS	Technology	40 CFR 423.12(b)(3), (4), (9), (11), and (13)
Total Recoverable Cyanide	Technology	Rule 2.508, and best engineering judgment of the permit writer
O&G	Water Quality	Rule 2.510
pH	Water Quality	Rule 2.504, CWA § 402(o), and previous permit
Outfall 401		
Flow	Technology	40 CFR 122.44(l), and previous permit
FAC	Technology	40 CFR 423.12(b)(6)
TRC	Technology	40 CFR 423.13(b)(1)
Temperature	Water Quality	Rule 2, Appendix A, Ozark Highlands Ecoregion - Site Specific Standards Variations Supported by Use Attainability Analysis, CWA § 402(o), and previous permit
pH	Water Quality	Rule 2.504, CWA § 402(o), and previous permit

No new information was received, except for TSS, and O&G, and the revised ELG prohibiting the discharge of bottom ash transport water generated on and after December 31, 2023, to warrant adding, removing, or revising any limitations in the permit. Therefore, the limitations in the permit, except for TSS and O&G (see Section 11.E.8 below), and the prohibition of the discharge of bottom ash transport water generated on and after December 31, 2023 (see Section 11.E.9 below), are consistent with the limitations in the previous permit.

B. **Anti-backsliding**

The permit is consistent with the requirements to meet Anti-backsliding provisions of the Clean Water Act (CWA), Section 402(o) [40 CFR 122.44(l)]. The final effluent limitations for reissuance permits must be as stringent as those in the previous permit, unless the less stringent limitations can be justified using exceptions listed in CWA 402(o)(2), CWA 303(d)(4), or 40 CFR 122.44(l)(2)(i).

The permit meets or exceeds the requirements of the previous permit, except for TSS and O&G for Outfall 101.

The TSS and O&G limits for Outfall 101 have been revised. These limits were originally established in 1989 and included in the NPDES permit which was effective on November 1, 1989. They have been continued in all permits renewed since that time. Since that time, there have changes in the flows and the wastestreams at facility, which necessitate re-calculating the limits based on the ELGs and using the combined wastestream formula. See Section 11.E.8 below for details.

The TSS and O&G limits are less stringent than the previous permit. This is not backsliding because the limits are based on new information not available at the time of permit issuance, in accordance with the exception listed in 40 CFR 122.44(l)(2)(i)(B)(1).

C. **Limits Calculations**

1. Mass Limits:

No mass limitations are included in the permit, except for FAC and TRC for Outfall 401. 40 CFR 122.45(f)(ii) allows for mass limits to not be included when applicable standards and limitations are expressed in terms of other units of measurement.

The calculation of the loadings (lbs per day) for TRC and FAC from Outfall 401 uses the following equation:

lbs/day = Concentration (mg/l) × Flow (MGD) × 8.34 × 2 units × 2/24

The factor 2/24 is based on the requirement that TRC and FAC are only allowed to be discharged from the generating units for a maximum of 2 hours per day (1 day = 24 hours).

Flow = 450 MGD (flow limit)
FAC Concentration = 0.2 mg/l (monthly avg. concentration limit)
FAC Concentration = 0.5 mg/l (daily max. concentration limit)

FAC Mass limit (monthly avg.) = 62.6 lbs/day
FAC Mass limit (daily max.) = 156.4 lbs/day

TRC Concentration = 0.2 mg/l (inst. max. concentration limit)
TRC Mass limit (daily max.) = 62.6 lbs/day

2. Daily Maximum Limits:

a. Outfall 101:

The daily maximum limit for TSS is based on the results of the combined wastestream formula. See Section 11.E.8 below for details.

The daily maximum limit for O&G is based on Rule 2.

b. Outfall 401:

The daily maximum limit for Temperature is an end-of-pipe water quality-based limit equal to the site-specific standard established for SWEPCO Reservoir in Rule No. 2 - Appendix A – Ozark Highlands Ecoregion.

The daily maximum limit for FAC is based on 40 CFR 423.12(b)(6).

D. **208 Plan (Water Quality Management Plan)**

This facility is not in the 208 Plan, nor required to be. Therefore, there are no changes to the 208 Plan occurring with this permit renewal.

E. **Applicable Effluent Limitations Guidelines**

Discharges from facilities of this type are covered by Federal effluent limitations guidelines promulgated under 40 CFR Part 423 – Steam Electric Power Generating Point Source Category.

1. 40 CFR 423.12(b)(2) applies to all discharges from the facility. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

2. 40 CFR 423.12(b)(3) is applicable to Outfall 101 because the discharge from this outfall contains low volume wastewater.

3. 40 CFR 423.12(b)(4) is applicable to Outfall 101 because the discharge from this outfall contains bottom ash transport water.

4. 40 CFR 423.12(b)(6) and (8) are applicable to Outfall 401 because the discharge from this outfall consists of once through cooling water.

5. 40 CFR 423.12(b)(9) is applicable to Outfall 101 because the discharge from this outfall contains coal pile runoff.

6. 40 CFR 423.13(b)(1) and (2) are applicable to Outfall 401 because the discharge from this outfall consists of once through cooling water.

7. 40 CFR 423.13(l) is applicable to Outfall 101 because the discharge from this outfall contains combustion residual leachate (ash landfill leachate).

8. Combined Wastestreams for Outfall 101:

   The TSS and O&G limits were originally established and included in the NPDES permit effective November 1, 1989. Since that time, there have been changes in the operation of the facility, including changes in the handling and treatment of leachate from the ash landfill.

   The following various wastestreams are combined in the ponds that discharge through Outfall 101:

   a. Low Volume Waste consisting of demineralizer process wastewater, lab drains, boiler blowdown, filter backwash, truck washwater, various plant washwaters, plant floor drains, stack seal water overflow, hydrovactor wastewater, and reclaim basin water [Ref. 40 CFR 423.12(b)(3)]

   b. Bottom Ash Transport Water [Ref. 40 CFR 423.12(b)(4)]

   c. Coal Pile Runoff consisting of coal yard stormwater runoff and water from coal yard reclaim hopper and dumper house sumps. [Ref. 40 CFR 423.12(b)(9)]

d. Treated ash landfill leachate. [Ref. 40 CFR 423.13(l) and 423.12(b)(11)]

e. Treated municipal wastewater from the City of Gentry. [Ref. AR0020184]

As noted, some of these wastestreams are categorical wastestreams regulated under the Steam Electric Power Generating Point Source Category, and one is discharge from a POTW. The various wastestreams have different technology-based TSS and O&G limitations. Therefore, the technology-based TSS and O&G limits have been recalculated, taking into account the flows of the various wastestreams as reported in the renewal application, the respective ELG limitations for the various wastestreams, and the permit limits for the treated municipal wastewater from the City of Gentry. This meets the requirements of 40 CFR 423.12(b)(13).

Since the discharge of bottom ash transport water will be prohibited December 31, 2023, two sets of calculations were performed: one that included bottom ash transport water, and one that did not. The TSS limitations based on the inclusion of bottom ash transport water have been included in Part IA Section A2. The TSS limitations based on the exclusion of bottom ash transport water have been included in Part IA Section A3. The calculated technology-based O&G limits were less stringent than the WQS for O&G. Therefore, the WQ-based limits for O&G have been included in Part IA Sections A2, and A3 of the permit.

The detailed calculation may be viewed on the Division's website at the following address:

http://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/AR0037842_Combined%20Wastestreams_20200430.pdf

9. Prohibition of the discharge of Bottom Ash Transport Water

40 CFR 423.13(k)(1)(i) is applicable to Outfall 101 beginning on December 31, 2023, since the facility discharges bottom ash transport water at the time of this permit renewal.

On November 3, 2015, the EPA issued a final rule amending 40 CFR Part 423, the effluent limitations guidelines and standards for the steam electric power generating point source category. The amendments addressed and contained limitations and standards on fly ash transport water, bottom ash transport water, flue gas desulfurization (FGD) wastewater, flue gas mercury control wastewater, and gasification wastewater. Of these wastestreams, only bottom ash transport water is generated at the facility.

The 2015 updates included revisions and additions to special definitions in Parts 423.11 (f), (p), and (t). They also included the addition of Part 423.13 (k) to the ELGs representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) to the discharge of bottom ash transport water.

Part 423.13 (k)(1)(i) prohibits the discharge of bottom ash transport water "as soon as possible after November 1, 2018, but no later than December 31, 2023."

On June 6, 2017, Federal Register Vol. 82, No. 107 (FR) published a proposed revision to the 40 CFR Part 423, on page 26019, which postponed the compliance dates noted above (see the link in Section 17.V below) and in this notice EPA solicited comments on whether this postponement should be for a specified period of time.

The FR notes that the EPA received seven petitions for review of the rule, and the United States Judicial Panel on Multi-District Litigation issued an order on December 8, 2015, consolidating all of the petitions in the U.S. Court of Appeals for the Fifth Circuit. On April 12, 2017, the EPA Administrator sent a letter to those who submitted the reconsideration petitions, announcing his decision to reconsider the Rule. On April 14, 2017, the EPA requested that the Fifth Circuit hold the case in abeyance while the Agency undertakes reconsideration. On April 24, 2017, the Fifth Circuit granted the motion and placed the case in abeyance.

On August 11, 2017, EPA sent a second letter to those who had submitted the reconsideration petitions for the 2015 Rule, announcing the Administrator's decision to conduct a new rulemaking to potentially revise the new, more stringent BAT limitations in the 2015 Rule that apply to two wastestreams: FGD wastewater and bottom ash transport water. On August 14, 2017, EPA filed a motion to govern further proceedings in the U.S. Court of Appeals for the Fifth Circuit, which explained that EPA intended to conduct further rulemaking to potentially revise the new, more stringent requirements in the 2015 Rule applicable only to FGD wastewater and bottom ash transport water (as noted above, FGD wastewater is not a wastestream at the facility), and requested, in part, that the Court sever and hold in abeyance all judicial proceedings concerning portions of the 2015 Rule related to those particular requirements. On August 22, 2017, the Court granted EPA's motion.

On September 18, 2017, Federal Register Vol. 82, No. 179 (FR) published a final revision to the 40 CFR Part 423, on page 43500, which postponed the "as soon as possible" compliance date for bottom ash transport water and FGD wastewater from November 1, 2018 to November 1, 2020. The "no later than" December 31, 2023 compliance date for bottom ash transport water and FGD wastewater was unchanged. (see the link in Section 17.U below).

In consideration of the fact that the "no later than" compliance date of December 31, 2023 is unchanged for elimination of bottom ash transport water from discharges, and that date is prior to the expiration date of the permit, the following additional requirements concerning the discharge of bottom ash transport water have been included in the permit:

a. Part II.23 has been added to the permit, which prohibits discharge of bottom ash transport water generated on or after December 31, 2023.

b. A compliance schedule was added as Part IB.2 of the permit, which requires periodic progress reports on meeting the no discharge requirement for bottom ash transport water, and a final certification that this requirement was met prior to December 31, 2023.

c. "Bottom ash transport water" has not been included in the discharge description in Part IA Section A3 of the permit, and footnotes were added to Part IA Sections A2, and A3, referencing the conditions in Part IB.2, and Part II.23 noted above.

d. To allow for possible permit action in the event of the issuance of a revised rule, the reopener clause in Part II.2 of the permit has been revised to specifically reference newly promulgated and effective ELGs as a cause for reopening and modifying the permit.

10. Cooling Water Intake Structures (CWISs) - CWA § 316(b)

EPA promulgated the Existing Facilities Rule pursuant to Clean Water Act Section 316(b) on August 15, 2014. The rule became effective on October 14, 2014. This Existing Facilities Rule is found in Subpart J of 40 CFR Part 125 (125.90 through 125.99). Subpart J establishes the 316(b) requirements that apply to CWIS at existing facilities for the purpose of minimizing adverse environmental impact associated with the use of CWIS. The requirements are established and implemented in NPDES permits.

Subpart J is applicable to existing facilities that commenced construction on or before January 17, 2002. Since this facility began operations in 1978, this facility is defined as an existing facility as defined in 40 CFR 125.92(k). Existing facilities are subject to Subpart J if all of the following items are true:

- The facility is a point source;
- The facility uses or proposes to use one or more CWIS with a cumulative design intake flow of greater than 2 million gallons per day (MGD) to withdraw water from waters of the United States; and
- Twenty-five percent (25%) or more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

This facility is a point source, the design intake flow of the CWIS associated with this facility is 432 MGD, and the facility uses at least 25% of the water withdrawn exclusively for cooling purposes. Therefore, this facility is subject to Subpart J for existing facilities.

Subpart J requires the facility to choose one of seven options that represent Best Technology Available (BTA) for impingement (IM), and also requires the permitting authority to determine BTA for entrainment (E) on a site-specific basis based on the information submitted in the permit application.

The Division received a letter, dated October 7, 2015 from David Hall, Ph.D of American Electric Power requesting that the Flint Creek Reservoir be designated as part of a closed-cycle recirculating cooling system, as defined in 40 CFR 125.92(c). Documents supporting the request were submitted with the letter. The documents consisted of:

- a copy of the application for construction of the dam on Flint Creek that was submitted to the Arkansas Soil and Water Conservation Commission (ASWCC) on October 15, 1974;

- a copy of the letter from the Arkansas Department of Commerce, Division of Soil and Water Resources, stating that the ASWCC had unanimously passed a motion to issue a permit to construct the dam on Flint Creek;

- a copy of the minutes from the meeting where the motion was passed;

- a copy of the permit for construction of the dam on Flint Creek issued by the ASWCC on May 19, 1975; and

- a copy of the letter from USEPA Region VI stating that the Flint Creek Reservoir was classified as a "cooling pond".

The Division reviewed the request, and the supporting documents, and determined that Flint Creek Reservoir meets the definition of a closed-cycle recirculating system (CCRS) as defined in 40 CFR 125.92(c)(2). A letter, dated April 19, 2016, was sent informing the facility of the determination. Pursuant to Subpart J, the operation of CCRS, and monitoring the actual intake flows on a daily basis, is a pre-approved BTA for minimizing impingement mortality, with no biological (IM or E) monitoring required. It is also determined that, in accordance with 40 CFR 122.21(r)(1)(B), and 40 CFR 125.94(d), operating a CCRS meets the site-specific BTA Standards for Entrainment.

Subpart J requires submittal of the information noted in 40 CFR 122.21(r). The Division granted a waiver for submittal of the information noted in 40 CFR 122.21(r)(9)-(13) in the above referenced letter, dated April 19, 2016, based on the determination that the facility operates a CCRS, as defined in 40 CFR 125.92(c)(2). In a separate letter, dated September 6, 2016, the Division specified that the information in 40 CFR 122.21(r)(2)-(5), and (8) must be submitted. The document, "Flint Creek Power Plant – Impingement Monitoring Data Report – Benton County, Arkansas", PBS&J, March 2007, originally submitted by the facility March 13, 2012, the information submitted in and attached to a letter from the facility, dated March 2, 2012, and the document "316(b) Proposal for Information Collection, Flint Creek Power Plant, AR0037842", Arkansas Electric Power, September 2005 (submitted March 19, 2019), fulfills the requirements of 40 CFR 122.21(r)(2)-(5). The letter submitted by the facility, dated April 20, 2018, described the current operational status of the CWIS, and meets the requirements of 40 CFR 122.21(r)(8).

In accordance with Part II.16.A of the permit, the facility is required to operate and maintain the closed-cycle recirculating cooling system in accordance with Best Management Practices (BMPs) that will minimize any Adverse Environmental Impacts (AEIs) from the CWIS.

Part II.16.B of the permit also requires the facility to monitor the actual intake flow at least daily. This monitoring must be representative of normal operating conditions. Actual intake flows may be calculated using the pump run time and pump capacity. The actual intake flows determined by this method will satisfy the monitoring requirements under Part II.16.B. Part II.16.B satisfies the reporting requirements of 40 CFR 125.94 (c)(1) and 40 CFR 125.97 (a) and (b).

In accordance with 40 CFR 125.98(b)(1), the following language is also included in Part II.16.C of the permit: "Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act."

Part II.17 satisfies the requirements for an annual certification statement and report in 40 CFR 125.97 (c).

Part II.18 satisfies the requirements for weekly visual inspections in 40 CFR 125.96 (e).

Parts II.19.A and B satisfy the requirements for recordkeeping in 40 CFR 125.95(e) and 125.97(f), respectively.

Part II.19.C satisfies the requirements for reporting in 125.97(a).

F. **Priority Pollutant Scan (PPS)**

DEQ has reviewed and evaluated the effluent in accordance with the potential toxicity of each analyzed pollutant using the procedures outlined in the Continuing Planning Process (CPP).

The concentration of each pollutant after mixing with the receiving stream was compared to the applicable water quality standards as established in the Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas, Rule 2 (Rule 2.508) and criteria obtained from the "Quality Criteria for Water, 1986 (Gold Book)."

Under Federal Regulation 40 CFR Part 122.44(d), as adopted by Rule 6, if a discharge poses the reasonable potential to cause or contribute to an exceedance above a water quality standard, the permit must contain an effluent limitation for that pollutant. Effluent limitations for the toxicants listed below have been derived in a manner consistent with the Technical Support Document (TSD) for Water Quality-based Toxics Control (EPA, March 1991), the CPP, and 40 CFR Part 122.45(c).

The following items were used in calculations:

Parameter	Value	Source
Discharge Flow = Q	Outfall 001: 9.37 MGD = 14.50 cfs Outfall 101: 8.41 MGD = 13.01 cfs Outfall 401: 406.08 MGD = 623.30 cfs	DMRs – highest monthly avg. flow
7Q10 Background Flow	0 cfs	Lake discharge
LTA Background Flow	0 cfs	Lake discharge
TSS	2.5 mg/l	CPP – Ozark Highlands Ecoregion
Hardness as $CaCO_3$	148 mg/l	CPP – Ozark Highlands Ecoregion
pH	7.50 s.u.	ARK0004

The following pollutants were reported above detection levels:

Pollutant	Concentration Reported, µg/l	MQL, µg/l
OUTFALL 001		
Arsenic	0.564[1]	0.5
Copper	1.62[1]	0.5
Mercury	0.00595[1]	0.005
Nickel	1.3[1]	0.5
Zinc	2[1]	20
Total Phenols	4.2[1]	5
Cyanide	4.78[1]	10
OUTFALL 101		
Arsenic	0.63[2]	0.5
Copper	6.07[2]	0.5
Lead	0.07[2]	0.5
Mercury	0.002[3]	0.005
Nickel	2.74[2]	0.5
Selenium	0.59[4]	5
Zinc	2.86[2]	20
Total Phenols	5.85[2]	5
Cyanide	3.46[2]	10

Pollutant	Concentration Reported, µg/l	MQL, µg/l
OUTFALL 401		
Arsenic	0.61[5]	0.5
Copper	17.1[5]	0.5
Mercury	0.00368[5]	0.005
Nickel	4.2[5]	0.5
Total Phenols	7.6[5]	5

[1] Single data point reported on EPA Form 2C for Outfall 001 in the permit renewal application.
[2] Geometric Mean of 2 data points from EPA Form 2C for Outfall 101 submitted with the permit renewal application, and the PPS received April 26, 2018.
[3] Geometric Mean of 15 data points from EPA Form 2C for Outfall 101 submitted with the permit renewal application, and sampling report submitted February 18, 2020. One data point, from the PPS received April 26, 2018, was omitted because the analysis did not meet the required MQL of 0.005 µg/l.
[4] Geometric Mean of 6 data points from EPA Form 2C for Outfall 101 submitted with the permit renewal application, the PPS received April 26, 2018, and laboratory reports submitted March 13, 2019.
[5] Single data point reported on EPA Form 2C for Outfall 401 in the permit renewal application.

Instream Waste Concentrations (IWCs) were calculated in the manner described in Appendix D of the CPP and compared to the applicable criteria. The following tables summarize the results of the analysis. The complete evaluation can be viewed on the Division's website at the following address:

http://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/AR0037842_Updated%20Toxicity%20Calculations_20200220.pdf

1. **Aquatic Toxicity Evaluation**

a. Acute Criteria Evaluation

Pollutant	Concentration Reported (C_e) µg/l	$C_e \times 2.13$[1]	Instream Waste Concentration (IWC)	Criteria[2]	Reasonable Potential (Yes/No)
			Acute, µg/l	Acute, µg/l	
OUTFALL 001					
Copper	1.62	3.45	3.45	57.11	No
Mercury	0.00595	0.01267	0.01267	7.24	No
Nickel	1.3	2.77	2.77	3405.03	No
Zinc	2	4.26	4.26	422.06	No
Cyanide	4.78	10.18	10.18	22.36	No
OUTFALL 101					
Copper	6.07	12.93	12.93	57.11	No
Lead	0.07	0.38	0.38	430.62	No
Mercury	0.002	0.0043	0.0043	7.24	No
Nickel	2.74	5.84	5.84	3405.03	No
Selenium	0.59	1.26	1.26	20.00	No
Zinc	2.86	6.09	6.09	422.06	No
Cyanide	3.46	7.37	7.37	22.36	No
OUTFALL 401					
Copper	17.1	36.42	36.42	57.11	No
Mercury	0.00368	0.003784	0.003784	7.24	No
Nickel	4.2	8.95	8.95	3405.03	No

[1] Statistical ratio used to estimate the 95th percentile using a single effluent concentration or the geometric mean of a dataset.
[2] Criteria are from Rule 2.508.

b. Chronic Criteria Evaluation

Pollutant	Concentration Reported (C_e) µg/l	$C_e \times 2.13$[1]	Instream Waste Concentration (IWC)	Criteria[2]	Reasonable Potential (Yes/No)
			Chronic, µg/l	Chronic, µg/l	
OUTFALL 001					
Copper	1.62	3.45	3.45	36.81	No
Mercury	0.00595	0.01267	0.01267	0.012	Yes
Nickel	1.3	2.77	2.77	378.16	No
Zinc	2	4.26	4.26	385.40	No
Cyanide	4.78	10.18	10.18	5.2	Yes
OUTFALL 101					
Copper	6.07	12.93	12.93	36.81	No
Lead	0.07	0.38	0.38	16.78	No
Mercury	0.002	0.0043	0.0043	0.012	No
Nickel	2.74	5.84	5.84	378.16	No
Selenium	0.59	1.26	1.26	5.00	No
Zinc	2.86	6.09	6.09	385.40	No
Cyanide	3.46	7.37	7.37	5.2	Yes
OUTFALL 401					
Copper	17.1	36.42	36.42	36.81	No
Mercury	0.00368	0.003784	0.003784	0.012	No
Nickel	4.2	8.95	8.95	378.16	No

[1] Statistical ratio used to estimate the 95th percentile using a single effluent concentration or the geometric mean of a dataset.
[2] Criteria are from Rule 2.508.

2. Human Health (Bioaccumulation) Evaluation

Pollutant	Concentration Reported (C_e) µg/l	$C_e \times 2.13$[1]	Instream Waste Concentration (IWC)	Criteria[2]	Reasonable Potential (Yes/No)
OUTFALL 001					
Arsenic	0.564	1.20	1.20	1.4	No
Copper	1.62	3.45	3.45	13,000	No
Mercury	0.00595	0.01267	0.01267	2[3]	No
Nickel	1.3	2.77	2.77	46,000	No
Zinc	2	4.26	4.26	260,000	No
Cyanide	4.78	10.18	10.18	4,000	No
OUTFALL 101					
Arsenic	0.63	1.34	1.34	1.4	No
Copper	6.07	12.93	12.93	13,000	No
Lead	0.07	0.38	0.38	50	No
Mercury	0.002	0.0043	0.0043	2[3]	No
Nickel	2.74	5.84	5.84	46,000	No
Selenium	0.59	1.26	1.26	42,000	No
Zinc	2.86	6.09	6.09	260,000	No
Cyanide	3.46	7.37	7.37	4,000	No
OUTFALL 401					
Arsenic	0.61	1.30	1.30	1.4	No
Copper	17.1	36.42	36.42	13,000	No
Mercury	0.00368	0.003784	0.003784	2[3]	No
Nickel	4.2	8.95	8.95	46,000	No

[1] Statistical ratio used to estimate the 95th percentile using a single effluent concentration or the geometric mean of a dataset.

[2] Unless otherwise specified, adapted from "National Recommended Water Quality Criteria: 2002 – Human Health Criteria Calculation Matrix," EPA. The respective WQC from the noted reference are Consumption of Organism Only values. The values from the reference are for a lifetime risk factor of 10-6. These values have been multiplied by 10 to correspond to human health criteria lifetime risk factor of 10-5 as stated in Rule 2.508.

[3] Primary Drinking Water Standard.

As can be seen in the tables above, the calculated IWCs for Mercury and Cyanide in the discharge from Outfall 001, and for Cyanide in the discharge from Outfall 101, show reasonable potential (RP) to violate their respective Arkansas Water Quality Standards (WQS).

However, the RP calculations were based on only one (1) data point each for Mercury and Cyanide from Outfall 001, and two (2) data points for Cyanide from Outfall 101 (see footnotes to the table on page 17 of the Fact Sheet). None of these individual data points were above their respective WQS.

Therefore, it is the best engineering judgment of the permit writer that monitoring and reporting requirements for Mercury and Cyanide for Outfall 001, and for Cyanide for Outfall 101, be included in the permit. At the next permit renewal, a reasonable potential analysis will be done on the larger data set to determine if limitations are appropriate.

G. **Water Quality Standards for ELG-limited pollutants – Outfall 401**

The ELGs promulgated under 40 CFR 423.12 and 423.13 include limitations for TRC and FAC. The TRC and FAC ELGs apply to Outfall 401. 40 CFR 122.44(d) and (d)(1) require NPDES discharge permits to include:

> "any requirements in addition to *or more stringent than* promulgated effluent limitations guidelines or standards under sections 301, 304, 306, 307, 318 and 405 of CWA necessary to:
>
> (1) Achieve water quality standards established under section 303 of the CWA, *including State narrative criteria for water quality*." Emphasis added.

There are no numerical water quality standards for TRC or FAC in Rule 2.508. However, the narrative water quality standard in Rule 2.409 forbids the discharge of toxic pollutants in amounts which are toxic. Outfall 401 has Whole Effluent Toxicity (WET) testing requirements. Part V – Chlorination/Dechlorination of the DEQ Discharge Permit, Toxic Control Implementation Procedure of the CPP, specifies the use of WET testing (biomonitoring) in the case of facilities that use chlorination without dechlorination. The CPP states:

> "If the chlorinated effluent is non-toxic and significant dilution is provided in the receiving stream (e.g., the Arkansas or Mississippi River) the permit will rely on biomonitoring to evaluate potential impacts from chlorine. If the toxicity test results show toxicity problems, a schedule of compliance to install dechlorination is required."

WET testing results for Outfall 401 from December 2014 through June 2019 show no failures, and a minimum No Observable Effect Concentration for all tests of 54% (the Critical Dilution). This indicates that the effluent is non-toxic.

Based on the results of WET testing, and the requirements in the CPP, the discharge meets the narrative water quality standard in Rule 2.409. Since WET testing monitors the combined effects of all pollutants in the effluent, it is an acceptable replacement for a concentration limit in this circumstance (it should be noted that FAC is a component of TRC). Therefore, no additional water quality-based TRC or FAC requirements are necessary for the discharge through Outfall 401. The ELG limits for TRC and FAC have been included for this outfall.

12. WHOLE EFFLUENT TOXICITY

Section 101(a)(3) of the Clean Water Act states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In addition, DEQ is required under 40 CFR Part 122.44(d)(1), adopted by reference in Rule 6, to include conditions as necessary to achieve water quality standards as established under Section 303 of the Clean Water Act. Arkansas has established a narrative criteria which states "toxic materials shall not be present in receiving waters in such quantities as to be toxic to human, animal, plant or aquatic life or to interfere with the normal propagation, growth and survival of aquatic biota."

Whole effluent toxicity (WET) testing is the most direct measure of potential toxicity which incorporates the effects of synergism of effluent components and receiving stream water quality characteristics. It is the national policy of EPA to use bioassays as a measure of toxicity to allow evaluation of the effects of a discharge upon a receiving water (49 Federal Register 9016-9019, March 9, 1984). EPA Region 6 and the State of Arkansas are now implementing the Post Third Round Policy and Strategy established on September 9, 1992, and EPA Region 6 Post-Third Round Whole Effluent Toxicity Testing Frequencies, revised March 13, 2000. Whole effluent toxicity testing of the effluent is thereby required as a condition of this permit to assess potential toxicity. The whole effluent toxicity testing procedures stipulated as a condition of this permit are as follows:

TOXICITY TESTS	**FREQUENCY**
Chronic WET	once/quarter

Requirements for measurement frequency are based on the CPP.

Since 7Q10 is less than 100 cfs (ft^3/sec), chronic WET testing requirements will be included in the permit.

The Critical Dilutions (CD) of 17% for Outfall 101, and 40% for Outfall 401, are continued from the previous permit based on the submitted mixing zone studies conducted by FTN Associates, Ltd.

Toxicity tests shall be performed in accordance with protocols described in "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA/600/4-91/002, July 1994. A minimum of five effluent dilutions in addition to an appropriate control (0%) are to be used in the toxicity tests. These additional effluent concentrations are **7%, 10%, 13%, 17%, and 23%** for Outfall 101, and **17%, 23%, 30%, 40%, and 53%** for Outfall 401 (See CPP). The low-flow effluent concentration (critical dilution) is defined as **17**% effluent for Outfall 101 and **40**% effluent for Outfall 401. The requirement for chronic WET tests is based on the magnitude of the facility's discharge with respect to receiving stream flow. The stipulated test species, *Ceriodaphnia dubia* and the Fathead minnow (*Pimephales promelas*) are representative of organisms indigenous to the geographic area of the facility; the use of these is consistent with the requirements of the State water quality standards. The WET testing frequency has been established to provide data representative of the toxic potential of the facility's discharge, in accordance with the regulations promulgated at 40 CFR Part 122.48.

Results of all dilutions as well as the associated chemical monitoring of pH, temperature, hardness, dissolved oxygen conductivity, and alkalinity shall be reported according to EPA-821-R-02-013, October 2002 and shall be submitted as an attachment to the Discharge Monitoring Report (DMR).

This permit may be reopened to require further WET testing studies, Toxicity Reduction Evaluation (TRE) and/or effluent limits if WET testing data submitted to the Division shows toxicity in the permittee's discharge. Modification or revocation of this permit is subject to the provisions of 40 CFR 122.62, as adopted by reference in APC&EC Rule 6. Increased or intensified toxicity testing may also be required in accordance with Section 308 of the Clean Water Act and Section 8-4-201 of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

Administrative Records

Permit Number:	AR0037842	AFIN:	04-00107	Outfall Number:	101
Date of Review:	12/5/2018	Reviewer:	A. Bates/M. Barnett		
Facility Name:	Southwestern Electric Power Company - Flint Creek Power Plant				
Previous Dilution series:	7, 10, 13, 17, 23%	Proposed Dilution Series:	7, 10, 13, 17, 23%		
Previous Critical Dilution:	17%	Proposed Critical Dilution:	17%		
Previous TRE activities:	none				
Frequency recommendation by species					
Pimephales promelas (Fathead minnow):		once per quarter			
Ceriodaphnia dubia (water flea):		once per quarter			

TEST DATA SUMMARY

	Vertebrate (*Pimephales promelas*)		Invertebrate (*Ceriodaphnia dubia*)		
TEST DATE	Lethal	Sub-Lethal	Lethal	Sub-Lethal	
	NOEC	NOEC	NOEC	NOEC	
12/31/2013	23	23	23	23	
3/31/2014	23	23	23	23	
12/31/2014	23	23	23	23	*
6/30/2015	23	23	23	23	
12/31/2015	23	23	23	23	
6/30/2016	23	23	23	23	*
12/16/2016	23	23	23	23	
6/30/2017	23	23	23	23	
12/31/2017	23	23	23	23	
3/31/2018	23	23	23	23	
6/30/2018	23	23	23	23	
9/30/2018	23	23	23	23	
12/31/2018	23	23	23	23	

* denotes tests for which one or more effluent samples was received above 6.0°C

Failures noted in BOLD

REASONABLE POTENTIAL CALCULATIONS

	Vertebrate Lethal	**Vertebrate Sub-lethal**	**Invertebrate Lethal**	**Invertebrate Sub-Lethal**
Min NOEC Observed	23	23	23	23
TU at Min Observed	4.35	4.35	4.35	4.35
Count	13	13	13	13
Failure Count	0	0	0	0
Mean	4.348	4.348	4.348	4.348
Std. Dev.	0.000	0.000	0.000	0.000
CV	0	0	0	0
RPMF	0	0	0	0
Reasonable Potential	0.000	0.000	0.000	0.000
100/Critical dilution	5.882	5.882	5.882	5.882
Does Reasonable Potential Exist	No	No	No	No

PERMIT ACTION

P. promelas Chronic - monitoring
C. dubia Chronic - monitoring

Review of the past five years of WET test data indicates that reasonable potential does not exist. There is insufficient evidence for the inclusion of limits at this time.

Permit Number:	AR0037842	AFIN:	04-00107	Outfall Number:	401
Date of Review:	12/5/2018	Reviewer:	A. Bates/M. Barnett		
Facility Name:	Southwestern Electric Power Company - Flint Creek Power Plant				
Previous Dilution series:	17, 23, 30, 40, 54%	Proposed Dilution Series:	17, 23, 30, 40, 53%		
Previous Critical Dilution:	40%	Proposed Critical Dilution:	40%		
Previous TRE activities:	none				

Frequency recommendation by species	
Pimephales promelas (Fathead minnow):	once per quarter
Ceriodaphnia dubia (water flea):	once per quarter

TEST DATA SUMMARY

	Vertebrate (*Pimephales promelas*)		Invertebrate (*Ceriodaphnia dubia*)		
TEST DATE	Lethal	Sub-Lethal	Lethal	Sub-Lethal	
	NOEC	NOEC	NOEC	NOEC	
12/31/2014	54	54	54	54	*
6/30/2015	54	54	54	54	*
12/31/2015	54	54	54	54	*
6/30/2016	54	54	54	54	*
12/31/2016	54	54	54	54	
6/30/2017	54	54	54	54	
12/31/2017	54	54	54	54	
3/31/2018	54	54	54	54	
6/30/2018	54	54	54	54	
9/30/2018	54	54	54	54	
12/31/2018	54	54	54	54	

* denotes tests for which one or more effluent samples was received above 6.0°C

Failures noted in BOLD

REASONABLE POTENTIAL CALCULATIONS

	Vertebrate Lethal	**Vertebrate Sub-lethal**	**Invertebrate Lethal**	**Invertebrate Sub-Lethal**
Min NOEC Observed	54	54	54	54
TU at Min Observed	1.85	1.85	1.85	1.85
Count	11	11	11	11
Failure Count	0	0	0	0
Mean	1.852	1.852	1.852	1.852
Std. Dev.	0.000	0.000	0.000	0.000
CV	0	0	0	0
RPMF	0	0	0	0
Reasonable Potential	0.000	0.000	0.000	0.000
100/Critical dilution	2.500	2.500	2.500	2.500
Does Reasonable Potential Exist	No	No	No	No

PERMIT ACTION

P. promelas Chronic - monitoring
C. dubia Chronic - monitoring

Review of the past five years of WET test data indicates that reasonable potential does not exist. There is insufficient evidence for the inclusion of limits at this time.

13. STORMWATER REQUIREMENTS

The federal regulations at 40 CFR 122.26(b)(14) require certain industrial sectors to have NPDES permit coverage for stormwater discharges from the facility. These requirements include the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) to control the quality of stormwater discharges from the facility. This facility was issued stormwater permit coverage under NPDES Tracking number ARR00B277.

14. SAMPLE TYPE AND FREQUENCY

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity [40 CFR Part 122.48(b)] and to ensure compliance with permit limitations [40 CFR Part 122.44(i)(l)].

Requirements for sample type and sampling frequency have been based on the current discharge permit, except for Mercury and Cyanide for Outfall 001 and Outfall 101, and FAC for Outfall 401. The sample type for Mercury and Cyanide has been set as "composite" because this is the appropriate sample type for metals. The sampling frequency has been set at "once/month" because this is an appropriate frequency for data gathering and monitoring compliance with metals limitations. The sample type and frequency for FAC have been set the same as for TRC because they are related pollutants.

Parameter	Previous Permit		Draft Permit	
	Frequency of Sample	Sample Type	Frequency of Sample	Sample Type
Outfall 001				
Flow	continuous	record	continuous	record
Total Recoverable Mercury	N/A	N/A	once/month	composite
Total Recoverable Cyanide	N/A	N/A	once/month	composite
pH	once/week	grab	once/week	grab
Outfall 101				
Flow	continuous	record	continuous	record
TSS	once/week	grab	once/week	grab
Total Recoverable Cyanide	N/A	N/A	once/month	composite
O&G	once/2 months	grab	once/2 months	grab
pH	once/week	grab	once/week	grab
Chronic WET	once/quarter	composite	once/quarter	composite

Parameter	Previous Permit		Draft Permit	
	Frequency of Sample	Sample Type	Frequency of Sample	Sample Type
Outfall 401				
Flow	continuous	record	continuous	record
FAC	N/A	N/A	twice/month	grab
TRC	twice/month	grab	twice/month	grab
Temperature	continuous	record	continuous	record
pH	twice/month	grab	twice/month	grab
Chronic WET	once/quarter	composite	once/quarter	composite

15. **PERMIT COMPLIANCE SCHEDULE**

A compliance schedule was added to Part IB.2 of the permit which requires periodic progress reports on meeting the no discharge requirement for bottom ash transport water, and a final certification that this requirement was met prior to December 31, 2023.

16. **MONITORING AND REPORTING**

The applicant is at all times required to monitor the discharge on a regular basis and report the results monthly. The monitoring results will be available to the public.

17. **SOURCES**

The following sources were used to draft the permit:

A. Application No. AR0037842 received June 29, 2017, and all additional information received by March 15, 2020.
B. APC&EC Rule 2.
C. APC&EC Rule 3.
D. APC&EC Rule 6 which incorporates by reference certain federal regulations included in Title 40 of the Code of Federal Regulations at Rule 6.104.
E. 40 CFR Parts 122 and 125.
F. 40 CFR Part 423.
G. Discharge permit file AR0037842.
H. Discharge Monitoring Reports (DMRs).
I. "2018 Integrated Water Quality Monitoring and Assessment Report," DEQ.
J. "2018 List of Impaired Waterbodies (303(d) List)," DEQ, May 2020.
K. Continuing Planning Process (CPP).
L. Technical Support Document For Water Quality-based Toxic Control.
M. Inspection Report #105719, dated December 7, 2018.
N. Compliance Review Memo from Christina Brown to Guy Lester, P.E., dated March 18, 2019.
O. Letter, dated October 7, 2015, from David P. Hall, PhD, of American Electric Power, to John Bailey, P.E., of ADEQ.

P. Letter, dated April 19, 2016, from John Bailey, P.E., of ADEQ, to Carl Handley, Plant Manager, of American Electric Power.
Q. "Flint Creek Power Plant - Impingement Monitoring Data Report - Benton County, Arkansas," PBS&J, March 2007.
R. "Mixing Zone Study at SWEPCO Lake," dated November 16, 1990, FTN Associates Ltd.
S. "316(b) Proposal for Information Collection, Flint Creek Power Plant, AR0037842," Arkansas Electric Power, September 2005.
T. Federal Register Vol. 82, No. 107 pp 26017-26019.
U. Federal Register Vol. 82, No. 179 pp 43494-43500.
V. Email series, dated October 26, 2017 concerning certification of analytical laboratory.
W. Letter, dated December 27, 2017, submittal of Mercury and Selenium analytical data.
X. Priority Pollutant Scan for Outfall 101, submitted April 26, 2018.
Y. Email comments by the U.S. Fish & Wildlife Service, dated September18, 2018.
Z. U.S. Fish & Wildlife Service ECOS Critical Habitat Map, March 19, 2019.
AA. Site visit report, November 14, 2018.
BB. Submittal of 2018 Mercury and Selenium analytical data for Outfall 101.
CC. Submittal of revised Mercury and Selenium analytical data for Outfall 101.
DD. ELG combined wastestream calculations.
EE. ArcGIS stream map.
FF. Google Earth Image.
GG. Google Earth Image - Outfalls.
HH. Revised EPA Form 2C, page 2.
II. Email, dated December 10, 2019, Advanced Industrial operators license requirement.
JJ. Letter, dated February 18, 2020, concerning contamination of Mercury samples, and submission of valid Mercury analytical data.
KK. Mercury Data for Outfall 101.
LL. Toxicity Calculations.
MM. Pre-draft review comments by Permittee, dated March 15, 2020.
NN. EPA No Objection letter, dated June 24, 2020.
OO. USF&WS No Comment Letter. dated August 6, 2020.
PP. Sierra Club Comment Letter, dated August 3, 2020.

18. PUBLIC NOTICE

The public notice of the draft permit was published for public comment on July 3, 2020. The last day of the comment period was August 3, 2020.

A summary of the comments received by the DEQ during the public comment period and response to the comments are included with this permit decision.

Copies of the draft permit and public notice were sent via email to the Corps of Engineers, the Regional Director of the U.S. Fish and Wildlife Service, the Department of Parks, Heritage, and Tourism, the EPA, and the Arkansas Department of Health.

19. **PERMIT FEE**

In accordance with Rule No. 9.403(A)(1), the annual fee for the permit is $15,000.

20. **POINT OF CONTACT**

For additional information, contact:

Guy Lester, P.E.
Permits Branch, Office of Water Quality
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317
Telephone: (501) 682-0023

RESPONSE TO COMMENTS
FINAL PERMITTING DECISION

Permit No.: AR0037842

Applicant: Southwestern Electric Power Company
Flint Creek Power Plant

Prepared by: Guy Lester, P.E.

The following are responses to comments received regarding the draft permit number above and are developed in accordance with regulations promulgated at 40 C.F.R. § 124.17, APC&EC Rule 8 Administrative Procedures, and A.C.A. § 8-4-203(e)(2).

Introduction

The above permit was submitted for public comment on July 3, 2020. The public comment period ended on August 3, 2020.

This document contains a summary of the comments that the DEQ received during the public comment period.

The following people or organizations sent comments to the DEQ during the public notice and public hearing. A total of eleven (11) comments were raised by one (1) commenter.

Commenter	Number of Comments Raised
Joshua Smith, Staff Attorney, Sierra Club	11

The complete text of the comments may be viewed at the following web page:

http://www.adeq.state.ar.us/downloads/WebDatabases/PermitsOnline/NPDES/PermitInformation/AR0037842_Comments%20by%20Sierra%20Club_20200803.pdf

Comment 1 **EPA's recent rule delaying the beginning of the compliance period provides no lawful basis for state permitting agencies to require compliance by the latest possible date of December 31, 2023.**

Response: 40 C.F.R. § 423.13(k)(1)(i) states: "…there shall be no discharge of pollutants in bottom ash transport water (BATW). Dischargers must meet the discharge limitation in this paragraph by a date determined by the permitting authority that is as soon as possible beginning November 1, 2020, but no later than December 31, 2023." December 31, 2023 is a valid compliance date for the elimination of the discharge of BATW.

The EPA established the requirements and guidelines for the BATW ELG. The preliminary draft renewal permit was submitted to the EPA for review on June 2, 2020. The EPA had no comment on the BATW compliance date in the preliminary draft renewal permit (see Section 17.NN of the Fact Sheet).

The EPA has also reviewed two other preliminary draft renewal NPDES permits for coal-fired steam electric power plants in Arkansas, where the compliance date for elimination of BATW from the discharge was December 31, 2023. [ref.

AR0036331, and AR0037451] The EPA had no comments on the BATW compliance date in these preliminary draft renewal NPDES permits.

It should be noted that the commenter did not submit comments on either of above referenced NPDES permits.

No change to the BATW compliance date has been made in the final permit.

Comment 2 **SWEPCO must eliminate bottom ash discharges from Flint Creek as soon as possible to protect vital water resources.**

Response: A toxicity evaluation of the discharge from Outfall 101 (the outfall where BATW is discharged) was performed as part of the drafting of the renewal permit, as described in Section 11.F of the Fact Sheet. Data used in the evaluation included sampling results of the 126 priority pollutants from Appendix A to 40 C.F.R. § 423. Acute Aquatic Life, Chronic Aquatic Life, and Human Health evaluations were performed. The evaluations showed that the discharge from Outfall 101, which includes BATW, does not show reasonable potential (RP) to cause a violation of the water quality standards (except for Chronic Aquatic Life for Cyanide – see Note below), nor EPA National Recommended Water Quality Criteria, in the receiving stream.

The facility performs quarterly Chronic Whole Effluent Toxicity (WET) testing on the discharge from Outfall 101, which includes BATW. There have been no WET test failures over the current permit term. The WET testing requirements from the current permit are continued in the renewal permit.

The above facts show that the conditions of the renewal permit, including the compliance date for the elimination of BATW from the discharge from Outfall 101, are protective of the WQS, and all beneficial uses of the receiving stream.

No change to the BATW compliance date has been made in the final permit.

Note: The analytical result for Cyanide was below the Chronic Aquatic Life water quality standard, but showed RP due to statistical considerations. Monitoring and reporting requirements for Cyanide were included in the permit to gather additional data.

Comment 3 **SWEPCO has not shown that it cannot comply with the ELG Rule before 2023, and its Application does not reflect the "expeditious planning" required by EPA.**

Response: See response to Comment 1.

Comment 4 **There is compelling evidence that SWEPCO can, in fact, comply with the ELG Rule before 2023.**

Response: See response to Comment 1.

Comment 5 **ADEQ must include a legally justified ELG compliance deadline in the permit.**

Response: See response to Comment 1.

Comment 6 ADEQ must include monitoring provisions for FGD and bottom ash discharges.

Response: The facility does not generate FGD wastewater, because a Dry Flue Gas Desulfurization system was installed in 2016, so no monitoring requirements concerning FGD wastewater are required.

The permit includes monitoring for BATW from the discharge through Outfall 101.

No changes to the monitoring requirements have been made in the final permit.

Comment 7 The permit must prohibit fly ash transport water discharges immediately.

Response: The facility uses a dry fly ash transport system, and does not generate fly ash transport water. Prohibition of a waste stream that is not generated at the facility is not required in the permit.

No changes concerning fly ash transport water have been made in the final permit.

Comment 8 ADEQ must ensure continued progress under the voluntary incentives program and evaluate whether water quality based effluent limits are needed.

Response: As noted in the response to Comment 2, a water quality-based evaluation was performed on the discharge from Outfall 101, which includes BATW, and the evaluation showed that water quality-based limitations were not required (see Section 11.F of the Fact Sheet for details).

No changes have been made in the final permit concerning this issue.

Comment 9 Even aside from ELG compliance, the permit must include technology-based effluent limits for toxic metals in coal combustion wastewaters.

Response: 40 CFR 122.44(d)(5) requires that water quality-based limits be included in a permit if they are more stringent than technology-based limits included in effluent limitation guidelines. It does not require that technology-based limits be developed that are more stringent than possible water quality-based limits.

The water quality-based evaluation in Section 11.F of the Fact Sheet shows that the requirements and limitations in the renewal permit are protective of water quality standards and all beneficial uses of the receiving stream. Additional technology-based limitations are not necessary.

As noted in the response to Comment 6, the permit includes the technology-based limits required by 40 C.F.R. § 423.12(b)(4) (and 40 C.F.R. § 423.12(b)(13)).

No changes have been made in the final permit concerning this issue.

Comment 10 ADEQ must evaluate whether water quality based effluent limitations are needed to meet water quality standards.

Response: See response to Comment 2.

Comment 11 The permit does not adequately address all discharges associated with the coal ash landfill and impoundments.

Response: The permit adequately addresses discharges from the coal ash landfill. The discharge description for Outfall 101 in Part IA Section A2 includes "treated combustion residual leachate (ash landfill leachate)". In Section 8.B of the Fact Sheet, the type of treatment listed for the discharge from Outfall 101 includes: "ash landfill leachate treatment (Advanced Biological Metals removal system - ABMet®)". This treatment system has been added since the last permit renewal, and treats ash landfill leachate from the leachate collection system. This is the reason for the new requirement for an Advanced Industrial Operators License in Part II.1 of the renewal permit.

The permit adequately addresses discharges from the coal ash impoundments. Flow from the primary ash pond discharges through Outfall 101. See responses to Comments 2, 8, and 9.

It should also be noted that the primary pond is being closed in accordance with the requirements of the Coal Combustion Residuals (CCR) rule in 40 C.F.R. § 257. This closure is outside of the scope of the NPDES permit.

No changes have been made in the final permit concerning these issues.

Exhibit 2

August 3, 2020

Via Email Water-Draft-Permit-Comment@adeq.state.ar.us

Guy Lester
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118

Re: Southwestern Electric Power Company
Flint Creek Power Plant
ADPES Permit Renewal Application
AFIN: 04-00107
NPDES Permit No. AR0037842

Sierra Club submits the following comments on the Arkansas Department of Environmental Quality ("ADEQ") draft Arkansas Pollutant Discharge Elimination System ("APDES") permit for Southwestern Electric Power Company's ("SWEPCO's") Flint Creek Power Plant, ADPES Permit Renewal Application, AFIN: 04-00107, NPDES Permit No. AR0037842 (the "Draft Permit"). Additionally, Sierra Club attaches and incorporates by reference the technical comments of Dr. Ranajit (Ron) Sahu, Ph.D, QEP, CEM, which assess the feasibility of timely compliance with EPA's Effluent Limitations Guidelines for electric power plants.[1]

Sierra Club is one of the oldest and largest national nonprofit environmental organizations in the country, with more than 800,000 members, including nearly 3,400 in Arkansas, dedicated to exploring, enjoying, and protecting the wild places and resources of the earth; practicing and promoting the responsible use of the earth's ecosystems and resources; educating and enlisting humanity to protect and restore the quality of the natural and human environment; and using all lawful means to carry out these objectives. To further those goals, Sierra Club submits these comments to help ensure that the final wastewater permit issued to the Flint Creek power plant ensures protection of designated uses in Flint Creek and the Illinois and Arkansas Rivers below the power plant.[2]

Sierra Club has a significant interest in ensuring that the Flint Creek APDES permit complies with all applicable statutory and regulatory requirements, which are created to protect human health and the environment. To that end, we reserve the right to rely on all public comments

[1] *See* Ex. 1 (Dr. Ranajit (Ron) Sahu, Technical Assessment of Feasibility of Timely Compliance with Bottom Ash Transport Water and FGD Wastewater Effluent Limitations Guidelines (Sept. 12, 2018)).
[2] SWEPCO, Flint Creek Power Plant ADPES Permit Renewal Application, Attachment C, Form 1 at 4 (June 27, 2017) [hereinafter, Flint Creek Application"].

submitted, request a written response to our comments, and request written notification when any action is taken on this Draft Permit. If the permit is amended or altered in response to comments, we request an opportunity to review and comment on any amended permit.

Additionally, Sierra Club respectfully requests an opportunity for members of the public to attend a hearing on this Draft Permit and submit further comment. As discussed below, the protection of receiving waters in Flint Creek and the Illinois and Arkansas River basins from the toxic metals and other pollutants being discharged from the Flint Creek power plant is of urgent interest to the public at large and to the many Sierra Club members who live and recreate in the impacted areas. In particular, the Draft Permit fails to address, let alone set a date, for compliance with federal effluent limit guidelines ("ELGs"). Because the ELGs for steam electric generating units ("EGUs") are still final and effective, the final permits for Flint Creek must reflect these new regulatory requirements. In particular, you must make findings regarding the date by which each of these facilities must fully comply with the new ELG rule. *See generally* 40 C.F.R. § 423.13. Compliance is not optional.

FACTUAL BACKGROUND

Each day across the United States, coal-fired electric generating units ("EGUs") like Flint Creek discharge millions of gallons of industrial wastewater contaminated with toxic pollutants like arsenic, boron, cadmium, chromium, lead, mercury, copper, nickel, and selenium into the rivers, lakes, and streams of the United States. This pollution is discharged directly from plants; flows from old, unlined surface impoundments that many plants use to store toxic slurries of coal ash and sludge; and seeps from unlined ponds and landfills into ground and surface waters.

The U.S. Environmental Protection Agency ("EPA") estimates that at least 5.5 billion pounds of pollution are released into the environment by coal-fired power plants every year.[3] These power plants are responsible for at least 50 to 60 percent of the toxic pollutants discharged in waters of the United States—more than the next nine top polluting industries combined.[4] In its final 2015 ELG rule, EPA estimated that timely implementation of the rule's wastewater limits for EGUs would reduce the amount of toxic pollution in the nation's waters by approximately 1.4 billion pounds, avoiding more than a half billion in social costs associated with those pollutant streams.[5] Timely implementation of the rule is therefore critical to the health and welfare of Arkansas communities, like the ones downstream of Flint Creek.

Flint Creek is a 558 MW coal-burning EGU. The unit burns primarily low-sulfur western coal and is currently equipped with an ESP and low NOx burners with over-fire air (LNB/OFA) to reduce nitrogen oxide ("NOx") emissions. SWEPCO has also installed and operates additional control equipment including dry flue gas desulfurization ("DFGD") and activated carbon injection (ACI) to reduce mercury and sulfur dioxide ("SO2") emissions.

The plant discharges more than 5 million gallons per day of contaminated wastewater to Lake SWEPCO, which is designated for use for primary and secondary contact recreation, fish and wildlife propagation, and agriculture.[6] The reservoir then discharges more than 7 million gallons per

[3] U.S. EPA, Environmental Assessment of the Proposed Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category 3-14, Docket No. EPA-HQ-OW-2009-0819-2260 (Apr. 2013).
[4] *Id.* at 3-13.
[5] 80 Fed. Reg. 67,838 (Nov. 3, 2015).
[6] Flint Creek Application, Attachment C at 10.

day to Flint Creek, which drains into the Illinois and Arkansas River basins, which are classified for primary and secondary contact recreation, raw water source for domestic (public and private), industrial, and agricultural water supplies, propagation of desirable species of fish and other aquatic life, and other compatible uses.[7] Notably, Flint Creek's discharges are within 5 miles of the City of Gentry's municipal water supply.[8] The wastewater discharged by the Flint Creek power plant includes wastewater effluent and runoff from cooling tower chemical storage area drains; bottom ash overflow and handling system; fly ash overflow; demineralizer regeneration wastewaters; boiler and cooling water blowdown; blowdown, condensate; metal cleaning wastewater; bottom ash hopper overflow; stormwater runoff from the oil storage area; coal pile runoff; process area runoff; and hydrostatic test wastewater.[9] The facility apparently dry handles fly ash, but discharges coal pile runoff, treated combustion residual leachate (ash landfill leachate) and bottom ash transport water through Outfall 101 and then 001.[10] These coal combustion wastes contain numerous highly toxic and bioaccumulative pollutants, such as arsenic, boron, cadmium, chromium, lead, mercury, copper, nickel, and selenium, among others.[11] Moreover, these pollutants are often not fully removed using sedimentation or settling methods similar to those employed at Flint Creek.

As explained in more detail below, ADEQ must revise the Draft Permit and require the Company to submit a revised application for the reasons described below:

- ADEQ must rationally evaluate and include a compliance deadline for the elimination of bottom ash transport water and the compliance with FGD numeric limitations for FGD discharges as soon as possible, as required by EPA's ELGs.

- As discussed below, EGUs like Flint Creek are capable of complying with EPA's ELG rule within just a few years, and certainly before the currently-effective 2023 compliance date.

- The Draft Permit fails to establish technology-based effluent limits ("TBELs") for the vast majority of toxic metals in wastewater discharges from the plant's flue gas desulphurization and ash water, and runoff from the coal pile.

- ADEQ must evaluate and establish water quality based effluent limits ("WQBELs") for each of the outfalls in this permit. Such a determination requires SWEPCO to amend its Application to provide an accurate and detailed understanding of where and in what quantities wastewaters are discharged.

- SWEPCO failed to properly address all discharges, including leachate discharges, associated with Flint Creek's coal ash landfill and impoundments, and ADEQ must evaluate whether the plant's ash and waste ponds are properly constructed, or are likely to seep, breach, or illegally discharge.

[7] ADEQ Fact Sheet at 4.
[8] Flint Creek Application, Attachment C at 7.
[9] Flint Creek Application, Attachment D at 1-2, Attachment Q; ADEQ Fact Sheet at 6.
[10] Flint Creek Application, Attachment D at 1-2; ADEQ Fact Sheet at 6..
[11] Flint Creek Application, Attachment D at V1 through V-9; Attachment O.

DISCUSSION

I. The December 2023 Deadline for Cleco Power to Eliminate Bottom Ash Transport Water and FGD Discharges Is Unlawful.

In September 2015, the U.S. EPA promulgated updated effluent limitation guidelines ("ELGs") for steam electric generating units like Flint Creek, the agency's first update to these standards since 1982.[12] The ELGs establish technology-based effluent limits that must be included in all NPDES permits, based on EPA's determination of the best available technology for treating particular waste streams. Relevant to Flint Creek, the EPA required that steam electric Electricity Generating Units ("EGUs") achieve zero discharge of bottom ash transport water, based on its determination that dry bottom ash handling or a closed-loop wet-handling system is the best available technology.[13] As EPA notes, these technologies "have been in operation at power plants for more than 20 years and are amply demonstrated by the record supporting the final rule."[14]EPA found that "more than 80 percent of coal-fired generating units built in the last 20 years have installed dry bottom ash handling systems," and that over half of existing facilities "are already employing zero discharge technologies (dry handling or closed-loop wet ash handling) or planning to do so in the near future."[15]

For FGD wastewater discharges, EPA set numeric effluent limitation on Total Suspended Solids ("TSS"), mercury, arsenic, selenium, and nitrate/nitrite. These limits are achievable through treatment using chemical precipitation followed by biological treatment. As EPA noted in the final rule, "forty-five percent of all steam electric power plants with wet scrubbers have equipment or processes in place able to meet the final BAT/PSES effluent limitations and standards."[16] Many of these plants use FGD wastewater management approaches that eliminate the discharge of FGD wastewater. Other plants employ wastewater treatment technologies that reduce the amount of pollutants in the FGD wastestream. Moreover, both chemical precipitation and biological treatment are well-demonstrated technologies that are available to steam electric power plants for use in treating FGD wastewater. Chemical precipitation has been used at "thousands of industrial facilities nationwide for the last several decades."[17] Biological treatment has been tested at power plants for "more than ten years" and full-scale systems have been operating at a subset of plants for seven years; it has been "widely used in many industrial applications for decades."[18]

The ELGs became effective January 4, 2016, and all permits issued after that date must include a compliance date. EPA delegated determination of the actual compliance date for each waste stream to permitting authorities, with the instruction that compliance be achieved "as soon as possible." 40 C.F.R. § 423.11(t). The rule established November 1, 2018 as the default date for compliance, noting that "*the 'as soon as possible' date determined by the permitting authority is November 1, 2018*, unless the permitting authority determines another date after receiving information submitted by the discharger."[19] EPA further stated that the permitting authority may determine that November

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[12] *See* U.S. EPA, Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 80 Fed. Reg. 67,838 (Nov. 3, 2015).
[13] *Id.* at 67,852.
[14] *Id.* at 67,845.
[15] *Id.* at 67,852.
[16] *Id.* at 67,850.
[17] *Id.*
[18] *Id.*
[19] *Id.* at 67,883 (emphasis added).

1, 2018, is "as soon as possible" for a discharger, even if it has received a request by the discharger for a later compliance date.[20]

In determining a compliance deadline that is "as soon as possible," the permitting authority must consider the factors "after receiving information from the discharger"[21]:

(a) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule;

(b) Changes being made or planned at the plant in response to greenhouse gas regulations for new or existing fossil fuel-fired power plants under the Clean Air Act, as well as regulations for the disposal of coal combustion residuals under subtitle D of the Resource Conservation and Recovery Act;

(c) For FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment; and

(d) Other factors as appropriate.

In the final rule, EPA explained how the permitting authority must support its determination:

> EPA recommends that the permitting authority provide a well-documented justification of how it determined the "as soon as possible" date in the fact sheet or administrative record for the permit. If the permitting authority determines a date later than November 1, 2018, the justification should explain why allowing additional time to meet the limitations is appropriate, and why the discharger cannot meet the final effluent limitations as of November 1, 2018.[22]

Discharges from Flint Creek are subject to the requirements of the ELG Rule because the power plant discharges bottom ash transport water (Outfalls 001 and 101).[23] As discussed below, and in the comments of Dr. Ranajit (Ron) Sahu, Ph.D, QEP, CEM, which we attach and incorporate by reference,[24] plants across the country have already started complying with the ELG Rule and any final permit that fails to include an adequately-supported compliance deadline would be unlawful.

- First, contrary to SWEPCO's suggestion, EPA's recent rule delaying the beginning of the compliance period does not provide a lawful basis for state permitting agencies to require compliance ***before*** December 23, 2023.
- Second, SWEPCO must eliminate bottom ash discharges from Flint Creek as soon as possible to protect vital water resources.

[20] *Id.* at 67,883 n.57.
[21] *Id.*; *see also* 40 C.F.R. § 423.11(t).
[22] *Id.* at 67,883.
[23] Flint Creek Application, Attachment D at 1-2, Attachment Q; Fact Sheet at 6. The Application raises the possibility that the plant discharges some FGD process wastewater (Outfall 101) potentially fly ash transport water. If not, ADEQ should explicitly prohibit such discharges absent compliance with EPA's ELG Rule.
[24] Ex. 1.

- Third, contrary to the ELG Rule, SWEPCO has not shown that it cannot eliminate bottom ash discharges before the final 2023 deadline, and the Draft Permit does not reflect the "expeditious planning" required by EPA.
- Fourth, there is compelling evidence that SWEPCO can, in fact, comply with the ELG Rule by 2020.
- Fifth, ADEQ must revise the ELG compliance deadlines in any final permit.
- Sixth, ADEQ must include monitoring provisions for FGD and bottom ash discharges.
- Seventh, the permit must make clear that, as of November 1, 2018, Flint Creek is not permitted to discharge fly ash transport water.
- Finally, and at a minimum, ADEQ must ensure continued progress under the voluntary incentives program and evaluate whether water quality based effluent limits are needed.

A. EPA's recent rule delaying the beginning of the compliance period provides no lawful basis for state permitting agencies to require compliance by the latest possible date of December 23, 2023.

On September 12, 2017, EPA promulgated a rule that merely delayed the *beginning* of the compliance period for bottom ash and FGD wastewater effluent limitations by two years, from November 1, 2018 to November 1, 2020. *See* Postponement of Certain Compliance Dates for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 82 Fed. Reg. 43,494 (Sept. 18, 2017) ("Delay Rule"). As a result of this Delay Rule, the relevant provisions in the Steam Electric ELGs require permitting authorities to establish compliance dates for bottom ash effluent limitations that are "as soon as possible beginning November 1, 2020, and no later than December 31, 2023." 40 C.F.R. § 423.13(g)(1)(i), (k)(1)(i). In issuing the Delay Rule, EPA emphasized that the standards for which it delayed the compliance deadlines remain in effect, despite the agency's ongoing reconsideration process.[25]

Of particular relevance here, the Delay Rule does not in any way change the factors set forth in 40 C.F.R. § 423.11(t) that ADEQ is required to consider when establishing an "as soon as possible" date for compliance. The only change that EPA made to 40 C.F.R. Part 423 in the Delay Rule is the two-year postponement of the beginning of the compliance period, so that compliance with bottom ash and FGD effluent limitations must now occur "as soon as possible" between 2020 and 2023, instead of the 2018-2023 compliance period that EPA had previously established in the 2015 ELG Rule. Moreover, EPA has made clear that notwithstanding its intent to engage in further rulemaking to consider whether to make additional changes to the Steam Electric ELGs, the agency may ultimately decide that no further changes are needed, including the compliance period.[26] Indeed,

[25] 82 Fed. Reg. at 43,496 ("This maintains the 2015 Rule as a whole at this time, with the only change being to postpone specific compliance deadlines for two wastestreams."); *see also* U.S. EPA, Response to Comment Document, EPA-HQ-OW-2009-0819, SE06669, at 8 (The only thing the Postponement Rule does is revise the 2015 ELG Rule's new, more stringent compliance dates for two wastestreams discharged from existing sources (bottom ash transport water and flue gas desulfurization wastewater). Otherwise, it leaves the Rule unchanged."); *id.* at 12 ("EPA's action to postpone certain compliance dates in the 2015 rule . . . does not otherwise amend the effluent limitations guidelines and standards for the steam electric power generating point source category.").

[26] *See* Response to Comment Document, *supra*, at 6 ("It is possible that the costs, impacts and benefits of the rule may be unchanged after EPA completes its new rulemaking."); *id.* at 18

at this stage, EPA is unable to say one way or the other whether it will take any future actions to modify the Steam Electric ELGs, consistent with its obligation not to predetermine the outcome of a future rulemaking.

Notably, other permitting authorities have likewise concluded that the mere fact that EPA has announced an intention to reconsider the ELG does *not* provide a basis for delaying compliance. Specifically, after first proposing to delay compliance with the ELG rule because of uncertainty surrounding EPA's potential reconsideration, the Michigan Department of Environmental Quality modified its proposed permit for the Belle River power plant to reflect a December 31, 2021 compliance date, concluding that the initial 2021 dates should be reinstated.[27] Accordingly, there is no valid basis to assume that EPA will make any changes to the Steam Electric ELGs in the future.

SWEPCO's apparent reliance[28] on the speculative possibility that EPA might revise those dates is unlawful.[29] EPA always retains the authority to revise a rule; and a party may not avoid compliance simply because the agency may someday change its mind. EPA's Delay Rule provides no basis for ADEQ to excuse Flint Creek from compliance with the ELG Rule "as soon as possible." This means that the Company has an affirmative obligation to demonstrate that it is not possible to comply with the rule before the final 2023 compliance date.

A. SWEPCO must eliminate bottom ash discharges from Flint Creek as soon as possible to protect vital water resources.

It is critical to eliminate Flint Creek's bottom ash discharges and to impose numeric limits on FGD wastewater discharges as soon as possible. The harm to streams, aquatic life and stream-dependent wildlife, and human health is well established and merits immediate attention.[30]Any decision to unnecessarily delay eliminating this waste stream from Flint Creek and the Illinois and Arkansas River basis would be an affirmative decision to allow that harm to continue.

According to EPA, bottom ash is the coarse, angular ash particle that is too large to be carried up into the smoke stacks and so it forms in the bottom of the coal furnace.[31] Bottom ash contains various toxic metals, including arsenic, boron, cadmium, lead, mercury, nickel, copper, and selenium. It also contains harmful levels of bromides and nutrients.[32]Many of these toxic metals

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(dismissing concerns about negative water quality impacts of the delay as "speculative at this point in time as EPA has yet to alter any of the effluent limitations in the 2015 Rule").

[27] Ex. 2 (Sierra Club Comments on NPDES Permit No. MI0038172 and MDEQ response to Comments).

[28] Flint Creek Application, Attachment D at 2, Cover Letter at 2.

[29] *Cf. American Petroleum Institute v. EPA,* 906 F.2d 729, 739–40 (D.C. Cir. 1990) (observing that "an agency *always* retains the power to revise a final rule . . . ."; *American Bird Conservancy, Inc. v. FCC,* 516 F.3d 1027, 1031 n. 1 (D.C. Cir. 2008) ("agencies cannot avoid judicial review . . . merely because they have opened another docket that may address some related matters.").

[30] *See* Environmental Integrity Project, Toxic Wastewater from Coal Plants (Aug. 2016), *available at* http://environmentalintegrity.org/wp-content/uploads/coal-wastewaterreport_FINAL-with-appendix.pdf.

[31] EPA, Coal Ash Basics, https://www.epa.gov/coalash/coal-ash-basics.

[32] U.S. EPA, Environmental Assessment for the Effluent Limitations Guidelines and Standards for the Stream Electric Power Generating Point Source Category, Doc. No. EPA-821-R-15-006, at 3-2 to 3-4 (Sept. 2015) ("EPA Environmental Assessment").

when discharged to streams are capable of harming fish and even causing fish kills.[33] Because the toxic metals bioaccumulate in fish, they affect humans who consume those fish.[34] These chemicals cause a wide variety of health risks, including birth defects, increased cancer risk, liver and kidney abnormalities, and diarrhea.[35] EPA detailed the risk of impairment that ash based discharges pose to protected water uses.[36]

The Flint Creek plant discharges bottom ash transport water to SWEPCO Lake and then to Flint Creek, and then to the Illinois and Arkansas River basins,[37] which are designated for primary and secondary contact recreation, fish and wildlife propagation, and agriculture, among other uses.[38] As noted, these bottom ash discharges are within 5 miles of the City of Gentry's municipal water supply intake.[39] These protected uses are at risk by continued bottom ash discharges. EPA has demonstrated that application of the zero-discharge standard for bottom ash discharges will improve groundwater and surface water quality and will reduce impacts to wildlife, human health cancer risk and non-cancer effects, and nutrient impacts.[40] Because the discharges cause so much harm and because the ELGs provide so many benefits, ADEQ has a duty to rigorously evaluate any request to extend the compliance date and must be precise about just how much it should be extended, if at all, given the *specific circumstances*.

B. SWEPCO has not shown that it cannot comply with the ELG Rule before 2023, and its Application does not reflect the "expeditious planning" required by EPA.

SWEPCO's Application states that due to the "considerable expense of potential modifications," the Company "does not plan to perform any work to modify" the facility to comply with EPA's ELG Rule until a final rule is published in the Federal Register.[41] Aside from its perfunctory adoption of a December 2023 compliance date, the Draft Permit does not provide any explanation for its proposed compliance deadline, let alone a rational evaluation of EPA's mandatory factors for extending the compliance timeframe. The Draft Permit is therefore legally and factually deficient, for several reasons.

First, as discussed, *there is a final rule in place*. On September 12, 2017, three months after SWEPCO submitted its Application, EPA issued a final rule delaying only the *beginning* of the compliance period for bottom ash and FGD wastewater effluent limitations by two years, from November 1, 2018 to November 1, 2020. 82 Fed. Reg. 43,494. EPA's rule delaying the beginning of the compliance period provides no lawful basis for state permitting agencies to require compliance by the latest possible date of December 23, 2023. And a regulated entity may not avoid compliance with a final and effective rule simply because an agency might someday revise the regulation. Such an approach would insulate regulated entities from compliance with any regulation.

Second, SWEPCO provided absolutely no technical information or analysis excusing it from complying with the ELG Rule before the December 23, 2023 deadline. As an initial matter, the

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[33] *Id.* at § 3.
[34] *Id.*
[35] *Id.*
[36] *Id.* at § 6.
[37] Flint Creek Application, Attachment C at 4.
[38] *Id.* at 3.
[39] Flint Creek Application, Attachment C at 7.
[40] 80 Fed. Reg. at 67,873-77.
[41] Flint Creek Application, Cover Letter at 2.

Company's conclusory complaint that environmental compliance is "too expensive" is not a valid basis for excusing Flint Creek from complying with the same rule that other utilities around the country have proactively planned for, and complied with. In fact, utilities like SWEPCO have spent years preparing for the ELGs. Indeed, the Utility Water Act Group ("UWAG"), a nationwide industry consortium of which SWEPCO is a member,[42] submitted case studies showing conversion to dry bottom ash handling is feasible within 27-33 months.[43] Similarly, similarly-situated utilities and vendors have installed and started operating technologies to meet the ELG Rule's FGD limits within 18-24 months for most plants.[44]

Third, in its cover letter to ADEQ, SWEPCO fails to provide any date for commencement of its ELG compliance activities and fails to explain why it could not have commenced *planning* activities five years ago when the ELG Rule was finalized. As noted in the attached technical comments of Dr. Sahu, technical solutions to comply with the ELG Rule readily available and can be implemented in 3 years or sooner. Even assuming that SWEPCO has done absolutely nothing to plan for implementation of the ELGs in the five years since the rule became final, it should not take any longer than late 2022, for Flint Creek to come into compliance. And there is *nothing* in the record to show that there are any unique technical issues at Flint Creek that would prevent SWEPCO from implementing currently available technologies that have been successfully adopted across the country. In fact, many coal-fired power plants, which face the same regulatory uncertainties as Flint Creek have already achieved zero discharge for bottom ash wastewater.[45]

Finally, the record is not only devoid of any technical explanation for allowing SWEPCO to defer ELG compliance indefinitely, but the record makes clear that SWEPCO has not even attempted to satisfy the ELG Rule's mandatory regulatory factors for postponing any compliance date. Nor does proposed permit reflect the "expeditious" planning and compliance required under the rule. The ELG Rule requires compliance *as soon as possible* beginning November 1, 2020 and no later than December 31, 2023. As EPA has recognized, the 2015 Rule set out the basic procedure for permitting authorities in determining that compliance date:

> First, the presumptive compliance date (or "as soon as possible" date) is November 1, 2018. Next, the permitting authority may determine a later compliance date, but no later than December 31, 2023, and *only if it receives information from the discharger justifying the later date*. Finally, after receipt of such justification, the permitting

[42] As UWAG's comments note, "UWAG is a voluntary, *ad hoc*, non-profit, unincorporated group of 198 individual energy companies and three national trade associations of energy companies: the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Association. The individual energy companies operate power plants and other facilities that generate, transmit, and distribute electricity to residential, commercial, industrial, and institutional customers." Utility Water Act Group Comments on EPA's Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, at 1 n.1.

[43] *See* Ex. 1 at 7 (citing Utility Water Act Group Comments on EPA's Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category at 1 n.1, EPA Docket EPA-HQ-OW-2009-0819-6232, *available at* https://www.regulations.gov).

[44] Ex. 1 at 10.

[45] Ex. 1 at 3-4.

> authority may set a compliance date later than the presumptive date *only after considering the factors* set forth above.[46]

As noted, "after receiving information from the discharger,"[47] the permitting authority is *required* to establish the soonest possible compliance date based on a consideration of the following factors:

> (a) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule;
>
> (b) Changes being made or planned at the plant in response to greenhouse gas regulations for new or existing fossil fuel-fired power plants under the Clean Air Act, as well as regulations for the disposal of coal combustion residuals under subtitle D of the Resource Conservation and Recovery Act;
>
> (c) For FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment; and
>
> (d) Other factors as appropriate.[10]

As an initial matter, SWEPCO has entirely failed to submit *any* technical information or support related to those mandatory factors. The regulation, on its face, requires the discharger to provide that information—the permitting authority cannot do it for them. Because SWEPCO has not provided any information related to the ELG's compliance factors, ADEQ cannot rationally evaluate the soonest "possible" compliance date. Consequently, ADEQ must require the Company to supplement its application with the information required under the ELG Rule.

On this record, ADEQ cannot rationally issue a final permit because SWEPCO failed to provide sufficient evidence related to any of the factors that the ELG Rule requires permitting authorities to consider. Perhaps most significantly, the very first factor enumerated in the above list requires consideration of "*expeditious*" planning in all aspects of compliance with the ELGs, underscoring EPA's directive to achieve compliance "as soon as possible." Here, SWEPCO's Application does not contemplate any compliance with the ELG Rule, let alone an "expeditious" one.

More significantly, the Draft Permit's selection of a December 2023 compliance date—the latest possible date under the ELG Rule—is arbitrary and unsupported by the record. As explained, the ELG Rule requires zero discharge of bottom ash transport water "as soon as possible," unless a careful consideration of the factors in 40 C.F.R § 423.11(t) demonstrates that a later date is appropriate. Here, ADEQ failed to evaluate any compliance date earlier than December 2023, let alone provide a rational explanation, based on EPA's mandatory factors, for extending compliance

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[46] Ex. 3 at 58 (EPA, Statement of Substantial New Questions for Public Comment (Discussion of Substantial New Questions and Possible New Conditions for the Merrimack Station Draft NPDES Permit that are Now Subject to Public Comment During the Comment Period Reopened by EPA under 40 C.F.R. § 124.14(b)), https://www3.epa.gov/region1/npdes/merrimackstation/pdfs/2017-statement-snqpc.pdf.

[47] 40 C.F.R. § 423.11(t).

to the latest possible date. The Draft Permit fails to comply with the unambiguous requirements of 40 C.F.R. § 423.11(t), and is therefore arbitrary unlawful.[48]

The ELG Rule's reference to "other factors as appropriate" cannot save ADEQ's facially deficient Draft Permit. Regulations, like statutes, must be interpreted as a whole, to arrive at the interpretation that "best comports with the overall regulatory scheme." *United States v. Transocean Deepwater Drilling, Inc.*, 767 F.3d 485, 496 (5th Cir. 2014) ("We believe that looking at the full text of the statute, rather than one isolated clause, along with the statute's structure and its public safety purpose shows that the comma-which clause was not intended to preclude the CSB from investigating all incidents involving marine oil spills."); *see also Abramski v. United States*, 134 S. Ct. 2259, 2267 ("[W]e must (as usual) interpret the relevant words not in a vacuum, but with reference to the statutory context, 'structure, history, and purpose.'") (quoting *Maracich v. Spears*, 133 S.Ct. 2191, 2209 (2013)). Even if SWEPCO had relied on the ELG Rule's "other factors" prong (which it does not), ADEQ could not approve the currently draft permit because such an approach would renders the remaining factors meaningless, and conflicts with the Clean Water Act's statutory goal that *all* water pollution from point sources "be eliminated by 1985." 33 U.S.C. § 1251(a)(1); *see also Texas Oil & Gas Ass'n*, 161 F.3d at 927.[49]

In sum, ADEQ cannot finalize the Draft Permit as written because there is no factual basis for the agency to conclude that SWEPCO cannot comply with the ELG Rule *before* 2023. Because it has failed to provide any explanation as to why it cannot complete the necessary work before 2023, SWEPCO's Application essentially comes down to its preference to be allowed a wait-and-see approach while EPA reconsiders the ELG rule. As explained above, that is not a legally adequate justification, and ADEQ should reject it. Specifically, ADEQ must require SWEPCO to supplement its application with a rational explanation and evidence demonstrating that compliance with the ELG Rule is not possible, and the agency must allow additional public comment addressing any such Application.

C. There is compelling evidence that SWEPCO can, in fact, comply with the ELG Rule before 2023.

There is compelling evidence that SWEPCO can, in fact, comply with the ELG Rule before December 2023. As explained in the technical comments of Dr. Sahu, numerous industry studies show that conversion to dry bottom ash handling can be accomplished in 27-33 months, and a significant number of existing coal-fired power plants already have zero discharge systems.[50] Similarly, several power plants have already installed technology to comply with numeric FGD discharge limits; and some facilities have installed such technology within 7 to 8 months.[51]

Moreover, in other NPDES permit renewal proceedings, permitting authorities across the country have proposed or finalized earlier compliance deadlines for bottom ash limits, demonstrating that it is, as a general matter, feasible for plants to achieve earlier compliance.

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[48] An agency rule is arbitrary and capricious if the agency entirely failed to consider an important aspect of the problem, or offered an explanation for its decision that runs counter to the evidence before the agency. *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).
[49] *U.S. v. Mead Corp.*, 533 U.S. 218, 251 (U.S. 2001) (statutes and regulations must not be interpreted in a manner that would render any provision meaningless or redundant).
[50] Ex. 1 at 6-7.
[51] *Id.* at 6-7, 9.

State	Facility	Permit Number	Status	Date	Bottom Ash Compliance Date
FL	Crystal River North Station Units 4 & 5	FL0036366	Draft	8/26/2016	2/1/2020
IA	George Neal	IA0004103	Draft	10/5/2017	121/1/2020
IA	Ottumwa Generating Station (IP&L)	IA9000101	Draft	9/27/2017	6/1/2021
IA	IPL Lansing Generating Station	IA0300100	Final	6/1/2016	12/31/2021
IL	Hennepin Power Station	IL0001554	Draft	11/9/2016	4/1/2019
IN	A.B. Brown Generating Station	IN0052191	Final	2/28/2017	11/1/2018
IN	Clifty Creek Station	IN0001759	Final	3/28/2017	4/1/2022
IN	Merom Generating Station	IN0050296	Final	8/5/2016	11/1/2018
IN	Michigan City Generating Station	IN0000116	Final	3/30/2016	11/1/2018
IN	Petersburg Generating Station	IN0002887	Final	8/25/2016	11/1/2018
IN	F.B. Culley Generating Station	IN0002259	Draft	1/12/2017	11/1/2018
MI	Belle River Power Plant	MI0038172	Final	1/27/2017	12/31/2021
MO	Sioux	MO0000353	Final	4/1/2017	5/1/2021
NC	Allen Steam Station	NC0004979	Draft	10/28/2016	2/28/2021
NC	Belews Creek Steam Station	NC0024406	Draft	1/15/2017	5/31/2021
NC	Marshall Steam Station	NC0004987	Final	9/9/2016	1/31/2021
NC	Mayo Steam Electric Generating Plant	NC0038377	Draft	8/25/2016	11/1/2018
NC	Rogers Energy Complex (aka Cliffside)	NC0005088	Draft	9/21/2016	12/31/2020
NC	Roxboro Steam Electric Generating Plant	NC0003425	Draft	1/21/2017	4/30/2021
ND	Leland Olds Station	ND-0025232	Final	3/31/2017	11/1/2018
PA	Brunner Island	PA0008281	Draft	4/5/2017	1/1/2022
SC	A.M. Williams Station	SC0003883	Final	11/16/2016	11/1/2018
VA	Chesterfield Power Station	VA0004146	Final	9/23/2016	11/1/2018
WI	Alma Site	WI0040223-08-0	Final	4/1/2017	1/1/2021

These permitting decisions make clear that earlier compliance with the bottom ash and FGD ELGs is, in fact, technically feasible.

D. ADEQ must include a legally justified ELG compliance deadline in the permit.

For all the reasons above, ADEQ must include a legally and factually justified ELG compliance schedule proposed in the Flint Creek permit. The schedule must reflect the agency's careful, independent, and critical analysis of the regulatory factors and any technical submission by SWEPCO, including assessments by qualified engineers. Based on the attached technical comments of Dr. Sahu, Sierra Club submits that December 2022 would be a reasonable—and even generous—compliance date for Flint Creek to eliminate bottom ash transport water discharges, and comply with the ELG Rule's FGD numeric limits where applicabe. As noted by Dr. Sahu, numerous sources across the country have already started compliance with the FGD limitations, or can comply within 8 months. Similarly, many sources have eliminated bottom ash transport water discharges, or can do so within 3 years at the latest. Given the minimal information provided by SWEPCO, there is no way for the public or ADEQ to meaningfully evaluate whether an earlier date would be possible in accordance with 40 C.F.R. §423.11(t).

E. ADEQ must include monitoring provisions for FGD and bottom ash discharges.

As explained further in the attached comments of Dr. Sahu, ADEQ should require monitoring the bottom ash discharge from Outfalls 101 and 001, as well as any FGD discharges, for various contaminants known to be present in these respective wastewaters, including numerous heavy metals, including arsenic, mercury, selenium, and nitrate/nitrite. Not only would this information be valuable to SWEPCO for designing any FGD wastewater treatment system, it would allow the public to determine the mass loading of contaminants from these wastewaters to receiving waters. Neither ADEQ, SWEPCO, nor the public have information about how much mass loading of these harmful contaminants are being discharge into receiving waters. To address this critical gap in information, ADEQ should include monitoring requirements in the APDES permit at each outfall (and internal outfall) where FGD wastewater or bottom ash wastewater discharges are possible.

F. The permit must prohibit fly ash transport water discharges immediately.

Although the Application is not a model of clarity, it appears that the operation of Flint Creek raises the potential for the discharge of fly ash transport water through Outfall 101 and/or 001.[52] In any event, the permit must include an explicit provision prohibiting the discharge of fly ash transport water, as of November 1, 2018.[53] Although EPA delayed the compliance dates for bottom ash and FGD wastewater, the agency did not amend the compliance date for fly ash transport water, which remains November 1, 2018. At a minimum, ADEQ must confirm that Flint Creek does have any potential for the discharge of fly ash transport water.

G. ADEQ must ensure continued progress under the voluntary incentives program and evaluate whether water quality based effluent limits are needed.

As discussed, because the ELG Rule is final and effective, ADEQ does not have discretion to delay compliance. But at a minimum, the agency must include in the Flint Creek APDES permit additional provisions to ensure ongoing progress toward compliance under the Voluntary Incentives Program under 40 C.F.R. § 423.12(g)(3)(i).

[52] Flint Creek Application, Attachments B and Q.
[53] 40 C.F.R. §§ 423.13(h)(1)(i); 423.11(t).

II. EVEN ASIDE FROM ELG COMPLIANCE, THE PERMIT MUST INCLUDE TECHNOLOGY-BASED EFFLUENT LIMITS FOR TOXIC METALS IN COAL COMBUSTION WASTEWATERS.

The Clean Water Act requires all pollutants to be controlled by technology-based limits, set to achieve reductions commensurate with those of the "best technology economically achievable" ("BAT"). 33 U.S.C. § 1311(b)(2). Generally, EPA promulgates BAT requirements as fixed numerical "effluent limitations," but, in some cases, it has not yet done so. Although EPA has issued final effluent limitations for some heavy metals associated with coal ash and scrubber sludge, it has not addressed the numerous other harmful pollutants discharged from Flint Creek.[54]

Even if Flint Creek was complying with the ELG Rule (it isn't), SWEPCO does not get a free pass to indiscriminately discharge all other toxic and heavy metals. Instead, permit writers are to impose "such conditions as [they] determine[ ] are necessary to carry out the provisions" of the CWA, as a matter of "best professional judgment," or "BPJ." *See* 33 U.S.C. §1342(a)(1)(B). ADEQ still has an obligation to include in the final permit TBELs, based on best professional judgment, for any pollutants beyond the bare minimum federal effluent limitation guidelines for this industry. SWEPCO's application makes clear that Flint Creek discharges numerous heavy metals and other toxins, including mercury, cooper, nickel, lead, aluminum, boron, and others from Outfalls 101 and 001.[55] Accordingly, ADEQ must employ its best professional judgment to determine BAT for toxic pollutants in these waste streams. The agency cannot simply wait until EPA has developed or reissued effluent limitation guidelines.

III. ADEQ MUST EVALUATE WHETHER WATER QUALITY BASED EFFLUENT LIMITS ARE NEEDED TO MEET WATER QUALITY STANDARDS.

ADEQ permits must also contain water-quality-based effluent limitations ("WQBELs") to ensure the protection of water quality.[56] ADEQ must set such effluent limits to control *all* pollutants which may be discharged into the relevant waterbody at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above state water quality standards.[57] Therefore, if Flint Creek discharges *any* pollutants at a level that may cause or contribute to any downstream exceedance of Arkansas water quality standards, ADEQ must set WQBELs for such pollutants during the renewal of the permit.

In addition to protecting water quality, ADEQ must ensure that Flint Creek's discharges comply with ADEQ's antidegradation requirements. Arkansas's EPA-approved antidegradation policy requires that, even after application of stringent treatment technologies and ensuring that a discharge does not violate or contribute to the violation of water quality standards. The antidegradation requirement is an ongoing requirement which must be examined, considered, and complied with each time ADEQ renews a permit or issues a new permit. All existing uses of all waters must be maintained and protected.[58]

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[54] *See* Flint Creek Application, Attachment D at V-1 through V-9; Attachment O.
[55] *Id.*
[56] 40 C.F.R. § 122.44(d)(1)(i). Section 303 of the Clean Water Act requires a water quality standard to be set for each water body in the state. 33 U.S.C. § 1313(a)-(c). The water quality standard consists of: (1) the designated use for the water body; (2) the water quality criteria necessary to protect that designated use; and (3) an antidegradation policy. *Id.* at § 1313; 40 C.F.R. § 131.6.
[57] 40 C.F.R. § 122.44(d)(1)(i).
[58] 40 C.F.R. § 131.12; 33 U.S.C. § 1313(d)(4)(B).

As discussed, Flint Creek and the Illinois and Arkansas River Basins are designated as primary and secondary contact recreation, fish and wildlife propagation, and agriculture. The City of Gentry's municipal water supply intake is less than 5 miles downstream from the plant. Thus, the draft permit must ensure that discharges from Flint Creek do not degrade those designated uses.

IV. THE PERMIT DOES NOT ADEQUATELY ADDRESS ALL DISCHARGES ASSOCIATED WITH THE COAL ASH LANDFILL AND IMPOUNDMENTS.

Finally, ADEQ must assess whether Flint Creek is discharging pollution from its coal combustion waste landfill and impoundments without a permit. These ponds contain the highly toxic coal combustion wastes such as bottom ash transport water, fly ash, and coal pile runoff that, if released into the Houston River, would be catastrophic.

Discharges from the landfill and impoundments to surface waters and/or groundwater with a hydrogeological connection to surface water without a permit are prohibited by the Clean Water Act.[59] Discharges to groundwater with a direct hydrogeological connection to "waters of the U.S." fall within the scope of the Clean Water Act.[60] All unpermitted discharges from a point source to these waters are violations of the CWA. Leaks in a pollution containment system, like coal combustion waste landfills and impoundments, are point sources.[61] Thus, discharges of toxic pollution from leaks in coal combustion waste landfills and impoundments are prohibited without an NPDES permit.[62]

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[59] *See, e.g.*, *Hernandez v. Esso Standard Oil Co.*, 599 F.Supp.2d 175, 181 (D. Puerto Rico 2009) (reviewing federal case law and holding "that the CWA extends federal jurisdiction over groundwater that is hydrologically connected to surface waters that are themselves waters of the United States"). *See also* U.S. Envtl. Prot. Agency, Office of Wastewater Mgmt., National Pollutant Discharge Elimination System Permitting of Wastewater Discharges from Flue Gas Desulfurization and Coal Combustion Residuals Impoundments at Steam Electric Power Plants, Att. B at 2 (2010) ("Permitting authorities should examine the need for [NPDES permit requirements such as lined impoundments and seepage interception systems] for hydrologically connected discharges that cannot be regulated through traditional NPDES outfalls"); U.S. Envtl. Prot. Agency, Office of Wastewater Mgmt., EPA-833- K-10-001, NPDES Permit Writer's Manual (2010) ("If a discharge of pollutants to ground water reaches waters of the United States . . . it could be a discharge to the surface water (albeit indirectly via a direct hydrological connection, *i.e.* the ground water) that needs an NPDES permit"); U.S. Envtl. Prot. Agency, Notice of Final NPDES General Permit for Egg Production Operations in New Mexico and Oklahoma NMG800000 and OKG800000, 67 Fed. Reg. 47,362-63 (July 18, 2002) ("The permit prohibits the discharge of process wastewater pollutants from retention or control structures to groundwater that has a direct hydrologic connection to Waters of the United States").

[60] *Id.*

[61] 33 U.S.C. § 1362(14) (defining "point source" broadly and specifically including "container" in the definition); *see, e.g., United States v. Earth Sciences, Inc.*, 599 F.2d 368 (10th Cir. 1979) (noting that "[w]hen a [closed circulating system] fails because of flaws in the construction or inadequate size to handle the fluids utilized, with resulting discharge, whether from a fissure in the dirt berm or overflow of a wall, the escape of liquid from the confined system is a point source").

[62] In fact, discharges that result from leaks and other failures of a pollution containment system should never be authorized by an NPDES permit because BAT is to contain the pollution. *See* 33 U.S.C. §§ 1311(b)(1), 1311(b)(2)(A), and 1314(b) (mandating that permitting agencies set technology-based effluent limits for all discharges).

Without a protective composite liner in place and other safeguards, landfills and impoundments routinely seep and/or leak dangerous toxins into ground and surface waters.[63] As EPA has acknowledged, "several damage case studies have documented impacts to surface waters due to ground water contamination from [coal combustion waste] impoundments and landfills."[64] For example, nearly half (30 of 67) of EPA's documented surface water damage cases from landfills and impoundments were caused by pollution from groundwater.[65]

SWEPCO's Application fails to disclose the condition of Flint Creek's coal ash landfill or examine whether the coal ash landfill is impermissibly discharging pollutants. Any unpermitted discharges from the landfill would be illegal and ADEQ must require the applicant to submit groundwater and lake water monitoring data to ensure that such discharges are not occurring. Recent EPA guidance has made clear that coal ash combustion impoundments are within the scope of NPDES permits for electric generating facilities and must be addressed by the permitting authority: "Seepage discharges to surface water through a shallow ground water hydrologic connection have been controlled in a number of cases through NPDES permit requirements to either use lined impoundments to prevent seepage or to install seepage interception systems. Permitting authorities should examine the need for these types of requirements for hydrologically connected discharges that cannot be regulated through traditional NPDES outfalls."[66]

CONCLUSION

ADEQ's APDES permit renewal for the Flint Creek power plant is facially deficient. Most significantly, the Draft Permit fails to evaluate compliance with EPA's final and effective ELG rule for steam electric EGUs. Even if that were permissible, it fails to meaningfully evaluate technology based effluent limits are readily achievable. The Draft Permit further fails to evaluate water quality and coal combustion disposal impacts and fails to impose monitoring and reporting requirements. As a result, on this record, ADEQ cannot rationally evaluate and issue a final permit. Sierra Club urges the agency to require SWEPCO to supplement its Application with information sufficient to meet the requirements of the Clean Water Act, and to take public comment for no less than 30 days on the revised Application.

If you have any questions or would like further input from the Sierra Club on this matter, please contact me at any time.

[63] Environmental Assessment for the Proposed Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category A-29 to A-39 (Apr. 2013), Docket No. EPA-HQ-OW-2009-0819-2260.
[64] *Id.* at 4-21.
[65] *Id.* at A-29 to A-39.
[66] *See id.* App'x B at 2.

Sincerely,

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Technical Assessment of Feasibility of Timely Compliance with Bottom Ash Transport Water and FGD Wastewater Effluent Limitations Guidelines at the Dolet Hills Power Station

Expert Report by Dr. Ranajit (Ron) Sahu

September 12, 2018

I. INTRODUCTION AND SUMMARY

The Louisiana Department of Environmental Quality (LDEQ) has proposed to reissue a Louisiana Pollutant Discharge Elimination System (LPDES) permit (No. LA0062600) to the Dolet Hills Power Station (DHPS), authorizing the discharge of a wide range of process waste waters to the receiving waters of the Red River, Mundy Bayou and Sawmill Creek as noted in the proposed permit.

Federal Effluent Limitations Guidelines (ELG) apply to two of the wastewaters, namely bottom ash transport water (BATW) and flue gas desulfurization (FGD) wastewater – both of which contain numerous toxic contaminants. The ELG for BATW is zero discharge of such water (unless they are reused in the FGD, in which case they must meet the FGD wastewater ELGs). The ELGs for FGD wastewater are specified numerical limits for four contaminants – namely arsenic, mercury, selenium, and nitrate/nitrite. The ELGs were promulgated in late 2015/early 2016 and have been subject to legal challenges. Relying on this regulatory uncertainty, the LDEQ, at the request of the DHPS, and with no technical basis,[1] has proposed that none of these ELGs should apply until EPA issues a final rule in the future which may be many years into the future.[2]

In these technical comments, I note simply, based on the support provided, that technical solutions to achieve the BATW and FGD ELGs are readily available and can be implemented in 3 years or sooner. Even assuming that the owners and operators of DHPS have done nothing to plan for implementation of the ELGs (a very generous assumption, given the long time it too to finalize the ELGs in 2015/2016 starting in 2009; and the almost 3 years since), and that such planning, design, procurement, installation, and operations began now, it should take no more than late 2021 for these ELGs to be achieved at the DHPS. The vast majority of the coal-fired power plants in the US who face the same regulatory uncertainties as DHPS already achieve the BATW ELG – i.e., zero

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[1] Rather than provide any technical support or even regulatory support for its decision, the LDEQ simply notes that:

> "Cleco believes it is impractical and cost prohibitive to pursue BAT requirements for FGD wastewater and bottom ash transport water at this time since these requirements are subject to change based on EPA's intention to conduct new rulemaking in the next three years." See LDEQ's Rationale accompanying the proposed permit, p. 15.

[2] See Other Conditions – Paragraph K, Item 2:

> "The discharge of bottom ash transport water is authorized at Outfall 002 and the discharge of FGD wastewater is authorized at Outfall 011. Cleco Power LLC provided additional information on November 29, 2017 regarding compliance dates for the Dolet Hills Power Station. LDEQ has determined that the Dolet Hills Power Station shall meet the final BAT effluent limitations and requirements for bottom ash transport wastewater and FGD wastewater no later than the final compliance dates listed in the final rulemaking for the effluent limitations guidelines and standards for bottom ash transport water and FGD wastewater in the steam electric power generating point source category found in 40 CFR 423. This time period is provided in order for the facility to budget, design, and construct the treatment system to meet the final EPA Effluent Guidelines." (emphasis added)

discharge. And, several also achieve the ELGS for FGD wastewater. To my knowledge, there is nothing in the record to show that there are any unique technical issues at DHPS that would prevent current technologies which have been implemented elsewhere multiple times, to also be implemented at the DHPS to meet the respective ELGs.

I note further that, based on a review of the monitoring requirements in the current LPDES permit for the DHPS and also in the proposed permit, that the LDEQ has never required and does not currently require even monitoring for the various FGD contaminants for which ELGs have been promulgated – namely arsenic, mercury, selenium, and nitrate/nitrite.[3] In other words, neither the LDEQ, nor the operator of the power plant not the public has any idea of how much mass loading of these harmful contaminants are being discharge into receiving waters – and will continue to be discharge in the future given the non-action by the LDEQ.

In summary, I ask that the LDEQ include (i) monitoring requirements in the LPDES permit at each outfall (and internal outfall) where FGD wastewater discharges are possible at the DHPS; and (ii) require that the DHPS meet the ELG requirements for BATW and FGD wastewater in roughly 3 years from permit issuance (i.e., no later than December 2021). This will ensure that harmful discharges of contaminants from the DHPS to receiving waters will stop (for BATW) or be minimized (for FGD wastewater) at least after December 2021, regardless of the uncertain timing of any future regulatory actions by the EPA.

II. THE DOLET HILLS POWER STATION (DHPS)

According to the record, "Cleco Power LLC's Dolet Hills Power Station is a fossil fuel fired steam/electric generating facility with a total generating capacity of approximately 650 megawatts. Lignite is fired in a boiler to produce steam that is used to power a steam turbine/electric generator. The facility consists of several process areas that include boiler operations, water treatment, turbine operations, oil storage, lignite storage, fly ash and bottom ash storage, service operations, solid fuels and limestone unloading operations, and various support structures."[4]

Also according to the record the DHPS discharges two wastewater streams subject to the ELGs: namely BATW and FGD wastewater.[5]

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[3] https://echo.epa.gov/tools/data-downloads/icis-npdes-dmr-and-limit-data-set

[4] LDEQ's Fact Sheet and Rationale (hereafter "Rationale") for the proposed permit, p. 2.

[5] "According to additional information submitted via an email from Cleco Power LLC (Cleco) on November 29, 2017, this existing facility has discharges of bottom ash transport water (Outfall 002) and FGD wastewater (Outfall 011)." Rationale, p. 10.

III. THE EFFLUENT LIMITATIONS GUIDELINES (ELGs)

The ELGs establish technology-based effluent limitations for wastewater discharges from steam electric power plants such as the DHPS. EPA finalized the ELGs in November 2015, following solicitation of input from the public and the regulated community.[6]

The final ELGs set federal limits on the discharge of toxic metals and other harmful pollutants from wastewater at steam electric power plants. The ELGs are based on technology improvements in the steam electric power industry over the last three decades and establish new requirements for wastewater streams from processes and byproducts associated with flue gas desulfurization, bottom ash transport, and fly ash transport (which does not apply at the DHPS).

The ELGs establish a best available technology ("BAT") standard for FGD wastewater[7] that is expressed in specific concentration limits for mercury, arsenic, selenium, and nitrate/nitrite.[8] These are shown in the table below, for reference.

Pollutant	Daily Maximum	30-day Average
Arsenic, total	11 ug/L (ppb)	8 ug/L (ppb)
Mercury, total	788 ng/L (ppt)	356 ng/L (ppt)
Nitrate/nitrite, as N	17.0 mg/L (ppm)	4.4 mg/L (ppm)
Selenium, total	23 ug/L (ppb)	12 ug/L (ppb)

For bottom ash transport waters, the BAT standard permits zero discharge.[9]

Importantly, and a point entirely glossed over and unmentioned by the LDEQ in its Rationale accompanying the proposed issuance of the LPDES permit, the BAT standards are to be achieved "as soon as possible (emphasis added) beginning November 1, 2018, but no later than December 31, 2023."[10] The regulations initially provided that "[t]he phrase 'as soon as possible' means November

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[6] As EPA noted in the preamble to the final ELG Rule, "EPA initiated a steam electric ELG rulemaking following a detailed study in 2009. EPA published the proposed rule on June 7, 2013, and took public comments until September 20, 2013." 80 Fed. Reg. at 67,844.

[7] 40 C.F.R. § 423.11(n) (defining "flue gas desulfurization (FGD) wastewater" as "any wastewater generated specifically from the wet flue gas desulfurization scrubber system that comes into contact with the flue gas or the FGD solids, including but not limited to, the blowdown from the FGD scrubber system, overflow or underflow from the solids separation process, FGD solids wash water, and the filtrate from the solids dewatering process").

[8] 40 C.F.R. § 423.13 (g)(1)(i).

[9] 40 C.F.R. §§ 423.13 (h)(1)(i) and (k)(1)(i).

[10] 40 C.F.R. §§ 423.13 (g)(1)(i), (h)(1)(i), and (k)(1)(i). While EPA has made recent statements concerning compliance deadlines for the 2015 revised ELGs, such as moving the November 2018 deadlines to November 2020 for BATW and

1, 2018, unless the permitting authority establishes a later date" based on a well-documented justification laying out certain enumerated factors demonstrating that the facility cannot comply with the November 1, 2018 default.[11] This November 1, 2018 deadline was moved to November 1, 2020 by the EPA subsequently.

The regulations note that factors which may affect the compliance date are as follows:

> (1) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of this part.
>
> (2) Changes being made or planned at the plant in response to:
>
> (i) New source performance standards for greenhouse gases from new fossil fuel fired electric generating units, under sections 111. 30 I, 302, and 307(d)(1)(C) of the Clean Air Act, as amended, 42 U.S.C. 7411. 7601, 7602, 7607(d)(1XC);
>
> (ii) Emission guidelines for greenhouse gases from existing fossil fuel-fired electric generating units, under sections 111. 301, 302, and 307(d) of the Clean Air Act, as amended, 42 U.S.C. 7411. 7601. 7602, 7607(d); or
>
> (iii) Regulations that address the disposal of coal combustion residuals as solid waste, under sections 1006(b), 1008(a), 2002(a), 3001, 4004, and 4005(a) of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. 6906(b), 6907(a), 6912(a), 6944, and 6945(a).
>
> (3) For FGD wastewater requirements only, an initial commissioning period for the treatment system to optimize the installed equipment.
>
> (4) Other factors as appropriate.[12]

Importantly, the very first factor enumerated in the above list requires consideration of "expeditious" planning in all aspects of compliance with the ELGs, thereby underscoring EPA's directive to achieve compliance "as soon as possible." Nevertheless, the proposed LPDES permit, which effectively imposes no timeline for compliance proposed timeline for compliance at the DHPS does not reflect this aspect of the regulation at all.

FGD wastewater, these are neither final nor do they alter LDEQ's permitting duty to set TBELs as a minimum level of control for wastewater discharges. *See* 82 Fed. Reg. 19,005 (Apr. 25, 2017); 40 C.F.R. § 125.3(c)(2) and (3).

[11] 40 C.F.R. § 423.11(t).

[12] *Ibid.*

The ELG Rule was challenged and recently EPA issued a rule delaying the November 1, 2018 initial compliance date by two years (i.e., to November 1, 2020).[13] In its rulemaking EPA did not push back the end of the compliance period (i.e., December 31, 2023).

IV. COMMENTS ON MEETING THE BATW ELG AT DHPS

First, as background, in order to gather information on handling BATW during the ELG rulemaking, EPA contacted several ash handling and ash storage vendors. The vendors provided the following types of information for EPA's analyses:

- Type of fly ash and bottom ash handling systems available for reducing or eliminating ash transport water;
- Equipment, modifications, and demolition required to convert wet-sluicing fly ash and bottom ash handling systems to dry ash handling or closed-loop recycle systems;
- Equipment that can be reused as part of the conversion from wet to dry handling or in a closed-loop recycle system;
- Outage time required for the different types of ash handling systems;
- Maintenance required for each type of system;
- Operating data for each type of system;
- Purchased equipment, other direct, and indirect capital costs for fly ash and bottom ash conversions;
- Specifications for the types of ash storage available (*e.g.*, steel silos or concrete silos) for the different types of handling systems;
- Equipment and installation capital costs associated with the storage of fly ash and bottom ash; and
- Operation and maintenance costs for fly ash and bottom ash handling systems.[14]

The vendor community has now been well aware of the rule requirements for almost a decade (since initial efforts at developing the ELG rule date back to 2009) and participated fully in the ELG rulemaking.

There are numerous well-qualified U.S. vendors (and foreign vendors that are active in the U.S. market) that are capable of providing equipment and services for ash handling and conversion of wet bottom ash handling systems to dry systems or closed-loop recycle systems. Major vendors include United Conveyer Corporation ("UCC"),[15] Clyde Bergemann,[16] and Magaldi[17]—each of

[13] See https://www.federalregister.gov/documents/2017/09/18/2017-19821. See also Fed. Reg. Vol. 82, No. 179, September 18, 2017, 43494.

[14] U.S. EPA, Technical Development Document for the Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category, EPA-821-R-15-007 at 3-21 and 3-22 (Sept. 2015).

[15] UCC offers various hydraulic, mechanical, pneumatic, and vibratory systems for dry bottom ash handling. See http://unitedconveyor.com/bottom_ash/ (last visited Sep. 26, 2016).

which has wet to dry conversion technologies. Other vendors such as GE, Veolia, Nalco, Aquatech, Heartland, LB Industrial Systems, and many others also have potential capabilities and solutions for specific aspects of ash handling. The ELG rulemaking docket shows that EPA consulted extensively with at least UCC and Clyde Bergemann with respect to BATW handling during rule development.[18] Both of these vendors have wet to dry ash conversion systems, which have been installed at coal plants around the world, including the U.S.

That the vendor community for bottom ash handling is robust is not surprising given that the U.S. coal-fired power plant fleet at the time of the rulemaking was over 800 units strong, with each one generating copious amounts of bottom ash that must be handled and managed. Further, as the ELG rulemaking record shows, a significant portion of the U.S. coal fleet already meets the ELG BAT standard for BATW using dry handling systems. Vendors, including those mentioned above, already have many technology solutions and offerings for achieving a zero discharge for BATW. As EPA states in the preamble to the ELG Rule:

> [T]echnologies for control of bottom ash transport water are demonstrably available. Based on survey data, more than 80 percent of coal-fired generating units built in the last 20 years have installed dry bottom ash handling systems. In addition, EPA found that more than half of the entities that would be subject to BAT requirements for bottom ash transport water are already employing zero discharge technologies (dry handling or closed-loop wet ash handling) or planning to do so in the near future.[19] (emphasis added)

Second, as far as schedule and timing for achieving compliance with the BATW ELG, it is instructive to review the comments provided by utilities themselves during the ELG rulemaking. While numerous parties provided comments to the EPA during the ELG rulemaking, it is particularly important to note certain, relevant portions of comments provided by Southern Company (a large peer utility of Cleco, the owner of the DHPS) and by the Utility Water Act Group ("UWAG"), an industry consortium, which includes almost all U.S. utilities as its members.[20] In its

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[16] Clyde Bergemann offers a trademarked "DRYCON" system for dry bottom ash handling. See http://www.cbpg.com/en/products-solutions-materials-handling-bottom-ash/drycon%E2%84%A2 (last visited Sep. 26, 2016).

[17] Magaldi offers a dry ash handling system called MAC. See http://www.magaldi.com/en/magaldi_solutions_for/Ash-Handling-Mac__9_11.php#tab_fototab (last visited Sep. 26, 2016).

[18] *See, e.g.*, ERG/EPA Call Notes re Ash Handling Conversion in the Industry (May 24, 2012), EPA-HQ-OW-2009-0819-0580, *available at* https://www.regulations.gov/document?D=EPA-HQ-OW-2009-0819-0580 (pertaining to EPA and its contractor's discussions with UCC); ERG Memorandum re Ash Handling Documentation from Communications with Clyde Bergemann (Sept. 30, 2015), EPA-HQ-OW-2009-0819-6232, *available at* https://www.regulations.gov/document?D=EPA-HQ-OW-2009-0819-6232.

[19] 80 Fed. Reg. at 67,852.

[20] As UWAG's comments note, "UWAG is a voluntary, *ad hoc*, non-profit, unincorporated group of 198 individual energy companies and three national trade associations of energy companies: the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Association. The individual energy companies operate power plants and other facilities that generate, transmit, and distribute electricity to residential, commercial,

comments pertaining to bottom ash conversions, Southern Company and UWAG both offer case studies showing conversion to dry bottom ash handling in 27-33 months:

> [I]n the case study presented in the attachment, it would take 30-36 months to convert from a wet bottom ash hopper to a dry bottom ash hopper for a large unit . . . Another case study for adding a remote wet ash hopper and submerged flight conveyor would take 27-33 months.[21] (emphasis added)

As I note above, a significant number of existing coal-fired power plants already have zero discharge BATW systems. Thus, there is nothing unique at the DHPS that the LDEQ can point to (and nor does it) that would require an open-ended timeline for BATW ELG compliance.

It is my opinion that, even starting its compliance efforts now (i.e., pretending that Cleco has done zero planning till today), it should be able to meet the BATW ELG in 36 months at most – or by December 2021.

V. COMMENTS ON MEETING THE FGD WASTEWATER ELGs AT DHPS

Just as for BATW, the LDEQ essentially imposes no timeline for compliance with the ELGs for FGD wastewater in the proposed LPDES permit for the DHPS. Instead, it simply and perfunctorily states that it accepts Cleco's rationale that it cannot possibly do anything while EPA is still addressing potential changes, which it may or may not propose, at some future, uncertain date. The LDEQ does not discuss in its rationale: (i) how others agencies and similar power plant operators are dealing with the same uncertainties faced by Cleco; or, importantly, (ii) the consequences of not implementing the ELGs "as soon as possible" in an "expeditious" manner – such as the continued and ongoing discharges of harmful pollutants to receiving waters. In fact, by not including even any monitoring conditions for such pollutants in the proposed LPDES permit, the LDEQ (and therefore without any data on such discharges), the LDEQ does not even attempt to fill a glaring data gap as to the extent of ongoing harmful discharges.

The FGD wastewater ELGs were established by EPA in part, by relying on existing and proven technologies that could reduce discharges of the harmful pollutants from this wastewater stream to below the levels required by the ELGs. No new technologies or breakthroughs were anticipated or relied upon. Simply, standard physical/chemical treatment common to industrial wastewaters (i.e., pH adjustments, additives for precipitation etc.) followed by biological treatment (for selenium, primarily) would be needed to meet the ELGS.

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industrial, and institutional customers." Utility Water Act Group Comments on EPA's Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, at 1 n.1.

[21] *Id.* at 84; *see also* Southern Company Comments on EPA's Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, Appendix B.

First, and generally, U.S. coal-fired power plants have been using biological treatment systems to treat selenium in FGD wastewater discharges to meet state and other obligations since at least 2009 and testing such systems for over a decade.[22] This includes, for example, systems at Duke Energy's Allen, Belews Creek, and Mayo plants in North Carolina and American Electric Power's ("AEP") Mountaineer plant in West Virginia. Based on this type of operating experience, EPA felt confident that the ELGs for FGD wastewater (and especially the selenium ELG) could be met using biological systems.

The vendor with the most experience in biological FGD wastewater treatment is Suez.[23] Suez recently acquired General Electric's, waste water treatment technology called ABMet. Suez, like GE before it, is a large company with the scale and resources to provide the technology and support needed to achieve ELG compliance. While there are other vendors and offerings such as the FBR by Envirogen and SeHAWK system by Frontier,[24] Suez's ABMet system, referenced above, is the most established. Specifically, Suez's ABMet system has been used since 2009 to achieve selenium levels than meet the ELG requirements. As a result of its early installations since 2009, Suez's ABMet process has accumulated extensive experience as well as operational efficiencies in the operation of its systems.

[22] 80 Fed. Reg. 67,850.

[23] https://www.suezwatertechnologies.com/products/abmet-selenium-removal

[24] *See e.g.*, http://www.power-eng.com/articles/print/volume-120/issue-12/departments/energy-matters/biological-treatment-for-fgd-wastewater-a-few-options.html.

Regarding the required installation timelines for a system such as the ABMet, it is instructive to look to prior experience. For example, at its Mountaineer plant, owner AEP (a large owner and operator of many coal-fired power plants) selected the ABMet system after prior evaluations, back in 2011.[25]

In April 2011, GE (the then-owner of the ABMet technology) put out an announcement describing this system and suggested it could be operational in approximately 8 months: (emphasis added)

> American Electric Power chose GE's ABMET wastewater bioreactor system at AEP's 1,300 MW Mountaineer coal-fired power plant in West Virginia. The system uses a molasses-based product as a nutrient for microbes that reduce selenium, which is found in wastewater from many coal-fired power plants. The microbes are seeded in a bed of activated carbon that acts as a growth medium to create a biofilm. The wastewater passes through the reactor and reduces the selenium in the water. The system is expected to be operational by the end of 2011. AEP is the third U.S. utility to use GE's wastewater treatment process.[26] (emphasis added)

As GE noted, even back in 2011, over four years prior to the finalization of the ELG Rule in 2015 and over two years prior to the proposed rule, AEP was the third utility to use this process.

A later statement confirms that the GE ABMet at Mountaineer was indeed installed quickly and produced selenium concentrations that meet the ELG limits (23 ug/l daily max/12 ug/l monthly average):

> "The ABMet system has consistently achieved less than 10 ppb selenium level… The ABMet system has been in service since November 2011 and as of June 2014 has provided 100% availability."[27]

The system was announced for Mountaineer in mid-April 2011 and was already in service by November 2011—i.e., in less than 8 months.

The physical/chemical treatment process at Mountaineer, in which FGD wastewater is first treated before it is biologically treated in the GE ABMet system, was installed after 2008, as discussed in EPA's Technical Development Document for the ELG Rule:

> One example of a treatment system operating to meet only the BPT-based limitations for TSS, pH, and O&G was AEP's Mountaineer plant, which initially

[25] http://www.businesswire.com/news/home/20110414006578/en/AEP-Turns-GE%E2%80%99s-ABMet%C2%AE-Technology-Reduce-Selenium.

[26] http://www.power-eng.com/articles/2011/04/ge-wastewater-system-picked-for-mountaineer.html

[27] https://www.gewater.com/kcpguest/documents/Case%20Studies.../CS1472EN.pdf

> operated a chemical precipitation system to treat its FGD wastewater. In 2008, 1 year after the start-up of the FGD scrubbers and the FGD wastewater treatment system, the plant went through a permit renewal process and the state proposed to add a WQBEL for mercury. Based on the proposed mercury limitations in the new permit, AEP conducted a pilot study evaluating three different technologies that could be installed as additional treatment downstream of the currently operating chemical precipitation system. Mountaineer conducted the pilot study from July through December 2008. During the first 3 months of the study, the mercury concentrations of the chemical precipitation system effluent feeding the pilot tests averaged 1,300 parts per trillion(ppt). None of the three technologies achieved the target effluent concentrations for the pilot testing. Therefore, AEP took steps to optimize the solids removal in the chemical precipitation system, including adding additional polymers and organosulfide. Using these optimization steps, AEP noted that "[t]he combination of supplemental coagulation and organosulfide addition consistently yielded approximately 80 percent of additional mercury reduction . . ." within the chemical precipitation system (internal citation omitted).[28]

It is likely that AEP began evaluations for options to treat selenium at Mountaineer in 2009 or later, after it had optimized its physical/chemical treatment system for mercury in 2008, as discussed. Assuming a start sometime in early 2009, the fact that AEP was able to select the GE ABMet system by April 2011, as described, means that this process took only around two years. Moreover, this technology evaluation was for the first application of this (relatively, at that time) new technology at a plant in AEP's system, although Duke (another large owner and operator or several coal plants) had similar systems at its plants, as noted. In any case, since the GE ABMet technology has now been operating for over 7 additional years at many more plants, with considerably more accumulated experience, the evaluation and implementation steps should take even less time.

Finally, recent discussions with the vendor (Suez/GE) confirm that it is able to bring its ABMet biological system online in 18-24 months for most plants.[29]

VI. CONCLUSIONS

Given the discussion above, it is my opinion that the LDEQ should include in the proposed LPDES permit for the DHPS that the station meet the zero discharge ELG for BATW no later than December 2021 and also that it meet the FGD wastewater ELG at the relevant internal outfall where

[28] EPA, Technical Development Document for the Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category, U.S. Environmental Protection Agency, EPA-821-R-15-007 at 7-6 and 7-7 (Sep. 2015), *available* at https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-2015-final-rule-documents.

[29] Personal communications with GE staff located in Ontario Canada dealing in coal plant ELG compliance options, including Suez/GE ABMet and other solutions.

this wastewater is first discharges, also no later than December 2021. This gives Cleco over 3 years from now to implement what others have implemented in much shorter timeframes, as I have shown above. Arguably, Cleco could achieve compliance in much less than 3 years.

Second, as I have noted, the LDEQ should require monitoring the BATW discharge as well as the FGD internal outfall discharge for various contaminants known to be present in these respective wastewaters, including numerous heavy metals in the BATW and at least the four ELG contaminants – arsenic, mercury, selenium, and nitrate/nitrite – in the FGD wastewater. Not only would this information be valuable to Cleco for designing the FGD wastewater treatment system, it would allow the public to determine the mass loading of contaminants from these wastewaters to receiving waters.

VII. AUTHOR'S EXPERTISE AND QUALIFICATIONS

Dr. Ranajit Sahu has over twenty-five years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

A significant portion of Dr. Sahu's educational background and consulting experience deals with addressing environmental impacts due to coal-fired power plants including all aspects of air emissions from such plants as well as environmental impacts from water/wastewater, cooling water, and solid/hazardous wastes at such plants and impacts due to coal mining, transportation, and stockpiling.

Dr. Sahu holds a B.S., M.S., and Ph.D., in Mechanical Engineering, the first from the Indian Institute of Technology (Kharagpur, India) and the latter two from the California Institute of Technology (Caltech) in Pasadena, California. His research specialization was in the combustion of coal and, among other things, understanding air pollution aspects of coal combustion in power plants as well as the formation of ash during combustion.

An abbreviated resume for Dr. Sahu is provided in Attachment A.

The opinions expressed in the report are Dr. Sahu's and are based on the data and facts available at the time of writing. Should additional relevant or pertinent information become available, Dr. Sahu reserves the right to supplement the discussion and findings.

ATTACHMENT A – RESUME

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty eight years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over twenty five years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty five years include various trade associations as well as individual companies such as steel mills, petroleum refineries, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, several states, various agencies such as the California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in all 50 states, numerous local jurisdictions and internationally.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as the US Department of Justice) and public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, Caltech, Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (#XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2017.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R. Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Purchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

“The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants,” with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

A. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

1. In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

B. Matters for which Dr. Sahu has provided affidavits and expert reports include:

2. Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

3. Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

4. Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

5. Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

6. Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

7. Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

8. Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

9. Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

10. Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

11. Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

12. Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

13. Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

14. Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

15. Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

16. Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).

17. Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

18. Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with *General Power Products, LLC v MTD Products Inc*., 1:06 CVA 0143 (Southern District of Ohio, Western Division) .

19. Expert Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

20. Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

21. Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

22. Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

23. Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.us

24. Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

25. Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

26. Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

27. Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

28. Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

29. Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

30. Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

31. Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

32. Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

33. Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

34. Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

35. Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (Eastern District of Michigan).

36. Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

37. Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (District of Colorado).

38. Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

39. Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

40. Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. Public Service Company of New Mexico* (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE) (District of New Mexico).

41. Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

42. Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

43. Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (Eastern District of Texas, Texarkana Division).

44. Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

45. Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

46. Expert Report (March 2011), Rebuttal Expert Report (June 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

47. Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the

Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority,* Civil Action No. 4:11-cv-00791 (Southern District of Texas, Houston Division).

48. Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

49. Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

50. Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.,* Civil Action No. A-08-CA-648-LY (Western District of Texas, Austin Division).

51. Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.,* Case No. 3:10-cv-747 (TJM/DEP) (Northern District of New York).

52. Declaration (October 2011) on behalf of the Plaintiffs in the matter of *American Nurses Association et. al. (Plaintiffs), v. US EPA (Defendant),* Case No. 1:08-cv-02198-RMC (US District Court for the District of Columbia).

53. Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association,* Case No. 11-417-MJP (Western District of Washington).

54. Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

55. Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency,* Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

56. Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

57. Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

58. Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.,* Civil Action No. 07-CV-5298 (JKG) (Eastern District of Pennsylvania).

59. Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project.

60. Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

61. Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

62. Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

63. Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

64. Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

65. Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

66. Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

67. Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

68. Declaration (April 2013) on behalf of Petitioners in the matter of *Sierra Club, et al., (Petitioners) v Environmental Protection Agency et al. (Resppondents),* Case No., 13-1112, (Court of Appeals, District of Columbia Circuit).

69. Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

70. Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of *A. J. Acosta Company, Inc., v. County of San Bernardino*, Case No. CIVSS803651.

71. Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

72. Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

73. Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

74. Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

75. Expert Report (January 2014) on behalf of Baja, Inc., in *Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al*, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

76. Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States*, Civil Action No. 13-1820 RC (District Court for the District of Columbia).

77. Declaration (April 2014) on behalf of Respondent-Intervenors in the matter of *Mexichem Specialty Resins Inc., et al., (Petitioners) v Environmental Protection Agency et al.,* Case No., 12-1260 (and Consolidated Case Nos. 12-1263, 12-1265, 12-1266, and 12-1267), (Court of Appeals, District of Columbia Circuit).

78. Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost

Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

79. Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

80. Direct Prefiled Testimony (August 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of Consumers Energy Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17317 (Michigan Public Service Commission).

81. Declaration (July 2014) on behalf of Public Health Intervenors in the matter of *EME Homer City Generation v. US EPA* (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

82. Expert Report (September 2014), Rebuttal Expert Report (December 2014) and Supplemental Expert Report (March 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

83. Expert Report (November 2014) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

84. *Declaration (January 2015) relating to Startup/Shutdown in the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.*

85. Pre-filed Direct Testimony (March 2015), Supplemental Testimony (May 2015), and Surrebuttal Testimony (December 2015) on behalf of Friends of the Columbia Gorge in the matter of the Application for a Site Certificate for the Troutdale Energy Center before the Oregon Energy Facility Siting Council.

86. Brief of Amici Curiae Experts in Air Pollution Control and Air Quality Regulation in Support of the Respondents, On Writs of Certiorari to the US Court of Appeals for the District of Columbia, No. 14-46, 47, 48. *Michigan et. al., (Petitioners) v. EPA et. al., Utility Air Regulatory Group (Petitioners) v. EPA et. al., National Mining Association et. al., (Petitioner) v. EPA et. al.,* (Supreme Court of the United States).

87. Expert Report (March 2015) and Rebuttal Expert Report (January 2016) on behalf of Plaintiffs in the matter of *Conservation Law Foundation v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

88. Declaration (April 2015) relating to various Technical Corrections for the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.

89. Direct Prefiled Testimony (May 2015) on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy and for Miscellaneous Accounting Authority, Case No. U-17767 (Michigan Public Service Commission).

90. Expert Report (July 2015) and Rebuttal Expert Report (July 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

91. Declaration (August 2015, Docket No. 1570376) in support of "Opposition of Respondent-Intervenors American Lung Association, et. al., to Tri-State Generation's Emergency Motion;" Declaration (September 2015, Docket No. 1574820) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors for Remand Without Vacatur;" Declaration (October 2015) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors to State and Certain Industry

Petitioners' Motion to Govern, *White Stallion Energy Center, LLC v. US EPA*, Case No. 12-1100 (US Court of Appeals for the District of Columbia).

92. Declaration (September 2015) in support of the Draft Title V Permit for Dickerson Generating Station (Proposed Permit No 24-031-0019) on behalf of the Environmental Integrity Project.

93. Expert Report (Liability Phase) (December 2015) and Rebuttal Expert Report (February 2016) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., Environmental Law and Policy Center, and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

94. Declaration (December 2015) in support of the Petition to Object to the Title V Permit for Morgantown Generating Station (Proposed Permit No 24-017-0014) on behalf of the Environmental Integrity Project.

95. Expert Report (November 2015) on behalf of Appellants in the matter of *Sierra Club, et al. v. Craig W. Butler, Director of Ohio Environmental Protection Agency et al.*, ERAC Case No. 14-256814.

96. Affidavit (January 2016) on behalf of Bridgewatch Detroit in the matter of *Bridgewatch Detroit v. Waterfront Petroleum Terminal Co., and Waterfront Terminal Holdings, LLC.*, in the Circuit Court for the County of Wayne, State of Michigan.

97. Expert Report (February 2016) and Rebuttal Expert Report (July 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

98. Direct Testimony (May 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

99. Declaration (June 2016) relating to deficiencies in air quality analysis for the proposed Millenium Bulk Terminal, Port of Longview, Washington.

100. Declaration (December 2016) relating to EPA's refusal to set limits on PM emissions from coal-fired power plants that reflect pollution reductions achievable with fabric filters on behalf of Environmental Integrity Project, Clean Air Council, Chesapeake Climate Action Network, Downwinders at Risk represented by Earthjustice in the matter of *ARIPPA v EPA, Case No. 15-1180.* (D.C. Circuit Court of Appeals).

101. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

102. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Backus Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

103. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Drakulic Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

104. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Deutsch Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

105. Affidavit (February 2017) pertaining to deficiencies water discharge compliance issues at the Wood River Refinery in the matter of *People of the State of Illinois (Plaintiff) v. Phillips 66 Company, ConocoPhillips Company, WRB Refining LP (Defendants)*, Case No. 16-CH-656, (Circuit Court for the Third Judicial Circuit, Madison County, Illinois).

106. Expert Report (March 2017) on behalf of the Plaintiff pertaining to non-degradation analysis for waste water discharges from a power plant in the matter of *Sierra Club (Plaintiff) v. Pennsylvania Department of Environmental Protection (PADEP) and Lackawanna Energy Center*, Docket No. 2016-047-L (consolidated), (Pennsylvania Environmental Hearing Board).

107. Expert Report (March 2017) on behalf of the Plaintiff pertaining to air emissions from the Heritage incinerator in East Liverpool, Ohio in the matter of *Save our County (Plaintiff) v. Heritage Thermal Services, Inc. (Defendant), Case No. 4:16-CV-1544-BYP*, (US District Court for the Northern District of Ohio, Eastern Division).

108. Rebuttal Expert Report (June 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight (Plaintiffs) v Coyote Creek Mining Company LLC (Defendant),* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

109. Expert Affidavit (August 2017) and Penalty/Remedy Expert Affidavit (October 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant,)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

110. Expert Report (August 2017) on behalf of Appellant in the matter of *Patricia Ann Troiano (Appellant) v. Upper Burrell Township Zoning Hearing Board (Appellee)*, Court of Common Pleas of Westmoreland County, Pennsylvania, Civil Division.

111. Expert Report (October 2017), Supplemental Expert Report (October 2017), and Rebuttal Expert Report (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

112. Declaration (December 2017) on behalf of the Environmental Integrity Project in the matter of permit issuance for ATI Flat Rolled Products Holdings, Breckenridge, PA to the Allegheny County Health Department.

113. Expert Report (Harm Phase) (January 2018) and Rebuttal Expert Report (Harm Phase) (May 2018) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

114. Declaration (February 2018) on behalf of the Chesapeake Bay Foundation, et. al., in the matter of the Section 126 Petition filed by the state of Maryland in *State of Maryland v. Pruitt (Defendant)*, Civil Action No. JKB-17-2939 (Consolidated with No. JKB-17-2873) (US District Court for the District of Maryland).

115. Direct Pre-filed Testimony (March 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of *NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC*, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

116. Expert Affidavit (April 2018) and Second Expert Affidavit (May 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.

C. Occasions where Dr. Sahu has provided oral testimony <u>in depositions, at trial or in similar proceedings</u> include the following:

117. Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

118. Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

119. Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

120. Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

121. Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

122. Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.

123. Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

124. Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

125. Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

126. Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

127. Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

128. Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al*.

129. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

130. Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

131. Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

132. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

133. Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

134. Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

135. Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

136. Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

137. Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

138. Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

139. Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

140. Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

141. Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

142. Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

143. Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

144. Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

145. Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

146. Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

147. Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

148. Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

149. Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

150. Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

151. Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

152. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

153. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

154. Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

155. Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

156. Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

157. Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the *US Federal Trade Commission (FTC) v. ECM Biofilms* (FTC Docket #9358).

158. Deposition (February 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

159. Oral Testimony at Hearing (April 2015) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

160. Deposition (August 2015) on behalf of Plaintiff in the matter of *Conservation Law Foundation (Plaintiff) v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

161. Testimony at Hearing (August 2015) on behalf of the Sierra Club in the matter of *Amendments to 35 Illinois Administrative Code Parts 214, 217, and 225* before the Illinois Pollution Control Board, R15-21.

162. Deposition (May 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

163. Trial Testimony (October 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

164. Deposition (April 2016) on behalf of the Plaintiffs in *UNatural Resources Defense Council, Respiratory Health Association, and Sierra Club (Plaintiffs) v. Illinois Power Resources LLC and Illinois Power Resources Generation LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (Central District of Illinois, Peoria Division).

165. Trial Testimony at Hearing (July 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

166. Trial Testimony (December 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

167. Trial Testimony (July-August 2016) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

168. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

169. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Backus Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

170. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Drakulic Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

171. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Deutsch Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

172. Deposition Testimony (July 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight v Coyote Creek Mining Company LLC (Defendant)* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

173. Deposition Testimony (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

174. Deposition Testimony (December 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

175. Deposition Testimony (January 2018) in the matter of National Parks Conservation Association (NPCA) v. State of Washington Department of Ecology and British Petroleum (BP) before the Washington Pollution Control Hearing Board, Case No. 17-055.

176. Trial Testimony (January 2018) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

177. Trial Testimony (April 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

SIERRA CLUB

Casey Roberts <casey.roberts@sierraclub.org>

NPDES Permit No. MI0038172 DECO-Belle River Plt Modification

Buckmaster, Tarek (DEQ) <BUCKMASTERT@michigan.gov> Thu, Dec 28, 2017 at 1:49 PM
To: "casey.roberts@sierraclub.org" <casey.roberts@sierraclub.org>, "Oday Salim GLELC (oday.salim@glelc.org)" <oday.salim@glelc.org>, Thomas Cmar <tcmar@earthjustice.org>, "regina.strong@sierraclub.org" <regina.strong@sierraclub.org>
Cc: "Alexander, Christine (DEQ)" <ALEXANDERC2@michigan.gov>, "Argiroff, Phil (DEQ)" <ARGIROFFP@michigan.gov>, "Aiello, Christine (DEQ)" <AIELLOC@michigan.gov>

Dear Ms. Roberts, Mr. Cmar, Mr. Salim, and Ms. Strong:

Thank you for your comments submitted via email and MiWaters in regard to the permit modification proposed for the DTE Electric Company's Belle River Power Plant. The MDEQ proposed to modify this permit in accordance with the Final EPA Rule in 40 CFR 423, entitled "Postponement of Certain Compliance Dates for the Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category," effective September 18, 2017. Specifically, the MDEQ proposed to postpone the interim compliance dates associated with Part I.A.10 – Schedule for Elimination of Bottom Ash Transport Water Discharge, and to revise the final compliance date of that schedule, from December 31, 2021, to December 31, 2023. This proposed revision to Part I.A.10. of the permit would also necessitate a similar revision to Part I.A.11. – Bottom Ash Transport Water Discharge Prohibition.

Your comments expressed opposition to the proposed revisions to Part I.A.10. – Schedule for Elimination of Bottom Ash Transport Water Discharge, and Part I.A.11. – Bottom Ash Transport Water Discharge Prohibition. Specifically, commenters requested that the MDEQ reinstate the final compliance date of December 31, 2021, and that the interim deadlines associated with that final compliance date also be reinstated.

Based on the number of comments received during the public notice period for this proposed permit modification, and after careful consideration of these comments and consistent with further evaluation of EPA's postponement rule, the MDEQ has agreed to reinstate the final compliance dates of both Part I.A.10. and Part I.A.11., to December 31, 2021, and the final modified permit, issued today, now reflects these changes. Please see the attached PDF copy of the permit.

As you know, the EPA's postponement rule delays, for a period of two years, the earliest compliance date for the new, more stringent, BAT effluent limitations for bottom ash transport water. This rule postpones the earliest compliance date from November 1, 2018, to November 1, 2020. Given this, the MDEQ believes that postponement of the interim compliance dates associated with Part I.A.10. of the subject permit is both justified and necessary to avoid interim compliance dates that are earlier than the new earliest compliance date set forth in EPA's postponement rule. Note that the only interim compliance date retained in the schedule within the subject permit is July 1, 2021. That date has been retained because it is later than the new earliest compliance date established by EPA's postponement rule.

There was also a request to extend the public comment period and hold a public hearing on the permit modification. The MDEQ has determined that a public hearing is not necessary based on restoration of the final compliance date of December 31, 2021. Similarly, the MDEQ has determined that an extension to the public comment period is not warranted.

In closing, the MDEQ believes the permit modification and change to the schedule fully complies with applicable state and federal law. Thank you again for your comments and for your willingness to share your concerns with us. We greatly value your participation in this process and believe that it resulted in a better permit. If you have any questions about the subject permit as revised, please do not hesitate to contact me.

Sincerely,

Tarek Buckmaster

Lakes Erie and Huron Permits Unit

Permits Section, Water Resources Division

Michigan Department of Environmental Quality

517-230-4233 New Number

buckmastert@michigan.gov

NPDES Permit - FINAL_DECO-Belle River Plt.pdf
310K

December 18, 2017

Via Electronic Mail

Christine Aiello
Michigan Department of Environmental Quality
Permits Section, Water Resources Division
P.O. Box 30458
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RE: Sierra Club, Earthjustice, and Great Lakes Environmental Law Center on Proposed Modification to National Pollutant Discharge Elimination System Permit for DTE Energy's Belle River Plant, Permit No. MI0038172

Dear Ms. Aiello:

Sierra Club, Earthjustice, and Great Lakes Environmental Law Center hereby submit the following comments on the proposed modification to the National Pollutant Discharge Elimination System Permit for DTE Energy's Belle River plant.

We urge MDEQ to withdraw the proposed modification for the reasons described below.

I. DEQ Lacks Authority to Modify the Permit.

DEQ's attempt to reverse its January 2017 decision that DTE must eliminate discharge of bottom ash transport water at Belle River by 2021 through this proposed permit modification fails for at least two reasons. First, DEQ never made the required finding that one of the modification criteria exists. Second, none of the modification criteria applies in this instance.

A. Rule 2159 Governs When MDEQ Has Authority to Modify a NPDES Permit.

Rule 2159 authorizes DEQ to modify NPDES permits. Mich Admin Code R 323.2159. To modify a permit based on Rule 2159, DEQ must make a finding of any of the following:

> (a) There is a change in any condition that requires a temporary or permanent reduction or elimination of a permitted discharge or constituent thereof.
>
> (b) The administrator of EPA issues a regulation prescribing a restriction or prohibition of a waste or wastewater constituent which is not covered by the terms and conditions of a permit, or the regulation is more stringent than any limitation imposed on a wastewater constituent in a permit.

> (c) A modification of the terms and conditions of a permit or a time schedule thereon is necessary because of an act of God or other conditions beyond the control of the permittee.
>
> (d) In the case of discharges from publicly owned treatment works, federal treatment works grant funds are not available or are not sufficient to allow construction of the treatment works in a time schedule set forth in the permit.
>
> (e) There is a violation of any term or condition of the permit.
>
> (f) The permittee has obtained a permit by misrepresentation or has failed to disclose all relevant facts to the commission.
>
> (g) A toxic effluent standard or prohibition, including any schedule of compliance specified therein, is established pursuant to section 307(a) of the federal act for a toxic waste or wastewater constituent which is present in the permittee's discharge and the standard or prohibition is more stringent than any limitation upon the waste or wastewater constituent in the permit.
>
> (h) The POTW receives wastewater from a nondomestic source and the development of a pretreatment program is necessary to control the introduction of regulated pollutants.
>
> (i) When a request for removal credits is approved in accordance with R 323.2313(a).

Mich Admin Code R 323.2159. Once a NPDES permit is final, it is final and cannot be modified until DEQ makes a Rule 2159 finding. Other than Rule 2159, there are no other permit modification options in Part 31 or its implementing rules. Also, there was no reopener provision in the Original Permit that might have authorized modification. To administer the federal NPDES program, Michigan needed to establish rules for permit modification. 40 CFR 123.25(22). Rather than simply adopt by reference the EPA's permit modification rule, codified at 40 CFR 122.62, DEQ instead promulgated Rule 2159. There is no other source of authority for permit modification.

B. DEQ Failed to Make the Necessary Rule 2159 Finding Here.

DEQ never made a finding that any of those items (the "modification criteria") existed for the Original Permit. In the basis for decision memo, the fact sheet, the public notice document, and the Draft Reversal Permit, DEQ never once referenced Rule 2159 and never once stated that it found that one of the modification criteria existed.

Instead of Rule 2159, DEQ referenced the EPA's ELG postponement decision. USEPA, *Postponement of Certain Compliance Dates for the Effluent Limitations Guidelines and*

Standards for the Steam Electric Power Generating Point Source Category, 82 FR 43494 (Sep. 18, 2017). However, nothing in the revised ELG (codified at 40 CFR 423.11, 423.13, and 423.16) or the Federal Register notice provides a basis for permit modification. EPA's postponement decision simply authorizes NPDES permitting agencies, *starting on September 18, 2017*, to require elimination of bottom ash discharge as soon as November 1, 2020 as opposed to November 1, 2018, but no later than December 31, 2023.

Without a Rule 2159 finding, which was not provided in the available materials, DEQ cannot modify the Original Permit. At the very least, DEQ must re-notice the proposed modification for public notice and comment with such a finding.

C. None of the Rule 2159 Criteria for Permit Modification Applies in this Instance.

None of the Rule 2159 criteria apply. Certain criteria can be ruled out immediately. Subrules (d) and (h) apply only to publicly owned treatment works. Mich Admin Code R 2159(1)(d), (h). Also, there has been no known permit violation, no claim of misrepresentation, no toxic effluent standard or prohibition that is more stringent than what is in the permit, and no request for removal of credits. Mich Admin Code R 2159(1)(e)-(g) and (i). That leaves subrules (a) to (c), which can also be ruled out, but merit at least some discussion.

Subrule (c) requires a finding by DEQ that modifying the time for compliance with the bottom ash discharge standard is necessary because "of an act of God or other conditions beyond the control of the permittee." Administrator Pruitt, while powerful, is no deity. And there is nothing in the record indicating that compliance by 2021 has somehow become impossible due to an emergency beyond DTE's control. DEQ's explanation of the reason for the modification of the compliance deadline does not indicate any reason that DTE cannot comply with that deadline, but rather asserts that it should not have to comply with the deadline originally established. Subrule (c), then, does not apply.

Subrule (b) requires a finding by DEQ that EPA issued a regulation that either "prescrib[ed] a restriction or prohibition of a waste or wastewater constituent which was not covered by the" permit to the modified, or was "more stringent than any limitation imposed on a wastewater constituent in a permit". Mich Admin Code R 323.2159(b). Neither applies to the Belle River permit.

The Original Permit addressed the timeframe for compliance with the bottom ash discharge limitation. The rule required that elimination discharge occur "as soon as possible" beginning as early as November 1, 2018. The revised ELG simply moved it back to November 1, 2020. All along, though, the ELG "prescribed a restriction or prohibition of a waste or

wastewater constituent" and the Original Permit "covered" that prescription. Also, the revised ELG established the earliest possible date on which bottom ash discharge elimination was required as later than that established by the 2015 ELG. Therefore, the revised ELG was *less* stringent, not "more stringent as required by subrule (b). Subrule (b), then, does not apply.

Subrule (a) requires a "*change in any condition* that requires temporary or permanent reduction or elimination of a permitted discharge or constituent thereof." Mich Admin Code R 323.2159(a) (emphasis added). The word "condition" refers to a factual condition related to the facility. Should the facility encounter an issue that require reduction or elimination of a discharge, then DEQ can modify the permit to reflect that. Subrule (a), then, does not apply.

In conclusion, DEQ lacks authority to modify this permit to delay the bottom ash ELG compliance date. Although this is the end of the matter, in the next section we explain why the particular modification that DEQ proposes would be arbitrary and capricious.

II. EPA's Delay of the Beginning of the Compliance Period to November 1, 2020 Provides No Lawful Basis to Modify the December 31, 2021 Bottom Ash Effluent Limitation Compliance Date in the Belle River Permit.

There is no lawful basis in the record before MDEQ to change the December 31, 2021 compliance deadline for bottom ash effluent limitations that it established in the January 2017 permit renewal for Belle River. The sole basis cited by MDEQ for the proposed delay of the compliance date is a new rule that was signed by the EPA Administrator on September 12, 2017. That new EPA rule, however, does not require MDEQ to reopen its prior compliance date determination and offers no basis for delaying compliance with bottom ash effluent limitations at Belle River.

The September 2017 EPA rule delayed the beginning of the compliance period for bottom ash and FGD wastewater effluent limitations by two years, from November 1, 2018 to November 1, 2020. *See* Postponement of Certain Compliance Dates for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 82 Fed. Reg. 43,494 (Sept. 18, 2017) ("Delay Rule"). As a result of this Delay Rule, the relevant provisions in the Steam Electric ELGs require permitting authorities to establish a compliance dates for bottom ash effluent limitations that are "as soon as possible beginning November 1, 2020, and no later than December 31, 2023." 40 C.F.R. § 423.13(g)(1)(i), (k)(1)(i). In issuing the Delay Rule, EPA emphasized that the standards for which it delayed the compliance

deadlines remain in effect, despite the agency's ongoing reconsideration process.[1] Of particular relevance here, the Delay Rule does not in any way change the factors set forth in 40 C.F.R. § 423.11(t) that MDEQ is required to consider when establishing an "as soon as possible" date for compliance. The only change that EPA promulgated to 40 C.F.R. Part 423 in the Delay Rule is the two-year postponement of the beginning of the compliance period, so that compliance with bottom ash and FGD effluent limitations must now occur "as soon as possible" between 2020 and 2023, instead of the 2018-2023 compliance period that EPA had previously established in the 2015 ELG Rule. Moreover, EPA has made clear that notwithstanding its intent to engage in further rulemaking to consider whether to make additional changes to the Steam Electric ELGs, the Agency may ultimately decide that no further changes are needed to the bottom ash and FGD standards effluent limitations or any other aspect of the 2015 ELG Rule, including the compliance period.[2] Indeed, at this stage, EPA is unable to say one way or the other whether it will take any future actions to modify the Steam Electric ELGs, consistent with its obligation not to predetermine the outcome of a future rulemaking. MDEQ thus has no valid basis to assume that EPA will make any changes to the Steam Electric ELGs in the future.

Accordingly, EPA's Delay Rule provides no basis for MDEQ to reopen its compliance date determination for bottom ash discharges at Belle River and no basis for any delay in that compliance date. When MDEQ issued the Belle River permit renewal in January 2017, MDEQ found that "[a]fter careful, independent review of all comments and new information received in response to the subject draft permit, in addition to consideration of information received from the facility . . . the MDEQ has concluded that an earlier deadline for final compliance with the revised ELGs is appropriate and achievable at the Belle River Power Plant, and we have revised the draft permit with a new final compliance date of December 31, 2021." Letter from Christine

[1] 82 Fed. Reg. at 43,496 ("This maintains the 2015 Rule as a whole at this time, with the only change being to postpone specific compliance deadlines for two wastestreams."); *see also* U.S. EPA, Response to Comment Document, EPA-HQ-OW-2009-0819, SE06669, at 8 (The only thing the Postponement Rule does is revise the 2015 ELG Rule's new, more stringent compliance dates for two wastestreams discharged from existing sources (bottom ash transport water and flue gas desulfurization wastewater). Otherwise, it leaves the Rule unchanged."); *id.* at 12 ("EPA's action to postpone certain compliance dates in the 2015 rule . . . does not otherwise amend the effluent limitations guidelines and standards for the steam electric power generating point source category.").

[2] *See* Response to Comment Document, *supra*, at 6 ("It is possible that the costs, impacts and benefits of the rule may be unchanged after EPA completes its new rulemaking."); *id.* at 18 (dismissing concerns about negative water quality impacts of the delay as "speculative at this point in time as EPA has yet to alter any of the effluent limitations in the 2015 Rule").

Aiello, MDEQ, to Casey Roberts, et al. (Jan. 30, 2017) (attached).[3] MDEQ has cited no legal or factual basis for it to reopen or reconsider this determination that compliance with bottom ash effluent limitations is achievable at Belle River by December 31, 2021. Because this compliance deadline remains within the compliance period for the Steam Electric ELGs even after promulgation of the Delay Rule, MDEQ must retain that deadline in the permit.

Please do not hesitate to contact the undersigned if you have any questions about these comments. Thank you for the opportunity to comment.

Sincerely,

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[3] The undersigned hereby incorporate by reference the October 21, 2016 Sierra Club, et al. comments on the draft permit renewal for Belle River, and the accompanying exhibits, as if fully set forth herein.

Statement of Substantial New Questions for Public Comment

(Discussion of Substantial New Questions and Possible New Conditions for the Merrimack Station Draft NPDES Permit that are Now Subject to Public Comment During the Comment Period Reopened by EPA under 40 C.F.R. § 124.14(b))

I. Introduction

Working together with the New Hampshire Department of Environmental Services (NHDES), the Region 1 Office of the United States Environmental Protection Agency (EPA or the Agency) has decided that it should exercise its discretion under 40 C.F.R. § 124.14(b) to reopen the comment period for the draft National Pollutant Discharge Elimination System (NPDES) permit for the Merrimack Station power plant in Bow, NH (NPDES Permit No. NH0001465) (the Draft Permit). The Merrimack Station power plant (referred to herein as either Merrimack Station, the Station or the Facility) is owned and operated by Public Service of New Hampshire (referred to either as PSNH, the Permittee or the Company), which is a subsidiary of Eversource Energy. EPA is working to reissue the NPDES permit under the Section 402 of the Clean Water Act (CWA). 33 U.S.C. § 1342.

EPA regulations state that:

> [i]f any data[,] information or arguments submitted during the public comment period, including information or arguments required under § 124.13, appear to raise *substantial new questions* concerning a permit, the Regional Administrator may take one or more of the following actions:
>
> (1) Prepare a new draft permit, appropriately modified, under § 124.6;
>
> (2) Prepare a revised statement of basis under § 124.17, a fact sheet or revised fact sheet under §124.8 and reopen the comment period under § 124.14; or
>
> (3) Reopen or extend the comment period under § 124.10 to give interested persons an opportunity to comment on the information or arguments submitted.

40 C.F.R. § 124.14(b)(1), (2) and (3) (emphasis added). In this case, EPA has determined that various data, information and arguments submitted during prior comment periods, or that were submitted or became known to EPA after the comment periods,[1] raise a number of substantial new questions concerning the Merrimack Station Draft Permit. In response, EPA has decided to issue a public notice reopening the comment period on the Draft Permit in order to provide the public with an opportunity to comment on the new information and the substantial new

[1] While the text of 40 C.F.R. § 124.14(b) refers to the comment period being reopened because of data, information or arguments submitted "during the comment period," EPA interprets this provision to recognize implicitly that EPA also has the discretion to reopen the comment period on the basis of new data, information, or arguments submitted or obtained *after* the public comment period but *before* issuance of the final permit. For example, if applicable laws or regulations change after closure of the comment period for a particular draft permit but before issuance of the final permit, EPA would conform the permit conditions to comply with the applicable law, *see* 40 C.F.R. § 122.43(b)(1), and would have the discretion to reopen the comment period to provide an opportunity to comment on the changes. As another example, if after closure of the comment period for a draft permit, EPA obtained new scientific data that the Agency concluded necessitated changes to the draft permit conditions or raised substantial new questions about the basis of those draft permit conditions, EPA would have the discretion to reopen the comment period to allow for public review and comment pertaining to the new data and its import for the draft permit conditions.

questions. EPA has also responded to the new information and questions by developing options for certain new (or revised) Draft Permit conditions, and by developing new (or revised) analyses in support of the Draft Permit conditions. In connection with the reopened comment period, EPA has prepared this Statement of Substantial New Questions for Public Comment (Statement) to describe the new information, the substantial new questions, the potential new permit conditions, and the new supporting analyses, so that the public can review the material and comment on it to EPA.

Therefore, EPA is issuing this Statement in conjunction with a Public Notice under 40 C.F.R. § 124.10 to inform the potentially interested public of (a) the reopening of the public comment period, (b) the particular substantial new questions that are at issue and that define the scope of the reopening of the comment period in accordance with 40 C.F.R. § 124.14(c), (c) how to access this Statement and other relevant materials for review in connection with the reopened comment period, and (d) when and where to submit comments to EPA and NHDES. In accordance with 40 C.F.R. § 124.14(c), the comment period for the Draft Permit is not being reopened "across the board." As explained in this Statement, the comment period is only being reopened with respect to certain questions, issues and information, including the following:

1) new EPA regulations under CWA § 316(b), 33 U.S.C. § 1326(b), pertaining to cooling water intake structures at existing facilities, 79 Fed. Reg. 48300 (Aug. 15, 2014) (Final Rule) (2014 CWA § 316(b) Regulations);

2) questions about how the 2014 CWA § 316(b) Regulations should be applied to the Merrimack Station NPDES permit;

3) new information regarding the efficacy of cylindrical wedgewire screen technology for reducing impingement mortality and entrainment by cooling water intake structures;

4) new information concerning cylindrical wedgewire screen design (*e.g.*, wedgewire "half-screens") that could facilitate deploying the technology at Merrimack Station;

5) new questions about what would constitute a reasonable schedule for retrofitting Merrimack Station to comply with CWA § 316(b) either by installing cooling towers to enable the facility to operate on a closed-cycle basis or by installing cylindrical wedgewire screens to operate in conjunction with open-cycle cooling;

6) new information concerning data reflecting Merrimack Station's waste heat discharges and their effects on Merrimack River water temperatures;

7) new information concerning the presence of the Asian clam, an invasive freshwater mollusk, in the Merrimack River in the vicinity of Merrimack Station;

8) questions about whether any of this new information (*i.e.*, the thermal data and the Asian clam data) should lead to changes either to EPA's decision to deny PSNH's

request for renewal of its existing thermal discharge variance under CWA § 316(a), 33 U.S.C. § 1326(a), or EPA's analysis of how to apply New Hampshire water quality standards to the regulation of Merrimack Station's thermal discharges;

9) questions about how the final permit requirements (including effluent limits and compliance dates) should be affected by new EPA regulations promulgated under CWA §§ 301 and 304, 33 U.S.C. §§ 1311 and 1314, that set new effluent limitation guidelines (ELGs) to address certain pollutant discharges from Steam Electric Power Plants, including wastewater discharges from Flue Gas Desulfurization (FGD) air emissions control equipment, bottom ash transport water, and non-chemical metal cleaning wastes, 80 Fed. Reg. 67838 (Nov. 3, 2015) (Final Rule) (40 C.F.R. Part 423) (the 2015 Steam Electric ELGs);

10) questions about how, in the development of Merrimack Station's new NPDES permit, EPA should take into account (a) the Agency's action to stay certain provisions of the 2015 Steam Electric ELGs while it reconsiders the ELGs in response to several petitions seeking such reconsideration by EPA, *see* 82 Fed. Reg. 19005 (April 25, 2017), and (b) the currently stayed litigation challenging the Steam Electric ELGs (see *Southwestern Electric Power Co. v. EPA*, No. 15–60821 (5th Cir. Apr. 24, 2017));

11) questions about how, if at all, EPA should, when setting NPDES permit limits for Merrimack Station, take account of the substantial drop in the facility's overall capacity utilization, while recognizing that the units still run a great deal at certain times; and

12) questions about how, if at all, EPA should, when setting NPDES permit limits for Merrimack Station, take account of the current state-administered auction process through which PSNH is expected to divest of its electrical generating assets, including Merrimack Station.

These issues and questions are discussed in detail in this Statement of Substantial New Questions for Public Comment.

II. Background

EPA last issued a new Final NPDES Permit to Merrimack Station on June 25, 1992. Administrative Record (AR) 236. The permit expired on July 31, 1997, but was administratively continued in 1997 as a result of PSNH's timely application for permit renewal. *See* 40 C.F.R. § 122.6(a). Since its 1997 application for permit renewal, PSNH supplemented the application in 2007 and 2010.

EPA issued PSNH a new Draft NPDES Permit for Merrimack Station on September 30, 2011 (the 2011 Draft Permit). AR-609. *See also* AR-608 (Fact Sheet for 2011 Draft Permit). The 2011 Draft Permit addresses various aspects of the power plant's operations affecting the Merrimack

River, including the Facility's withdrawal of water from the River for cooling uses and its discharges of a variety of pollutants to the river. Pollutants discharged, or potentially to discharged, by the Facility to the Hooksett Pool section of the Merrimack River include waste heat, FGD wastewater, bottom ash transport water, non-chemical metal cleaning wastes, and many others. The comment period on the 2011 Draft Permit extended five months, from September 30, 2011, to February 28, 2012. After the public comment period for the Draft Permit closed, EPA began work to consider the voluminous and conflicting public comments that were submitted and develop the Final Permit. This involved not just reviewing comments, but also, in some cases, doing additional research on issues raised by the comments.

As EPA worked on the permit, it decided to issue for public comment a new, Revised Draft Permit proposing different effluent limits for Merrimack Station's FGD wastewater discharges. EPA came to this decision because it had learned that after the original Draft Permit was issued, the Facility installed a new, highly effective treatment system for its FGD wastewater, and this new treatment system was not reflected in either the 2011 Draft Permit's proposed effluent limits or its supporting record.

EPA issued the Revised Draft Permit on April 18, 2014, AR-1136, and provided a two-stage comment period pursuant to 40 C.F.R. § 124.14(a). In the first comment period, the public was invited to comment on the Revised Draft Permit. In the second comment period, the public was given the opportunity to comment on the comments submitted by others during the first comment period. The second public comment period ended on October 22, 2014, entailing an overall comment period of approximately 6 months. *See* AR-1137 (2014 Revised Draft Permit Public Notice). Once again, EPA received voluminous and conflicting public comments.

Since closure of the comment period for the Revised Draft Permit, EPA has been working to consider all of the public comments received on the 2011 Draft Permit and the 2014 Revised Draft Permit, and to develop the new Final Permit. At the same time, however, a variety of significant new developments relevant to the Merrimack Station permit have unfolded since closure of the public comment periods for the 2011 Draft Permit and the 2014 Revised Draft Permit. These new developments include the following:

1. Developments related to CWA § 316(b):

    a. EPA promulgated the 2014 CWA § 316(b) Regulations, as mentioned above, which address requirements for cooling water intake structures at existing facilities, 79 Fed. Reg. 48300 (Aug. 15, 2014) (Final Rule);
    b. Litigation challenging the 2014 CWA § 316(b) Regulations is underway, *see Cooling Water Intake Structure v. EPA*, No. 14-4645 (2d Cir. consolidated Dec. 18, 2014), but the regulations are currently in effect;
    c. New information has been submitted to EPA regarding the efficacy of cylindrical wedgewire screen (CWS) technology for reducing impingement mortality and entrainment;

d. PSNH submitted to EPA a report identifying a new CWS design concept (namely, CWS "half screens") that could alter prior assessments of the viability of using CWSs at Merrimack Station; and
e. PSNH has indicated that it is doing additional analysis of the potential efficacy of wedgewire screen technology at Merrimack Station.

2. Developments related to the regulation of waste heat discharges under CWA § 316(a) and state water quality standards:

   a. PSNH submitted additional thermal discharge data;
   b. PSNH submitted a letter clarifying, and changing EPA's understanding of, thermal discharge data previously submitted by the Company;
   c. PSNH submitted a number of new scientific reports pertaining to the effects of Merrimack Station's thermal discharges on aquatic life in the Merrimack River;
   d. Data submitted by PSNH with its original comments on the 2011 Draft Permit unexpectedly indicated the presence of the Asian clam, an invasive species of freshwater mollusk, in the Merrimack River in the vicinity of Merrimack Station, and this prompted EPA to collect additional data on the presence of this species and to begin evaluating the import of that data for thermal discharge regulation; and
   e. PSNH has indicated to EPA that in May 2017, the Company will submit additional Asian clam data and an assessment of the import of the data for the new NPDES permit. Although PSNH did not actually submit the data in May, the Company has maintained that it will submit this data eventually.

3. Developments related to the regulation of a variety of pollutant discharges regulated under the Steam Electric ELGs:

   a. EPA promulgated the 2015 Steam Electric ELGs, 80 Fed. Reg. 67838 (Nov. 3, 2015) (Final Rule), which substantially revised the preexisting Steam Electric ELGs and, among other things:
      i. set new effluent limits and compliance timelines for controlling discharges of FGD wastewater;
      ii. set new effluent limits and compliance timelines for controlling discharges of bottom ash transport water; and
      iii. discussed how to set effluent limits for discharges of non-chemical metal cleaning wastes.
   b. Litigation challenging the 2015 Steam Electric ELGs was filed but is currently stayed through at least August 12, 2017, pending EPA reconsideration of the various aspects of the ELGs;

c. In response to requests from EPA, PSNH wrote to EPA to indicate how Merrimack Station planned to comply with the requirements of the 2015 Steam Electric ELGs for FGD wastewater and bottom ash transport water;
d. EPA, however, has now issued a Federal Register notice postponing certain aspects of the 2015 Steam-Electric ELGs while it reconsiders them in response to several petitions seeking such reconsideration by the Agency, *see* 82 Fed. Reg. 19005 (Apr. 25, 2017); and
e. The postponement of the 2015 Steam Electric ELGs affects various provisions of the ELGs as well as PSNH's plan for complying with requirements governing discharges of bottom ash transport water, but does not affect the provisions of the ELGs applicable to PSNH's compliance plan for limiting FGD wastewater discharges.

4. Since issuance of the 2011 Draft Permit, the capacity utilization (*i.e.*, the frequency or rate of electricity-generating operations) of Merrimack Station Units 1 and 2 – the two large coal-burning generating units at the Facility – has substantially diminished. Despite overall reduced operations, however, these units still run at high levels during peak demand periods, typically on cold winter days and hot summer days.

5. As required by New Hampshire law, PSNH is currently auctioning its electrical generating assets, including Merrimack Station.

In addition to these substantive developments, PSNH has requested on multiple occasions that EPA issue a revised draft permit and reopen the comment period for the permit. PSNH's requests have been based on specific legal and factual developments since the Draft Permit and/or the Revised Draft Permit were issued, such as those described above. *See* AR-1357 (Apr. 12, 2017 Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to David M. Webster, Sharon DeMeo and Mark A. Stein, EPA Region 1); AR-1352 (Dec. 22, 2016 Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to David M. Webster, Sharon DeMeo and Mark A. Stein, EPA Region 1); AR-1299 (Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to Eric Nelson, EPA Region 1 (Feb. 29, 2016) (response to EPA information request letter)), p. 5. In the December 22, 2016, letter, PSNH argued that case law under the Administrative Procedure Act and the Clean Water Act indicates that a new notice-and-comment period is necessary. AR-1352, p. 3.

In a contrary vein, in November 2016, the Sierra Club sued EPA alleging that the Agency has unreasonably delayed reissuance of the NPDES permits for both Merrimack Station and Schiller Station, another (primarily) coal-burning New Hampshire power plant, owned and operated by PSNH. On November 23, 2016, Sierra Club filed a petition in the United States Circuit Court of Appeals for the First Circuit seeking a writ of mandamus to require EPA to issue both NPDES permits by June 30, 2017. *See In re Sierra Club* (1st Cir., No. 16-2415), *Sierra Club's Petition for Writ of Mandamus and Addendum Pursuant to 28 U.S.C. § 1651, and Clean Water Act, 33 U.S.C. § 1369(1)(F)* (Nov. 23, 2016) (AR-1397, p. 28). On January 12, 2017, however, EPA

filed an opposition to the Sierra Club's petition. *In re Sierra Club* (1st Cir., No. 16-2415), *Opposition to Petition for Mandamus by Respondents the United States Environmental Protection Agency, Gina McCarthy and Curt Spalding*, (Jan. 12, 2017) (AR-1398). In its Opposition, EPA argued that reissuance of the Merrimack Station NPDES permit had not been unreasonably delayed in light of the facts of the case and the applicable law and that the court should not issue an order requiring permit issuance by a specific date. (PSNH intervened in the case and also opposed the Sierra Club's petition.) At the same time, EPA indicated that it recognized that the permit had been administratively continued for a long time and that issuing an updated permit to Merrimack Station was a priority. EPA further indicated that it was working toward a target of issuing new final permits for both Merrimack and Schiller Stations by no later than December 31, 2017. EPA also explained, however, that it was considering PSNH's request for the comment period to be reopened and that additional time would likely be needed to complete the Merrimack Station permit if EPA reopened the comment period. *See* Declaration of David M. Webster in Support of Opposition to Petition for a Writ of Mandamus at 12-13 (¶ 18), 72 (¶ 98(e), *In re Sierra Club*, No. 16-2415 (1st Cir. Jan. 12, 2017).

On April 19, 2017, the First Circuit issued its Judgment denying Sierra Club's petition for mandamus. The court stated that (internal citations omitted):

> [w]e conclude that, under the circumstances presented here, the "drastic remedy" of mandamus is not warranted. … While the delays in reissuing these NPDES permits continue to be concerning and extensive, the EPA has issued draft permits to both facilities and is working on finalizing these complex permits, while balancing competing priorities with its limited resources. Sierra Club has not met its burden, on this record, of showing that the court should step in to reprioritize the EPA's work.
>
> The EPA estimates that it will issue final permits to both facilities by the end of 2017. While we decline to enforce this schedule, we expect the EPA to work diligently to complete these permits.

In re Sierra Club, No. 16-2415 (1st Cir. decided April 19, 2017) (AR-1392). EPA is acutely aware that the Merrimack Station and Schiller Station permits have been administratively continued for a lengthy period and is eager to issue new final permits for both facilities as soon as possible. At the same time, EPA is also committed to providing a fair, legally sound process for the development of the permits, and to developing scientifically and legally sound permit conditions in both cases.

III. EPA Determination to Reopen the Public Comment for Certain Issues

As indicated in its above-mentioned court filings in *In re Sierra Club*, EPA has been considering PSNH's requests for the comment period for the Draft Permit to be re-opened. Indeed, given the developments discussed above, EPA would have been considering whether reopening the comment period was advisable even apart from PNSH's requests.

As suggested above, competing considerations are at stake. On one hand, EPA is eager to complete development of the Final Permit for Merrimack Station as expeditiously as possible. On the other hand, EPA must ensure a fair, legally sound administrative process for developing the permit. Ensuring a sound process is not only the right thing to do because it comports with the law and generates the information needed to produce the best permit decisions possible, but it is also likely the fastest route to a new Final Permit taking effect. This is because in the event of permit appeal, a reviewing court could remand the permit to the Agency for additional proceedings if there are procedural flaws in the permit's development.

EPA waited to make its final decision about whether to reopen the comment period until PSNH responded to EPA's queries about how and when the Company planned to comply with the 2015 Steam Electric ELGs' new effluent limits for bottom ash transport water discharges. *See* AR-1377 (Sept. 21, 2016, Email from Mark Stein, EPA Region 1, to Linda T. Landis, Senior Counsel, Eversource Energy). PSNH provided its response on February 17, 2017. *See* AR-1378 (Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to Mark A. Stein, EPA Region 1). (Because Eversource designated it as Confidential and Proprietary Business Information (CBI), this letter is part of the confidential portion, rather than the public portion, of the administrative record for this permit.) *Having considered PSNH's response, as well as a great deal of other relevant information, EPA has decided that it should reopen the comment period with regard to certain issues. The issues to be addressed by this reopening of the comment period have been discussed above and are detailed farther below.*

EPA's NPDES permit development procedures are governed by the CWA, EPA regulations promulgated pursuant to the CWA, *see* 40 C.F.R. Parts 122 and 124, and the Administrative Procedure Act (APA), 5 U.S.C. §§ 551, *et seq.* The APA provides overarching standards governing federal administrative practices for activities such as rulemakings and the development of permits or licenses. More specifically, EPA regulations at 40 C.F.R. § 124.14 address whether a comment period may be reopened in response to changed NPDES permit conditions and/or new information, data or arguments being added to the administrative record. The regulation gives the permitting agency discretion regarding whether to reopen the comment period in a particular proceeding, stating that the comment period "may" be reopened if new data, information or arguments appear to raise "substantial new questions." 40 C.F.R. § 124.14(b). This discretion, however, is not unlimited. *See, e.g., In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 147; (EAB, 2006) ("While the Board often defers to the permit issuer's discretion in these matters, the Board nonetheless will look at the change in the draft permit and, based on the significance of the change, will determine whether reopening the public comment period is warranted in a given circumstance.").

When an earlier proposed permit condition is changed, or a new condition is added, for the final permit, additional public comment is not necessary if the new or changed permit condition is deemed a "logical outgrowth" of the proposed conditions and the supporting record, including the comments received. *See, e.g., Ne. Md. Waste Disposal Auth. v. EPA*, 358 F.3d 936, 951-52 (D.C. Cir. 2004). In addition, adding new information to the record does not trigger additional notice-and-comment unless the new information raises "substantial new questions," *see* 40

C.F.R. § 124.14(b) and (b)(3), and it is "critical" to the basis of the final permit conditions. *See also In re City of Attleboro*, 14 E.A.D. 398, 463 (EAB 2009).

The analysis under the APA runs along the same lines as that which EPA applies under 40 C.F.R. § 124.14. The APA also does not always require a public comment period to be reopened when, after the comment period for the draft permit has closed, permit conditions are changed for the final permit, or new analysis or factual material is added to the administrative record for the permit. The policy underlying the APA recognizes that it is desirable for agencies to consider public comments on a proposed action and to respond, when appropriate, by conducting additional research, writing additional analysis, and/or making appropriate changes to proposed permit conditions (or other types of proposed actions). *See Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 632 n.51 (D.C. Cir. 1973). If additional notice-and-comment was needed in every case in which a draft permit condition was altered or factual material was added to the record, it could be a disincentive to agencies responding appropriately to public comments or other developments. Moreover, the administrative process might never end if every appropriate adjustment to a proposed action or the record supporting it necessarily triggered the need for an additional comment period. *See Conn. Light & Power Co. v. Nuclear Regulatory Com.*, 673 F.2d 525, 533 (1982); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1031 (1978).

Therefore, under the APA, each specific condition in a final permit, and all the analysis and factual material in the record supporting the final permit, does not necessarily need to have been available for review during the public comment period. What is critical is that the public has been notified of the relevant, material issues and given an opportunity to comment on them at a time when the comments could potentially influence the permitting agency's final action. Like EPA's Environmental Appeals Board, the federal courts apply the "logical outgrowth" test to determine when additional opportunity for comment must be allowed in response to new or changed permit conditions being included in a final permit. Under this test, additional comment is not needed when the new or changed permit condition is considered a logical outgrowth of the draft permit condition and the supporting record. *See, e.g., Hudson Riverkeeper v. EPA*, 358 F.3d 174, 202 (2d Cir. 2004). Conversely, if the new or changed permit condition is not a logical outgrowth – *i.e.*, commenters could not have foreseen that the final permit condition was a possibility and therefore commented on it – then the permit is procedurally flawed and an opportunity to provide additional comment on the condition may be required.

When new information (*e.g.*, data, studies or analysis) is added to the administrative record after closure of the public comment period, additional public comment will not be required unless the new information raises substantial new questions or is critical to basis of the final permit conditions. In some cases, new information added to the record in response to comments may address existing questions rather than new ones. Moreover, even if the new information raises new questions, additional comment is not needed if the new questions are insubstantial or the new information is not critical to the final permit decision.

Finally, even when post-comment period changes to permit conditions are not a logical outgrowth of the draft permit, or new information is added to the record, the APA does not require additional comment if it would serve no purpose. *See* 5 U.S.C. § 553(b). For example, if

new statutory law or a court decision mandates a particular change to the final permit conditions, then taking comment on that new permit condition might serve no purpose because the agency has no choice but to include the new condition in the final permit. *See Lake Carriers' Ass'n v. EPA*, 652 F.3d 1, 10 (D.C. Cir. 2011); *United States v. Garner*, 767 F.2d 104, 120 n.24 (5th Cir. 1985).

There are many Environmental Appeals Board (EAB) and federal court cases addressing whether a comment period should be reopened and the decisions go both ways, often turning on highly case-specific factual analyses. EPA has carefully considered the facts in this case, as well as the applicable law, and has decided to reopen the comment period to address new data, new information, potential new Draft Permit conditions, and the substantial new questions specified below.

IV. Issues to Be Addressed During the New Comment Period

A. New Information Raising Substantial New Questions Pertaining to Permit Requirements for Cooling Water Intake Structures Under CWA 316(b)

1. Background: The 2011 Draft Permit's Requirements Under CWA § 316(b)

The 2011 Draft Permit included a variety of requirements under CWA § 316(b) that address Merrimack Station's cooling water intake structures. CWA § 316(b) creates the "best technology available" (or "BTA") standard for cooling water intake structures, specifying that:

> **(b) Cooling water intake structures**
> Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

At the time of the 2011 Draft Permit, there were no national BTA standards in place for existing facilities. Therefore, in accordance with 40 C.F.R. § 125.90(b), EPA determined the BTA for Merrimack Station's cooling water intake structure on a case-specific, Best Professional Judgment (BPJ) basis. EPA's determination is documented in its "Clean Water Act NPDES Permitting Determinations for the Thermal Discharge and Cooling Water Intake Structures at Merrimack Station in Bow, New Hampshire – NPDES Permit No. NH 0001465" (September 2011) (the 2011 Draft Permit Determinations). *See* AR-618, Chs. 10-12.

Ultimately, the BTA proposed by EPA for Merrimack Station's Draft Permit consisted of adding closed-cycle cooling capability at the Facility for use on a seasonal basis (from April 1 through August 31, based on when the highest densities of aquatic life are present). By using closed-cycle cooling during the specified period, the Facility could greatly reduce both its water withdrawals from the Merrimack River and the entrainment and impingement of aquatic life that those withdrawals entail. Closed-cycle cooling operations were required only from April 1 to August 31 according to the BTA determination because based on the biological data, EPA

concluded that *entrainment* only needed to be addressed during that time period since entrainable life stages of local aquatic species are largely absent from the Hooksett Pool from September 1 through March 31. Therefore, the 2011 Draft Permit's proposed conditions under CWA § 316(b) would allow the use of open-cycle cooling from September 1 through March 31. Still, because the data indicated that *impingement* mortality was a concern during those cooler weather months, the 2011 Draft Permit also proposed certain intake screen operations and fish return system improvements to reduce impingement mortality during that period. *Id*., pp. 346-347. These improvements included steps such as the use and optimization of a low pressure screen spray wash, specific upgrades to the fish return sluice to safely transport impinged fish back to the river, and specific travelling screen rotation requirements.

EPA's BTA determination was based on an evaluation of various technological alternatives in light of a multitude of factors, including, among other things, the degree to which each alternative could reduce the adverse environmental effects of the Facility's cooling water intake structure operations (*e.g.*, harm to aquatic organisms from entrainment and impingement), cost, engineering feasibility, secondary or indirect environmental and energy effects, and comparative costs and benefits. *See* AR-618, Chs. 11 and 12. EPA also found that the proposed intake requirements would satisfy New Hampshire's applicable water quality standards and could not be made significantly less stringent without running afoul of those state standards. *Id.*, pp. 345-346.

In its 2011 Draft Permit Determinations, EPA also discussed the interplay of the Draft Permit's proposed cooling water intake structure requirements with its thermal discharge limits. EPA explained that despite the permit's *seasonal* closed-cycle cooling requirements under CWA § 316(b), the Facility was expected to use closed-cycle cooling *year-round* in order to meet the permit's thermal discharge limits. This results from the fact that the same technology, closed-cycle cooling, can be used to greatly reduce both adverse intake effects and thermal discharges without significantly inhibiting the Facility's ability to generate electricity. EPA further explained that if the Facility operates closed-cycle cooling year-round to meet thermal discharge limits, it would also be regarded to be in year-round compliance with CWA § 316(b)'s BTA requirements for controlling both entrainment and impingement mortality, and major upgrades to the Facility's travelling screens would be unnecessary, though certain improvements to the fish return system and the travelling screen operational requirements would still be required. *Id.*, pp. 346-348.

As mentioned above, in the analysis supporting its BTA determination for Merrimack Station, EPA evaluated a number of technological alternatives, including closed-cycle cooling and *cylindrical wedgewire screens* (CWSs). S*ee, e.g., id.*, pp. 273-280. EPA ultimately rejected CWS technology as the BTA for Merrimack Station, concluding as follows:

> [i]n sum, under certain environmental conditions, wedgewire screen technology may be capable of substantial reductions in entrainment and impingement mortality at facilities with certain characteristics. EPA concludes, however, that the necessary conditions for an effective wedgewire screen installation are not present at Merrimack Station on a consistent and reliable basis during the period

> when fish eggs and larvae are present. Indeed, this problem contributed to PSNH's decision only to propose wedgewire screens with a mesh size of 1.5 mm or greater and, at that, only to deploy the screens for four months each year (from April to July). Even during this period, PSNH recognized that low water levels could be problematic and suggested that wedgewire screen operation could be limited to times in which adequate submergence is present (Enercon 2009). As discussed above, EPA has identified a number of problems that are likely to undermine the effectiveness of wedgewire screens at Merrimack Station and, therefore, EPA rejects this technology as an option for the BTA at this facility.

Id. at 280. While rejecting wedgewire screens as the proposed BTA for Merrimack Station on site-specific grounds, EPA has not generally opposed this technology. Indeed, EPA Region 1 has selected (or proposed) wedgewire screens as part of the site-specific BTA for other facilities, such as the General Electric Aviation power plant in Lynn, MA (GE Aviation) and PSNH's Schiller Station power plant in Portsmouth, NH (Schiller). *See* AR-1419, pp. 29-32 (GE Aviation Final NPDES Permit) and AR-1410, pp. 16-18 (Schiller Draft NPDES Permit).

The public comment period for Merrimack Station's 2011 Draft Permit closed on February 28, 2012. EPA received a large volume of conflicting public comments addressing, among other things, EPA's proposed BTA determination under CWA § 316(b). The Agency has been considering these comments and will provide written responses to the significant ones in conjunction with issuing a new Final NPDES Permit to Merrimack Station.

That said, a number of legal and factual (or informational) developments raising substantial new questions related to the permit's CWA § 316(b) requirements have occurred since the initial comment period closed on February 28, 2012. As discussed below, EPA wants to provide the public an opportunity to comment on these new developments and questions and how they might affect the Final Permit's requirements under CWA § 316(b).

2. The 2014 CWA § 316(b) Regulations

As mentioned above, in 2014, EPA promulgated new regulations under CWA § 316(b) that apply to existing facilities with cooling water intake structures, such as Merrimack Station. *See* 79 Fed. Reg. 48300 (Aug. 15, 2014) (Final Rule) (codified at 40 C.F.R. § 122.21(r) and Part 125, Subpart J). Although they are currently being challenged in federal courts, *see Cooling Water Intake Structure Coalition v. EPA*, Case No. 14-4645 (2d Cir.) (consolidated), these regulations are now in effect and govern the Final Permit for Merrimack Station. *See* 40 C.F.R. §§ 122.43(b)(1), 125.91(a) and 125.94(a)(1).

Therefore, one reason that EPA is reopening the comment period for the Merrimack Station permit is to *invite public comment regarding the import of the 2014 CWA § 316(b) Regulations for the Final Permit for Merrimack Station*. *In other words, EPA is reopening the comment period to allow for public comment regarding what cooling water intake structure requirements should be included in the Final Permit in light of the 2014 CWA § 316(b) Regulations*. In this regard, EPA notes that PSNH has already submitted at least some of its views about how the new

regulations should be applied to the Facility's Final Permit. *See* AR-1231 (PSNH October 2014 Response to Comments on the Revised Draft NPDES Permit for Merrimack Station). While EPA will consider these already submitted comments, *the Agency also invites PSNH to submit additional comments to confirm, supplement or supplant its earlier comments concerning the import of the 2014 CWA § 316(b) Regulations for the terms of the Merrimack Station Final Permit.*

EPA crafted the 2014 CWA § 316(b) Regulations to allow for site-specific determinations of the BTA for minimizing impingement mortality and entrainment at regulated facilities. *See* 40 C.F.R. §§ 125.94(c) and (d). This approach was a response to the unique character of CWA § 316(b)'s BTA standard, which combines a technological criterion with an environmental impact-focused criterion. *See* 79 Fed. Reg. 48300, 48314 (Aug. 15, 2014) (Final Rule). Specifically, CWA § 316(b) requires use of "the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). EPA's approach to the regulations also recognizes the central importance of site-specific considerations in determining the scope of adverse environmental impacts from a particular facility's cooling water intake structure operations, and the availability, cost, energy implications, and environmental performance of various technologies if used at that particular facility.79 Fed. Reg. at 48313-14, 48337-52.

Thus, the 2014 CWA § 316(b) Regulations call for a site-specific determination of the BTA for controlling entrainment at each facility. *See* 40 C.F.R. §§ 125.94(d). Furthermore, with regard to controlling impingement mortality, the new regulations provide a menu of specific technologies deemed to satisfy the BTA standard (*e.g.*, closed-cycle cooling, measures that reduce through-screen intake velocity to a maximum of 0.5 feet per second (fps), modified travelling screens[2]), but allow the facility to choose its own preferred technology. Moreover, the regulations do not limit facilities to using only the specified technologies. Instead, these technologies are offered as "pre-approved" options that a facility may select, but facilities also are free to propose other technologies for approval on a site-specific basis if specific standards are met. *See* 40 C.F.R. §§ 125.94(c)(6) and (7).

a. Ongoing Permit Proceedings, Permit Application Materials, and BTA Factors

In order to generate the basis for each permit's BTA determination, the 2014 CWA § 316(b) Regulations generally require facilities seeking an NPDES permit to authorize their cooling water intake structure operations to submit a variety of types of information as part of their permit applications. *See* 40 C.F.R. § 122.21(r). Permitting agencies are then to use this information, among other things, to develop the necessary site-specific permit requirements for controlling impingement mortality and entrainment.

For permit proceedings already underway on the effective date of the 2014 CWA § 316(b) Regulations, however, the regulations authorize the permitting agency to decide on a facility-specific basis whether it needs the information submissions detailed in 40 C.F.R. § 122.21(r), or whether it already has enough information to advance the permit proceeding without

[2] *See* 40 C.F.R. §§ 125.94(c)(1), (3) and (5).

backtracking for additional information submissions. Thus, the regulations state as follows with regard to "ongoing permitting proceedings":

> (g) *Ongoing permitting proceedings.*
> In the case of permit proceedings begun prior to October 14, 2014[,] whenever the Director has determined that the information already submitted by the owner or operator of the facility is sufficient, the Director may proceed with a determination of BTA standards for impingement mortality and entrainment without requiring the owner or operator of the facility to submit the information required in 40 CFR 122.21(r). The Director's BTA determination may be based on some or all of the factors in paragraphs (f)(2) and (3) of this section and the BTA standards for impingement mortality at § 125.95(c). In making the decision on whether to require additional information from the applicant, and what BTA requirements to include in the applicant's permit for impingement mortality and site-specific entrainment, the Director should consider whether any of the information at 40 CFR 122.21(r) is necessary.

40 C.F.R. § 125.98(g). This provision applies to the Merrimack Station permit proceeding because the proceeding commenced prior to October 14, 2014.

EPA has considered whether any of the 40 C.F.R. § 122.21(r) information submissions are necessary for this proceeding and has decided that they are not. EPA has sufficient information in the record to determine the BTA requirements for the Merrimack Station permit. EPA has collected this information from PSNH's permit application materials as well as from Company responses to EPA requests for information. *See, e.g.*, AR-4, AR-6. In addition, EPA has obtained information from research and analysis by EPA's staff and contractors. Moreover, since issuance of the 2011 Draft Permit, EPA has garnered additional information from the comments and related material submitted by members of the public, including PSNH. This information includes material submitted by PSNH during the comment period on the 2011 Draft Permit that ended on February 28, 2012, and after closure of the original comment period. In light of all of this information, EPA concludes that it can address the appropriate factors under the statute and regulations without additional information submissions under 40 C.F.R. § 122.21(r). In fact, directing PSNH to make those submissions now would unnecessarily delay completion of the Final Permit for Merrimack Station. Therefore, EPA declines to call for new submissions from PSNH under 40 CFR 122.21(r). At the same time, *EPA will consider any public comments submitted during the current comment period on either side of this issue (i.e., whether or not additional submissions under 40 C.F.R. § 122.21(r) are needed).*

When rendering a BTA determination in an ongoing permit proceeding, 40 C.F.R. § 125.98(g) also grants the permitting agency discretion whether or not to consider each of the factors specified in 40 C.F.R. § 125.98(f)(2) and (3). As the regulation states, "[t]he Director's BTA determination may be based on some or all of the factors in paragraphs (f)(2) and (3) of this section and the BTA standards for impingement mortality at § 125.95(c)." Although EPA's 2011 Draft Permit pre-dated promulgation of the 2014 CWA § 316(b) Regulations, EPA's analysis effectively considered all of the § 125.98(f)(2) and (3) factors, as well as the technologies

specified in 40 C.F.R. § 125.94(c), in rendering its proposed BTA determination. This is evident in Chapters 10-12 of the 2011 Draft Permit Determinations. AR-618, Chs. 10-12.

EPA also expects to consider the § 125.98(f)(2) and (3) factors, as well as the BTA standards for controlling impingement mortality specified in § 125.95(c), in rendering its BTA determination for Merrimack Station's Final Permit. EPA's site-specific determination of the BTA for controlling entrainment and impingement mortality at the Facility will comply with 2014 CWA § 316(b) Regulations, but if these regulations were remanded by a court, the Agency's site-specific determination would still hold as a BPJ-based determination of the BTA under 40 C.F.R. § 125.90(b). *EPA invites comments during the new comment period regarding whether or not it should consider each of the factors specified in § 125.98(f)(2) and (3) and, if so, how it should consider and weigh those factors. Similarly, EPA invites comments regarding whether or not it should consider the BTA standards for impingement mortality at § 125.95(c) in making its final BTA determination for the Final Permit.*

3. New Information Concerning BTA Alternatives for Controlling Entrainment, Particularly with Regard to Cylindrical Wedgewire Screens

Even apart from the 2014 CWA § 316(b) Regulations, EPA has received a substantial amount of new information related to the BTA proposed in the 2011 Draft Permit. Public comments submitted to EPA on this subject during the comment period for the 2011 Draft Permit, AR-609, and 2014 Revised Draft Permit, AR-1136, constitute one type of such new information. These public comments are part of the administrative record for the permit and are available on EPA's website.

In addition, and more specifically, EPA has received or collected new information that raises substantial new questions about the potential for fine-mesh (or "narrow slot"), cylindrical wedgewire screens to qualify as the BTA for controlling both entrainment and impingement mortality at Merrimack Station. As discussed above, for the 2011 Draft Permit, EPA carefully evaluated, but ultimately rejected, cylindrical wedgewire screen technology as the BTA for Merrimack Station based on a variety of site-specific considerations. *See* AR-618, pp. 271-280. Although EPA acknowledged that wedgewire screen technology could possibly be capable of achieving substantial reductions in impingement and entrainment under certain environmental conditions, EPA did not propose wedgewire screens as the BTA for the Merrimack Station Draft Permit because, at the time, it appeared that the conditions necessary for an effective wedgewire screen installation would not exist in the Hooksett Pool on a consistent and reliable basis. *See id.*, pp. 271-280. EPA expressed concern that PSNH's proposed design to serve Merrimack Station's cooling water intake structures, while accommodating the potential limitations of the physical setting (*e.g.*, water depth, current, rate of sediment deposition), would require so many screens and would occupy such a large area of the river, that it would excessively interfere with public uses of the waterway.[3]

[3] In its 2007 report responding to an EPA request for information, AR-6, PSNH's consultant Enercon estimated that 24 to 36 CWW screens 5 feet in length and 3 feet in diameter would be required. In its 2009 report providing a supplemental response to EPA's request for information, AR-4, Enercon estimated that 44 to 76 CWW screens 80

In addition to these physical factors, EPA noted significant uncertainty about the extent to which wedgewire screens could reduce entrainment of fish eggs and larvae at the Facility. This uncertainty grew from questions about whether adequate ambient currents (*i.e.*, sweeping flows) would be present to enable/assist organisms to escape/avoid the screens, and whether the particular species and life stages of organisms present in the river would be able to avoid or survive contact with the screens in light of through-screen velocities, ambient currents, and the swimming abilities and overall hardiness of the species in question. Moreover, EPA was concerned that the "slot size" proposed for the wedgewire screens would be too large to successfully exclude organisms from being entrained, and further that if the slot size was reduced sufficiently for that purpose, then not only might the organisms be harmed due to contacting the screens, but the screens would be more prone to fouling and an excessively large installation would be required.

EPA is now reconsidering wedgewire screens as the possible BTA for Merrimack Station in light of public comments and new information. In this regard, new information suggests that an effective screen array potentially *can* be implemented in the Hooksett Pool section of the Merrimack River, and that this technology may be more effective at reducing the Facility's entrainment than previously thought. To begin with, data has been submitted suggesting that the conditions in Hooksett Pool can, in fact, accommodate an appropriate wedgewire screen installation. In particular, a newly proposed screen design variation (*i.e.*, "wedgewire half-screens") would result in a smaller installation without excessive interference with public uses of the river. *See* AR-1231, Exhibit 4; AR-1352, Attachment 1; and AR-1361. Furthermore, additional data has been submitted suggesting that adequate sweeping flows are likely to exist during the time period when the majority of eggs and larvae are present. *See* AR-1231, Attachment 1 to Exhibit 4. As EPA notes below, PSNH has indicated that it is planning to conduct a pilot-scale study of wedgewire screens in the Hooksett Pool during the summer of 2017 which will include study of water velocity using Acoustic Doppler Current Profiling. *See* AR-1361. All of this suggests that despite the physical limitations in Hooksett Pool, wedgewire screens could potentially be viable at Merrimack Station.

As stated above, EPA's analysis for the 2011 Draft Permit, AR-618, pp. 273-280, notes significant uncertainty about the effectiveness of wedgewire screens for reducing the entrainment of fish eggs and larvae based on the information available to EPA at the time of the Draft Permit. In particular, EPA had based its review of biological effectiveness primarily on the ability of narrow-slot wedgewire screens to prevent entrainment eggs and larvae too large to fit through the slot. *See id.* Because the primary mechanism for entrainment prevention was assumed to be physical exclusion, EPA determined that a slot size no larger than 0.5 mm would be required to reduce entrainment based on comparison of slot size to egg diameter and larval head capsule width for species in the Hooksett Pool. *Id.*, p. 278. Laboratory investigations, field studies, and new analysis performed on a wider number of species and range of conditions since the issuance of the Draft Permit have provided new information about two additional mechanisms by which

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inches in length and 2 feet in diameter would be required. The ranges in the number of CWW screens reflect differences in slot size.

wedgewire screens may reduce entrainment: hydraulic bypass and larval avoidance. *See* AR-1418; AR-1420; AR-1421; AR-1231, Attachment 1 to Exhibit 4; AR-1399, Appendix 3 to Exhibit 1; AR-1352, Attachment 1 to Attachment 1 (and references therein). This new information suggests that wedgewire screens with slot sizes larger than 0.5 mm may be able to reduce the entrainment of fish larvae at Merrimack Station more effectively than previously thought.

First, additional information has been submitted suggesting that the ambient "sweeping" current velocities affect the probability that an organism will encounter the screen. (The term "sweeping current" or "sweeping flow" refers to the current moving downstream past the screens and is important for moving organisms past and away from the wedgewire screen system.) At higher ambient velocities, a substantial number of eggs and larvae may not encounter the screens due to hydraulic bypass. This factor could improve the effectiveness of wedgewire screens for reducing entrainment and increasing the survival of larvae in particular, because larvae are less likely to survive contact with the screens. It is possible that, during the peak entrainment period in the Hooksett Pool, the sweeping flow may be sufficient to enable a substantial number of eggs and larvae to avoid entrainment by bypassing the wedgewire screens entirely.

Finally, new information is available indicating that some larvae may actively avoid entrainment and that larval avoidance is influenced by sweeping flow and larval length. The information suggests that larval avoidance increases with larval length and as the ratio of sweeping current velocity to through-screen velocity increases. This information may be particularly relevant to the possible use of wedgewire screens at Merrimack Station because the majority of entrainment is comprised of post-yolk sac larvae. PSNH is now urging that rather than needing a specific minimum sweeping flow velocity, lesser sweeping flow velocities are acceptable as long as the ratio of intake velocity to sweeping flow velocity is maintained at 1:1 or greater. If the effectiveness of wedgewire screens is influenced more by larval length and sweeping flow, it is possible that larger wedgewire screen slot sizes (*i.e.*, greater than 0.5 mm) could be more effective at Merrimack Station than previously thought. If so, then aquatic life could be protected from entrainment with a relatively smaller screen array which would be less prone to fouling, all while allowing the Facility to withdraw a sufficient volume of water for its cooling. EPA notes, however, that these studies have focused on slot sizes of 2 and 3 mm, and that larger slot sizes (*e.g.*, 6 to 9 mm) are unlikely to be as effective to reduce entrainment though hydraulic bypass and larval avoidance.

In light of the information discussed above, cylindrical wedgewire screen technology appears potentially capable of reducing entrainment at Merrimack Station to a greater degree than previously estimated. In addition, previous logistical and engineering concerns (*e.g.*, low water depths, interference with public uses of the river by a large screen array) may be surmountable. Taking these considerations into account, together with the fact that cylindrical wedgewire screen technology is much less costly than closed-cycle cooling, EPA is now reevaluating whether wedgewire screens should be EPA's preferred BTA technology for controlling entrainment at Merrimack Station in light of the costs and benefits of the options. While closed-cycle cooling would still be expected to reduce entrainment to a greater degree than wedgewire screens, EPA is reconsidering under CWA § 316(b) whether the greater cost of closed-cycle

cooling is warranted in light of the potentially better-than-previously-estimated performance of wedgewire screens and the possible resolution of logistical and engineering issues. *See* 40 C.F.R. §§ 125.94(d) and 125.98(f). Also, to be clear, given that entrainment is expected to be a minor issue from September 1 to March 31, a new BTA determination favoring wedgewire screens would only require use of the technology *for controlling entrainment* from April 1 to August 31, just as the BTA proposed for the 2011 Draft Permit only required closed-cycle cooling to control entrainment during that period. Of course, the impingement mortality standards would still need to be satisfied over the entire year.

EPA notes that PSNH has expressed reservations about using wedgewire screens during August due to concern about the potential for the screens being fouled by debris during the low river flow conditions that can occur during that month. Due to these reservations, PSNH earlier suggested deploying wedgewire screens only from April 1 to July 31, and urged that any entrainment losses likely to occur during August would not be so substantial as to preclude such a plan. More recently, however, the Company suggested that wedgewire screens could be used with a system of "bypass" gates so that the screens could be bypassed if clogging or fouling became a concern. This could enable or facilitate the use of wedgewire screens in August, with the possibility of the screens being bypassed under emergency fouling conditions, if any. EPA has previously expressed the view that entrainment *should* be addressed during August. The Agency continues to hold this view but is considering whether implementing wedgewire screens with the proposed bypass capability would be a sound BTA option in light of costs and benefits and current uncertainties about how often bypass conditions would arise. Once installed, data could be gathered over time regarding the frequency of screen bypassing to inform development of the next renewal permit.

Finally, EPA notes that PSNH has informed the Agency that the Company intends to do on-site pilot testing during the spring/summer of 2017 to investigate the efficacy of cylindrical wedgewire screen technology at Merrimack Station. *See* AR-1357 (Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to David Webster, Sharon DeMeo and Mark Stein, EPA Region 1), pp. 1-7; Attachment 4 (April 12, 2017). While this testing is not being required by EPA, the Agency welcomes submission of the data by PSNH as soon as it becomes available. If timely submitted, EPA would expect to carefully consider such data.

EPA invites public comment on all of the issues and information concerning cylindrical wedgewire screens discussed in the paragraphs above, including the following:

- *the extent to which wedgewire screens with different screen slot sizes can prevent mortality to aquatic life from entrainment and/or impingement and satisfy the BTA requirements of CWA § 316(b);*

- *the likely expense of using wedgewire screens at Merrimack Station;*

- *if wedgewire screens are the BTA, or part of the BTA, at Merrimack Station, should wedgewire half-screens or standard wedgewire screens be used;*

- how the costs of using wedgewire screens compare to the benefits of using them, and how those costs and benefits compare to the costs and benefits of using closed-cycle cooling as part of the BTA;

- which months (e.g., April 1 through August 31, April 1 through July 31), if any, should wedgewire screens be implemented as the BTA for controlling entrainment; and

- whether Merrimack Station should be permitted to bypass the screens and if so, under what circumstances should this be allowed.

4. New Information Concerning BTA Alternatives for Controlling Impingement

The 2011 Draft Permit recognized that when closed-cycle cooling was being used to reduce entrainment or thermal discharges, it would also reduce impingement mortality to the greatest extent possible. Therefore, although EPA found impingement mortality to be a concern year-round, the 2011 Draft Permit did not propose major traveling screen upgrades. Instead, it only proposed certain improvements to the fish return system, the screen spray wash system and the operational protocols for the traveling screens, as discussed above. *See* AR-618, pp. 346-347. Similarly, under the 2014 CWA § 316(b) Regulations, a facility using closed-cycle cooling would satisfy the BTA requirements for controlling impingement mortality. *See* 40 C.F.R. § 125.94(c)(1). If closed-cycle cooling is not operated year-round, however, improvements to the Facility's fish return system, spray wash system and traveling screen operational protocols would still make sense because the facility would still impinge aquatic organisms when the closed-cycle system is not operating, and the current traveling screens and fish return system at Merrimack Station are unnecessarily damaging to impinged organisms. *See* AR-618, pp. 263-271. For example, the current fish return sluice does not reliably return fish to the river. Moreover, replacing the present high pressure spray wash system with a low pressure system will help to prevent unnecessary harm to fish that are impinged by the Facility.

If EPA determines that Merrimack Station can comply with the site-specific entrainment requirements using wedgewire screens and the Facility does not install closed-cycle cooling, the Facility will likely satisfy the BTA requirements of the 2014 CWA § 316(b) Regulations for reducing impingement mortality whenever the wedgewire screen system is in use because it is expected to reduce intake through-screen velocities below 0.5 feet per second (fps). *See* 40 C.F.R. § § 125.94(c)(2) and (3). Thus, if used from April 1 to August 31 to control entrainment, the system would also satisfy the impingement mortality control requirements during that time period. If used during additional months, the Facility could also satisfy impingement mortality reduction requirements during those months. During any months that the wedgewire screens are not used, however, the Facility would need other measures to satisfy requirements for controlling impingement mortality. *See* 40 C.F.R. § 125.94(c). (EPA recognizes that PSNH has argued that Merrimack Station's impingement mortality should be considered *de minimis* under the regulations and that, as a result, no further impingement mortality controls are needed. EPA plans to consider the Company's arguments in this regard.) For example, the same traveling screen and fish return system improvements that were part of EPA's proposed BTA for the 2011 Draft Permit could satisfy the applicable BTA requirements. *See* 40 C.F.R. § 125.94(c)(5). Coupling this technology with the seasonal use of wedgewire screens for entrainment control

could make sense given concerns PSNH has expressed about the screens being fouled by debris in August and by "frazil ice" during the winter months. Alternatively, once the wedgewire screens are in place, the Facility could use them year-round while developing a contingency plan for responding to frazil ice, which appears to be a fairly infrequent occurrence. As noted above, PSNH has identified the possibility of using wedgewire screens with a system of "bypass" gates that would enable the wedgewire screens to be bypassed if frazil ice is interfering with their operation. *See* AR-1352 (Attachment 1), pp. 13-14.

EPA invites comments on the issues discussed above regarding the BTA for impingement mortality control at Merrimack Station, including the following:

- *whether Merrimack Station's impingement mortality should be considered to be de minimis all year, during certain months, or not at all?*

- *whether wedgewire screens, closed-cycle cooling, or some other technology or combination of technologies should be the BTA for controlling impingement mortality at the Facility?*

- *if either wedgewire screens or closed-cycle cooling are the BTA, or part of the BTA, for controlling impingement mortality, should they be deployed all year or only during certain months and, if the latter, during which months should they be used?*

- *if wedgewire screens are used, will screen fouling by debris or frazil ice be a problem at certain times of the year and, if so, how and when should the problem be managed;*

- *if wedgewire screens are used, should PSNH be authorized to "bypass" the screens under certain conditions and, if so, should additional protective measures for impingement be required during those periods?*

5. Interplay of Thermal Discharge Limits and Cooling Water Intake Requirements

As discussed above, in the record for the 2011 Draft Permit, EPA discussed the interplay of the proposed cooling water intake structure requirements with the proposed thermal discharge limitations. EPA explained that despite the fact that the 2011 Draft Permit's cooling water intake structure requirements under CWA § 316(b) were based on the use of closed-cycle cooling only from April 1 to August 31, EPA expected the Facility to use closed-cycle cooling *year-round* in order to meet the permit's thermal discharge limits. EPA further explained that if the Facility operated closed-cycle cooling year-round to control thermal discharges, it would also be considered to be in compliance with CWA § 316(b)'s BTA requirement and further steps to upgrade the Facility's traveling screens would be unnecessary. *See* AR-618, pp. 346-348. This same reasoning would apply if EPA was to adopt a new BTA based on wedgewire screens. In other words, if closed-cycle cooling is used year-round to limit thermal discharges, then the BTA standard under the 2014 CWA § 316(b) Regulations would be satisfied for controlling impingement mortality and entrainment. *See* 40 C.F.R. §§ 125.94(c)(1), 125.94(d) and 125.98(f)(1). As a result, the installation of wedgewire screens would be unnecessary even if that technology had been selected as the BTA.

6. Compliance Schedules

Since issuance of the 2011 Draft Permit, it has been evident that if the Final Permit requires Merrimack Station to add new equipment to comply with the BTA standard, then the Facility will need time to install that equipment. When EPA issued the 2011 Draft Permit, it expected to include a schedule for the necessary compliance steps in some sort of enforceable document *outside* of the NPDES permit, such as a non-penalty administrative compliance order. *See* CWA § 309(a), 33 U.S.C. § 1319(a). This approach would have been consistent with past Agency practice. *See, e.g.*, AR-1383 (EPA Region 1, Findings and Order for Compliance, "*In the Matter of Dominion Energy Brayton Point Station*" (Docket No. 08-007; December 17, 2007) (the Brayton Point A.O.)). The approach was based on a longstanding interpretation of the CWA concluding that the statutory deadline for compliance with the BTA standard of CWA § 316(b) had already passed and the permit, therefore, needed to require immediate compliance. *See* 40 C.F.R. § 122.47(a). *See also, e.g.*, EPA General Counsel's Opinion No. 41 (1976). As a result, EPA did not include a schedule in the 2011 Draft Permit for Merrimack Station to install technology to comply with CWA § 316(b).

As of the 2014 CWA § 316(b) Regulations, however, EPA changed its position regarding whether compliance schedules can be included in permits for CWA § 316(b) requirements. Under a revised interpretation of the CWA reflected in the 2014 CWA § 316(b) Regulations, *see* 79 Fed. Reg. 48300, 48359 (Aug. 15, 2014), EPA decided that compliance schedules for the installation of cooling water intake structure improvements to meet new permit requirements may be included in an NPDES permit. *See* 40 C.F.R. §§ 125.94(b)(1) and (2), 125.98(c). *See also* 40 C.F.R. § 125.94(h) (interim BTA requirements). The regulations call for such compliance schedules to require compliance *as soon as practicable* with entrainment and impingement requirements under 40 C.F.R. §§ 125.94(c) and (d), but also direct that permitting agencies should consider the potential effects of such compliance schedules on local electrical service. *See* 40 C.F.R. § 125.98(c). Specifically, the regulation states, in pertinent part, that:

> … [w]hen establishing a schedule for electric power generating facilities, the Director should consider measures to maintain adequate energy reliability and necessary grid reserve capacity during any facility outage. These may include establishing a staggered schedule for multiple facilities serving the same localities. The Director may confer with independent system operators and state public utility regulatory agencies when establishing a schedule for electric power generating facilities.

Id. Thus, under CWA § 316(b), whether the BTA for Merrimack Station involves the installation of closed-cycle cooling, wedgewire screens, or some other technology, a compliance schedule may be included in the NPDES permit, as appropriate.

When considering compliance schedules, it is again important to understand the interplay between the permit requirements for controlling thermal discharges and the requirements for controlling cooling water intake structure effects. Unlike the regulations governing *cooling water intake structure* improvements, the regulations and law applicable to *thermal discharge limits*

provide that NPDES permits *may not* include a schedule for coming into compliance in the future with thermal discharge limits unless those limits are based on state water quality standards that expressly allow compliance schedules for future compliance. *See In re D.C. Water & Sewer Auth.*, 13 E.A.D. 714, 734 (EAB 2008); *In re Star-Kist Caribe, Inc.*, 3 E.A.D. 172 (Adm'r 1990), *modification denied*, 4 E.A.D. 33 (EAB 1992). This is because the statutory compliance deadlines in the CWA have already passed for federal technology-based effluent limitations and state water quality standards generally, and these statutory deadlines cannot be extended by a permit. *See* 33 U.S.C. §§ 1311(b)(1)(C) and (b)(2)(F); 40 C.F.R. §§ 125.3(a)(2)(v) and (b). *See also* 40 C.F.R. § 122.47(a)(1). Therefore, if a thermal discharger needs a schedule for installing equipment to come into compliance with a permit's thermal discharge requirements, that schedule would need to be included in an instrument outside of the permit, such as a non-penalty administrative compliance order under CWA § 309(a), unless, as stated above, the limits are based on a state water quality standard that allows for schedules for future compliance. This is so even if the same technology, such as closed-cycle cooling, was going to be used to comply with both cooling water intake structure requirements *and* thermal discharge requirements, and a compliance schedule is being allowed for the cooling water intake structure requirements. Because permittees must comply with both sets of permit requirements, the compliance schedule for the intake requirements could be in the permit, while immediate compliance would be required for the thermal discharge limits and any schedule for coming into compliance with those requirements would be embodied in an instrument outside the permit.

As explained above, EPA did not propose a schedule in the 2011 Draft Permit for installing the technologies needed to comply with CWA § 316(b). Moreover, in response to the 2011 Draft Permit, no party commented to EPA concerning how much time it would take to install the technologies that had been specified for compliance with CWA § 316(b). Now that a compliance schedule may be included in the NPDES permit for steps to comply with CWA § 316(b), EPA is proposing below two potential compliance schedules, one for a BTA based on closed-cycle cooling, and one for a BTA based on wedgewire screens. *While EPA believes these schedules provide reasonable timelines for installing the technologies in question at the Facility, EPA invites public comments regarding whether or not the Merrimack Station permit should include a compliance schedule for measures to comply with CWA § 316(b) and what the terms of any such schedule should be. Such comments could range from suggesting adjustments or modifications to the schedules EPA proposes here, to proposing an entirely different compliance schedule.*

a. Compliance Schedule for a BTA Option Including Closed-Cycle Cooling

If closed-cycle cooling is selected as part of the BTA for Merrimack Station's Final Permit, EPA is considering including in the Final Permit a compliance schedule like the one presented below. This schedule is based on EPA's knowledge of the Merrimack Station facility and EPA's experience with closed-cycle cooling at other sites, as well as consideration of the schedules previously proposed by PSNH for closed-cycle cooling retrofits at Merrimack and Schiller

Stations (*see* AR-6 (Attachment 7) and AR-1415),[4] and the schedule that governed the conversion from open-cycle to closed-cycle cooling at Brayton Point Station in Somerset, MA (*see* AR-1383, EPA Administrative Compliance Order Issued by EPA to Brayton Point Station (December 17, 2007)).

Using the Merrimack Station schedule submitted by PSNH as a point of reference for the permit schedule makes sense for obvious reasons. That schedule was developed by Merrimack Station's owner and operator for this specific facility. Using the Schiller Station schedule as a second point of reference makes sense because PSNH also owns and operates the facility and it developed the schedule. Moreover, like Merrimack Station, Schiller Station is a multi-unit (primarily) coal-burning facility in New Hampshire. Schiller Station is also similar in size to, albeit smaller than, Merrimack Station. (Schiller Station is a 150 MW power plant that withdraws approximately 125 million gallons of water per day through two cooling water intake structures from the Piscataqua River, whereas Merrimack Station is 470 MW power plant with two cooling water intake structures that withdraw approximately 287 MGD of water from the Merrimack River.)

In addition, considering the Brayton Point Station schedule as a third point of reference for developing a schedule for Merrimack Station makes sense because both are relatively large, decades-old coal-burning facilities with open-cycle cooling systems. The schedule for converting Brayton Point Station's cooling system from open-cycle cooling to closed-cycle cooling was negotiated with, and agreed to by, the owner/operators of the facility. Moreover, Brayton Point ultimately was able to meet this schedule (which was embodied in a non-penalty administrative compliance order). *See* AR-1383.

EPA also concludes that it is reasonable to expect that applying the Brayton Point Station timeline to Merrimack Station would provide a conservative schedule (*i.e.,* a schedule likely to provide more than enough time to complete the necessary work). This is because Brayton Point Station is a substantially larger facility than Merrimack Station. *See* AR-662; AR-618. Brayton Point Station's four generating units produced substantially more electricity than Merrimack Station's two units, and Brayton Point Station used more cooling water (1 billion gallons per day vs. 287 million gallons per day). *Id.* Moreover, Brayton Point Station chose to install "natural draft" cooling towers, which likely entailed a more complex construction project than if mechanical draft cooling towers had been used. AR-1383. *See also* AR-618, pp. 138-142. EPA expects that mechanical draft towers would be preferred at Merrimack Station. *See* AR-618, pp. 138-142. *See also* AR-6, p. 33. In addition, while both power plants have two cooling water intake structures, Brayton Point Station's two intakes are located on opposite sides of the site, while Merrimack Station's intakes are closer to each other. *See* AR-662. For these reasons, EPA expects that closed-cycle cooling could be installed more rapidly at Merrimack Station than it was at Brayton Point Station. That said, every facility is different and can have its own unique site-specific constraints and difficulties. *EPA invites public comments on this analysis and, as stated above, on the terms of the proposed schedule set forth below.*

[4] To be clear, PSNH provided the estimated schedules, but has not favored converting from open-cycle to closed-cycle cooling at either Merrimack Station or Schiller Station.

Consistent with the terms of the 2014 CWA § 316(b) Regulations set forth above, EPA has considered the local energy ramifications of the proposed schedule for adding closed-cycle cooling capacity at Merrimack Station. *See* 40 C.F.R. § 125.98(c). EPA concludes that converting to closed-cycle cooling could take place without disrupting the local or regional energy supply. Merrimack Station's operations have been much curtailed in recent years due to market forces which have led to less expensive, more efficient natural gas-burning facilities increasing their market share at the expense of older, coal-burning facilities such as Merrimack Station. *See* AR-1369; ISO-New England webpage on "Plant Retirements"; AR-1396. Indeed, a number of coal-burning power plants have terminated operations or are planning to do so, including Brayton Point Station, Salem Station and Mt. Tom Station. *Id.* Consistent with these developments, Merrimack Station now tends to generate little electricity during the fall and spring "shoulder seasons," but can still be a significant producer of electricity during cold winter and warm summer conditions. *See* AR-1369.

This seasonal pattern of operations is currently expected to continue, assuming the Facility remains in operation. This pattern should be well-suited to accommodating the retrofitting of closed-cycle cooling at the Facility. A power plant can install the new closed-cycle cooling equipment—assuming adequate space—while it continues generating electricity. A relatively brief outage may be required when "tying in" the new cooling system to the existing operation. The proposed compliance schedule would give the Facility the option to undertake the tie-in, and any necessary related outage, during one of the shoulder seasons when the generating units are likely to be idle. As discussed previously, *see* AR-618, pp. 306 and 163-164, converting to closed-cycle cooling can yield a relatively small reduction in power generation due to reduced efficiency and auxiliary energy needs. *See id.,* p. 139. This impact should not affect the regional energy supply to a significant degree.

In light of all of the above, adding closed-cycle cooling at Merrimack Station would not realistically threaten the reliability of the region's energy supply or grid reserve capacity. Furthermore, if necessary due to changed market conditions, the schedule could potentially be adjusted in the future to avoid regional energy problems. We have reviewed energy needs forecasting reports by the New England ISO and find them consistent with our analysis. *See* ISO-New England webpage on "Plant Retirements". *That said, EPA will provide the ISO with a copy of this document and seek any comments the ISO may wish to offer.*

Based on the factors described above, as well as consideration of the terms of 40 C.F.R. § 122.47(a), if EPA determines that the BTA for Merrimack Station includes converting to the closed-cycle cooling option, the Agency is contemplating including in the Final Permit the compliance schedule set forth immediately below. (The schedule below sets time-frames for each task relative to the effective date of the permit. It does not include specific dates for these tasks at this time.)

EPA invites public comment on the following proposed compliance schedule.

Compliance Schedule if BTA Requirements Are Based on Closed-Cycle Cooling

1. In order to comply with Part I.___ of this permit, which assigns BTA requirements under CWA § 316(b), the permittee will need to install and operate new equipment. Permit requirements under CWA § 316(b) must be complied with as soon as practicable. 40 C.F.R. §§ 125.94(b)(1) and (2), 125.98(c). In this case, the permittee needs a period of time to achieve such compliance. As a result, this permit sets forth a schedule according to which the permittee shall attain compliance with the BTA requirements under CWA § 316(b). Specifically, steps for the installation and operation of equipment required to comply with Part I.__ of this permit shall be completed as soon as practicable but no later than the schedule of milestones set forth below. The permittee shall notify EPA in writing of compliance or non-compliance with each milestone no later than fourteen (14) days following each specified deadline.

    a. By one week after the effective date of this permit, the permittee shall contact all relevant permitting authorities to request pre-application meetings.

    b. From the effective date of this permit until issuance of all permits and approvals needed to implement the BTA, the permittee shall provide timely and complete responses to all reasonable and appropriate requests for additional information from each relevant permitting and approval authority.

    c. Within six (6) months of the effective date of this permit, the permittee shall complete final design and engineering necessary to convert the open-cycle cooling systems for Merrimack Station Units 1 and 2 to closed-cycle cooling and install all necessary BTA technologies, including any cooling towers, pumps and pipes, intake screening system improvements, and fish return system improvements.

    d. Within nine (9) months of the effective date of this permit, the permittee shall complete submission of all federal, New Hampshire, and local permit applications, notices, and requests for governmental authorizations necessary to allow the permittee to install and operate closed-cycle cooling and any other required BTA technologies (e.g., pumping and piping improvements, screening system and fish return system improvements) at Merrimack Station.

    e. Within five (5) days of obtaining all necessary permits and approvals, the permittee shall issue the Notice to Proceed with Engineering and Procurement to the permittee's contractor (or contractors) for the construction and installation of all required BTA technologies for Merrimack Station, including any cooling towers, pumping and piping improvements, screening system improvements and fish return system improvements.

    f. Within nine (9) months of obtaining all necessary permits and approvals, the permittee shall commence construction and/or installation of cooling towers and all other equipment needed to come into compliance with the Final Permit's BTA

requirements, including pumping and piping improvements, screening system and fish return system improvements.

g. No later than May 15 of the calendar year prior to the anticipated tie-in date for each unit, the permittee shall, in order to facilitate the tie-in process, request a planned outage for that unit from the Independent System Operator (ISO) New England in accordance with, and pursuant to, the applicable ISO New England Operating Procedures.

h. Within 12 months of obtaining all necessary permits and approvals, the permittee shall complete construction and installation of all screening system and fish return system improvements needed to comply with the Final Permit's cooling water intake structure requirements under CWA § 316(b).

i. Within 24 months of obtaining all necessary permits and approvals, the permittee shall:

   i. complete construction and installation of all cooling tower, piping, pumping, electrical work, and any other remaining equipment, needed to comply with the Final Permit's cooling water intake structure requirements under CWA § 316(b); and

   ii. commence the process of tying-in Merrimack Station condenser units 1 and 2 to cooling towers consistent with any necessary generating unit outage schedule approved by the ISO New England.

j. Within 26 months of obtaining all necessary permits and approvals, complete the tie-in of Merrimack Station condenser units 1 and 2 to the cooling towers and achieve full compliance with all the Final Permit's BTA requirements.

2. Interim Requirements

During the interim period extending from the effective date of this permit until the Permittee achieves full compliance with all of the Final Permit's BTA requirements, the Permittee shall comply with the following interim requirements:

a. Within nine (9) months of the effective date of this permit, the permittee shall complete improvements to the traveling screens and the fish return sluice so that fish or other aquatic organisms impinged on the traveling screens are returned safely and directly into the water of the Merrimack River.

b. Within thirty (30) days of the effective date of this Order, the permittee shall begin continuously rotating the traveling screens for each cooling water intake structure whenever water is being withdrawn from the Merrimack River through that intake structure.

Again, EPA invites public comment on the above schedule, including whether additional or alternative milestones should be included, whether different dates or time-frames should be included, and whether certain milestones should be deleted.

b. Compliance Schedule for a BTA Option Including Cylindrical Wedgewire Screens

If EPA determines that the BTA for controlling entrainment at Merrimack Station includes cylindrical wedgewire screens, rather than closed-cycle cooling, the Agency contemplates including in the Final Permit the compliance schedule set forth below to address installation of the needed equipment. In developing this schedule, EPA has taken into account Agency regulations at 40 C.F.R. §§ 125.94(b), (c) and (d) and 40 C.F.R. § 122.47, as well as the schedule for wedgewire screen installation proposed by PSNH in its 2009 Supplemental Alternative Technology Evaluation (AR-4, Attachment B), the wedgewire screen installation schedule in the Final Permit for the GE Aviation facility in Lynn, MA (AR-1419), and the schedule for wedgewire screen installation proposed by EPA in the draft permit for PSNH's Schiller Station power plant (AR-1410). In addition, EPA has also considered comments that PSNH submitted with regard to the compliance schedule proposed by EPA in the draft permit for Schiller Station (AR-1399, pp. 75-77). (EPA notes that PSNH did not agree that wedgewire screens are needed for Schiller Station, but provided comments on the schedule that EPA included in the draft permit.)

Finally, EPA has also taken into account that PSNH is currently planning to conduct on-site testing of wedgewire screens at Merrimack Station during the spring/summer of 2017. *See* AR-1357 (Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to David Webster, Sharon DeMeo and Mark Stein, EPA Region 1, pp. 1-7; Attachment 4 (April 12, 2017)). Related to this fact, EPA notes that since it is currently considering requiring entrainment control technologies only during the warmer weather months *(i.e.*, April 1 to August 31), no pilot testing is needed to investigate entrainment reduction from September to March 31.

At the same time, Merrimack Station's cooling water intake structures will need to satisfy the impingement mortality control requirements of 40 C.F.R. § 125.94(c) *throughout* the year. If the Facility can reduce intake through-screen velocities to 0.5 fps or less by using wedgewire screens, as PSNH has indicated, then using the screens year-round would satisfy the impingement mortality control requirements of 33 U.S.C. §§ 125.94(c)(2) and (3) for the full year. In light of the reduced intake velocity, EPA's current thinking is that pilot testing of wedgewire screens to assess impingement mortality control in the winter months should not be needed. EPA also thinks that if wedgewire screens are determined to be the BTA for entrainment, year-round use of the screens would also be a possible alternative for compliance with the BTA standards for impingement mortality. *See* 40 C.F.R. § 125.94(c)(2). EPA also notes that using wedgewire screens should not affect electrical generation by Merrimack Station and would have an insignificant effect, if any, on the regional energy supply. This technology should neither affect plant efficiency nor make any significant demands on electricity generated by the Facility. Also, installing wedgewire screens should not require any significant plant outages. *See* AR-846, pp. 112-113.

Based on the factors described above, if EPA determines that the BTA for Merrimack Station includes the cylindrical wedgewire screen option, then the Agency is contemplating including in the Final Permit the compliance schedule set forth immediately below. (Note once again that rather than include specific dates, the schedule below consists of time-frames for each task relative to the effective date of the permit.)

BTA Requirements and Schedule for Compliance with BTA including Cylindrical Wedgewire Screens

1. Best Technology Available. The design, location, construction, and capacity of the permittee's cooling water intake structures (CWISs) shall reflect the best technology available (BTA) for minimizing adverse environmental impacts from the impingement and entrainment of various life stages of fish and other organisms (e.g., eggs, larvae, juveniles, adults) by the CWISs. The following requirements have been determined by the EPA to represent the BTA for minimizing impingement and entrainment impacts at Merrimack Station:

    a. The permittee shall install and operate for the CWIS's of Units 1 and 2 a fine mesh wedgewire screen intake system[5] with the slot openings oriented perpendicular to the predominant direction of ambient flow current, a pressurized airburst system to clear debris from the screens, and a through-screen intake velocity of no more than 0.5 feet per second (fps). The wedgewire screen units must be positioned as close to the west bank of the Hooksett Pool segment of the Merrimack River and the CWIS as possible, while 1) meeting all operational specifications required by this permit; 2) meeting the conditions of any other permits for the equipment; and 3) assuring that the equipment performs as designed.

    b. The permittee shall verify that the through-screen velocity at the wedgewire screen surface is 0.5 fps or less through measurement or calculation, and that the ratio of through-screen velocity to ambient sweeping current velocity is maintained at 1:1 or greater from April 1 through August 31 of each year under all river and plant operating conditions.

[5] There is no universally accepted definition of "fine mesh." EPA notes that the Final Rule at 40 C.F.R. § 122.21(r)(10)(i) requires an evaluation of the technical feasibility of fine mesh screens with a mesh size of 2 mm or less. *See also* 79 Fed. Reg. at 48349, 48350, and 48367. The Technical Development Document for the Final Rule states that "fine mesh screens have mesh sizes typically ranging from about 0.5 mm to 3 mm, depending on the organisms to be protected" (at p. 6-22), and, alternatively, specifies that since 2000, new data shows that fine mesh screens "must be less than 2 mm to have a significant effect on total entrainment" (n. 107 at p. 6-45). While EPA may conclude that screens with slot sizes larger than 2 mm are appropriate on a case-by-case basis with site-specific data for wedgewire screens, EPA generally considers "fine mesh" as slot sizes less than or equal to 2.0 mm. *As part of this re-notice, EPA is requesting comment on the extent to which wedgewire screens with different screen slot sizes can prevent mortality to aquatic life from entrainment and/or impingement and satisfy the BTA requirements of CWA § 316(b).* If cylindrical wedgewire screens are determined to be the BTA for entrainment at Merrimack Station, EPA will define the appropriate slot size based on its consideration of, among other things, the comments received and on the results of the site-specific data collected at Merrimack Station during spring/summer 2017.

c. The permittee shall institute a best management practice (BMP) of shutting down the intake pumps associated with a particular generating unit to the extent practicable when that generating unit is not operating and water does not need to be withdrawn from the river through that intake structure for fire prevention or other emergency conditions.

d. Unless specified by this permit, the permittee shall make no changes to the location, design or capacity of the present cooling water intake structures, without prior approval by EPA.

2. Compliance Schedule. Permit requirements under CWA § 316(b) must be complied with as soon as practicable. 40 C.F.R. §§ 125.94(b)(1) and (2), 125.98(c). In order to comply with Part I.__ of this permit, the permittee needs to install and operate new equipment. As a result, the permittee needs a period of time to install this equipment and achieve compliance. Therefore, this permit sets forth below a schedule according to which the permittee shall attain compliance with the permit's BTA requirements under CWA § 316(b). Specifically, steps for the installation and operation of equipment required to comply with Part ___ of this permit shall be completed as soon as practicable but no later than the schedule of milestones set forth below. The permittee shall notify EPA in writing of compliance or non-compliance with the requirements for each milestone no later than fourteen (14) days following each specified deadline.

a. Design

i) Within six (6) months of the effective date of this permit, the permittee shall submit to EPA and NHDES a preliminary design of the wedgewire screens to be installed at Merrimack Station and include justifications for 1) the proposed screen slot size based on consideration of each option's ability to reduce impingement mortality and entrainment, minimize through-screen velocity, avoid screen clogging, fouling or other maintenance issues, and any other relevant considerations; 2) the proposed material or alloy chosen for the equipment in order to reduce bio-fouling; and 3) the permittee's choice of either traditional cylindrical wedgewire screens or wedgewire half-screens in order to reduce entrainment and impingement mortality. The preliminary design shall also provide data establishing the through-screen velocities that will be maintained by the Facility under various river and plant operating conditions, while also identifying the ratios of through-screen velocities to ambient sweeping current velocities that will be maintained under the different river and plant operating conditions. The screen slot size selected will be subject to EPA approval and based upon consideration of the results of the permittee's "confirmatory study" during the spring/summer of 2017, as well as any other pertinent information.

ii) Data collection, including but not limited to topographic and bathymetric surveys, geotechnical exploration, and other design and aquatic construction variables that need to be evaluated for installation of the wedgewire screens to satisfy the BTA requirements of this Final Permit, shall be completed no later than six (6) months from the effective date of the permit.

iii) Within two (2) months after receipt of correspondence from EPA approving the permittee's preliminary design, including the screen slot size and through-screen velocity for the wedgewire screens, the permittee shall submit a final design for the wedgewire screens and all other technologies needed to satisfy the BTA requirements of this Final Permit.

b. Permitting

i) Within four (4) months of submitting the final design, the permittee shall complete submission of all permit applications and notices necessary to obtain authorization for installation and construction of the wedgewire screens and all other technologies needed to satisfy the BTA requirements of this Final Permit, including any permits or authorizations required from the U.S. Army Corps of Engineers (ACOE), the United States Fish and Wildlife Service (USFWS), the NHDES, the New Hampshire Fish & Game, any local conservation commissions, and any other relevant regulatory authorities, as necessary. This task shall include all necessary engineering to support development and submission of adequate permit applications and the collection of all necessary supplementary data.

c. Construction

i) Within four (4) months of submitting the final design, the permittee shall select and enter into an Engineering, Procurement and Construction agreement (or agreements) with all needed contractors.

ii) The permittee shall comply with the conditions of all permits and approvals related to installing the wedgewire screens and any other technologies needed to satisfy the BTA requirements of this Final Permit. In addition, EPA will work with representatives of Merrimack Station and, as appropriate, the New England ISO to schedule any necessary power plant downtime associated with installing the wedgewire screens or other equipment needed to comply with the BTA requirements of this permit – though no such downtime is currently anticipated – so as to minimize or eliminate any effects on the adequacy of the region's supply of electricity.

iii) No later than sixteen (16) months from obtaining all necessary permits and approvals, the permittee shall complete site mobilization and modifications, installation, tie-in, testing, startup and commissioning of the wedgewire screens and all other technologies needed to satisfy the BTA requirements of this Final Permit for the cooling water intake structures serving Units 1 and 2 at Merrimack Station.

As stated above, EPA invites public comments on the above compliance schedule for installing wedgewire screens at Merrimack Station and the discussion that EPA has provided above that relates to the schedule.

7. Additional Information Related to Cylindrical Wedgewire Screen Technology and Its Potential Application at Merrimack Station

Since closure of the original comment period on February 28, 2012, a significant amount of additional information has been submitted to, or collected by, EPA relevant to whether cylindrical wedgewire screens should potentially be determined to be a component of the BTA for Merrimack Station under CWA § 316(b). EPA has added this material to the administrative record for the Merrimack Station permit available on EPA's website. EPA is making, or has made, this post-Draft Permit material available for public review and *EPA invites public comments that address relevant issues raised by this post-Draft Permit material that pertain to EPA's determination of the BTA for Merrimack Station under CWA § 316(b).*

The materials in question include, at a minimum, the following:

List of References Regarding Wedgewire Screens

AR-1231. Enercon Services, Inc. October 2014. Assessment of 2007 Response to U.S. Environmental Protection Agency CWA § 308 Letter PSNH Merrimack Station Units 1 & 2; Prepared by Enercon Services, Inc. for PSNH. October 2014. (Included as Exhibit 4 in PSNH's Response to Comments on EPA's Revised Draft NPDES Permit.)

AR-1231 (Attachment 1 to Exhibit 4). Normandeau Associates, Inc. 2014. Update of Impingement Abundance and Mortality Assessment for Merrimack Station Response Supplement to United States Environmental Protection Agency CWA § 308 Letter, prepared by Normandeau Associates, Inc., October 2014.

AR-1399 (Appendix 3 to Exhibit 1). Normandeau Associates, Inc., 2016: Potential Entrainment Reduction for Cylindrical Wedgewire Screens at Schiller Station, Incorporating a Length-Based Wedgewire Avoidance Model. Prepared by Normandeau Associates, Inc., for PSNH. January 2016.

AR-1352. (Attachment 1) Enercon Services, Inc., 2016: Wedgewire Half Screen Technical Memo PSNH Merrimack Station Units 1 & 2; Prepared by Enercon Services, Inc., for PSNH. December 2016.

AR-1352 (Attachment 1 to Attachment 1). Mattson, M.T., 2016. Memorandum to Ms. Linda Landis of Eversource Energy and Mr. Richard Clubb of Enercon Services, Inc. RE: Wedgewire Screen Update Attachment 1 to the 2016 Enercon Report for Merrimack Station.

AR-1361. Enercon Services, Inc., 2017. Wedgewire Screen Confirmatory Study Scope Description, PSNH Merrimack Station Units 1 & 2, Bow, New Hampshire. Includes 2 Attachments.

AR-1401. Normandeau Associates, Inc., and ASA Analysis and Communications, Inc., 2011. 2010 IPEC Wedgewire Screen Laboratory Study. Prepared for Indian Point Energy Center,

Buchanan, NY., January 2011. Submitted as Reference 21 to Comments of the Entergy Corp. on Proposed Rule titled National Pollution Discharge Elimination System-Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22174 (April 20, 2011).

AR-1402. Normandeau Associates, Inc., and ASA Analysis and Communications, Inc., 2011. 2011 IPEC Wedgewire Screen Laboratory Study. Prepared for Indian Point Energy Center, Buchanan, NY. July 2011. Submitted as Exhibit 2 to Comments of the Entergy Corp. on Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities: Notice of Data Availability Related to Impingement Mortality Control Requirements, 77 Fed. Reg. 34315 (June 11, 2012).

AR-1403. Normandeau Associates, Inc., and ASA Analysis and Communications, Inc., 2012. Wedgewire Screen In-River Efficacy Study at Indian Point Energy Center. Prepared for Indian Point Energy Center, Buchanan, NY. January 2012. Submitted as Exhibit 6 to Comments of the Entergy Corp. on Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities: Notice of Data Availability Related to Impingement Mortality Control Requirements, 77 Fed. Reg. 34315 (June 11, 2012).

AR-1418. Electric Power Research Institute. 2013. Fish Protection at Cooling Water Intake Structures: A Technical Reference Manual – 2012 Update, Chapter 5: Cylindrical Wedgewire Screens. Palo Alto, CA. Report 3002000231.

AR-1420. Mattson, M., P. Lindsay, J. Young, J. Black. 2011. Larval Avoidance Enhances the Entrainment Reduction Performance of Cylindrical Wedgewire Screens. August 2011. Presentation to the American Fisheries Society Annual Meeting in Seattle, WA, on behalf of Entergy's Indian Point Energy Center, Buchanan, NY.

AR-1421. Mattson, M., P. Lindsay, J. Young, D. Heimbuch, L. Barnthouse. 2014. In-River Performance of a 2-MM Slot Wedgewire Screen for Reducing Entrainment. August 2014 Presentation to the American Fisheries Society Annual Meeting in Quebec City, Quebec, Canada, on behalf of Entergy's Indian Point Energy Center, Buchanan, NY.

8. <u>Ramifications of Reduced Capacity Factor and PSNH Divestiture Process for the Merrimack Station NPDES Permit</u>

At the time of the 2011 Draft Permit, Merrimack Station operated as a baseload power plant. In other words, to meet demand for electricity, the plant operated on a near-constant basis, with the exception of regularly scheduled maintenance outages. Consistent with this fact, PSNH applied for NPDES permit conditions that would allow for continuing such baseload operations and EPA has evaluated permit conditions on this basis. *See 2011 Draft Permit Determinations,* pp. 132, 145, 156 n.51, and 158. Since EPA issued the 2011 Draft Permit for public comment, however, Merrimack Station's electrical generation has diminished substantially. *See* AR-1369; AR-1396. This is primarily the result of market factors, including the emergence of relatively inexpensive natural gas and the new dominance of that fuel source in the New England market. *See* AR-1396.

As a result of these developments, a number of large or mid-sized New England power plants have closed or announced plans for closure, including Brayton Point Station (coal), Vermont Yankee (nuclear), Pilgrim Station (nuclear), Salem Station (coal), and Mt. Tom Station (coal). *See* AR-1369; AR-1396. Merrimack Station has not yet proposed closure, however, and the Facility has been operating more as a "peaking plant" that generates electricity primarily during peak demand periods in the winter and the summer. *See* AR-1369.

At the same time, New Hampshire is deregulating its electricity markets and has required PSNH to divest of its generating assets, including Merrimack Station (as well as Schiller Station and various hydro-electrical facilities). *See* AR-1396; *see also* Section IV(E)(3) below. As a result, an auction process is underway to allow prospective purchasers to bid on the Facility. Final, binding bids are expected in early August 2017. *See* AR-1390 ("Timing of certain key process milestones" updated February 17, 2017, *in* NHPUC Commencement of Auction Process). At present, in light of developments at other power plants, there is uncertainty about how Merrimack Station may operate in the future. *See* AR-1396; AR-1369. PSNH has not, however, indicated any current plans to close the Facility, *see* 2013 PSNH Report on Market Conditions (AR-1396), and it still seeks a permit that would allow for baseload operations in the future. If Merrimack Station is sold, decisions about the Facility's future would be made by the new owners.

EPA notes that under the 2014 CWA § 316(b) Regulations, reduced operations by Merrimack Station could, under certain circumstances, affect which regulatory requirements apply to the Facility. First, with regard to requirements for controlling impingement mortality, the regulations provide:

> (12) *Low capacity utilization power generating units.* If an existing facility has a cooling water intake structure used for one or more existing electric generating units, each with an annual average capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period, the owner or operator may request the Director consider less stringent requirements for impingement mortality for that cooling water intake structure. The Director may, based on review of site-specific data concerning cooling water system data under 40 CFR 122.21(r)(5), establish the BTA standards for impingement mortality for that cooling water intake structure that are less stringent than paragraphs (c)(1) through (7) of this section.

40 C.F.R. § 125.94(c)(12). Thus, if a facility has "an annual average capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period" and requests less stringent impingement mortality control requirements, the permitting authority may consider providing less stringent requirements. As of yet, however, PSNH has neither requested such less stringent requirements nor demonstrated that its generating units have a capacity utilization rate of less than the specified criterion. Therefore, consistent with the Company's permit application, EPA is not currently applying the low capacity utilization rate provision.

Second, the 2014 CWA § 316(b) Regulations specify that in determining requirements for controlling entrainment one of the factors that the permitting agency should consider is "remaining useful plant life." 40 C.F.R. § 125.98(f)(2)(iv). In general, requiring significant expenditures to control a facility's entrainment is unlikely to make sense if plans are in place to close that facility in the relatively near future. EPA has considered this factor for the Merrimack Station permit but concludes, at present, that it should not affect the Final Permit conditions. Again, although some New England power plants have decided to close, and although Merrimack Station is being auctioned by PSNH, the Company has neither proposed closing the Facility nor given any other indication to EPA that it expects the Facility to close. As stated above, a new owner will determine Merrimack Station's future, and such new owner may decide to continue the Facility's operations indefinitely. EPA does not have a basis for predicting otherwise with confidence.

EPA invites comments from the public regarding how the Agency should account in its development of the Final Permit conditions under CWA § 316(b) for Merrimack Station's currently reduced level of operations, the potential sale of the Facility, and questions regarding the remaining useful life of the Facility.

B. New Information Raising Substantial New Questions Regarding the Application of CWA § 316(a) and New Hampshire Water Quality Standards for Setting NPDES Permit Requirements for Merrimack Station's Thermal Discharges

Merrimack Station takes water from the Merrimack River to use for cooling in its process for generating electricity. Specifically, the Facility uses river water to cool and condense steam in the power plant's condensers. In the process, waste heat from the condensers is transferred to the cooling water and discharged to the river. Under the CWA, these "thermal discharges" are regulated by Merrimack Station's NPDES permit.

The thermal discharge limits in the Facility's current permit, which was issued in 1992, were set pursuant to a thermal discharge "variance" granted by EPA under CWA § 316(a), 33 U.S.C. § 1326(a). *See* AR-236 (1992 NPDES Permit), pp. 2-3, 8 and 16; AR-618 (2011 Draft Permit Determinations), pp. 27-28. The permit also regulates thermal discharges under New Hampshire water quality standards. AR-236, pp. 2-3.

In its permit application, PSNH sought renewal of the thermal discharge variance and the associated permit limits. *See* AR-618, p. 28. EPA discussed the application of CWA § 316(a), technology standards, and water quality standards to Merrimack Station's thermal discharges in Sections 4.0 through 9.0 of the 2011 Draft Permit Determinations. AR-618. For the 2011 Draft Permit, after reviewing PSNH's permit application and a variety of related thermal and biological data and information, EPA proposed denying PSNH's request for renewal of the CWA § 316(a) variance. *See id.* at Section 6.0. Instead, EPA proposed thermal discharge limits based on applicable technology standards and water quality standards. *See* AR-618, Sections 7, 8 and 9. More specifically, limits were based on a site-specific, BPJ application of the Best Available Technology (BAT) standard, *see id.* at Sections 7 and 9, *see also* 33 U.S.C. §§ 1311(b)(2)(A) and (F) and 40 C.F.R. § 125.3(c)(2), and a site-specific application of relevant New Hampshire water

quality standards. *See* AR-618, Sections 8 and 9. *See also* 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d).

During the public comment period for the 2011 Draft Permit, EPA received numerous comments addressing the proposed thermal discharge limits and issues related to them. Some commenters supported the proposed permit limits, while others disagreed with them and urged EPA to revise them. EPA has been considering all of these comments and will respond to the significant ones in writing in conjunction with development and issuance of the Final Permit to Merrimack Station.

Unlike the situation for CWA § 316(b) requirements, since issuance of the 2011 Draft Permit, there have been no material changes to the legal regime governing thermal discharges under either the CWA or New Hampshire water quality standards. That said, since the comment period on the 2011 Draft Permit closed on February 28, 2012, new information has come to light which raises substantial new questions pertaining to the application of CWA § 316(a) and New Hampshire water quality standards to the development of thermal discharge limits for the Merrimack Station permit. As EPA evaluates this new information and these new questions, the Agency now also invites additional public comment on these items. Below, EPA discusses the new information and the questions that it raises and specifies the topics upon which additional public comment is invited.

1. <u>New Thermal Information and Data Raising Substantial New Questions</u>

Under CWA § 316(a), 33 U.S.C. § 1326(a), the permitting agency may base permit limits for thermal discharges on a variance from the otherwise applicable technology-based and water quality-based standards if the permit applicant demonstrates that less stringent limits will nevertheless assure the protection and propagation of the receiving water body's balanced, indigenous population of shellfish, fish, and wildlife (BIP). In determining whether the protection and propagation of the BIP will be assured, other environmental stresses are taken into account along with any stress from the thermal discharge. *See id.*; 40 C.F.R. § 125.73(a) and (c)(1). The evaluation under CWA § 316(a) involves considerations such as (a) the scope of the discharger's waste heat discharges (*e.g.*, the amount of heat being discharged (in British thermal units (or Btus)), the maximum water temperatures, the timing and duration of thermal discharges (*e.g.*, are there seasonal or daily variations?)), (b) the effect of the discharges on ambient conditions (*e.g.*, the portion of the receiving water body that is affected by the discharge and the extent of that effect), and (c) the manner in which the alteration of water temperatures by the discharge affects aquatic life (*e.g.*, whether increased water temperatures have affected the ability of aquatic organisms to survive, reproduce, or successfully compete with other native and non-native organisms). EPA's assessment of these issues for the 2011 Draft Permit is presented in Sections 4.0, 5.0 and 6.0 of the 2011 Draft Permit Determinations. AR-618. Similar biological and habitat effects-oriented analyses are conducted for the application of New Hampshire's water quality standards. EPA evaluated these water quality issues in Sections 8.0 and 9.0 of the 2011 Draft Permit Determinations. *Id.*

In its CWA § 316(a) analysis, EPA considered and analyzed, among other things, a substantial amount of temperature data and analysis submitted by PSNH with its permit application. *See, e.g.,* AR-618, pp. 80-86. An important component of this thermal data was a 2007 report (AR-10) by Normandeau, one of PSNH's consultants. In comments submitted during the comment period for the 2011 Draft Permit, PSNH urged that EPA had misunderstood or misinterpreted certain aspects of the Company's thermal data as presented in the 2007 Normandeau report. *See, e.g.,* AR-872, pp. 97-98 (Comments by Normandeau on the 2011 Draft Permit). As EPA worked to consider public comments on the 2011 Draft Permit, it carefully considered the points made by PSNH. Initially, the Agency was not persuaded that it had incorrectly interpreted the Company's thermal data.

Then PSNH sent EPA a letter dated September 4, 2015, again commenting that EPA had misunderstood and misinterpreted the Company's temperature data and providing a more detailed explanation of how the data *should* be interpreted. *See* AR-1367. At the same time, PSNH took responsibility for the confusion about the data, stating that, "[a]dmittedly, any misinterpretation of the data by the agency is due to a lack of clarity in the Report itself as described in greater detail below, and we regret that it was not presented better." *Id.* In response, EPA again reevaluated the data in question.

The original temperature data tables presented in Normandeau's April 2007 report, "A Probabilistic Thermal Model of the Merrimack River Downstream of Merrimack Station," AR-10, are labelled as the "Average Daily Maximum, Minimum, and Mean Water Temperature Measured at Monitoring Stations N-10, S-0, and S-4 and Predicted at A-0 for Merrimack Station for the 1 April to 1 November period of 1984 through 2004." EPA understood this to mean that the instantaneous maximum and minimum temperatures, as well as the daily mean temperatures, were collected for each calendar day for each of the 21 years and then averaged together. Using the calendar day of July 1 as an example, EPA thought that Normandeau had identified the maximum temperatures for each July 1 over the 21-year period and then averaged these 21 daily maximum temperatures together. EPA thought that the same approach was also used to produce average daily minimum and average daily mean values for July 1 using the 21 years of July 1 values available for each metric. EPA also thought that this type of average data would provide useful information for reasonably characterizing water temperatures for any given day, from April 1 to November 30, over the 21-year period under review. These temperatures could then be compared to ambient temperatures in areas of Hooksett Pool unaffected by the plant's thermal discharge. EPA further thought that annual temperature data submissions included in the Company's Environmental Monitoring Program Annual Reports since the 1970's supported this interpretation since they presented maximum and minimum instantaneous temperature data, as well as daily average data, for each day of the month.

In its September 4, 2015, letter, however, PSNH clarified that the temperature data in the Normandeau Report are *not* the 21-year average of the daily maximum temperatures for each day of the calendar year. *See* AR-1367. Instead, the data simply represent the maximum of the daily averages that occurred on a given calendar day, possibly only one time, during the entire 21 years that monitoring data were collected (between 1984 and 2004). *Id.* In light of PSNH's new

explanation of the data, EPA decided to reassess its interpretation of the data but found that it did not have sufficient data to do so.

Therefore, on November 30, 2015, EPA sent PSNH an information request letter under Section 308(a) of the CWA, 33 U.S.C. § 1318(a), seeking additional thermal data *and* further clarification regarding the existing data. *See* AR-1298. PSNH provided its response to the information request letter in a submission dated February 29, 2016. *See* AR-1299 through AR-1307. This submission included data that EPA had requested, as well as various analytical reports that went beyond what EPA had requested. It bears mentioning that PSNH shifted the time period for its new data set later in time than EPA had requested, and that this new, more recent data reflects conditions when Merrimack Station was operating at a lower capacity factor than was reflected in the prior, older data. EPA notes that, in its view, the above-mentioned new data set reflecting current reduced operations is primarily useful if the new permit includes effluent limits reflecting this reduced operational profile. This new data would be less useful for helping to determine limits that would accommodate baseload operations, as past permit limits have and as PSNH has requested. That said, EPA is now considering *all* the material submitted by PSNH, including the data and analytical reports, and this includes reassessing PSNH's request for a CWA § 316(a) variance and the application of New Hampshire water quality standards to the Merrimack Station permit in light of this new information.

After evaluating the new data received in response to its information request (specifically attachments B (AR-1301) and C (AR-1305)), EPA found that it did, indeed, appear that the Agency had misunderstood the earlier temperature data because of confusing aspects of how it was presented. As mentioned above, the data provided by Normandeau (the measured average daily maximum temperature, in particular), correctly interpreted, represents just one day in the 21-year review period, not a 21-year average of the instantaneous maximum temperatures. EPA originally intended to use the 21-year data set to help understand the extent to which the plant's thermal discharge may have affected the thermal environment and biological community in the river over *the long-term*. EPA had not expected that Normandeau would provide data representing temperatures from only a single day out of the 21-year data set because, among other things, EPA initially did not think that such single-day data would be particularly useful for assessing the effects of thermal discharges on the aquatic community. Again, EPA is now re-evaluating its conclusions presented in the 2011 Draft Permit Determinations (AR-618) that were based on the Agency's original interpretation of the temperature data.

PSNH's clarifications about the data have also led EPA to reconsider the ways in which the effects of elevated temperatures can be usefully evaluated to support the development of thermal discharge limits that are adequately protective of the biological community in the affected receiving water. Thus, EPA has reevaluated the use of these data in its assessment of PSNH's thermal variance request and presently concludes that the single-day data submitted by Normandeau can, in fact, provide one useful metric for assessing the effects of Merrimack Station's thermal discharge. While considering long-term averages has utility for evaluating thermal discharge impacts, looking *only* at long-term averages would obscure more extreme conditions that fish and other aquatic life might be exposed to over shorter, but still biologically significant periods of time. For example, such shorter, but impactful periods could occur during

the summer when the plant is in full operation during low river flow and high ambient temperature conditions. Such temperature and flow extremes would be masked by only considering the data averaged over the full 21-year period. Consequently, in response to PSNH's clarification of the data it had submitted, EPA is now also reevaluating the effects of shorter-term thermal conditions, particularly on species that may be especially sensitive to such temperature excursions in relation to their ability to survive and compete with more thermally-tolerant species.

As previously stated, Eversource's February 29, 2016, response to EPA's information request included additional information that EPA did not specifically request, but that the Company felt was relevant to evaluating the thermal issue. This information was presented in a report entitled, "Review of technical documents related to NPDES permitting determinations for thermal discharge and cooling water intake structures at Merrimack Station." AR-1300. The Company also submitted additional information (again not specifically requested by EPA) in a letter dated December 22, 2016. AR-1352. This letter included a thermal plume report based on a CORMIX modeling analysis, as well as an additional report by PSNH consultant, Dr. Lawrence Barnthouse, that provides his assessment of thermal effects on the Hooksett Pool fish community based in large part on the CORMIX modeling results. *See* AR-1352, Attachments 2 and 3.

EPA invites additional public comment addressing the above-discussed issues and materials relevant both to EPA's decision on PSNH's CWA § 316(a) variance application and to EPA's application of New Hampshire water quality standards with regard to thermal effects. In particular, EPA invites public comment on:

- *the import of PSNH's new data submissions for EPA's application of CWA § 316(a) and New Hampshire's water quality standards in developing thermal discharge standards for the Merrimack Station permit;*
- *the question of how shorter-term and longer-term thermal data should be factored into the evaluation under CWA § 316(a) and New Hampshire's water quality standards of the effects of Merrimack Station's thermal discharges on the Hooksett Pool and the development of thermal discharge limits for the Merrimack Station permit; and*
- *EPA is considering the above-mentioned material from Dr. Barnthouse, AR-1352, Attachments 2 and 3, and invites the public to review and comment on the import of this new information.*

Moreover, additional public comment is solicited regarding any thermal discharge-related materials submitted to EPA since closure (on February 28, 2012) of the public comment period on the 2011 Draft Permit, including the following:

a) AR-1367 (PSNH's September 4, 2015, letter to EPA, including all attachments (excluding any CBI materials));

b) AR-1298 (EPA's letter requesting thermal data from PSNH); and

c) AR-1299 through AR-1307 (PSNH's response to EPA's request for information (excluding any CBI materials)).

2. New Information Concerning the Presence of the Asian Clam (*Corbicula fluminea*) in Hooksett Pool and Substantial New Questions Regarding the Import of this Information for Application of CWA § 316(a) and New Hampshire Water Quality Standards to the Merrimack Station NPDES Permit

During the public comment period on the 2011 Draft Permit, PSNH submitted comments including a report by its consultant, Normandeau, entitled, "Comparison of Benthic Macroinvertebrate Data Collected from the Merrimack River near Merrimack Station During 1972, 1973, and 2011," dated January 2012. (Normandeau 2012). AR-870. In reviewing this report, EPA became aware of the presence of non-native organisms in Hooksett Pool; in particular, the Asian clam (*Corbicula fluminea*). The presence of this highly invasive species, (*see* Sousa et al. 2008, AR-1406), appeared notably concentrated in areas of Hooksett Pool with water temperatures directly affected by the plant's thermal discharge. *See* AR-870. The data provided in the report did not reveal if any individual Asian clams were collected in samples taken upstream from the plant's thermal discharge, but they were not listed as the dominant taxon. *See* AR-870, p. 12-14. Of the 18 samples taken at or downstream of the plant's discharge canal, however, Asian clams were the dominant taxon in 14 of them, ranging in relative abundance from 58 to 94 percent, with a mean of 78.6 percent at the sites where they were dominant. *Id.*, pp. 12-14.

EPA found this discovery worthy of further research because of the possibility that Merrimack Station's thermal discharge was contributing to the presence and/or prevalence of the Asian clam in the Hooksett Pool and the potential relevance of such a finding to regulating the Facility's thermal discharges under CWA § 316(a) and New Hampshire water quality standards. As explained in detail previously, CWA § 316(a) variance-based temperature limits must assure the protection and propagation of the balanced indigenous population of organisms, *see* AR-618, pp. 18-23, while New Hampshire water quality standards impose similar requirements for the protection of local aquatic life. *See id.*, pp. 174-178.

The Asian clam is widely distributed in the United States, but its limited presence in northern New England has been attributed to prolonged periods of cold water temperatures and ice cover that is believed to cause high mortality during winter months (Simard et al., 2003) (*See* AR-1404). When PSNH submitted its report in 2012, the presence of Asian clams in New Hampshire had only been documented in the Merrimack River south of Bow, New Hampshire, and in Cobbetts Pond, in Windham, New Hampshire, according NHDES's environmental fact sheet on Asian clams (NHDES, 2012) (*See* AR-1408). NHDES later documented them in Long Pond, as well. EPA notes that when Merrimack Station is operating, one of its most visible thermal effects can occur during periods in the winter when the river just upstream of the discharge canal is completely ice-covered, but the river is ice-free for miles downstream of the discharge canal, including in the waters of Amoskeag Pool below Hooksett Dam. *See, e.g.,* Satellite photo of Hooksett Pool taken on February 27, 2014 (AR-1894*).*

EPA reviewed two peer-reviewed journal articles that studied the relationship between Asian clams and thermal discharges from power plants. Both studies, one conducted in the Connecticut River (Connecticut) and the other in the St. Lawrence River (Canada), found that higher winter survival rates of Asian clams occurred within the influence of the power plants' thermal discharge than in ambient areas, and that the elevated temperatures appeared to affect the clam's reproductive success, growth, and abundance (Simard et al. 2012, and Morgan et al., 2003) (*see* AR-1404 and AR-1405).

In response to interest and concern over the presence of Asian clams in Hooksett Pool, EPA not only evaluated the data provided by PSNH, *see* AR-870, and the literature cited above, but the Agency also collaborated with NHDES in 2013 (AR-1414) and 2014 (AR-1413) on a study to investigate the presence and abundance of Asian clams in the Hooksett Pool and other locations in New Hampshire. Sampling was conducted in July and November of 2013, and in September, 2014. Stations sampled by Normandeau in 2011 were revisited, while sites upstream of the Facility's discharge canal, including stations in Garvins Pool, and sites downstream of the discharge in Amoskeag Pool, were also investigated. During the sampling effort in September 2014, EPA divers collected samples and took video and photos of the river bottom in areas directly downstream of, at the mouth of, and directly upstream of the plant's discharge canal. This qualitative sampling revealed both higher densities of clams and larger individuals near the mouth of the discharge canal, as compared to clams collected farther downstream in Hooksett Pool, and in Amoskeag Pool below the Hooksett Dam. Neither benthic sampling conducted by NHDES during 2013 (AR-1414), nor EPA dive investigations in 2014 (AR-1412), found evidence of Asian clams upstream from the plant in Hooksett Pool or Garvins Falls Pool.
The arrival of invasive Asian clams in NH represents a threat to the state's water quality. Their presence is regulated in New Hampshire, and it is illegal to import, possess or release Asian clams in the state, according to NHDES (NHDES 2012) (AR-1408).

Furthermore, in its Final 2014 Surface Water Quality Assessment (AR-1409), NHDES listed "non-native fish, shellfish or zooplankton" as a parameter that rated a "3-PNS," or "insufficient data/potentially not attaining standard," for the section of Hooksett Pool downstream from the Facility (NHIMP700060802-02). The same rating was applied to the Hooksett Pool bypass, just below the Hooksett Dam (NHRIV700060802-14-01) and in the Amoskeag Pool of the Merrimack River (NHRIV700060802-14-02) *See* AR-1409. Notably, there is no such listing for either the section of river immediately upstream of the plant's discharge canal within Hooksett Pool (NHRIV700060302-25-02), or for the section of river upstream of Merrimack Station in the southern end of Garvins Pool (NHRIV700060302-24). *See* AR-1409. These ratings have all remained unchanged in the latest,2016, draft Surface Water Quality Assessment by NHDES (AR-1407).

In response to a PSNH request for records under the Freedom of Information Act, EPA has already shared this Asian clam-related data with the Company. By this notice, EPA is also informing other potentially interested persons of this information. EPA also notes that in response to seeing the Asian clam data, PSNH hired a consultant scientist to evaluate the Asian clam issue and the Company has indicated that it will be submitting a report to EPA about the Asian clam in the near future. *See* AR-1364 (Email from Linda T. Landis, Senior Counsel,

Eversource Energy, to Mark Stein, EPA Region 1 (March 10, 2017)). In this regard, PSNH stated as follows:

> … we have one the country's leading experts on the propagation of the [A]sian clam preparing a report documenting the results from his diving surveys in the Merrimack River over the last few years, his review of the NHDES [A]sian clam survey results, as well as a summary of his in-depth research on this topic. Based on my review of the FOIA response documents, I expect this report will be of particular interest to Eric Nelson. We hope to have this complete in early May.

Id. No report was submitted in early May, but EPA still expects PSNH to submit this report either by the time EPA has issued this notice or along with its comments in response to this notice.

EPA invites public comments addressing the information discussed above indicating the presence of the Asian clam in the Hooksett Pool, as well as comments addressing the import of this information for setting thermal discharge limits for the Merrimack Station permit under CWA § 316(a) and/or New Hampshire water quality standards. (As stated previously, EPA extensively discussed the requirements of CWA § 316(a) and New Hampshire water quality standards related to thermal conditions in Chapters 4 and 8 of the 2011 Draft Permit Determinations.) EPA also invites comments addressing the following specific items in the administrative record for the Merrimack Station permit that are related to the Asian clam issue and were added to the administrative record for the permit after closure of the public comment period for the 2011 Draft Permit:

AR-1405. Morgan, D.E., J.T. Swenarton, and J.F. Foertch. 2003. Population dynamics of the Asiatic clam, *Corbicula fluminea* (Müller) in the lower Connecticut River: establishing a foothold in New England. J. Shellfish Res., 22 (1) 193-203. New Hampshire Department of Environmental Services. 2012. Environmental Fact Sheet: Asian Clams in New Hampshire. 3 pp.

AR-1409. NHDES Surface Water Quality Assessments. New Hampshire Watershed Report Card FINAL 2014 305(b)/303(d). http://www4.des.state.nh.us/WaterShed_SWQA//WaterShed_SWQA.aspx. 89 pp.

AR-1407. NHDES Surface Water Quality Assessments. New Hampshire Watershed Report Card DRAFT 2016 305(b)/303(d). http://www4.des.state.nh.us/WaterShed_SWQA//WaterShed_SWQA.aspx. 62 pp.

AR-870. Normandeau (Normandeau Associates, Inc.). 2012. Comparison of Benthic Macroinvertebrate Data Collected from the Merrimack River near Merrimack Station During 1972, 1973, and 2011. 17 pp.

AR-1404. Simard, M. Anouk, Annie Paquet, Charles Jutras, Yves Robitaille, Pierre U. Blier, Réhaume Courtois and André L. Martel. 2012. North American range extension of the

invasive Asian clam in a St. Lawrence River power station thermal plume. Aquatic Invasions, 7 (1) 81-89.

AR-1406. Sousa, R., C. Antunesand L. Guilhermino. 2008. Ecology of the invasive Asian clam *Corbicula fluminea* (Müller, 1774) in aquatic ecosystems: an overview. Ann. Limon. – Int. J. Lim., 44 (2), 85-94.

C. New Information Concerning New Technology-Based Standards for FGD Wastewater, Bottom-Ash Wastewater, Combustion Residual Leachate, and Non-Chemical Metal Cleaning Wastes at Merrimack Station

Under CWA § 301(a), 33 U.S.C. § 1311(a), point source discharges of pollutants into waters of the United States are unlawful unless, among other things, the discharges are authorized by an NPDES permit issued under CWA § 402, 33 U.S.C. § 1342. NPDES permits set effluent limits based on technology-based standards, except that if technology-based limits are insufficiently stringent to satisfy state water quality standards, then water quality-based effluent limits are applied. To establish technology-based limitations, the CWA authorizes EPA to promulgate effluent limitations guidelines (ELGs) and new source performance standards pursuant to CWA §§ 301, 304, and 306, 33 U.S.C. §§ 1311, 1314, and 1316. In addition, where EPA has not promulgated national technology-based standards, technology-based effluent limits may be developed for individual permits based on a best professional judgment (BPJ), site-specific application of the pertinent technology standard. *See* 33 U.S.C. § 1342(a)(1)(B); 40 C.F.R. §§ 125.3(a)(2) and (3).

ELGs are established by EPA regulation for categories of industrial dischargers and are based on the degree of control that can be achieved using various levels of pollution control technology, as specified in the Act. Section 301(b)(1)(A) of the Clean Water Act requires industrial dischargers, by July 1, 1977, to have satisfied limits based on the application of the best practicable control technology currently available (BPT). 33 U.S.C. §1311(b)(1)(A); *see also* 40 C.F.R. § 125.3(a)(2)(i). The statute further mandates that industrial dischargers were to have complied by March 31, 1989, with effluent limits for toxic and non-conventional pollutants that reflect the best available technology economically achievable (BAT). 33 U.S.C. §§ 1311(b)(2)(A) and (F); 40 C.F.R. § 125.3(a)(2)(iii) – (v). Industrial dischargers were also required by March 31, 1989, to have met limits for conventional pollutants based on the best conventional pollutant control technology (BCT). See 33 U.S.C. §1311 (b)(2)(E); 40 C.F.R. § 125.3(a)(2)(ii).

EPA first promulgated ELGs for the Steam Electric Power Generating category of point sources in 1974. *See* 40 C.F.R. Part 423. *See also* 39 Fed. Reg. 36186, *as amended at* 40 Fed. Reg. 7095 (February 19, 1975); 40 Fed. Reg. 23987 (June 4, 1975) (previously codified at 40 C.F.R. Part 423). EPA subsequently amended the regulations in 1977 and 1982. *See* 80 Fed. Reg. 67838; 78 Fed. Reg. at 34438-39 (describing the history of EPA's ELG rulemaking actions). Despite this rulemaking history, as of 2015, EPA had yet to promulgate ELGs addressing many toxic pollutants discharged by the electric power industry and the Agency was considering updates to the standards to reflect advancements in wastewater treatment processes.

EPA promulgated new ELGs on November 3, 2015, and they became effective on January 4, 2016 (the 2015 Steam Electric ELGs). 80 Fed. Reg. 67838 (Nov. 3, 2015). Numerous parties then challenged the new regulations in the Fifth Circuit Court of Appeals. *See Southwestern Electric Power Co., et al. v. EPA*, No. 15-60821. The Petitioners have filed briefs in support of their challenges to the Rule. EPA was scheduled to file its reply brief by May 4, 2017, but the court has now stayed this deadline, as explained below.

On March 24, 2017, EPA received a petition for reconsideration of the 2015 Steam Electric ELGs from the Utility Water Action Group (UWAG). On April 5, 2017, EPA received an additional petition for reconsideration from the Small Business Administration Office of Advocacy (SBA). *See UWAG Petition to Reconsider the Final Rule* (March 24, 2017); *SBA Petition to Reconsider the Final Rule* (April 5, 2017) (both available in EPA's online docket for the 2015 Steam Electric ELGs at https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-petitions-reconsideration). After reviewing the two petitions, EPA Administrator E. Scott Pruitt sent a letter to UWAG and SBA announcing his decision to grant their requests and reconsider the rule. AR-1366 (*EPA Response to UWAG & SBA Petitions – 2015 Steam Electric ELG Final Rule* (April 12, 2017)), *available at* https://www.epa.gov/sites/production/files/2017-04/documents/steam-electric-elg_uwag-sba-petition_epa-response_04-12-2017.pdf.

The Administrator also announced that the Agency would "issue an administrative stay of the compliance dates in the rule that have not yet passed pending judicial review." *Id.* at 1. That same day, the Administrator signed a Public Notice entitled, "Stay of Certain Compliance Deadlines for the Final Rule Entitled 'Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category' Published by the Environmental Protection Agency on November 3, 2015." *Steam Electric Power Generating Effluent Guidelines - Stay of Certain Compliance Deadlines - FR Pre-Publication* (April 12, 2017). This Notice was then published in the Federal Register on April 25, 2017. *Postponement of Certain Compliance Dates for Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*, 82 Fed. Reg. 19005 (Apr. 25, 2017), *available at* https://www.federalregister.gov/documents/2017/04/25/2017-07811/postponement-of-certain-compliance-dates-for-effluent-limitations-guidelines-and-standards-for-the. In the Federal Register notice, the Administrator determined, after considering the objections raised in the petitions for reconsideration, that it is appropriate and in the public interest to reconsider the 2015 Steam Electric ELGs and postpone certain compliance dates in the ELGs pursuant to Section 705 of the Administrative Procedure Act (APA). 5 U.S.C. § 705. Specifically, the notice serves to administratively stay, pending judicial review, compliance dates that have not yet passed for certain new, more stringent effluent limitations and standards in the ELGs.[6]

In its letter of April 12, 2017, to UWAG and SBA, as well as its April 25, 2017, Federal Register Notice, EPA also indicated its intention to "file a motion requesting the Fifth Circuit to hold the

[6] The compliance deadlines affected are those identified at 40 C.F.R. §§ 423.11(t), 423.13(g)(1)(i), 423.13(h)(1)(i), 423.13(i)(1)(i), 423.13(j)(1)(i), and 423.13(k)(1)(i), and 40 C.F.R. §§ 423.16(e), 423.16(f) 423.16(g) 423.16(h) 423.16(i), originally published at 80 Fed. Reg. 67838 (Nov. 3, 2015). 82 Fed. Reg. 19006.

litigation challenging the Rule in abeyance while the Agency reconsiders the Rule," and to "conduct notice and comment rulemaking to stay the compliance deadlines for the new, more stringent limitations and standards in the Rule." 82 Fed. Reg. at 19005-19006. At the same time, other provisions of the 2015 Steam Electric ELGs were not stayed and presently remain in effect. On April 14, 2017, EPA filed a motion seeking to stay the proceedings in the Fifth Circuit pending reconsideration of the ELGs. The motion specifically requested a 120-day stay and that, upon the conclusion of the 120 days, EPA be permitted to file a motion to govern further proceedings and inform the court whether it wishes to seek a remand of any provisions of the ELGs. *Southwestern Elec. Power Co., v. EPA*, No. 15-60821 (docket). After numerous parties filed responses to EPA's motion, the Court granted the Agency's request and stayed the litigation for 120 days, as outlined in the Court's April 24, 2017, Order.

Then, on May 3, 2017, numerous environmental groups filed a complaint in District Court for the District of Columbia alleging that by issuing the April 25, 2017, notice described above, EPA violated the Administrative Procedure Act (APA). *Climate Action Network v. EPA*, No. 17-00817 (May 3, 2017). This litigation has yet to result in any rulings and may or may not ultimately affect EPA's stay of compliance deadlines in the 2015 ELGs. As a result, it is currently unclear whether this case will have any bearing on EPA's development of the Merrimack Station permit.

Finally, as EPA foreshadowed in the April 12, 2017, Letter and the April 25, 2017, Postponement, on June 6, 2017, the Agency published a Proposed Rule entitled, "Postponement of Certain Compliance Dates for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category." 82 Fed. Reg. 26017 (June 6, 2017). Publication of the Proposed Rule commenced a notice-and-comment rulemaking process to stay the compliance dates for certain new, more stringent limitations and standards in the 2015 Steam Electric ELGs. The proposed rule seeks to stay the same provisions of the Steam Electric ELGs that are subject to the current administrative postponement, and it is "intended as a temporary, stopgap measure to prevent the unnecessary expenditure of resources until EPA completes reconsideration of the 2015 rule."[7] 82 Fed. Reg. 26017, 26018. EPA has accepted public comments on the proposed rule and specifically requests comments "on whether this postponement should be for a specified period of time, for example, two years." *Id.*

As is evident from the discussion thus far, the regulatory landscape within which the Steam Electric Power Generating Point Source Category is governed has shifted in significant ways since EPA issued the 2011 Draft Permit for Merrimack Station. These regulatory shifts constitute new information that raises certain substantial new questions for the Merrimack Station NPDES permit. Therefore, EPA is issuing this public notice and reopening the public comment period to invite the public to submit comments on the information and questions specified below.

[7] Because the April 25 Postponement only stays the compliance deadlines *pending judicial review*, EPA determined that it was necessary to conduct notice and comment rulemaking to "postpone certain compliance dates in the rule *in the event that the litigation ends*, and while the Agency is undertaking reconsideration." 82 Fed. Reg. 26017, 26018 (emphasis added).

1. FGD Wastewater

a. FGD Wastewater Limits Prior to 2015 Promulgation of ELGs

Discharges of wastewater from a flue gas desulfurization (FGD) scrubber system to a water of the United States must comply with the requirements of an NPDES permit, *see* 33 U.S.C. §§ 1311(a) and 1342(a), which must include effluent limits that satisfy federal technology-based treatment requirements as well as any more stringent state water quality-based requirements that may apply. Although compliance with the best available technology (BAT) standard was due by March 31, 1989, *see* 40 C.F.R. § 125.3(a)(2)(iii) and (iv), at the time the 2011 Draft Permit and 2014 Revised Draft Permit were developed, the ELGs for the Steam Electric Power Generating Point Source Category, *see* 40 C.F.R. Part 423, did not include BAT limits for FGD wastewater.[8] In the absence of applicable ELGs, technology-based limits are developed by EPA (or state permitting authorities administering the NPDES permit program) on a case-by-case, Best Professional Judgment (BPJ) basis. *See* 33 U.S.C. § 1342(a)(1)(B); 40 C.F.R. § 125.3(c) ("Where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the Act."). *See also* AR-608 (Fact Sheet for the 2011 Draft Permit, Attachment E), pp. 3-4.

b. 2011 Draft Permit Conditions

For the 2011 Draft Permit, Region 1 conducted a BPJ evaluation in which it examined eleven candidate technologies to determine the BAT for treating wastewater from Merrimack Station's FGD system. *See* 40 C.F.R. §§ 125.3(a)(2)(iv) and (v), (c)(3). At that time, Region 1 proposed, based on BPJ, that the Station's newly installed primary treatment system (providing physical/chemical treatment and the EMARS (mercury removal) feature) for FGD wastewater, coupled with biological treatment, was the BAT for limiting the discharge of pollutants present in FGD wastewater at Merrimack Station. *See* AR-608, Attachment E. Therefore, based on the proposed BAT treatment system, Region 1 included effluent limits for FGD wastewater in the 2011 Draft Permit, including specific limits for various metals (*e.g.*, mercury, arsenic, selenium), chlorides, and total dissolved solids (TDS). Because these limits differed from those applied to low volume waste and other wastes deposited into the slag settling pond, Region 1 concluded that the FGD wastewater needed to be sampled at a separate internal outfall (Outfall 003C) prior to mixing with other wastes in the settling pond. *See id.*, Attachment E. Once discharged through internal Outfall 003C into the slag settling pond, however, the FGD wastewater was to remain subject to the limits for total suspended solids (TSS) and Oil and Grease (which are the same for all the commingled wastes in the slag settling pond) at Outfall 003A.

c. 2014 Revised Draft Permit Conditions

[8] In the 1982 ELGs, EPA had regulated FGD wastewater as a part of the "low volume waste" category of effluent, which was subject only to BPT limitations for TSS and Oil and Grease. *See* 39 Fed. Reg. 36186, *as amended at* 40 Fed. Reg. 7095 (February 19, 1975); 40 Fed. Reg. 23987 (June 4, 1975) (previously codified at 40 C.F.R. § 423.12).

After the public comment period for the 2011 Draft Permit concluded, Region 1 learned that PSNH had installed and, in June of 2012, begun operating Vapor Compression Evaporation (VCE) treatment technology to treat and reduce the volume of FGD wastewater at Merrimack Station so that direct discharge of the wastewater to the Merrimack River would be unnecessary. *See* AR-638; AR-303; AR-1135, p. 18. Given this new information, Region 1 completed a new BPJ, case-by-case analysis of BAT for Merrimack Station and "determined that the Facility's existing primary FGD wastewater treatment system (which includes physical/chemical treatment components and the EMARS system), combined with its [now] existing secondary FGD wastewater treatment (which includes the two-stage evaporation system which can be operated to achieve [zero liquid discharge] ZLD) are the [new proposed] BAT." AR-1135 (Fact Sheet for 2014 Revised Draft Permit), pp. 40-41. On this basis, EPA issued the 2014 Revised Draft Permit on April 18, 2014. The new Draft Permit proposed a zero discharge limit for pollutants in FGD wastewater based on the VCE technology outlined in the Region's BPJ determination. Under this approach, the internal outfall (Outfall 003C) created for FGD wastewater in the 2011 Draft Permit was no longer necessary and was removed from the Revised Draft Permit.

Both the 2011 Draft Permit and the 2014 Revised Draft Permit were developed in the absence of national BAT effluent limitation guidelines for FGD wastewater and, therefore, technology-based effluent limits for FGD wastewater in these draft permits were based on BPJ determinations. On November 3, 2015, however, EPA promulgated the 2015 Steam Electric ELGs after an extensive rulemaking process. 80 Fed. Reg. 67838 (Nov. 3, 2015). A number of the provisions of the 2015 Steam Electric ELGs apply to Merrimack Station and, as a result, if these provisions remain in effect, they will require changes to the effluent limits included in the 2014 Revised Draft Permit. *See* 40 C.F.R. § 122.43(b)(1). Relevant provisions of the 2015 Steam Electric ELGs, and their potential impact on Merrimack Station's Final Permit, are discussed below.

d. Requirements for FGD Wastewater in the 2015 Steam Electric ELGs

The new 2015 Steam Electric ELGs include significant new requirements for the control of FGD wastewater discharges. The new ELGs provide a new definition clearly distinguishing FGD wastewater from other wastestreams (particularly low volume wastes). 80 Fed. Reg. 67838, 67848 (Nov. 3, 2015) ("[T]he final rule establishes separate definitions for FGD wastewater, FGMC wastewater, gasification wastewater, and combustion residual leachate, making clear that these four wastestreams are no longer considered low volume waste sources."). They also set BPT limits for FGD wastewater that are the same as the BPT limits for low volume wastes. *See* 40 C.F.R. § 423.12(b)(3) and (12). Compliance with these BPT limits is due immediately and EPA has not postponed or stayed these BPT limits. *See* 40 C.F.R. § 125.3(a)(2); 82 Fed. Reg. 19006 (list of postponed provisions does not include 40 C.F.R. § 423.12(b)).

In addition to the BPT limits, the 2015 Steam Electric ELGs also established the first national BAT effluent limitation guidelines for FGD wastewater. These BAT limits are based on wastewater treatment using chemical precipitation followed by biological treatment. The new BAT standards for FGD wastewater, 40 C.F.R. § 423.13(g), state as follows:

(g)(1)

(i) *FGD wastewater.* Except for those discharges to which paragraph (g)(2) or (g)(3) of this section applies, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table following this paragraph (g)(1)(i). Dischargers must meet the effluent limitations for FGD wastewater in this paragraph by a date determined by the permitting authority that is as soon as possible beginning November 1, 2018, but no later than December 31, 2023. These effluent limitations apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph.

	BAT Effluent limitations	
Pollutant or pollutant property	**Maximum for any 1 day**	**Average of daily values for 30 consecutive days shall not exceed**
Arsenic, total (ug/L)	11	8
Mercury, total (ng/L)	788	356
Selenium, total (ug/L)	23	12
Nitrate/Nitrite as N (mg/L)	17.0	4.4

(ii) For FGD wastewater generated before the date determined by the permitting authority, as specified in paragraph (g)(1)(i), the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for TSS in § 423.12(b)(11).

40 C.F.R. § 423.13(g)(1)(i) and (ii). These effluent limitations provide the BAT standards that are generally applicable to facilities such as Merrimack Station. At present, however, EPA has indefinitely postponed the compliance date for the BAT limits in 40 C.F.R. § 423.13(g)(i), 82 Fed. Reg. 19006 (April 25, 2017), as well as commenced a notice-and-comment rulemaking process to stay these requirements. *See id.* It is unclear at this time whether these standards will be reinstated as enforceable requirements with a new compliance due date, or whether EPA will withdraw and/or replace them.

Furthermore, of particular significance for the Merrimack Station permit, the BAT effluent limitation guidelines for FGD wastewater in the 2015 Steam Electric ELGs also establish what is referred to as the "Voluntary Incentives Program" (VIP). *See* 40 C.F.R. § 423.12(g)(3)(i) and (ii); 80 Fed. Reg. 67841 n.6, 67852-67853, and 67858-67859. The VIP sets more stringent effluent limitations than the baseline BAT standards based on the pollutant reduction capability of treatment with evaporation technology. *See id.* at 67858-67859. Compliance with the VIP limits is not, however, legally required for all facilities. Instead, the VIP limits are presented as a *voluntary compliance alternative* that dischargers may choose to comply with at their option. The VIP "provides the certainty of more time (until December 31, 2023) for plants to implement

new BAT requirements, if they adopt additional process changes and controls that achieve limitations on mercury, arsenic, selenium, and TDS in FGD wastewater, based on evaporation technology." 80 Fed. Reg. at 67858; *see also* 40 C.F.R. 423.13(g)(3).[9] In other words, in exchange for voluntarily opting to meet the more stringent limits, the facility gets more time to achieve compliance. A facility participating in the VIP has until December 31, 2023, to comply with the stricter BAT effluent limits. Prior to the compliance date of December 31, 2023, the facility's FGD wastewater needs only to comply with BPT-based TSS limits.

With regard to the VIP, 40 C.F.R. § 423.13(g)(3) provides the following:

> **(g)(3)**
>
> **(i)** For dischargers who voluntarily choose to meet the effluent limitations for FGD wastewater in this paragraph, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table following this paragraph (g)(3)(i). Dischargers who choose to meet the effluent limitations for FGD wastewater in this paragraph must meet such limitations by December 31, 2023. These effluent limitations apply to the discharge of FGD wastewater generated on and after December 31, 2023.

	BAT Effluent limitations	
Pollutant or pollutant property	**Maximum for any 1 day**	**Average of daily values for 30 consecutive days shall not exceed**
Arsenic, total (ug/L)	4	
Mercury, total (ng/L)	39	24
Selenium, total (ug/L)	5	
TDS (mg/L)	50	24

> **(ii)** For discharges of FGD wastewater generated before December 31, 2023, the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for TSS in § 423.12(b)(11).

40 C.F.R. § 423.13(g)(3). In sum, the new ELGs treat FGD wastewater as a distinct wastestream and establish a two-pronged set of potentially applicable BAT effluent limitations: 1) "default" BAT limits that generally apply to all covered facilities; and 2) alternative BAT limits that are more stringent, but only apply if a covered facility opts into the VIP. The regulations clearly articulate that EPA *shall* apply the VIP BAT limits (and compliance deadline) set forth in 40 C.F.R. § 423.13(g)(3)(i) and (ii) to any facility that opts into the VIP program.

[9] More specifically, a facility must "indicate their intent to opt into the program prior to issuance of its next NPDES permit, following the effective date of this rule. A plant can indicate its intent to opt into the voluntary program on its permit application or through separate correspondence to the NPDES Director, as long as the signatory requirements of 40 CFR 122.22 are met." 80 Fed. Reg. at 67859.

In its recent regulatory actions, EPA neither postponed or stayed the compliance deadline, the effluent limitations, or any other aspect of the VIP program. *Therefore, the VIP requirements remain in effect.*

In addition, both BAT options in the new ELGs also establish less stringent BAT limits that apply to FGD wastewater discharges *prior to* the applicable deadline for compliance with the more stringent BAT limits.[10] *See* 40 C.F.R. § 423.13(g)(1)(ii) and (g)(3)(ii). Specifically, for discharges of FGD wastewater prior to the final BAT compliance deadlines, the 2015 Steam Electric ELGs set "interim" BAT limits that address only TSS. These BAT limits for TSS match the BPT limits for TSS in 40 C.F.R. § 423.12(b)(11).

The 2015 Steam Electric ELGs for FGD wastewater apply to Merrimack Station's NPDES permit and, if in effect, these new requirements would supplant the effluent limits that EPA earlier developed on a BPJ basis for the 2014 Revised Draft Permit and the 2011 Draft Permit. *See* 40 C.F.R. §§ 122.43(b)(1), 125.3(c)(1). As a result, once they were promulgated, EPA began to consider the application of the new ELGs to the Merrimack Station permit.

e. Application of the 2015 Steam Electric ELGs to Merrimack Station's FGD Wastewater

As discussed above, the technology-based effluent limits and corresponding compliance timelines for controlling FGD wastewater discharges that are specified in the 2015 Steam Electric ELGs are different in many respects from the effluent limits proposed in both the 2014 Revised Draft Permit and the 2011 Draft Permit. If the 2015 Steam Electric ELGs are in effect, they are controlling for the Final Permit for Merrimack Station. *See* 40 C.F.R. §§ 122.43(b)(1) and 125.3(c)(1). Therefore, for the Final Permit, EPA expected to make changes to the limits in the 2014 Revised Draft Permit to conform the Final Permit's effluent limits and compliance deadlines to the new ELGs.

On March 23, 2016, after the new ELGs became effective, PSNH sent a letter to EPA formally opting to comply with the requirements of the VIP. *See* AR-1343. On July 7, 2016, PSNH submitted another letter to EPA further discussing its decision to opt into the VIP and its view of the specific applicability of the VIP limits and compliance deadlines to Merrimack Station. AR-1354. With its July 7, 2016, letter, PSNH attached a report discussing its FGD wastewater treatment system, but labelled the report as Confidential Business Information (CBI). *Id.* (Attachment). As a result of the CBI claim, this report is presently part of the administrative record for the NPDES permit but *not* part of the public portion of the record. EPA has, however, obtained from PSNH a redacted copy of the report that obscures the CBI and this redacted version of the report has been included in the public version of the administrative record. *See*

[10] For the default option, these discharges include those generated prior to the date that the permitting authority determines compliance is required (between November 1, 2018, but no later than December 31, 2023). 40 C.F.R. § 423.13(g)(1)(i). For the VIP option, the discharges include those generated prior to December 31, 2023. 40 C.F.R. § 423.13(g)(3)(i).

AR-1416. The two letters and the report were submitted to Region 1 after the comment period for the 2014 Revised Draft Permit ended. Therefore, while these materials have been included in the Administrative Record, potentially interested parties have not yet had an opportunity to comment to EPA on these documents.

As stated previously, the new regulations require the NPDES permitting authority to apply the BAT limits outlined in the VIP to any facility that chooses to participate in the program. Therefore, having received PSNH's letters outlining its decision to opt into the VIP, EPA anticipated including the new final VIP effluent limits for arsenic, mercury, selenium, and TDS in the Final Permit and giving the Facility until December 31, 2023, to comply with such limits. 40 C.F.R. § 423.13(g)(3)(i). As outlined above, these effluent limits are as follows:

Pollutant or pollutant property	BAT Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Arsenic, total (ug/L)	4	.....
Mercury, total (ng/L)	39	24
Selenium, total (ug/L)	5	.....
TDS (mg/L)	50	24

Furthermore, consistent with the regulations, EPA also anticipated including in Merrimack Station's Final Permit the following interim BAT limits for TSS in FGD wastewater discharged *prior to* December 31, 2023:

Pollutant or pollutant property	BPT Effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0

40 C.F.R. § 423.13(g)(3)(ii).[11]

f. New Administrative and Legal Developments

As discussed previously, EPA recently granted a number of petitions requesting that the Agency reconsider the 2015 Steam Electric ELGs. In conjunction with this decision, EPA also decided to

[11] In addition to the BAT limits for TSS, the BPT limits for Oil and Grease will also be applied in the Final Permit prior to (and after) the VIP compliance date. *See* 40 C.F.R. § 423.12(b)(11); *see also* AR-608, p. 22.

administratively postpone, pending judicial review, the deadlines that have not yet passed for compliance with new, more stringent effluent limitations in the Rule. 82 Fed. Reg. 19005 (Apr. 25, 2017). The Federal Register notice lists the specific provisions being postponed as follows: 40 C.F.R. §§ 423.11(t), 423.13(g)(1)(i), (h)(1)(i), (i)(1)(i), (j)(1)(i), and (k)(1)(i), and §§ 423.16(e), (f), (g), (h), and (i). Included in this list is the provision that sets the default BAT requirements for FGD wastewater. *See* 40 C.F.R. § 423.13(g)(1)(i). Therefore, the compliance deadlines established for the BAT limits based on chemical and biological treatment technology for FGD wastewater are now postponed, pending judicial review. In addition, as stated above, EPA has also begun notice-and-comment rulemaking to postpone the compliance deadlines specified in the current administrative postponement, pending completion of EPA's reconsideration of the 2015 Steam Electric Guidelines. 82 Fed. Reg. 26017 (June 6, 2017) (Proposed Rule).

That said, 40 C.F.R. § 423.13(g)(1)(ii), which establishes the (interim) BAT limits for discharges of FGD wastewater *prior to* the deadline for final compliance, has not been postponed. Therefore, the 2015 Steam Electric ELGs still provide BAT limits for FGD wastewater —equal to TSS limits listed in 40 C.F.R. § 423.12(b)(11)— even while the postponement is in effect. Moreover, EPA has not postponed the provisions of the 2015 Steam Electric ELGs that establish the VIP as an optional way to comply with BAT standards for FGD wastewater.[12] 40 C.F.R. § 423.13(g)(3). Therefore, opting into the VIP remains a viable, more environmentally protective option for meeting the BAT standards.

In the case of Merrimack Station, not only did PSNH previously decide to opt into the VIP, but on April 18, 2017, PSNH informed EPA that regardless of the postponement and reconsideration of other aspects of the 2015 Steam Electric ELGs, the Company still intends to comply with VIP requirements at Merrimack Station. AR-1382 (Telephone Call between Mark Stein, Senior Assistant Regional Counsel, EPA Region 1 and Linda T. Landis, Senior Counsel, Eversource Energy). Therefore, EPA currently expects that any technology-based requirements included in the Final Permit for Merrimack Station's FGD wastewater will be based on the VIP requirements set forth in the 2015 Steam Electric ELGs. As such, the above-indicated VIP final BAT effluent limitations will apply as of December 31, 2023, and the above-indicated interim BAT limits for TSS will apply prior to that date.[13] *See* 40 C.F.R. § 423.13(g)(3)(i) and (ii).

g. Invitation for Comments on Technology-Based Effluent Limits for FGD Wastewater

EPA has described and explained the new requirements for discharges of FGD wastewater under the 2015 Steam Electric ELGs, including both the "default" BAT requirements and the VIP requirements. In addition, EPA has explained the current status of these requirements under EPA's recent administrative actions: EPA has postponed the compliance deadlines for the new

[12] The Notice of Proposed Rule also has not identified 40 C.F.R. § 423.13(g)(3) (the VIP) as a provision that will be subject to the more permanent stay. 82 Fed. Reg. 26017.
[13] EPA notes that if PSNH had not opted to comply with the VIP requirements, then the above-specified TSS limits would apply as the currently effective and applicable BAT effluent limitations. 40 C.F.R. § 423.13(g)(1)(ii).

more stringent effluent limits in the default BAT requirements but has *not* postponed the VIP requirements. Merrimack Station has opted to comply with the VIP.

EPA currently anticipates that the effluent limits and compliance deadlines for controlling FGD wastewater that will be included in the Final Permit for Merrimack Station will, as described above, have to be based on the requirements of the VIP program of the 2015 Steam Electric ELGs. Given that EPA does not have the discretion to not apply the ELGs, *see* 40 C.F.R. §§ 122.43(b)(1) and 125.3(c)(1), it is not clear that there is an important purpose to be served by taking comment on issues concerning the application of the 2015 Steam Electric Guidelines to FGD wastewater. That said, EPA recognizes that the 2015 Steam Electric ELGs were promulgated after the comment period for the 2014 Revised Draft Permit and the public has not had a chance to comment on the application of the new regulations to the Merrimack Station permit.

Therefore, EPA is exercising its discretion, see 40 C.F.R. § 124.14(b)(1), to invite public comment on how the 2015 Steam Electric ELGs should be applied to set the Final Permit's requirements for Merrimack Station's FGD wastewater discharges.

2. Bottom Ash Transport Water

a. Bottom Ash Transport Wastewater Limits Prior to the 2015 Steam Electric ELGs

Like FGD wastewater, bottom ash transport water, or any wastewater that has direct contact with and is used to convey bottom ash at a steam electric power plant, 40 C.F.R. § 423.11(p), is regulated under the 2015 Steam Electric ELGs. Prior to the 2015 rulemaking, the Steam Electric ELGs established BPT-based limits for bottom ash transport wastewater, 47 Fed. Reg. 52290 (Nov. 19, 1982) (previously codified at 40 C.F.R. § 423.12(b)(4)), but failed to establish BAT or BCT limits for this particular wastestream. The regulations established BPT limits for TSS and Oil and Grease equal to the limits applicable to low volume waste. *Id.* Again, in the absence of promulgated technology-based effluent limits, the permitting authorities make BPJ case-by-case determinations as to BAT and BCT. *See* 40 C.F.R. § 125.3(c) ("Where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the Act.").

b. 2011 Draft Permit Conditions

The 2011 Draft Permit for Merrimack Station proposed to authorize the discharge of bottom ash transport water into the slag settling pond through Outfall 003A along with several other waste streams (including treated FGD wastewater, low volume wastes, and metal cleaning wastes) and stormwater. *See* AR-608 (Fact Sheet for the Draft 2011 Permit), p. 21. Bottom ash transport water, as well as all the other wastestreams to be discharged into the slag settling pond, were subject to technology-based effluent limits for TSS and Oil and Grease as outlined in 40 C.F.R. § 423.12(b)(3) and (4) (edition published July 1, 2015), and discharges from the slag settling pond were also subject to water quality-based limits for total recoverable aluminum, arsenic, copper,

mercury, and selenium based on New Hampshire DES's antidegradation analysis, which was triggered by the proposed FGD wastewater discharges. *See* AR-609, p. 4; AR-608, pp. 34-40. Both TSS and Oil and Grease are conventional pollutants subject to BCT limits, but because EPA has not yet promulgated BCT limits for Steam Electric power plants, *see* 40 C.F.R. § 423.14 (BCT limitations are "Reserved"), the Agency determined using BPJ that BCT limits for TSS and Oil and Grease at Outfall 003A (bottom ash and other low volume wastes) would be equal to the *BPT* limits for those pollutants. AR-608, p. 22.

Thus, in the 2011 Draft Permit, bottom ash transport water was commingled with low volume wastes, metal cleaning wastes, and stormwater, and was subject to the following technology-based limits (40 C.F.R. § 423.12(b)(3) and (4)):

Pollutant or pollutant property	**BPT effluent limitations**	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

c. 2014 Revised Draft Permit Conditions

Region 1 issued the 2014 Revised Draft Permit in response to new information indicating that Merrimack Station had installed and was operating evaporation technology to treat its FGD wastewater (*see* discussion of FGD wastewater above). Because Region 1 determined that the BAT for FGD resulted in zero discharge effluent limits based on using evaporation technology, the 2014 Revised Draft Permit contemplated that FGD wastewater would neither be treated and discharged into the slag settling pond through Outfall 003C, nor treated and discharged at Outfall 003A with other commingled waste, as allowed in the 2011 Permit. Therefore, the Revised Draft Permit eliminated Outfall 003C and required that the commingled wastewater comprised of bottom ash transport water, low volume wastes, stormwater, and metal cleaning wastewater, but excluding FGD wastewater, would be sampled and discharged at Outfall 003A. The effluent limits for bottom ash transport water and other wastewaters at Outfall 003A remained the same for TSS and Oil and Grease, based on 40 C.F.R. § 423.12(b)(3) and (4) (July 1, 2015), as those included in the 2011 Draft Permit. The water quality-based reporting requirements for chlorides, and the reporting requirements and effluent limits for aluminum, arsenic, copper, mercury and selenium, were removed from Outfall 003A because these water quality-based requirements were based on the presence of FGD wastewater in the slag settling pond, but under the 2014 Revised Draft Permit the FGD wastewater discharges would be eliminated.

d. Bottom Ash Transport Water Discharge Limits in the 2015 Steam Electric ELGs

The 2015 Steam Electric ELGs include amendments to the BAT limitations for bottom ash transport water and the deadline for compliance with such limits. The TSS and Oil and Grease BPT limitations for bottom ash have not changed. The 2015 ELGs do, however, outline two sets of BAT limitations for bottom ash transport water. 80 Fed. Reg. 67837, 67841. The first (or interim) set of limits place numeric effluent limitations on TSS in bottom ash transport water equal to the TSS limitations in the previous BPT regulations. 80 Fed. Reg. 67837, 67841; 40 C.F.R. §§ 423.13(k)(1)(ii), 423.12(b)(4). These interim BAT limitations apply to any discharge of bottom ash transport water that occurs *prior to* the final compliance deadline determined by the permitting authority (*see discussion of compliance dates below*).[14] The second (or final) set of limits applies *after the final compliance date* that has been set by the permitting authority. 40 C.F.R. § 423.13(k)(1)(i). This two-tiered set of BAT limitations for bottom ash transport water mirrors the 2015 Steam Electric ELG's two-tiered, interim and final BAT limitations scheme for FGD wastewater, as discussed above.

More specifically, the interim BAT limits for bottom ash transport water provide as follows:

> **(k)(1)**
>
> **(ii)** For discharges of bottom ash transport water generated before the date determined by the permitting authority, as specified in paragraph (k)(1)(i) of this section, the quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the concentration for TSS listed in § 423.12(b)(4).

40 C.F.R. § 423.13(k)(1)(ii).[15] This provision essentially incorporates the BPT limit for TSS in bottom ash transport water from 40 C.F.R. § 423.12(b)(4) as the interim BAT limit. The specific TSS limits are the same as the interim BAT limits for FGD wastewater discussed above. *Compare* 40 C.F.R. § 423.12(b)(4), *with* 40 C.F.R. § 423.12(b)(11) (single day maximum limit of 100.0 mg/L, and 30-day daily average limit of 30.0 mg/L). *See also* 40 C.F.R. § 423.13(g)(1)(ii) and (g)(3)(ii).

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[14] The preamble to the 2015 Steam Electric ELGs also explains that the interim effluent limitations for TSS also apply to any discharges of bottom ash transport water that occur after the effective date of the ELGs, but prior to November 1, 2018. EPA states as follows:

> [i]n cases where a plant's final NPDES permit will be issued after the effective date of the final ELGs, but before November 1, 2018, the permitting authority should apply limitations based on the previously promulgated BPT limitations or the plant's other applicable permit limitations until at least November 1, 2018.

80 Fed. Reg. 67837, 67883.

[15] It is important to note that while TSS is a conventional pollutant that is not generally subject to BAT regulations, EPA is regulating TSS under the BAT standard "as an indicator pollutant for the particulate form of toxic metals." 80 Fed. Reg. 67837, 67849 n.15.

The final set of BAT limitations are based on a determination that dry-handling or closed-loop technology is the BAT for treating bottom ash transport water, resulting in a zero discharge effluent limitation for all pollutants in bottom ash transport water. 80 Fed. Reg. 67837, 67841, 67846, 67849 (promulgated at 40 C.F.R. 423.13(k)(1)(i)). The zero discharge limitation must be met by a compliance date determined by the permitting authority that is as soon as possible between November 1, 2018, and December 31, 2023, and applies only to bottom ash discharges generated beginning on the determined compliance date. *Id.* The new provisions specifying this second, final set of limitations are as follows:

> **(k)(1)**
>
> > **(i)** *Bottom ash transport water*. Except for those discharges to which paragraph (k)(2) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, there shall be no discharge of pollutants in bottom ash transport water. Dischargers must meet the discharge limitation in this paragraph by a date determined by the permitting authority that is as soon as possible beginning November 1, 2018, but no later than December 31, 2023. This limitation applies to the discharge of bottom ash transport water generated on and after the date determined by the permitting authority for meeting the discharge limitation, as specified in this paragraph. Whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant (except when it is used in the FGD scrubber), the resulting effluent must comply with the discharge limitation in this paragraph. When the bottom ash transport water is used in the FGD scrubber, the quantity of pollutants in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the concentration listed in the table in paragraph (g)(1)(i) of this section.

40 C.F.R. § 423.13(k)(1)(i). While the second set of BAT limitations mandate that "there shall be no discharge of pollutants in bottom ash transport water," they also give the permitting authority discretion to determine the compliance date – *i.e.*, the date that is "as soon as possible" beginning on November 1, 2018, but no later than December 31, 2023 – for a particular discharging facility.

In the preamble to the 2015 Steam Electric ELGs, EPA clearly explains the scope of this discretion and how the permitting authority must proceed in selecting an appropriate compliance date. The preamble states that:

> [a]s specified by the rule, the "as soon as possible" date determined by the permitting authority is November 1, 2018, unless the permitting authority determines another date after receiving information submitted by the discharger. Assuming that the permitting authority receives relevant information from the discharger, in order to determine what date is "as soon as possible" within the

> implementation period, the permitting authority must then consider the following factors:
>
> (a) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule;
> (b) Changes being made or planned at the plant in response to greenhouse gas regulations for new or existing fossil fuel-fired power plants under the Clean Air Act, as well as regulations for the disposal of coal combustion residuals under subtitle D of the Resource Conservation and Recovery Act;
> (c) For FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment; and
> (d) Other factors as appropriate.

80 Fed. Reg. 67837, 67883 (internal footnotes omitted). A few procedural requirements are worth noting from the above-cited text. First, the presumptive compliance date (or "as soon as possible" date) is November 1, 2018. Next, the permitting authority may determine a later compliance date, but no later than December 31, 2023, and *only if* it receives information from the discharger justifying the later date. Finally, after receipt of such justification, the permitting authority may set a compliance date later than the presumptive date only after considering the factors set forth above.

e. Effects of the New Regulations and New Information

As promulgated, the 2015 Steam Electric ELGs significantly modified the national effluent limitation guidelines for discharges of bottom ash transport water by adopting the two-tiered BAT limits discussed above. Nevertheless, the first tier of BAT limitations does not substantively alter the Merrimack Station permit. These interim BAT limits essentially incorporate the TSS limits previously established under the BPT standard, and both the 2011 Draft Permit and the 2014 Revised Draft Permit applied the BPT limit for TSS (and Oil and Grease) to bottom ash transport water at the Facility. Therefore, during the interim timeframe (*i.e.*, during the time before the final compliance deadline), the 2015 Steam Electric ELGs impose the same effluent limits that were already included in the draft permits for Merrimack Station. The public has already had ample opportunity to comment on those specific limits.

The second, final set of BAT limitations, however, are based on different technology than is associated with the previously promulgated BPT limits. These BAT limits call for zero discharge of pollutants from bottom ash transport water. If in effect at the time of issuance of the Final Permit, these BAT limitations would govern the permit's final technology-based limits and EPA would apply the zero discharge limit to Merrimack Station's discharges of bottom ash transport water as of the appropriate compliance date. *See* 40 C.F.R. § 423.13(k)(i). *See also* 40 C.F.R. §§ 122.43(b)(1) and 125.3(c)(1). This limit would be more stringent than the effluent limits proposed in both the 2011 Draft Permit and the 2014 Revised Draft Permit, and it would require

PSNH to employ different treatment technology (*i.e.*, dry handling or closed loop technology) in order to achieve compliance.

A crucial component of applying the final BAT limitations is determining the compliance date. *See* 40 C.F.R. § 423.13(k)(1)(i). The 2015 Steam Electric ELGs vest permitting authorities, in this case EPA, with the authority to determine the compliance date that would be "as soon as possible" beginning November 1, 2018, but no later than December 31, 2023, for each facility covered by the ELGs. The regulations provide that EPA would automatically apply November 1, 2018, as the "as soon as possible" date unless the Region received relevant information from PSNH justifying an alternative date. Therefore, after promulgation of the 2015 ELGs, EPA asked PSNH how and when it would meet the final BAT limitations for bottom ash transport water. *See* AR-1377 (Series of Emails between Mark Stein, EPA Region 1, and Linda Landis, Senior Counsel, Eversource Energy, regarding bottom ash transport water, September 21, 2016).

On February 17, 2017, PSNH sent EPA a letter outlining its plan for achieving compliance with the new zero discharge limit for bottom ash transport water through installation of close-loop recycling technology. AR-1378. PSNH's letter presents information regarding anticipated challenges related to construction and other matters and ultimately suggests December 31, 2022, as the appropriate date for compliance with the zero discharge limitation.[16] Because PSNH marked the February 7, 2017, letter as "Confidential Business Information" (CBI), it is part of the administrative record for the permit, but not part of the *public* administrative record. EPA must maintain this CBI record with its confidential files. PSNH's letter provides information relevant to EPA's determination of the "as soon as possible" date for compliance. Therefore, pursuant to the new regulations and the accompanying language from the preamble, EPA was considering this information and was contemplating whether to set December 31, 2022, as the final compliance date, taking into account the listed factors. EPA recognizes that because the 2015 Steam Electric ELGs and PNSH's compliance plan were developed well after the public comment period ended for the Revised Draft Permit, the public has not yet had an opportunity to review and comment on these issues.

f. Recent Administrative and Legal Developments

As discussed above, recent administrative and legal developments—*i.e.*, EPA's decision to reconsider certain aspects of the 2015 Steam Electric ELGs, EPA's administrative postponement of compliance dates, and EPA's Proposed Rule concerning postponement of certain compliance dates, including the compliance date for bottom ash transport water—affect, or may affect, the regulatory requirements applicable to Merrimack Station's bottom ash transport water discharges. Region 1 outlines these potential effects below.

[16] Currently, slag settling pond water, which primarily consists of bottom ash transport water, is used as make-up water in the Facility's FGD scrubber. If PSNH's proposed closed-looped bottom ash transport system is installed at some point in the future, the Company could decide that some portion of that recycled transport water should be used as FGD scrubber make-up water. As previously mentioned, the 2015 Steam Electric ELGs allows for the discharge of bottom ash transport water when it is used in an FGD scrubber. *See* 40 C.F.R. § 423.13(k)(1)(i).

Postponement or Stay of Compliance Dates

As mentioned previously, in response to a number of petitions, EPA is reconsidering the 2015 Steam Electric ELGs. *See* 82 Fed. Reg. 19005. In addition, EPA has postponed the compliance dates contained in several sections of the 2015 Steam Electric ELGs, pending judicial review of the ELGs. 82 Fed. Reg. at 19006. The sections subject to postponement are only those which impose effluent limitations more stringent than the existing limitations and have compliance dates for the limits that have not yet passed. *See* 82 Fed. Reg.19005 - 19006; 40 C.F.R. §§ 423.11(t), 423.13(g)(1)(i), (h)(1)(i), (i)(1)(i), (j)(1)(i), and (k)(1)(i), and §§ 423.16(e), (f), (g), (h), and (i)). In addition, EPA has issued a Proposed Rule that proposes postponement of the same group of regulations and compliance deadlines pending the Agency's completion of its reconsideration of the ELGs. 82 Fed. Reg. 26017 (June 6, 2017). EPA is taking public comment on this proposed action through July 6, 2017. 82 Fed. Reg. at 26017.

Of particular import for the Merrimack Station NPDES permit, the list of affected sections includes 40 C.F.R. § 423.13(k)(1)(i), the regulatory provision setting BAT limits requiring zero discharge of pollutants in bottom ash transport water. The regulation called for this zero discharge standard to be met as soon as possible beginning November 1, 2018, but no later than December 31, 2023. EPA has now postponed this compliance deadline. While PSNH had developed a plan for meeting the zero discharge standard by December 31, 2022, it has now indicated to EPA that it will hold off on pursuing that plan in light of the postponement of the compliance deadline. PSNH indicated that it plans to wait for the results of EPA's reconsideration of the ELGs before deciding on how to proceed. *See* AR-1362 (Letter from Linda T. Landis, Senior Counsel, Eversource Energy, to Mark Stein, Senior Assistant Regional Counsel, EPA Region 1). With the compliance date for the zero discharge limit postponed and the ELGs under reconsideration, 40 C.F.R. § 423.13(k)(1)(i), EPA cannot incorporate that limit into Merrimack Station's Final Permit.

In the absence of the zero discharge limits, the 2015 Steam Electric ELGs prescribe the interim BAT effluent limits for TSS discussed above. 40 C.F.R. § 423.13(k)(1)(ii) (incorporating the TSS effluent limits from 40 C.F.R. § 423.12(b)(4)). These interim BAT limits have not been postponed or stayed. 40 C.F.R. § 423.13(k)(1)(ii). *See* 82 Fed. Reg. 19006. Therefore, under the 2015 Steam Electric ELGs that are currently in effect, BAT limits—equal to the TSS limits listed in § 423.12(b)(4)—apply to bottom ash transport water discharges. These TSS limits are the same as those included in the 2011 Draft Permit and the 2014 Revised Draft Permit. *See* AR-608 (Fact Sheet for 2011 Draft Permit), p. 21.

EPA currently anticipates that the interim TSS limits will constitute the technology-based limits applicable to Merrimack Station's bottom ash transport water. This could change in the future, however, if the status of the 2015 Steam Electric ELGs changes again prior to EPA's issuance of the Final Permit to Merrimack Station. As described above, the Agency is currently reconsidering the 2015 Steam Electric ELGs and upon completing that reconsideration, EPA might or might not conclude that one or more provisions of the ELGs should be changed. If it deems changes to the ELGs to be in order, EPA indicated that it will seek a remand of the ELGs from the Fifth Circuit Court of Appeals so that the Agency can conduct notice and comment

rulemaking to formally modify the ELGs. EPA has not yet completed its reconsideration of the ELGs, *see* 82 Fed. Reg. 19005, and there is no way to be sure about how or when the above-described legal developments concerning the 2015 Steam Electric ELGs will be resolved.

At the same time, EPA is continuing its ongoing effort to finalize and issue a renewed permit to Merrimack Station. Ultimately, for the Merrimack Station permit, EPA will apply the technology-based requirements that are in effect at the time of Final Permit issuance. *See* 40 C.F.R. § 122.43(b)(1).[17] Presently, with the Administrator's postponement in effect, EPA anticipates including the interim BAT limits for TSS in the Final Permit for Merrimack Station's bottom ash transport water discharges.[18]

The Region welcomes public comment on how the Final Permit for Merrimack Station should regulate discharges of bottom ash transport water in light of (a) the 2015 Steam Electric ELGs, (b) the postponement of the compliance deadline for the final, zero discharge BAT limits pending judicial review, and (c) the current proposed rulemaking to stay the compliance deadline pending EPA reconsideration of the ELGs. More specifically, EPA also invites public comment on what technology-based effluent limits should be applied to Merrimack Station's bottom ash transport water discharges and what the compliance deadline should be for meeting all such limits.

3. Non-chemical Metal Cleaning Waste

Merrimack Station also discharges both chemical and non-chemical metal cleaning wastes, which are both subsets of the metal cleaning waste category identified and regulated under the Steam Electric ELGs. Metal cleaning wastes are subject to BPT limitations for TSS, Oil and Grease, copper, and iron. 40 C.F.R. § 423.12(b)(5). *Chemical* metal cleaning wastes are subject to BAT limitations for copper and iron that are equal to the limits identified as BPT. 40 C.F.R. § 423.13(e). The BAT regulations for *non-chemical* metal cleaning wastes are "Reserved." 40 C.F.R. § 423.13(f). Because BAT limits for non-chemical metal cleaning wastes are "reserved," the permitting authority determines BAT limits for this waste on a BPJ, case-by-case basis. This regulatory structure was created well before the 2015 Steam Electric ELGs were promulgated and was not modified by the new ELGs.

During the rulemaking for the 2015 Steam Electric ELGs, EPA initially "proposed to establish BAT/NSPS/PSES/PSNS requirements for non-chemical metal cleaning wastes equal to previously established BPT limitations for metal cleaning wastes," 80 Fed. Reg. 67838, 67863 (Proposed Rule), and also proposed "an exemption for certain discharges of non-chemical metal

[17] EPA notes that a coalition of citizen groups recently filed a law suit challenging EPA's action to postpone the compliance dates of the more stringent limitations included in the 2015 Steam Electric ELGs. Ultimately, as explained before, technology-based limits will be derived from the ELGs that are in effect at the time of Final Permit issuance.

[18] Under this approach, bottom-ash transport water would continue to be discharged into the slag settling pond, and the abovementioned limits would be applied at Outfall 003A. Thus, bottom-ash would be regulated in the same manner as proposed in the Draft Permits issued for Merrimack Station before promulgation of the 2015 ELGs.

cleaning waste, which would be treated as low volume waste sources." *Id.* at 67863 n. 40. In the Final Rule, however, EPA took no action with regard to non-chemical metal cleaning wastes. The preamble clearly articulates this decision:

> [u]ltimately, EPA decided that it does not have enough information on a national basis to establish BAT/NSPS/PSES/PSNS requirements for non-chemical metal cleaning wastes. The final rule, therefore, continues to ''reserve'' BAT/NSPS/PSES/PSNS for non-chemical metal cleaning wastes, as the previously promulgated regulations did.

Id. at 67863. Thus, the Agency did not modify the standards governing non-chemical metal cleaning wastes in the 2015 rulemaking and, as a result, the new ELGs do not substantively alter the manner in which non-chemical metal cleaning waste discharges should be regulated at Merrimack Station.

Despite the lack of substantive changes to the ELGs, the preamble to the 2015 Steam Electric ELGs provides a detailed discussion of how these previously established limitations should be applied to discharges of non-chemical metal cleaning waste at individual facilities:

> [b]y reserving BAT and NSPS for nonchemical metal cleaning wastes in this final rule, the permitting authority must continue to establish such requirements based on BPJ for any steam electric power plant discharging this wastestream. As explained in Section VIII.I, in permitting this wastestream, some permitting authorities have classified it as non-chemical metal cleaning wastes (a subset of metal cleaning wastes), while others have classified it as a low volume waste source; NPDES permit limitations for this wastestream thus reflect that classification. In making future BPJ BAT determinations, EPA recommends that the permitting authority examine the historical permitting record for the particular plant to determine how discharges of non-chemical metal cleaning wastes have been permitted in the past. *Using historical information and its best professional judgment, the permitting authority could determine that the BPJ BAT limitations should be set equal to existing BPT limitations or it could determine that more stringent BPJ BAT limitations should apply*. In making a BPJ determination for new sources, EPA recommends that the permitting authority consider whether it would be appropriate to base standards on BPT limitations for metal cleaning wastes or on a technology that achieves greater pollutant reductions."

Id. at 67884 (emphasis added). This quoted language as well as other related comments in the preamble to the 2015 ELGs underscores the permitting authority's obligation to conduct a BPJ analysis for BAT for non-chemical metal cleaning waste and also emphasizes the importance of considering the historical permitting record at a particular facility. Finally, the preamble language explicitly states that this BPJ analysis may either result in limits equal to existing BPT limits or to more stringent limits. EPA believes that its analysis of this issue for the 2011 Draft Permit is fully consistent with past regulations and the more recent interpretations of such regulations outlined above. EPA's Fact Sheet for the 2011 Draft Permit clearly expresses the

Region's careful application of sections 423.13(e) and (f) to Merrimack Station's metal cleaning effluent. *See* AR-608 (Fact Sheet for the 2011 Draft Permit), pp. 28-33.

Region 1 welcomes public comment on how the Final Permit for Merrimack Station should regulate non-chemical metal cleaning waste discharges in light of the 2015 Steam Electric ELGs and the discussion in the preamble to the ELGs about how to regulate non-chemical metal cleaning waste discharges. As part of this, EPA specifically seeks comments on whether it should continue to rely upon its earlier BPJ determination of BAT limits for non-chemical metal cleaning wastes, or whether that discussion and analysis should be changed.

D. Interrelationship of Various Permit Changes

Thus far, EPA has discussed various types of new information that have emerged since the 2011 Draft Permit and the 2014 Revised Draft Permit were published for public comment. This new information includes the promulgation of the 2015 Steam Electric ELGs and numerous administrative developments related to the ELGs, such as EPA's postponement of certain compliance deadlines in the regulations. In the text above, EPA has identified specific ways in which this new information raises substantial new questions about how NPDES permit requirements for certain pollutants discharged by Merrimack Station should be finalized.

At Merrimack Station, different wastestreams and treatment processes can interact in complex ways. As a result, changes in permit requirements and treatment methods for one wastestream can lead to additional changes with regard to another wastestream. This section of this Statement of Substantial New Questions identifies and describes issues that could arise from such interactions between permit requirements, wastestreams and treatment methods. It also discusses logistical changes that may be undertaken to address these issues for the Final Permit.

First, the presence of different compliance schedules for separate wastestreams could impact what effluent limits should be applied when to various outfalls (i.e., sampling points) at the Facility. For example, the VIP compliance deadline of December 31, 2023, for FGD wastewater discharges, and any compliance deadline for the installation and operation of closed-cycle cooling technology, could have interactive effects on permit requirements.

As discussed above, low volume wastes, metal cleaning wastes, bottom ash transport water, stormwater and FGD wastewater will be permitted to be sent to, and discharged from, the slag settling pond and sampled at Outfall 003A. Before the VIP compliance date, all these sources would be subject to the same BAT limits on TSS and Oil and Grease, as well as water quality-based limits, based on New Hampshire DES's analysis as identified in the 2011 Draft Permit. *See* AR-608, pp. 22-26. Starting on the VIP compliance date of December 31, 2023, however, FGD wastewater would be subject to new effluent limits that are more stringent than those required for the other commingled wastestreams.[19] Therefore, EPA expects to include an internal

[19] FGD wastewater will also be subject to BCT limits for TSS and Oil and Grease equal to the BPT limits for those conventional pollutants. Once FGD wastewater is discharged from Outfall 003C into the slag settling pond, it will be

Outfall 003C, at which the FGD BAT limits for arsenic, mercury, selenium, and TDS will be applied. The BAT limits would be applied at an internal outfall because they are more stringent than the water quality-based limits that were previously applied at Outfall 003A to address the contribution of pollutants from FGD wastewater (other wastestreams did not trigger the water quality-based effluent limits).[20] The chart below provides a basic overview of the two relevant time periods or "Phases" of effluent limits:

Phase 1 **Effective Date of Permit until December 31, 2023**	**Phase 2** **Starting December 31, 2023**
• All wastestreams discharging into the slag settling pond are subject to same effluent limits (Flow, pH, TSS, Oil and Grease, and water quality-based limits triggered by FGD wastewater) at Outfall 003A.	• More stringent technology-based effluent limits for metals and TDS apply to FGD wastewater at internal Outfall 003C (40 C.F.R. § 423.13(g)(3)(i)). • All *other* wastestreams discharged into the slag settling pond are subject to the same effluent limits for flow, pH, TSS, and Oil and Grease at Outfall 003A. (Water quality-based limits are no longer necessary at Outfall 003A for arsenic, selenium, and mercury, but are still necessary for aluminum and copper.)

Therefore, EPA anticipates that the Merrimack Station NPDES Permit would include two phases of effluent limits as a result of the later-in-time compliance deadline for the VIP, described above.[21]

In addition, since EPA anticipates that the Merrimack Station permit may, in effect, require the use of closed-cycle cooling technology at the Facility, EPA discusses here the interaction between the abovementioned effluent limits and the possible installation and operation of closed-cycle cooling pursuant to permit requirements for controlling the Facility's thermal discharges (and potentially its cooling water intake structure effects).[22] With closed-cycle cooling, the Facility would no longer discharge once-through cooling water into the discharge canal. Removal of the once-through cooling water will significantly reduce the flow into the discharge canal and through Outfall 003. The reduction in flow would have a significant effect on Outfall

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subject to the same TSS and Oil and Grease limitations as the other commingled wastestreams, which are equal to the BCT limits just described.

[20] For the next permit reissuance, EPA will analyze and re-evaluate these water quality-based and technology-based limits based on the then current data and then applicable legal requirements.

[21] Region 1 further notes that these phases are based on the current status of the 2015 ELGs, where the compliance date for bottom ash transport water has been postponed and the interim BAT limits for TSS are in effect. If the postponement were not in effect, then the Region would anticipate including an additional phase of effluent limits to account for implementation of the zero discharge limitation for bottom ash transport water.

[22] As discussed farther above, EPA is currently contemplating whether the BTA under CWA § 316(b) for Merrimack Station's cooling water intake structures is closed-cycle cooling or cylindrical wedgewire screens.

003 because the reduced flow in the discharge canal could cause (or allow) river water to flow into the discharge canal, which would interfere with accurate sampling at Outfall 003. Therefore, the Region is considering the appropriateness of removing Outfall 003 from the permit once closed-cycle cooling is installed. Furthermore, because Outfall 003 is the location where whole effluent toxicity (WET) testing requirements are applied, if the Region required removal of the outfall, the WET testing requirements, as well as other effluent limits, would be applied at Outfall 003A instead of Outfall 003. Alternatively, EPA is also considering whether the discharge canal should instead be engineered to separate the process water in the canal from the river water so that limits and monitoring requirements would be applied at the point the re-engineered discharge canal (or pipe) discharge directly to the river.

While the Region specify with certainty when closed cycle cooling operations would begin, the installation of closed cycle cooling would result in modifications being needed for both Outfall 003 and Outfall 003A. Thus, closed cycle cooling triggers a *third phase* of effluent limits, that would be included after Phase 1 and either before or after Phase 2 begins. Two possible scenarios are described below:

Scenario 1:[23]

Phase 1 **Effective Date of Permit until Date Closed Cycle Cooling Becomes Effective**	**Phase 3** **Date Closed Cycle Cooling Becomes Effective (*before* December 31, 2023)**	**Phase 2** **Starting December 31, 2023 VIP Compliance Deadline**
• All wastestreams discharging into the slag settling pond are subject to same effluent limits (Flow, pH, TSS, Oil and Grease, and Water Quality based limits) at Outfall 003A.	• All wastestreams discharging into the slag settling pond are subject to same effluent limits (Flow, pH, TSS, Oil and Grease, and Water Quality based limits) at Outfall 003A. • *WET Testing applied at Outfall 003A.* • *Removal of Outfall 003 or engineered solution to separate process water from river water in the discharge canal.*	• More stringent FGD effluent limits apply at internal Outfall 003C for metals (40 C.F.R. § 423.13(g)(3)(i)). • All *other* wastestreams discharged into the slag settling pond are subject to the same effluent limits for only flow, pH, TSS, and Oil and Grease at Outfall 003A. (Water quality based limits are no longer necessary at Outfall 003A for arsenic, selenium, and mercury, but are still necessary for aluminum and copper.) • *WET Testing applied at Outfall 003A.* • *Removal of Outfall 003 or engineered solution to*

[23] The changes resulting from closed cycle cooling are italicized in Scenarios 1 and 2.

		separate process water from river water in the discharge canal.

Scenario 2:

Phase 1 **Effective Date of Permit until December 31, 2023**	**Phase 2** **Starting December 31, 2023, VIP Compliance Deadline**	**Phase 3** **Date Closed Cycle Cooling Becomes Effective (*after* December 31, 2023)**
• All wastestreams discharging into the slag settling pond are subject to same effluent limits (Flow, pH, TSS, Oil and Grease, and Water Quality based limits) at Outfall 003A.	• More stringent FGD effluent limits apply at internal Outfall 003C for metals (40 C.F.R. § 423.13(g)(3)(i)). • All *other* wastestreams discharged into the slag settling pond are subject to the same effluent limits for only flow, pH, TSS, and Oil and Grease at Outfall 003A. (Water quality based limits are no longer necessary at Outfall 003A for arsenic, selenium, and mercury, but are still necessary for aluminum and copper.)	• More stringent FGD effluent limits apply at internal Outfall 003C for metals (40 C.F.R. § 423.13(g)(3)(i)). • All other wastestreams discharged into the slag settling pond are subject to the same effluent limits for only flow, pH, TSS, and Oil and Grease at Outfall 003A. (Water quality based limits are no longer necessary at Outfall 003A for arsenic, selenium, and mercury, but are still necessary for aluminum and copper.) • *WET Testing applied at Outfall 003A.* • *Removal of Outfall 003 or engineered solution to separate process water from river water in the discharge canal.*

Region 1 welcomes public comment on how the Final Permit for Merrimack Station should address the interaction between different wastestreams' compliance deadlines and other effluent requirements, in light of the 2015 Steam Electric ELGs and the new 316(b) regulations. Specifically, the Region seeks comment on the potential scenarios described above, or other scenarios, and the proposed methods for addressing changes in flow at Merrimack Station.

E. Other Minor Modifications

1. Sufficiently Sensitive Test Methods Rule

After Region 1 assembled and published the 2014 Revised Draft Permit for public notice, EPA Headquarters promulgated a rule entitled, "National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting"

(Sufficiently Sensitive Test Methods Rule). 79 Fed. Reg. 49001 (Aug. 19, 2014). The rule provides the following:

> [t]he purpose of today's final rule is to codify that where EPA-approved methods exist, NPDES applicants must use sufficiently sensitive EPA-approved analytical methods when quantifying the presence of pollutants in a discharge, and the Director must prescribe that only sufficiently sensitive EPA-approved methods be used for analyses of pollutants or pollutant parameters under the permit.

79 Fed. Reg. 49001, 49001-49002. Because this rule was not finalized or promulgated until after Region 1 published the Revised Draft Permit, the Sufficiently Sensitive Test Methods requirements were not included. These regulatory requirements are now effective, however, and must be incorporated into Merrimack Station's Final Permit. Pursuant to the new regulations, Region 1 anticipates including the following language in the Merrimack Station Permit:

> In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall use sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapter N or O, for the analysis of pollutants or pollutant parameters limited in this permit (except WET limits). A method is considered "sufficiently sensitive" when either: (1) The method minimum level (ML) is at or below the level of the effluent limit established in this permit for the measured pollutant or pollutant parameter; or (2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapter N or O for the measured pollutant or pollutant parameter. The ML is not the minimum level of detection, but rather the lowest level at which the test equipment produces a recognizable signal and acceptable calibration point for a pollutant or pollutant parameter, which is representative of the lowest concentration at which a pollutant or pollutant parameter can be measured with a known level of confidence. For the purposes of this permit, the detection limit is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions (i.e., the level above which an actual value is reported for an analyte, and the level below which an analyte is reported as non-detect).

The public has yet to comment on the manner in which this new rule is reflected in Merrimack Station's NPDES permit. Therefore, Region 1 welcomes comment on EPA's proposed method of reflecting the Sensitive Test Methods Rule in the Merrimack Station NPDES Permit, including the specific language quoted above.

2. Effluent Limits for PCBs

EPA would like to point out an additional modification that it anticipates will be a necessary addition to the Merrimack Station Permit. In both the 2011 Draft Permit and 2014 Revised Draft Permit, EPA failed to include an effluent limit prohibiting the discharge of polychlorinated

biphenyl compounds (PCBs) in wastestreams discharged by the Facility. EPA did not expect there to be any PCB discharges from Merrimack Station and the Facility did not request authorization for any such discharges. Still, the Steam Electric ELGs have long included provisions that prohibit discharges of PCBs. 40 C.F.R. §§ 423.12(b)(2), 423.13(a). Specifically, the BPT limits for all wastestreams subject to the Steam Electric ELGs provide that:

> (2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 C.F.R. § 423.12(b)(2). Moreover, BAT limits for all wastestreams are subject to the same PCB prohibition:

> (a) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 C.F.R. § 423.13(a).

Therefore, the permitting authority—in this case EPA—should include a zero discharge limitation for PCB discharges from facilities in the Steam Electric point source category. EPA acknowledges that in assembling the previous draft permits for Merrimack Station, it did not prohibit PCB discharges expressly, although EPA also did not authorize any such discharges. EPA now intends to incorporate an express zero discharge limit for PCBs in the Merrimack Station Permit. The Permit will include the exact language of the rule (*i.e.*, "There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.") to establish an overall permit limit prohibiting the discharge of PCBs. Finally, the Region notes that this zero discharge limit is included in Merrimack Station's 1992 Permit, which remains in effect, *see* AR-236, p.3, Part I(A)(1)(h), and the limit could not be relaxed due to antibacksliding requirements. *See* 33 U.S.C. § 1342(o).

EPA is hereby notifying the public of this addition to the Merrimack Station Permit and invites any public comment on this subject.

3. <u>Relevance for NPDES Permit Development of Merrimack Station's Reduced Capacity Utilization and the Current Process for Auctioning the Facility</u>

As mentioned above, since issuance of the 2011 Draft Permit, Merrimack Station's capacity utilization rate has dropped considerably. Whereas the Facility used to operate as a baseload plant, it now operates more as a peaking plant. It operates little in the shoulder seasons of fall and spring, but can operate a great deal during the peak demand periods that occur during cold winter conditions and hot summer conditions. *See* AR-1369 and AR-927.

EPA is considering whether this changed operating profile should trigger changes to the permit limits being developed for the Facility's NPDES permit. At present, EPA has determined that the changing operating scenario does not provide a basis for altering what would otherwise be the permit limits. PSNH has not indicated any desire or willingness to have the Facility's operations

restricted based on its current capacity utilization. Instead, the Company has sought permit limits based on the Facility operating at full capacity. Furthermore, market conditions could change in the future, as they have in the past, and more frequent operations could be called for. Therefore, consistent with the Company's permit application, EPA has approached the permit based on the assumption of full-scale operations. Furthermore, given that the Facility still operates at high rates in hot summer and cold winter conditions, its extensive operations during those periods can still potentially have serious environmental effects.

While this is EPA's current view, the Agency invites public comments on what effect, if any, Merrimack Station's reduced capacity utilization rate should have on the limits for the Facility's new Final NPDES Permit.

In addition, since issuance of the 2011 Draft Permit, New Hampshire has called for PSNH to divest of its electrical generating assets. *See* H.B. 1602, Ch. 310, 2014 N.H. Laws (2014) (an act relative to the divestiture of PSNH assets); *2015 Public Service Company of New Hampshire Restructuring and Rate Stabilization Agreement*, 18 (June 10, 2015), *available at* https://www.eversource.com/Content/docs/default-source/rates-tariffs/psnh-june-2015-divestiture-settlement-agreement.pdf?sfvrsn=0; N.H. Rev. Stat. Ann. § 369-B:3-a. Therefore, PSNH is receiving bids from prospective purchasers for Merrimack Station and PSNH's other generating assets. The bidding process is currently underway, with the expectation being that a sale of the Facility could be consummated by the end of 2017. *See* AR-1390 On the other hand, it is also possible that the sale of the Facility will take longer or that no sale will occur. If the Facility is not sold to a new owner after two rounds of the auction process, then New Hampshire law in conjunction with PSNH's 2015 Settlement Agreement appear to call for the Facility to be retired. *2015 Public Service Company of New Hampshire Restructuring and Rate Stabilization Agreement*, 22 (June 10, 2015); *see also Amendment to the 2015 Public Service Company of New Hampshire Restructuring and Rate Stabilization Agreement*, 4 (Jan. 26, 2016), *available at* http://www.puc.state.nh.us/Regulatory/Docketbk/2014/14-238/LETTERS-MEMOS-TARIFFS/14-238_2016-01-26_EVERSOURCE_EXECUTED_AMEND_2015_PSNH_SETTLEMENT.PDF. At the same time, a new buyer might or might not decide to close the Facility.

While there is considerable uncertainty about how all this will unfold, EPA currently concludes that none of it currently affects the NPDES permit limits for Merrimack Station's permit. If a new owner purchases the Facility and continues its operations, then the permit can be modified to address the change in ownership. 40 C.F.R. §§ 122.63(d) and 124.5(c)(3). If a new owner decides to close the Facility, EPA would then consider what ramifications such a closure plan would have for the permit. For example, under the 2014 CWA § 316(b) Regulations, the permitting agency can consider a facility's remaining useful life in determining requirements for its cooling water intake structures. *See* 40 C.F.R. § 125.98(f)(2)(iv). *See also* 40 C.F.R. § 122.47(b).

EPA welcomes public comment regarding whether the current auction process for Merrimack Station should affect any of the Final Permit's limits and, if so, how it should affect them.

V. Comment Period and Procedures for Final Decisions

All persons, including permit applicants, submitting comments on the issues identified for comment in this Statement must raise all issues and submit in full all available arguments, and all supporting material for their arguments, by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, Industrial Permits Branch, 5 Post Office Square, Suite 100, Boston, Massachusetts 02109-3912. As part of making decisions on the Final Permit, Region 1 will respond to all significant comments and make these responses available to the public.

Following the close of the comment period, Region 1 will consider the comments submitted and issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days of Region 1's serving notice of the final permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board to review any condition of the permit decision. See 40 C.F.R. § 124.19(a)(3).