west virginia department of environmental protection

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Pursuant to 45 CSR §13-8.8, the Division of Air Quality presents the

FINAL DETERMINATION

for the

Construction Permit

of

Longview Power LLC

Maidsville Facility

located in

Maidsville, Monongalia County, West Virginia

Permit Application Number: R13-3495

Facility Identification Number 061-00134

Date: December 23, 2020

BACKGROUND INFORMATION

Application No.:	R13-3495
Plant ID No.:	061-00134
Applicant:	Longview Power LLC
Facility Name:	Longview Power LLC
Location:	Maidsville
NAICS Code:	221112
Application Type:	Construction
Received Date:	June 1, 2020
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	$1,000.00
Date Received:	June 1, 2020
Complete Date:	July 29, 2020
Due Date:	October 27, 2020
Applicant Ad Date:	July 17, 2020
Newspaper:	*Dominion Post*
UTM's:	Easting: 580.6 km Northing: 4,306.9 km Zone: 17
Description:	This action is to establish a carbon dioxide emission standard using the Best Standard of Emission Reductions (BSER) outlined in the Emission Guidelines of 40 CFR 60, Subpart UUUUa. This action is to establish a carbon dioxide emission standard using the Best Standard of Emission Reductions (BSER) outlined in the Emission Guidelines of 40 CFR 60, Subpart UUUUa (also referred to as the ACE Rule) for a Pulverized Coal-Fired Steam Generating Unit (PC-Boiler).

NOTICES AND PUBLICATION

Pursuant to 45 CSR §13-8.7. the West Virginia Division of Air Quality (DAQ) sent a copy of the advertisement, engineering evaluation, and draft permit to representatives of the applicant, and U.S. EPA Administrator, on October 8, 2020 via email. On October 9, 2020, the DAQ went to public notice in the above-noted newspaper with an "Intent to Approve" Longview Power LLC's permit to establish a carbon dioxide standard for their existing coal-fired electric generating unit (EGU) in Maidsville, Monongalia County, West Virginia. The Application, Draft Permit, Engineering Evaluation, and Interim Permit Review (IPR) File were made available at the following web link:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

Under 45 CSR §13-9.1., the Director determined that holding a public meeting was appropriate for this application. On October 27, 2020 at 6:00 pm, the DAQ conducted a public meeting to provide information to the public regarding what was being permitted under this

application and to take oral comments from the public. This meeting was held virtually to prevent the spread of COVID-19 in accordance with the WVDEP COVID-19 Policy. Notice for the public meeting was incorporated into the legal advertisement for the "Notice of Intent to Approve," the notice was provided to the U.S. EPA Administrator and applicant's representatives, and was sent to all subscribers of the Department of Environmental Protection's Enhanced Mailing List on October 9, 2020.

Comments on the Draft Permit were accepted until 5:00 PM on November 9, 2020.

This Final Determination summarizes the comments received on the draft permit, includes responses to the comments, and documents any actions taken or changes made in response to the comments regarding Permit Application R13-3495.

COMMENTS ON THE DRAFT PERMIT

During the public comment period, comments were received from the parties listed below. Each is briefly summarized here. All original comments and associated DAQ responses are in the public file available at https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

U.S. EPA's Comments

The DAQ did not receive any comments from the U.S. EPA Administrator or his/her representative during the public comment period.

Written Comments

During the comment period, the DAQ received two comment letters supporting the application and draft permit from the West Virginia Attorney General Mr. Patrick Morrisey; and second one from the West Virginia congressional delegation, which was signed by Congressman Mr. David McKinley, Congresswoman Ms. Carol Miller, Congressman Mr. Alex Mooney, and Senator Ms. Shelley Moore Capito. In addition to these two letters of support, the DAQ received a written copy of Congresswoman Miller's comments made during the October 27, 2020. These letters do not require any response.

The DAQ received two sets of comment emails from two separate organizations (Mon Valley Clean Air Coalition and the Sierra Club West Virginia Chapter). Also, the DAQ received five emails from individuals. The following table was developed to link specific responses to individual commenters.

Commenter No.	Name of Organization	Name of Commenter	Submittal Date
1	N/A	Joe Robinson	October 26, 2020
2	N/A	Bill Reger-Nash	October 28, 2020
3	N/A	Betsy Lawson*	October 31, 2020
4	N/A	Stephen Lawson*	November 1, 2020

5	N/A	Stephen Lawson*	November 1, 2020
6	Sierra Club WV	James Kotcon	November 9, 2020
7	Mon Valley Clean Coalition	Duane G. Nichols	November 9, 2020

** Stephen Lawson and Betsy Lawson submitted identical comments three times from two different email addresses.*

Comment #1 from Commenter 2, 3,4,5, 6, and 7

Several commenters commented that the permit would allow Longview Power to emit more carbon dioxide emissions. One commenter, Comment #6, specifically noted that the unit degradation factor is compounding the bin limits and the UDAF should only be based on the base year. The DAQ assumed that the other comments were implying this in their remarks as well.

DAQ's Response to Comment #1

This permit is to establish a carbon dioxide emissions standard in accordance with the emission guidelines that EPA established under the ACE Rule.[1, 2] Under this regulation, the carbon dioxide standard must be established in the terms of pounds (lbs) of carbon dioxide per unit of energy output from the emissions unit.[3] The limits in Permit R13-3495 do not relieve Longview Power of the responsibility to comply with all of the requirements established in R14-0024G which includes a limit on the amount of heat energy that can be burned in their electric generating unit (EGU). This heat energy input limit indirectly caps Longview's carbon dioxide emissions on a mass basis. However, this indirect cap is not in the form of the CO_2 standard as set forth in the emissions guidelines[4] and, therefore, is not acceptable. The permit does not replace or increase the heat input restriction in Permit R14-0024G.[5]

The ACE Rule requires evaluation of seven heat rate improvement technologies that EPA determined to be the Best System of Emission Reductions (BSER) for existing coal-fired EGUs.[6] If the evaluation of the BSER technologies had determined that there were additional heat rate improvement (HRI) opportunities through the implementation of feasible BSER technologies, then there would have been a corresponding reduction in the standard from the baseline. For the Longview Power BSER evaluation, that was not the case, as there were no additional HRI opportunities available. Based on DAQ's review of Longview Power's evaluation of the BSER candidate technologies identified in the federal ACE emission guidelines, Longview Power has fully implemented six of the seven BSER candidate technologies and practices. The only BSER

[1] EPA-452/R19-003, Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, June 2019, Page 1-9
[2] 84 FR 32520, Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, July 8, 2019, page 32521.
[3] 84 FR 325555. (July 8, 2019)
[4] 40 CFR §60.5755a(a)(1).
[5] Permit R14-0024G, Condition 5.1.1.a.
[6] 84 FR 32537. (July 8, 2019)

technology not currently installed is the use of variable frequency drives (VFD) on some facility equipment; however, the technology currently being utilized by Longview Power is equivalent to or better than VFDs in this application, in the opinion of the DEP. Enumeration of the reasons that the Variable Frequency Drives (VFD) were not feasible is provided starting on page 10 of the Engineering Evaluation. Therefore, there is not a corresponding reduction to the CO_2 emission rate at Longview Power that is consistent with the anticipated HRI ranges provided in Table 1 of the federal ACE emission guidelines.[7]

This unit has been in service for less than ten years and most of the key pieces of equipment have not undergone a major maintenance outage. The unit will degrade (unit heat rate performance will decay) over time with or without implementing these HRI technologies. Lacking unit specific data, Longview Power proposed a decay and recovery rate less than the decay rate (decay curve) of similar units operating in the same regional transmission organization (PJM). The DAQ's detailed evaluation of the proposed decay and recovery curve are provided in Regulatory Applicability Section of the Engineering Evaluation. The U.S. EPA recognized degradation of equipment in its discussion of the BSER candidate technologies, such as the blade path upgrade discussion when it states "(t)hese improvements in new turbines can also be utilized to improve the efficiency of older steam turbines whose efficiency has degraded over time."[8]

Regarding the calculation of the standard of performance for each load bin based on the mean plus two times the standard deviation, statistically speaking, 95% of the data will fall within this range. This is important especially for load bins LB-1 through LB-4 due to the smaller amount of data available in the baseline period for these load bins because Longview Power has operated over 90% of the time in LB-5. The use of the standard deviation therefore accounts for normal operational and measurement variability. It is worth noting that measurement accuracy alone can account for more variation than calculating the standard as the mean plus two times the standard deviation. Additional discussion on this topic was provided in the engineering evaluation and in DAQ's Response to Comment #12 regarding a suggested alternative approach.

The permit allows for a 0.4% increase per year in the standard in terms of pounds per megawatt hour over 5 years because of the degradation of the emissions unit between maintenance outages. The permit also provides for a decrease of the standard of 0.7% every fifth year to account for the efficiency recovered during reconditioning/repairing degraded equipment during major maintenance outages. The compounding as referred to by Commenter # 6 is applied in the same manner for the degradation (increase the bin limits) and recovery (decreasing the bin limits) years and is capped in 2046, as shown in Appendix A of the Engineering Evaluation. For additional explanation of degradation, please also refer to the DAQ's Response to Comment #14 and to Mr. Kotcon's Comment #6 for additional discussion concerning the Unit Degradation Adjustment Factor (UDAF).

[7] 84 FR 32537, (July 8, 2019), Table 1 - Summary of Most Impactful HRI Measures and Range of Their HRI Potential (%) by EGU Size, page 32537.
[8] 84 FR 32539 (July 8, 2019)

Comment #2 from Commenter 2

Please do not allow Longview to spew more toxic emissions into our air, waterways, and ultimately our soil.

DAQ's Response to Comment #2

This permit only establishes a carbon dioxide emission standard for Longview Power's EGU. The limitations imposed in this permit do not alter Longview Power's obligation to comply with all the limitations within Permit R14-0024G. Permit R14-0024G requires Longview Power to control its release of hazardous air pollutants (HAPs) to levels below major source thresholds (e.g., total HAPs less than 25 tons per year).

Comment #3 from Commenters #3, 4, 5, and 7

Several comments questioned the legal grounds to develop and establish a carbon dioxide standard in accordance with the ACE Rule. Also, the timing to issue a permit with such limits in it.

DAQ's Response to Comment #3

Longview Power elected to move forward and develop a carbon dioxide emission standard for their unit in line with the Emission Guidelines set forth in the ACE Rule without a mandate developed and approved by the State of West Virginia. Longview Power elected to proceed using the Rule 13 Permitting Process (45 CSR 13) to make this carbon dioxide emission standard enforceable and permanent. The authority for 45 CSR 13 is provided under West Virginia Code § 22-5-11, *Construction, modification or relocation permits required for stationary sources of air pollutants*.

Owners/operators of stationary sources can submit a request to obtain a permit to establish enforceable terms on a voluntary basis under Rule 13, Section 5.5.[9] Longview Power initially applied to have their R14-0024G permit administratively updated. The DAQ determined that using the administrative update process[10] did not provide public participation and did not allow the DAQ the authority to establish reasonable conditions which would be necessary to completely account for all of the requirements for developing a CO_2 standard and determined that a construction permit application should be submitted. There is no provision within 45 CSR 13 that allows the DAQ to deny such permit unless the permitted source will violate applicable emissions standards or interfere with attainment or maintenance for an applicable ambient air quality

[9] 45 CSR 13, Permits for Construction, Modification, Relocation and operation of Stationary Sources of Air Pollutants, Notifications, Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation, 45 CSR 13-5.5.
[10] 45 CSR §13-4.

standard.[11] Under West Virginia Code § 22-5-6, the violation of a permit is subject to the same enforcement remedies as the violation of a rule.

The West Virginia State Code was amended during the 2020 Legislative Session which requires the DAQ to submit a complete or partial state plan to the U.S. EPA by September 1, 2020 for one or more of the EGU facilities that voluntarily were prepared to move forward with a permit application to limit CO_2 emissions for one or more of their EGUs.[12] Even without a specific mandate, Longview Power has a right under DAQ rules to request a voluntary permit to establish carbon dioxide emission standards and the agency has been tasked by the West Virginia Legislature to process such a request in a manner that can be used to develop a state plan to fulfill the State of West Virginia's obligation to comply with the ACE Rule.

West Virginia Code and Rule 13 require the DAQ to render a final decision on each application within 90 days once the application is determined to be complete.[13, 14] Thus, the DAQ is obligated to make a final decision on all complete applications in a timely fashion.

In this permitting action, the DAQ is attempting to comply with the timelines outlined in the West Virginia Code for acting on permits and as a prerequisite for submitting a timely state plan to the U.S. EPA.

Comment #4 from Commenters #3, 4, and 5

"Doubtless Longview has the provision that permits extra emissions when not operating at full capacity clearly in mind. This, as inevitably coal energy will become less profitable as alternative energy becomes more so, as it already is. On top of this economic crutch, an increase of 0.4% per annum after 20 years would allow an increase to 108% from the starting point, more if compounded - instead of less, as the future habitability (and economic stability) of the world requires."

DAQ's Response to Comment #4

U.S. EPA allowed/granted the states flexibility in establishing CO_2 standards by not providing a model rule or guidance on the ACE Rule.[15] U.S. EPA has made it clear to the states that the standard must include all periods of operation, which include startup, shutdown, and non-base load operating times. The Longview Power EGU was designed to operate in a base load operation mode, and currently operates as a base load unit. While Longview Power would prefer to operate as a base load unit, its most efficient mode, the DAQ recognizes that due to the economic

[11] 45 CSR 13, Rule 13, 45 CSR §13-5.7.
[12] Chapter 22 Environmental Resources, Development of State Plan Relating to Carbon Dioxide Emissions from Exiting Fossil Fuel-Fired Electric Generating Units. West Virginia Code §22-5-20.
[13] W. Va. Code § 22-5-11(d).
[14] 45 CSR §13-5.7.a
[15] 84 FR 32521. (July 8, 2019)

dispatch of units by PJM, there are limitations on Longview Power's ability to operate as a base load unit long-term.

Longview Power is a single merchant power plant operating in the PJM regional transmission organization (RTO). PJM Interconnection is a RTO that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. Longview Power is compensated for its generation based on wholesale electricity pricing rates, which are set by PJM for each operating day. Also, PJM controls or determines how much electricity Longview Power will generate each day. This supply and demand process sets the pricing based on the amount of electricity needed to maintain the electric grid each day. Longview Power cannot control the pricing or the demand for its electricity each operating day, that is the role of the RTO.

The DAQ believes that the load bin approach accounts for the unit's efficiencies at all load ranges and allows the standard to be constraining regardless of which operating load the unit is operating within. The first issue with setting a single limit based on the average of the carbon dioxide over all operating loads is that the standard would clearly not be constraining at the unit's most efficient operating load. The second is that the standard must be achievable for all operating modes.

Establishing specific conditions to account for unit degradation is not unheard of in the New Source Review Program.[16,17] The Virginia Department of Environmental Quality (VA DEQ) established heat rate and carbon dioxide limits for the Chickahominy and Greenville Power Stations in their permits. These conditions allowed for the incremental increases in the unit's heat rate and carbon dioxide rate limits over time. The incremental increase that VA DEQ permitted was approximately 0.25% annually for the Chickahominy Power Station and 0.31% annually for the Greenville Power Station. Both facilities are combined cycle combustion turbine EGUs.

As noted earlier and in the engineering evaluation, Longview Power's EGU operates in the PJM's RTO market. The daily pricing is based on supply and demand for electricity each day, and accounts for the cost from lower cost generators – natural gas, hydro, solar and wind operators. Economics, the daily pricing and the unit's operating cost, will ultimately determine if the unit will operate.

Please refer to DAQ's Response to Comments #1, #14, and Mr. Kotcon's Comment #6 for additional explanation concerning the unit degradation adjustment factor.

[16] Virginia Department of Environmental Protection, Construction Permit for Chickahominy Power Station – Registration No. 52610, June 24, 2019, Condition 8 and 35 on pages 4 and 13.
[17] Virginia Department of Environmental Protection, Construction Permit for Greenville Power Station – Registration No. 52525, June 17, 2016, Condition 8 and 40 on pages 4 and 13.

Comment #5 from Commenters #3, 4, and 5

"Moreover, Longview included years of operation without their current more efficient emissions controls when proposing their averaged emissions, ensuring the ceiling would be well above their current emissions. This means that they are applying to emit above their current pollution levels, on top of the proposed increase. What is the point of having installed such, to propose to run them at 'half-cock' - apart from selling electricity more cheaply to their customers outwith West Virginia {sic}, which will suffer the poorer air quality, but where the permit would come from."

DAQ's Response to Comment #5

The selected baseline period is representative of the additional improvements that Longview Power has made within the scope of the BSER candidate technologies in the emissions guidelines. Longview also made additional improvements which were outside of the scope of BSER candidate technologies during the selected baseline period.

Of the BSER technologies, only the neural network and intelligent sootblowing technologies can be turned off or not utilized. The intelligent sootblowing systems are programed to activate the sootblowers at the target section of the unit without any action or acknowledgement from an operator. To prevent the generator from tripping offline, operators usually disable the intelligent sootblowing systems when the unit is operating at low loads that do not support sootblowing operations or program the system such that it is not activated at low steam production conditions.

Please also refer to DAQ's Response to Comment #1, #11, Ms. Rosser's Comments, and Ms. Barbor's Comments for additional responses on increases emissions.

Comment #6 from Commenters #3, 4, and 5

"How much of this does the taxpayer cover?"

DAQ's Response to Comment #6

Longview Power is a merchant power plant and is not regulated by the West Virginia Public Service Commission. DEP does not regulate how Longview is financed.

Comment #7 from Commenter #7

"Now the WV-DEP is proposing more concessions to Longview Power LLC so as to permit them to pollute the environment, even more than otherwise. How in God's name can you look at yourself in the mirror if you are the enabler of increased pollution? The WV-DEP has a responsibility to DECREASE pollution, NOT INCREASE IT, where have you been? In other words, who is running our state government?"

DAQ's Response to Comment #7

Please refer to DAQ's Response to Comments #1, #14, and Mr. Kotcon's Comments #6 and #7.

Comment #8 from Commenter #7

Because this draft permit would establish excessive and unnecessary carbon dioxide emissions, all other emissions will also be increased. The intent of climate change regulations is to reduce all greenhouse gases. Even the water vapor and the particulates contribute to this, so must be considered.

This draft is premature. There is no current level of regulation or control. In fact, the operation of Longview isn't needed, not necessary, since our PJM has plenty of generation. This company is not operating in as a public service, rather as a private operator for private gain, i.e. to maximize profits. The WV-DEP has no such mandate, rather you should function in the public interest.

DAQ's Response to Comment #8

U.S. EPA specified in the ACE Rule that the pollutant to be regulated is greenhouse gases (GHG) in the form of carbon dioxide and provided its justification for doing so by stating:

> The air pollutant regulated in this final action is GHGs. However, the standards in this rule is expressed in the form of limits solely on emissions of CO_2, and not the other constituent gases of the air pollutant GHGs. The EPA is not establishing a limit on aggregate GHGs or separate emission limits for other GHGs (such as methane (CH_4) or nitrous oxide (N_2O)) as other GHGs represent significantly less than one percent of total estimated GHG emissions (as CO_2equivalent) from fossil fuel-fired electric power generating units. Notwithstanding the form of the standard, consistent with other EPA regulations addressing GHGs, the air pollutant regulated in this rule is GHGs.[18]

Other emissions from Longview Power will not be increased because of this action. Emissions of other pollutants are regulated under Permit R14-0024G. Longview Power must continue to adhere to those other emission limitations regardless of this action.

The DAQ is responsible for regulating air pollution from EGUs and has no authority for regulating or approving electrical generation. One of the primary entities responsible for regulating and approving electrical generation is the Federal Energy Regulatory Commission

[18] 84 Fed. Reg. 32534 (July 8, 2019).

(FERC), an independent agency that regulates the interstate transmission of electricity, natural gas, and oil.

Longview demonstrated that the feasible BSER technologies have already been installed or implemented in accordance with the federal emission guidelines. The emission guidelines are focused on reducing carbon dioxide emissions from existing coal-fired EGUs. Longview Power meets the definition of an affected facility.

In the Regulatory Impact Analysis (RIA) for the ACE Rule, U.S. EPA acknowledged that the emission guidelines are not expected to result in any additional reductions in CO_2 emissions from units currently operating with a heat rate of less than 9,773 Btu/kWh.[19] U.S. EPA's own data indicates that Longview Power's unit heat rate is below this threshold.[20] The DAQ did not identify any additional improvements based on the BSER that would provide any additional heat rate improvements within the U.S. EPA's expected heat rate improvement potential ranges for the Longview Power unit. The commenter did not provide any specific HRI that the DAQ overlooked to suggest that the standard should be lower than proposed.

Neither the Clean Air Act nor the Air Pollutant Control Act[21] requires that the emission source or emission unit be operated as a public service.

Comment #9 from Commenter #6

1) The Engineering Evaluation (EE) for the draft permit indicates that the limits were established using annual emissions averages, plus two Standard Deviations. I have not found anything in the federal ACE rule nor in the proposed 45-CSR-44 state rule to require that either a 3-Standard-Deviation or 2-Standard Deviation variation be considered. Incorporation of statistical variability is appropriate to reflect random, uncontrollable variability in the production process or in measurement of the emission rate. The EE discusses variation in hourly and monthly emission rates. Because the proposed standard is based on annual average emissions variations over shorter time periods are irrelevant. The annual average emission rates at Longview are a compilation of thousands of individual measurements over the year and so, address random variability over shorter time frames. The variation in annual performance over time largely reflect matters, such as technology upgrades, ongoing maintenance schedules and operating loads that are within the control of the operator and are not random events. Other variables, such as variation in annual average cooling water temperature, that are not in LVP's control and could theoretically affect the annual average emission rate are ordinarily quite small and have not been separately determined by WVDEP. The historic emission rates at Longview (as measured and reported by the operator to EPA) demonstrate that the plant, even at

[19] U.S. EPA, Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, June 2019, Page 1-16.
[20] Nation Electric Energy Data System v6, https://www.epa.gov/sites/production/files/2020-10/needs_v620_10-05-20_0.xlsx, October 5, 2020.
[21] West Virginia Code Chapter 22-5.

10 years of age, has sustained and maintained rolling annual average emission rates below 1750 lb/MWh (gross) or 1925 lb/MWh (net).

DAQ's Response to Comment #9

Under the ACE Rule, U.S. EPA specifically intended the details of determining emission rates and standards development methods be under the purview of states.[22] Indeed, Congress has expressly provided that the U.S. EPA must permit states to take into consideration a source's remaining useful life, among other factors, when applying a standard of performance to a particular source.[23] U.S. EPA specifically acknowledges that the states are better suited to develop those standards and states should take into consideration source-specific factors, such as the EGU's past and projected utilization rate, maintenance history, and remaining useful life (among other factors), when develop such standards.[24]

Since every unit operates differently, a single hard-coded approach is not feasible. A permitting agency must consider the historical emission rates from each unit to determine at which levels the unit can be feasibly and most efficiently operated. This historical performance includes operational variation including random, unanticipated, and un-forecastable factors, such as variation in the annual average cooling water temperature. The economics and profitability of a unit are not within the scope of the agency's mission.

Regarding the calculation of the standard of performance for each load bin based on the mean plus two times the standard deviation, statistically speaking, 95% of the data will fall within this range. This is important especially for load bins LB-1 through LB-4 due to the smaller amount of data available in the baseline period for these load bins because Longview Power has operated over 90% of the time in LB-5. The use of the standard deviation therefore accounts for normal operational and measurement variability. It is worth noting that measurement accuracy alone can account for more variation than calculating the standard as the mean plus two times the standard deviation. Additional discussion on this topic was provided in the engineering evaluation and in DAQ's Response to Comment #12 regarding a suggested alternative approach.

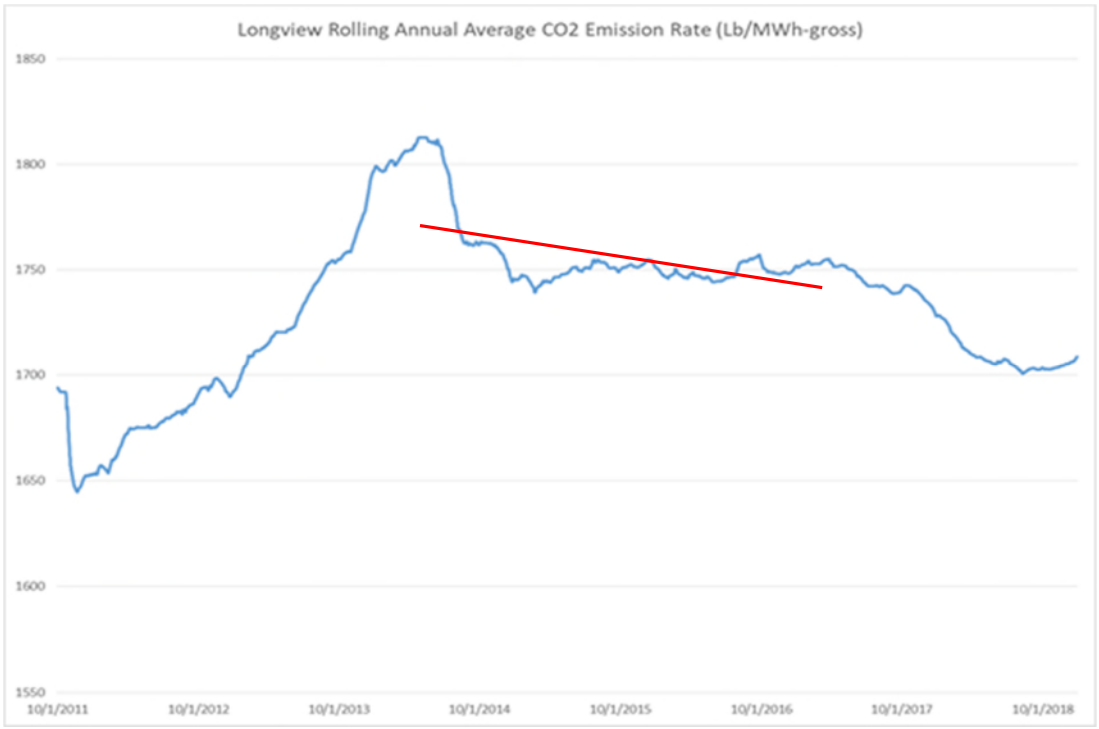
Comment #10 from Commenter #6

These data (See Figure One, below) also show that, after initial startup issues were resolved, the emission rate improved over time (as some – but by no means all - of the recommended HRI technologies were adopted) rather than degrading. It should also be understood that these rates include operation in all Load Bins and were achieved at a time when Longview's operator was under no obligation to maintain a specific emission limitation and may have found it to be economically rewarding to operate in a fuel-inefficient manner. Thus,

[22] 84 FR 32521-32523 and 32530. (July 8, 2019)
[23] 42 U.S.C. 7411(d)(1).
[24] 84 FR 32536.(July 8, 2019)

instead of seeking improvements in performance and reductions in emissions, the proposed limits in the draft permit would allow significant increases in greenhouse gas emissions.

Figure One from Commenter #6. Longview Rolling Annual Average Emission Rates[25]



DAQ's Response to Comment #10

It is always to the operator's economic advantage to operate in the most fuel-efficient manner possible, as fuel is the largest operational cost for any fossil-fuel EGU. Certain combinations of operating conditions may exist that compel an operator to temporarily operate in an inefficient manner, but these conditions are acutely transitory, unsustainable, unexpected, and would have little impact on the long-term average CO_2 emission rate. Longview is still a relatively new unit which has not experienced its first major maintenance outage. Over time the unit will degrade, even with all appropriate maintenance, similar to a new car which over time operates less efficiently, even with all scheduled maintenance.

Please also see the DAQ's Responses to Comment #1, Ms. Lawson's Comments, and Ms. Rosser's Comments concerning the increase in emissions and the DAQ's Responses to Comment #14, #15, Ms. Barbor's Comments, and Mr. Kotcon's Comments #6 and #7 concerning degradation.

[25] Source: emissions data reported by Longview to USEPA www.ampd.epa.gov.

Comment #11 from Commenter #6

The use of 2014-2018 data to calculate the average and Standard Deviation inflates the emissions because 2014 occurred before installation of certain HRIs, such as the Neural Network Upgrade (June 2015) and the Intelligent Combustion (Fall 2018). It certainly inflates the estimate of Standard Deviation because it includes higher rates from those years with lower rates in 2019-2020 in that calculation, Indeed, because of the increased Standard Deviation that results, the inclusion of the lower emission rates in 2017 and 2018 actually increases the proposed emission rate over what it would have been had only the pre-modification date (2014 to 2016) been employed. It is inappropriate to establish a standard for operation with HRIs by including emission data from years of operation without those HRIs. Yet the EE clearly states (page 22, repeated on page 23) that:

"the entire baseline period was used for developing the standards for all of the bins".

The most appropriate approach would be to estimate the variability in emissions based solely on 2019 and 2020 data, because those are the only data for emissions with all HRIs in place. The mean and the variance can be estimated from the hourly emissions data from those years. Thus, the mean for all emissions in 2019 should be 1899 lbs/MWh or lower.

DAQ's Response to Comment #11

The baseline period ultimately selected to calculate the standard is 2016 through the second quarter of 2020 because all BSER HRIs were installed prior to this timeframe, specifically so the standard was calculated after the BSER HRIs were implemented. The comment that 2014-2018 data was used to calculate the standard and the commenters assertion that the standard was inflated as a result are incorrect.

Intelligent combustion HRI is not identified as a BSER candidate technology in the emission guidelines and therefore has no bearing on the selection of the baseline period. See DAQ's Response to Comment #12 for further explanation.

The DAQ's decision to retain the baseline period as 2016 through the second quarter of 2020 remains appropriate for the reasons previously identified in the Engineering Evaluation. Please also refer to the DAQ's Responses to Comment #1 above and Comment #12 below for additional discussion concerning the standard deviations for the baseline period.

Comment #12 from Commenter #6

Furthermore, the 2019-2020 data represent a mean over hours of operation that include all of the operating loads. Figure 8 of the EE indicates that Longview operated at something less than 90 % of the time, and Figure 12 suggests that the plant was operating in Load Bin 0 (<40 % capacity) approximately 50-100 hours in 2019 when would have the highest emissions rates, and had a significant number of operating hours in Load Bins 1-4 in 2019-2020. Table 4

(page 23) implies that emissions limits were calculated using emissions data for the respective Load Bins, however, those means do not match the levels in the draft permit. It is inappropriate to establish a standard for operation with HRIs during periods of peak performance (full capacity loads) by including emissions data from hours of operation at lower unit loads, when emissions per MWh are higher.

DAQ's Response to Comment #12

As noted by the commenter, 1st and 2nd Quarters of 2020 contains emissions data that increase the number of data point for the lower load bins. Longview Power and the DAQ added this additional time to the base period to increase the amount of data for the lower load bins which was needed to allow the use of a cumulative approach to refine the data with an acceptable standard deviation for each of the bins. This additional data by itself would not be sufficient in developing a limit for these lower bins, which will be explained in further detail in this response.

The use of load bins allows the DAQ to evaluate the unit's emission data and limit the variability to load bins. Furthermore, the standards or limits are weighted averages for each load bin based on the number of hours operated in a particular load bin and the established limit for that load bin. To clarify, if the unit operated in LB-5 (i.e., full capacity load range) 100% of the time, the lower load bin limits would have no effect on the LB-5 limit.

The DAQ was tasked in this review process to develop and establish a realistic performance standard that is both constraining and achievable. Looking at a shorter baseline period limits the amount of data (number of data points) to be considered in the lower load bins. Such data is needed for the approach that the DAQ used to develop the standard.

The following table was developed using 2019 unit data through 2nd Quarter 2020 unit data as suggested by the commenter.

Table 1 Evaluating Longview Power Emissions Data from 2019 through 2nd Quarter of 2020[26]		
	Shorten Baseline Period of 2019 to 2020 2nd Qtr.	**Baseline Period of 2016 to 2020 2nd Qtr.**
	CO_2 Rate (lb/MWh-net)	
Average Rate for LB-1	2140	2183
Count for LB-1	11	24
Standard Deviation of LB-1	96	22
Commenter's Suggested Limit for LB-1*	2333	2,231
Average Rate LB-2	2038	2050
Count for LB-2	11	25
Standard Deviation of LB-2	54	29

[26] Data Source used to determine the values in the table is Clean Air Markets Division of Longview Power, ORIS 56671, Quarter 1, 2, 3, 4 of 2019, and Quarter 1, 2, and 3 of 2020. U.S. EPA Field Audit Checklist Tool Version 1.6.0.3 was used to obtain these data set from CAMD.

Commenter's Suggested Limit for LB-2*	2146	2108
Average Rate for LB-3	1993	1998
Count for LB-3	17	34
Standard Deviation of LB-3	36	26
Commenter's Suggested Limit for LB-3*	2065	2050
Average LB-4	1952	1966
Count for LB-4	18	38
Standard Deviation of LB-4	32	18
Commenter's Suggested Limit for LB-4*	2015	2002
Average Rate for LB-5	1893	1916
Count for LB-5	18	42
Standard Deviation of LB-5	21	21
Commenter's Suggested Limit for LB-5*	1935	1958

* The bin limit was calculated by adding the average for the bin to two times the standard deviation for the bin.

As shown in Table 1 above, for Load Bins 1-4, the commenter's suggested approach for calculating the standard is based on fewer data and results in a less stringent standard for those load bins. The average rate for each bin using the shorter period is lower than the average rate based on the selected baseline used to develop the proposed standards. This shorter period does not reduce or minimize the variability in the hourly rates by bin, which is indicated in the standard deviation in the above table except for Load Bin 5. The 95% confidence level of the data for the shorter period ranges from 10.4 for Load Bin 5 to 64.7 for Load Bin 1.

The 95% confidence level from the approach used in the permit ranges from 6.0 (for Load Bin 4) to 12.1 (for Load Bin 2). This approach gave the DAQ a reasonable level of confidence that future carbon dioxide emissions rates should comply with the permit over the whole normal operating range of the unit. The 95% confidence level for the shorter baseline period is almost nonexistent in the lower to mid operating ranges. For LB-1 with the shorter baseline period, the standard deviation was determined to be four times higher than the standard deviation determined using the four and half years of data for the baseline period with the DAQ approach.

Due to these low confidence levels using the data from the shorter baseline period, the method used to account for the whole or nearly the whole population of the data (2*SD) in the load bin limits would need to be revisited as well. Two times the standard deviation (critical value) would only account for the whole population of the data for Load Bin 5. 2*SD does not account for the highest rate from the population. To account for this issue, the individual bin limits for the normal operating range would be raised even higher than listed in the above table.

The processed data using the suggested shorter baseline does not minimize the variability in the data. The standard deviation from the shorter baseline period ranged from a low of 21 for LB-5 to a high of 96 for LB-1. DAQ used a 12-month rolling average to refine the monthly data to yield a standard deviation that ranged from a low of 18 for LB-4 to a high of 29 for LB-2.

Another approach suggested by the commenter that might seem appropriate is the use of the highest reading from each bin using the reduced baseline period. These readings are presented in the following table.

Table 2. The Highest Rate by Load Bin from 2019 through 2nd Quarter of 2020[27]			
Load Bin No.	Commenter's Suggested Limit from Table 1	Highest Rate from 2019-2020 2nd Qtr	Highest Rate from 2016 to 2020 2nd Qtr
	lb/MWh- Net	lb/MWh- Net	lb/MWh- Net
Highest Reading for LB-1	2,333	2,373	2,229
Highest Reading for LB-2	2,146	2,093	2,096
Highest Reading for LB-3	2,065	2,038	2,036
Highest Reading for LB-4	2,015	2,031	1,998
Highest Reading for LB-5	1,935	1,920	1,942

The suggestion of only using the narrow period that indicates a better CO_2 performance from the unit is not a reasonable alternative for developing a limit or standard. This shorter baseline would raise another issue in establishing a compliance period that is representative of the developed standard. Load Bin 4 and 5 could be set on an 18-month basis because there were data in every month of the shorter baseline period for these two load bins. Load Bin 3 would only have 17 data points, which is not enough for developing an 18-month standard/limit. Bins 1 and 2 have less than 12 data points which is not enough to develop an annual standard. The method(s) used to develop bin limits and/or standard(s) must be representative of the time frame for the compliance period.

By using 4.5 years of data, the baseline period contained enough data in each load bin to use a cumulative approach – taking the monthly data and determining a rolling 12-month average for each bin. Second, the DAQ approach did not exclude or omit any of the emissions data from the baseline period. In selecting an averaging period using the shorter baseline period, the compliance period would have to be on a quarterly basis.

The use of two times the standard deviation (2*SD) for each bin in establishing the bin limit uses the historical variability in the data to create the margin of compliance. The average plus 2*SD covers or accounts for the highest rates of each of the load bins without adding any additional margin of compliance. Thus, Longview Power cannot claim that the bin limits are not appropriate or do not account for the variability of the CO_2 emission rate by each bin.

The reduced baseline period would not result in a more constraining standard than the limit proposed in the permit, except for Load Bin 5. The bin limits developed in the draft permit are less than the limits from the shorter baseline period. The DAQ looked at several different

[27] Data Source used to determine the values in the table is Clean Air Markets Division of Longview Power, ORIS 56671, Quarter 1, 2, 3, 4 of 2019, and Quarter 1, 2, and 3 of 2020. U.S. EPA Field Audit Checklist Tool Version 1.6.0.3 was used to obtain these data set from CAMD.

approaches or other methods to develop either bin limits and/or the standard, which yielded nearly the same results as those developed using the shorter baseline period suggested by the commenter.

Tables of the monthly rates and descriptive statistics based on the unit's emission data from 2019 through 2nd Quarter 2020 can be found in Appendix A of this final determination.

Comment #13 from Commenter #6

Section 4.1.1.b. The provision that the plant can operate for up to 180 days at the Level 2 emissions limits, and "shall be deemed approved…" places the burden on WV-DEP to affirmatively verify if the incident qualifies as a Level 2 event and provides no means for the public to determine whether WV-DEPs determinations are correct or to challenge any WV-DEP determinations. The provisions give too much incentive to Longview to declare such events for relatively minor problems, problems that the O&M practices should prevent and too much of an administrative burden of WV-DEP. There is no limit in the draft permit on how often a Level 2 event might be declared, nor whether overlapping events might allow Longview to operate indefinitely with Level 2 limits. We recommend that the hours of Level 2 operation be restricted to less than 8 hours per event (so as to allow for shut down of the unit) to prevent unwarranted emissions from running at Level 2 indefinitely.

DAQ's Response to Comment #13

The 180-day allowance for Level 2 events allows LVP to maintain critical grid-support operations in the event of major equipment failure should the unit be called upon by PJM to maintain operations. The purpose of the Level 2 limit is to encourage Longview Power to develop a plan, prepare for repairs, and coordinate with the RTO to minimize the time the unit operates at Level 2. Requiring DAQ approval could prevent the unit from operating during times of critical load generation required by the RTO or require the RTO to call up less efficient unit(s) that would not normally operate to make up the difference in loss generation.

The Level 2 provisions should encourage Longview to identify these impaired operations timely and complete repairs in a timely fashion verses operating the unit impaired using the margin of compliance in hopes the unit can make it to the next major maintenance outage without causing a exceedance in the standard. Major maintenance outages are normally scheduled every 5 or 6 years.

The suggestion made by the commenter does not encourage operators to identify the issue that is impairing their unit operations. Instead, the suggestion would encourage the operator to fix the unit to point that the unit can be operated at an impaired performance level, not inform the DAQ of the impaired operations and make required repairs at the next planned major outage, which may be years down the road. The Level 2 provisions allow the unit to still generated revenue for the operator while waiting for resources to be made available to make the repairs.

After consideration, the DAQ determined that the suggested time frame of 8 hours for a Level 2 (impaired operation) is unreasonable. For an annual compliance period, a single event of 8 hours would not affect compliance unless that impairment or damage increased the unit's heat rate by more than 10%. The suggestion of setting a maximum duration of operating at Level 2 was not adopted into the permit.

Comment #14 from Commenter #6

Section 4.1.1.c. The Unit Degradation Adjustment Factor (UDAF) allows a 0.4 % increase per year, with a 0.7% recovery every five years. These values appear to be based on Longview's analysis of historic data for similar plants within the region. Since none of these units are under any obligation to maintain a maximum emission rate, this data only tells us what has been done in the absence of a rule that is intended to change past practices. There does not appear to be any analysis of the extent to which new HRI technology or Operating and Maintenance Practices (O&M) programs were used in this fleet-wide analysis, yet the ACE rule clearly requires such on-going O&M to demonstrate Heat Rate Improvement compliance. Including emissions rates and UDAFs for plants that do not implement the needed O&M is inappropriate. The assumption that Unit Degradation is inevitable has not been demonstrated, and is directly contradicted the Longview performance data over the last 10 years and by the new legal obligation to achieve and maintain a specified heat rate or adopt Heat Rate Improvements.

DAQ's Response to Comment #14

None of the O&M practices that are outlined in the emission guidelines prevent unit degradation. Longview Power's efforts to operate the most efficient unit possible, continually looking for and implementing HRIs at the facility, hide the unit's decay within OPM[28] data. The OPM data is on a net generation basis and is responsive to operating changes that affect the auxiliary load on the unit.

The 40 CFR Part 75 emission data can be used to determine a unit's heat rate; however, this data is limited because the heat rate can only be calculated on a gross basis. With the configuration of the Longview Power unit, this calculated heat rate would not take into consideration degradation of certain pieces of equipment that use electric energy to operate (e.g., electrically driven pumps, fans, mills, etc.).

The DAQ calculated the unit's heat rate on a gross basis from 2012 through 2nd Quarter 2020 by load bin. The following is the daily heat rate for Load Bin 5 with a linear trendline added to the chart.

[28] Black & Vetch's Online Performance Model

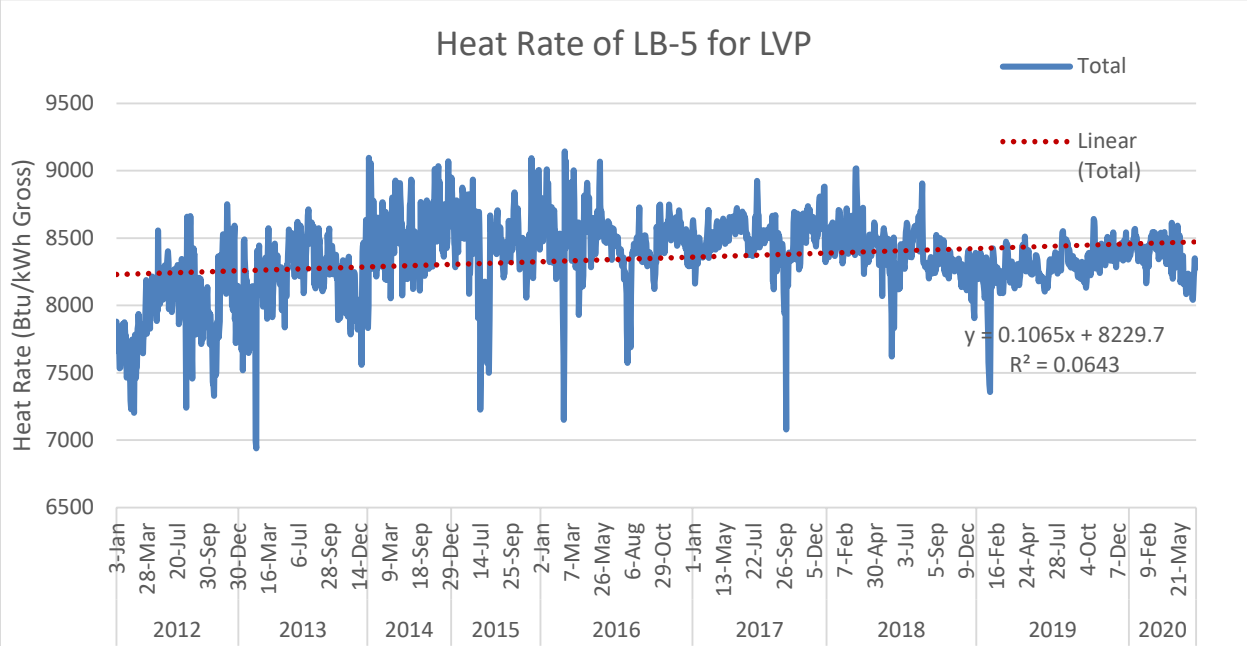


Figure 1: Chart of the Heat Rate of LB-5 for LVP

The trendline indicates that the unit is degrading at a rate of 0.11 Btu/kWh for each operating day, which equates to an increase of 40 Btu/kWh on an annual basis. The other load bins are decaying at a higher rate than Load Bin 5, which are presented in the following charts (see the increase of the slope of the predicted linear function for each bin).

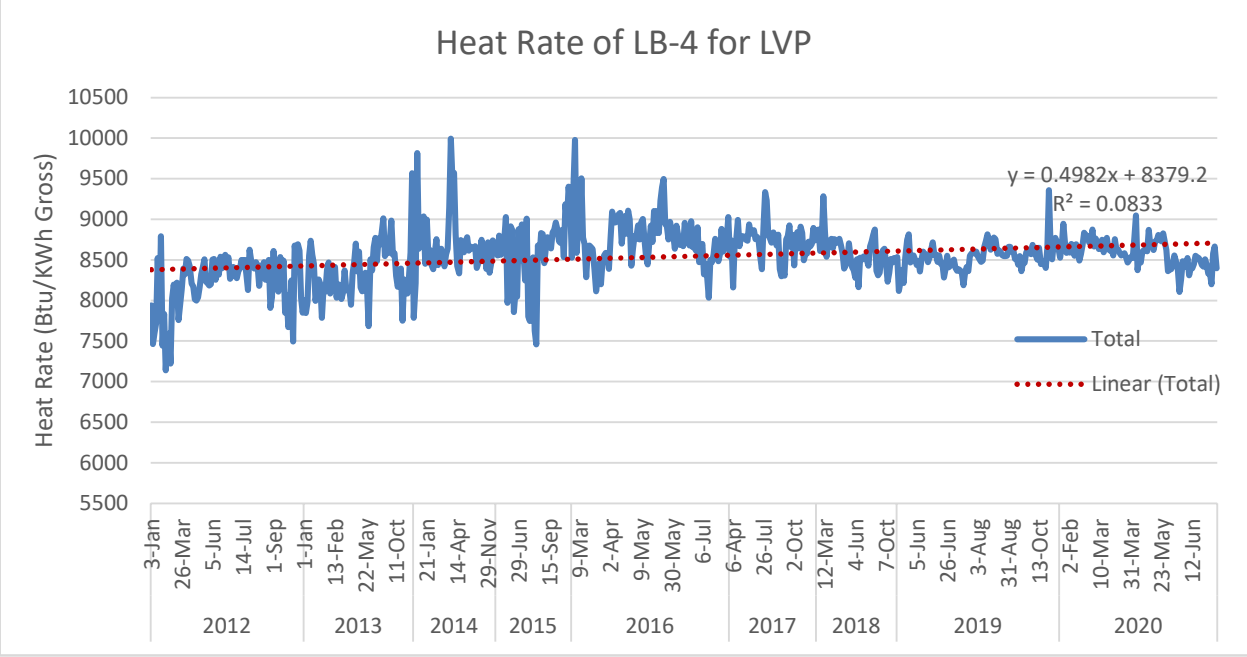


Figure 2: Chart of the Heat Rate of LB-4 for LVP

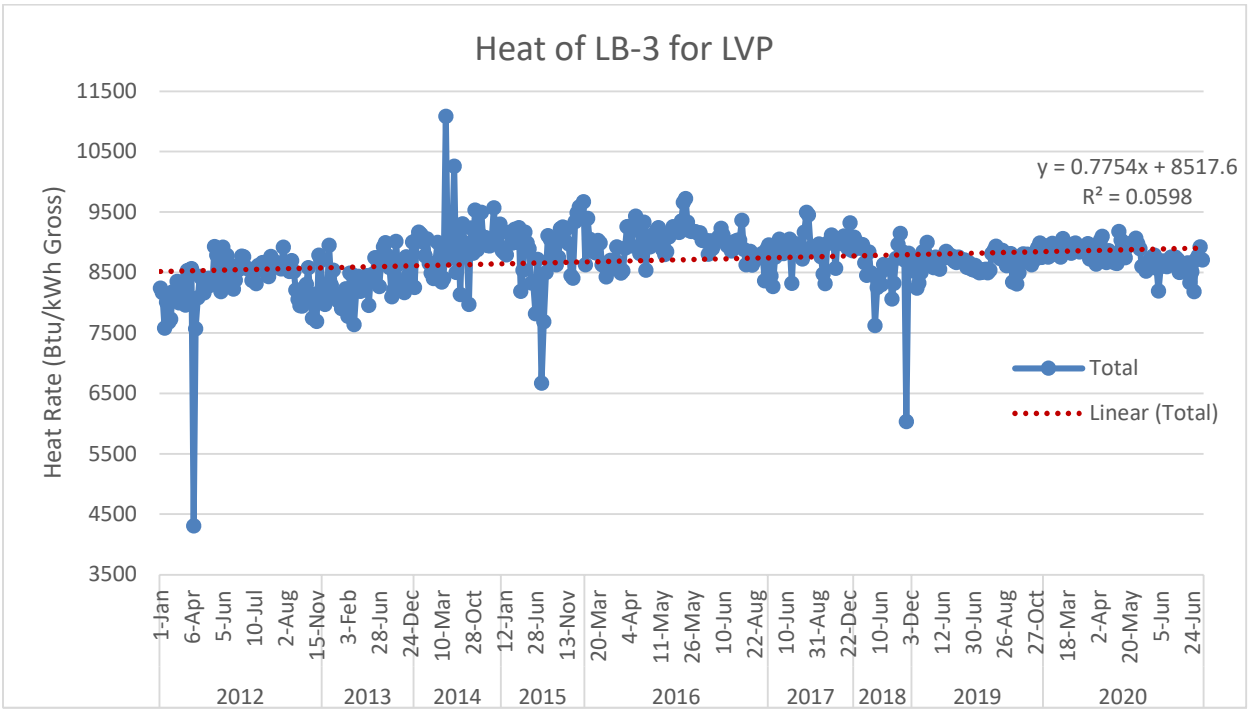


Figure 3; Chart of the Heat Rate of LB-3 for LVP

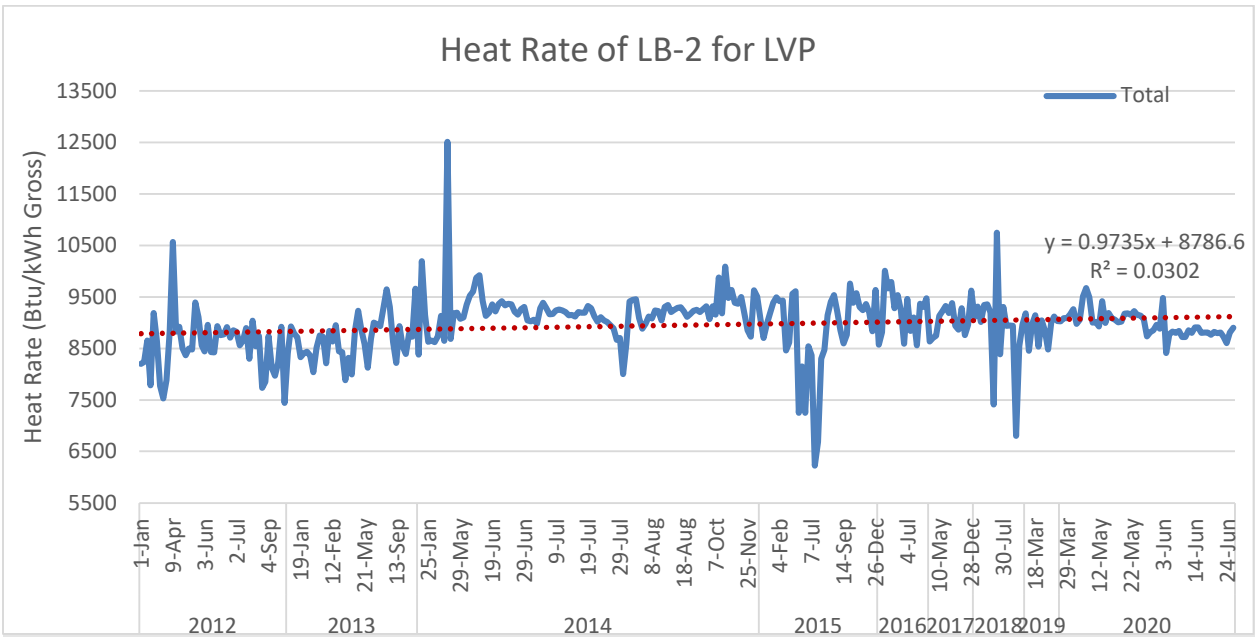


Figure 4: Chart of the Heat Rate of LB-2 for LVP

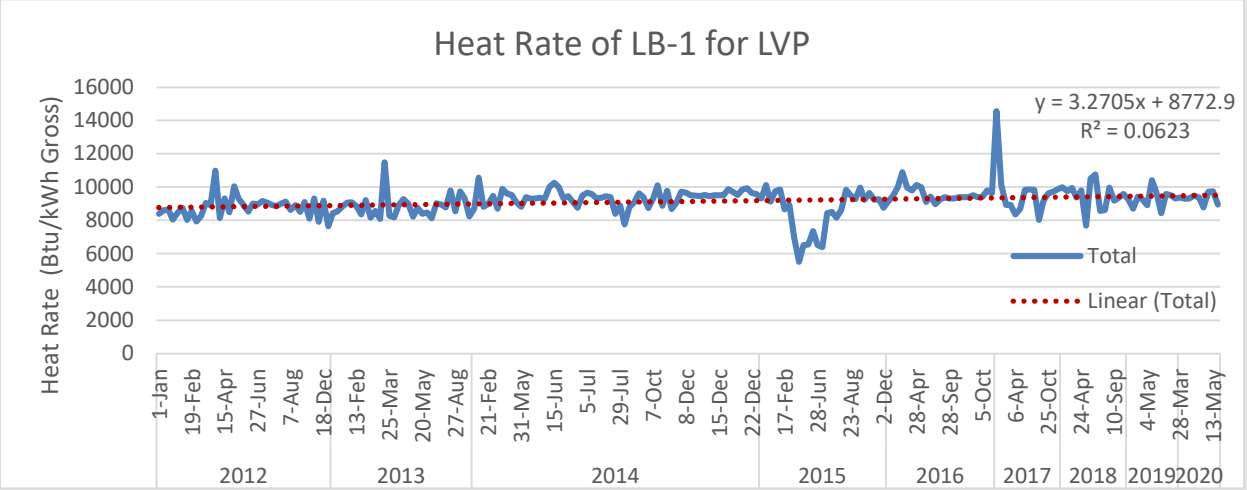


Figure 5: Chart of the Heat Rate of LB-1 for LVP

The proposed rate of 0.4% annually equates to approximately 35 Btu/kWh on an annual basis. These charts suggest that Longview Power will be required to find additional improvements to maintain compliance in the future or reduce the degradation rate by improving maintenance of equipment that affects the unit heat rate.

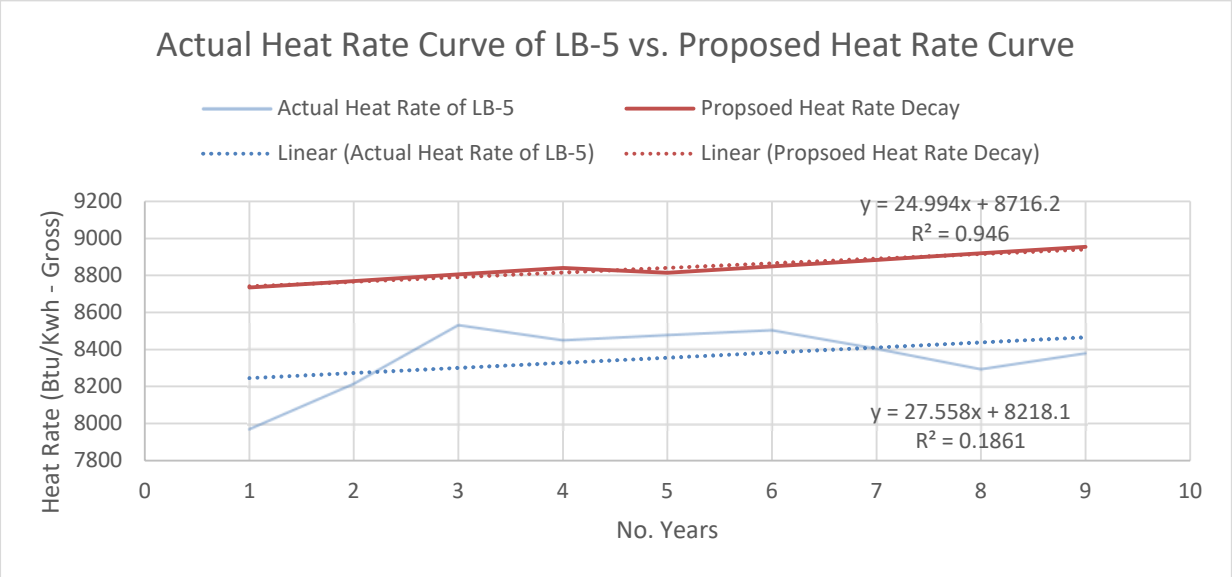


Figure 6: Actual Heat Rate Curve of LB-5 vs. Proposed Heat Rate Curve

The commenter did not provide any support of their claim that unit degradation is not inevitable.

Comment #15 from Commenter #6

The UDAF also allows the emissions rate increases to compound year-over-year, thus allowing much larger annual increases in later years. There does not appear to be any evidence to justify this, and Figure 20 shows a linear, not logarithmic, increase (even in plants not required to implement Heat Rate Improvements). Since the goal is to limit greenhouse gas emissions, we recommend that the permit use lower rates for UDAF, provide better justification for any non-zero UDAF, and apply them only to the base year, rather than using a compound interest approach as currently proposed.

DAQ's Response to Comment #15

The goal of the ACE Rule is to regulate greenhouse gas emissions by evaluating the HRI candidates that U.S. EPA has determined to be the BSER for existing units. The ACE Rule requires states to establish a performance standard based on the implementation of the feasible BSERs in accordance with the emission guidelines. The DAQ does not have the regulatory authority to require additional reductions outside of the scope of the emission guidelines.

The DAQ's Response to Comment #14 indicates that the rate of decay (slope) of the actual unit's heat rate is increasing faster that the proposed degradation rate set forth in the permit. (See Figure 6.) From Figure 6, the DAQ understands that Longview Power will have to improve the unit's actual recovery rate order to maintain compliance in the future (e.g., reduce the amount of heat rate that is lost due to equipment degradation) or implement additional HRI to offset the unit's degradation rate.

The DAQ reminds the commenter that the UDAF includes both a degradation rate and a recovery rate both of which are capped in 2046 and offers the additional justification below for the non-zero UDAF as requested by the commenter. Coal-fired power plants conduct major outages to perform maintenance that cannot be performed while the EGU is in operation and must be done when the unit is out of service. These outages tend to be longer in duration, commonly lasting a few months. These outages are scheduled well in advance and are coordinated with the PJM RTO to ensure electrical grid reliability. Equipment degradation is observed between periods of major outages, with efficiencies gained following the tune-ups that occur during the major outages.

LVP has been in commercial operation less than ten years; therefore, the steam turbine for the unit has not gone through its first major outage and does not yet have any facility specific experience with how the equipment will respond following its first major outage and how much efficiency will be regained as a result of the major tune-up outage. For this reason, LVP conducted an extensive analysis of peer supercritical coal fired plants in PJM Interconnection to determine historical actual degradation rates over time to which the commenter refers.

When looking at unit degradation over time, fleet performance is a key indicator of what may be expected in terms of rate of decay, and in turn, CO_2 and heat rate performance degradation. While there are many factors that can influence this degradation, two critical issues are mechanical

and thermal stress and corresponding decreased unit efficiency. These may be recovered in part through maintenance activities and repair/replacement of critical systems. Another factor that greatly influences unit degradation is the Capacity Factor (CF) of the unit. As units shift from traditional base-loaded operation to increased load swings, lower steady state loads, and are operated as peaking units (many startup/shutdown events), the lower efficiency inherent in units (as demonstrated by each units unique "Heat Rate Curve") at these lower loads and changing loads, will appear as degraded performance. While it may seem that capacity factor influence may be readily filtered out from the unit degradation due to thermal and physical stresses and associated inefficiencies, it cannot. Increased startup and shutdown (SUSD) operations, more and more radical load shifts, and increased operation at lower loads all increase physical stress, fatigue, creep, corrosion, and wear thus causing unit degradation above and beyond what may be accounted for in the observed unit efficiency reductions when operating in lower load bins.

Performance recovery after major outage work has been predicted for the Longview unit, and is reflected in the degradation/recovery rate. These outages will occur in future years and while some level of performance enhancement is expected, it may not be analytically quantified at this time due to a lack of data. It should be noted that not all outage/maintenance work will sufficiently recover all damage as there are practical physical and economic limits to repair and replacements at every overhaul cycle.

Comment #16 from Commenter #6

WV-DEP has apparently uncritically accepted Longview's assertions regarding Heat Rate Improvement technologies. For example, it appears that the intelligent soot-blowing system performed better than EPA's estimated range would suggest. However, there is no evaluation as to whether the "intelligent combustion system" is a BSER-level of application of the technology. No data concerning the performance of the heaters and duct leakage was reviewed by DEP. Nor did DEP evaluate what technical improvements were available. DEP offers a number of general conclusions regarding O&M practices, but does not provide any specifics as to the nature and rigor of Longview's O&M practices, how they differ from those at other plants and why they are BSER. The list of practices that should be evaluated is lengthy, well beyond what Longview described in their application. We recommend that WV-DEP seek an independent analysis of HRI technologies.

DAQ's Response to Comment #16

The U.S. EPA identified a list of "candidate technologies" of the BSER that included technologies, equipment upgrades, and operating and maintenance practices that were deemed most impactful because they can be applied broadly and are expected to provide significant HRI without limitations due to geography, fuel type, and other characteristics. Those candidate technologies must be evaluated in establishing a standard of performance for each affected source within the state boundary. "(S)ome existing EGUs will have already implemented some of the listed HRI technologies, equipment upgrades, and operating and maintenances practices. There will also be unit-specific physical or cost considerations that will limit or prevent full

implementation of the listed HRI technologies and equipment upgrades."[29] The list of candidate technologies include: neural network/intelligent sootblower, boiler feed pumps, air heater and duct leakage control, variable frequency drives, blade path upgrade (steam turbine), redesign/replace economizer, and improved operating and maintenance practices. [30] The "intelligent combustion system" was not identified by U.S. EPA as a BSER candidate technology. Please refer to pages 6 through 19 of the Engineering Evaluation for Permit R13-3495 for an in-depth discussion of the analysis conducted by DAQ concerning these candidate technologies that is more comprehensive than the information provided in the permit application to which the commenter referred.

The emission guideline does not require that the applicant's heat rate improvements be compared to other units or heat rate studies be conducted by independent firms.

U.S. EPA determined that it would be best to allow the states to establish performance standards on an individual unit basis due to the differences in operating characteristics, designs, fuel types, and other factors. There are numerous factors that will affect a unit's heat rate. In order to compare different units on a unit-by-unit basis, the actual design, operating mode, fuel, and maintenance plans would, at a minimum, need to be determined for both units.[31]

The emission guidelines do not require the affected units to measure their improvements. Not all HRIs are measurable because they are small and are often within the variation of the measurement instrument's margin of error. Therefore, the degree that a specific improvement makes on a unit's heat rate is difficult to measure or quantify. One piece of the system could be degrading and hide an improvement in another part of the system. The unit's heat rate may not improve because other downstream process equipment may not be capable of taking advantage of the improved efficiency of the upstream process. Additionally, some HRIs will only improve the heat rate on a net generation basis and cannot be observed on a gross generation basis.

The baseline period used for Longview Power is representative of the HRIs already implemented which EPA determined to be BSER candidate technologies. The emission guidelines require that for those BSER candidate technologies that have not been implemented but are feasible to implement, the potential improvement of such candidate technology should be identified and applied to the actual standard. However, during the evaluation for Longview Power, no other HRIs were found that meet this criteria and, therefore, no adjustments were made.

It should be noted that the emission guidelines do not specify that a source must implement a particular HRI to achieve compliance[32]. The operator has a choice of which measures or technologies to implement in order to achieve compliance with the standard by the compliance

[29] 84 Fed. Reg. 32537. (July 8, 2019)
[30] 84 Fed. Reg. 32536-32537. (July 8, 2019)
[31] U.S. EPA, Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, June 2019, page ES-14
[32] 84 Fed. Reg. 32555. (July 8, 2019)

date. The implemented HRI technologies may be different than the technologies that were identified as BSER candidate technologies.

Longview Power did have an independent firm evaluate the feasibility of the feed water pump, and variable frequency drives HRI candidates with respect to their unit.[33] See DAQ's Response to Comment #8 for additional remarks.

Comment #17 from Commenter #6

WV-DEP has apparently accepted Longview's contention that they will continue to operate as a base load plant (page 48 of the EE), however, this ignores the abundant evidence of market realities in our region. Use of coal as a fuel for generating electricity is declining, and the Capacity Factor of plants is declining as well, as demonstrated in Figure 19 of the EE. Most projections show that this rate of decline will accelerate in coming years. That means it is realistic to expect an increased frequency of operations in Load Bins 1-4, and especially, an increase in Load Bin 0, as the plant shuts down more often. The goal of regulating greenhouse gas emissions is to prevent just such increases. We recommend that total emissions per year be capped, to prevent Longview from "gaming" the system and dramatically increasing greenhouse gas emissions by operating in inefficient Load Bins or engaging in excessive shut downs and start-ups. Furthermore, WV-DEP should require Longview to evaluate feasibility of additional Heat Rate Improvement technologies in these reduced unit Load Bins.

DAQ's Response to Comment #17

Understanding the historic operating mode is important in processing the data. Market conditions and the unit's operating cost will determine how the unit will operate in the future. By establishing the limits on a bin basis and setting the standard on a weighted-average basis, the operating mode of the unit does not affect the unit's ability to comply with the standard. These bin limits are based on operating data within the selected base line period and, therefore, are representative of the unit's operating efficiency within the respective operating loads.

Capping mass emissions is not an option for states to use in establishing emission limits in accordance with the emission guidelines. The regulation is very clear that the standard must be performance-rate based relating the mass of carbon dioxide emitted per unit of energy.[34] The regulation prohibits a mass-based form for the performance standard.

As explained in DAQ's Response to Comment #1, the limits in Permit R13-3495 do not relieve Longview Power of the responsibility to comply with all of the requirements established in R14-0024G which includes a limit on the amount of heat energy that can be burned in their electric generating unit (EGU). This heat energy input limit indirectly caps Longview's carbon dioxide emissions on a mass basis. However, this indirect cap is not in the form of the CO_2

[33] Black & Vetch, Longview Unit 1 Heat Rate Study, July 31, 2020.
[34] 40 CFR §60.5755a(a)(1)

standard as set forth in the emissions guidelines[35]and, therefore, is not acceptable as a limit in Permit R13-3495. Permit R13-3495 does not replace or increase this heat input restriction in Permit R14-0024G.[36]

Oral Comments Made during the October 27 Public Meeting

Angie Rosser, West Virginia Rivers Coalition – 16:40

Trying to understand how BSER candidate technologies are determined. If they are determined by some type of national survey average of what the status quo is. That is not good enough. Wrong direction. Bottom line is to improve this permit, so it reduces and not increases emissions.

DAQ's Response to Ms. Rosser's Comments

U.S. EPA established the BSER candidate technologies. "It is the EPA's responsibility to determine the BSER for designated facilities for standards developed under both CAA section 111(b) for new sources and section 111(d) for existing sources. In making this determination, the EPA identifies all "adequately demonstrated" "system[s] of emission reduction" for a particular source category and then evaluates those systems to determine which is the "best" while "taking into account" the factors of "cost . . .non-air quality health and environmental impact and energy requirements."[37]

U.S. EPA's full justification and rationale for establishing these BSER candidate technologies are in the preamble to the ACE Rule and Regulatory Impact Analysis for the ACE Rule. A brief overview from the background and BSER determination by the U.S. EPA is quoted below:

> Heat rate is a measure of efficiency that is commonly used in the power sector. . . The lower an EGU's heat rate, the more efficiently it converts heat input to electrical output. As a result, an EGU with a lower heat rate consumes less fuel per kWh of electricity generated and, as a result, emits lower amounts of CO_2—and other air pollutants—per kWh generated (as compared to a less efficient unit with a higher heat rate). Heat rate data from existing coal-fired EGUs indicate that there is potential for improvement across the source category.
>
> Heat rate improvement measures can be applied—and some measures have already been applied—to all existing EGUs (supporting the Agency's determination that HRI measures are the BSER). . . T(t)he the EPA identified several available technologies and equipment upgrades, as well

[35] 40 CFR §60.5755a(a)(1).
[36] Permit R14-0024G, Condition 5.1.1.a.
[37] 84 Fed. Reg. 32534 (July 8, 2019)

as best operating and maintenance practices, that EGU owners or operators may apply to improve an individual EGU's heat rate. The EPA referred to these HRI technologies and techniques as "candidate technologies".[38]

Longview has clearly demonstrated that all the feasible HRIs that were identified as BSER candidate technologies by U.S. EPA have been installed or implemented by Longview Power. Thus, the proposed carbon dioxide standard for the ACE Rule cannot reduce Longview Power's carbon dioxide rate any further than what it is achieving today. This does not mean that Longview Power will not implement additional improvements in the future.

The U.S. EPA states "Group 1 represents the most efficient units in the fleet. Those units are assumed to have little to no potential for further HRI applying the BSER technologies.[39]" Group 1 was defined in Table 1-1 of the RIA as EGUs having a heat rate range of less than or equal to 9,773 But/kWh[40]. The heat rate for Longview Power from the NEEDS_v6 database is 8,904 Btu/kWh and therefore is one of the Group 1 most efficient coal fired EGUs in the country, as shown in the table below.

Plant Name	State Name	Capacity (MW)	Heat Rate (Btu/kWh)	On Line Year
Longview Power Plant	West Virginia	700	8904	2011
James E. Rogers Energy Complex	North Carolina	844	9090	2012
John W Turk Jr Power Plant	Arkansas	609	9102	2012
Belews Creek	North Carolina	1110	9185	1974
Belews Creek	North Carolina	1110	9203	1975
Marshall (NC)	North Carolina	660	9300	1965

Figure 7: List of the Most Efficient Coal Fired Units in the US in 2020.[41]

The ACE rule requires the analysis of each BSER candidate technology for applicability to an affected EGU, in this case, Longview. If it has been demonstrated that the BSER candidate technology has already been implemented and no further regulatory reductions are possible, this HRI analysis meets the intent of the ACE Rule.

[38] 84 Fed. Reg. 32535 (July 8, 2019).
[39] Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, Section 1.6.2, Page 1-12
[40] *Ibid.*, Page 1-13
[41] https://www.epa.gov/sites/production/files/2020-10/needs_v620_10-05-20_0.xlsx

As noted in the engineering evaluation, Longview Power is a merchant power plant. The amount of electricity that it generates is entirely dictated by the demand for electricity in the PJM marketplace. No West Virginia ratepayers or other state ratepayers compensate Longview Power to make any investment to its unit. Longview Power is motivated to be the most efficient operator in the PJM market, which means it generates electricity in the most fuel-efficient manner it can.

Market conditions are what drove Longview Power to install the HRIs that have already been installed, in absence of any federal or state regulatory requirements. The installation of the improvements by Longview Power is the reason they are one of the most efficiently run coal-fired EGUs in the nation (See Figure 7).

The PJM RTO dispatches units like Longview Power based on who is available to generate electricity and in order of the lowest cost generation first. For Longview Power to continue to be dispatched at or near its full capacity, Longview Power's management team continues to look for improvements or measures to maintain the unit heat rate at the lowest level possible (most fuel-efficient manner).

Please also refer to the DAQ' Response to Comment #1 above.

Stephen Nelson, Longview Power – 20:30

Thanks everyone for attending and weighing in.

DAQ's Response to Mr. Nelson's Comments

No response required.

Leah Barbor, Moms Clean Air Force – WV – 21:38

Opposes this rule and mirrors some of West Virginia Rivers concerns. Greenhouse gas emissions have adverse effects on our health and welfare. EPA has a legal obligation to limit the pollution that endangers our health and welfare but the ACE Plan doesn't fulfill this legal obligation. Recognizes that energy efficiency measures have value, but they should also include emissions reductions. It is unacceptable that the draft permit would allow substantial increases in greenhouse gas emissions for years to come, growing at a rate of 0.4 percent every year. Baseline emission rate being 60 pounds of CO_2 per megawatt hour beyond the actual 2019 rate seems irresponsible and unnecessary.

DAQ Response to Ms. Barbor's Comments

The Unit Degradation Adjustment Factor (UDAF) only allows an increase in the bin limit of 0.4% annually with a recovery factor (decrease in the bin limit) of 0.7% once every five years. The demand for electricity was high in 2019 which allowed Longview Power to operate their unit at on steady state basis for most of the year.

Simply looking at the annual rates from Table 1[42] and comparing these values to the bin limits does not paint an adequate picture as to whether the limit is too high or is never going to require any further improvement on the applicant's part to maintain compliance. Assuming the annual rates from the table are representative of Load Bin 5 and taking the average of the four whole years of the baseline period (2016-2019), the margin of compliance would only be 1.5% over this four-year period.

Due to the variability in the source's emission data and current trend in the power generation sector, the probability of Longview Power to continually reduce its CO_2 rate or heat rate is highly unlikely without significant advancements outside of the scope of the BSER candidate technologies in the emission guidelines.

The DAQ had to develop a constraining and achievable limit. Because the evaluation of the BSER candidate technologies with respect to Longview Power's unit did not find any additional potential improvements within U.S. EPA's suggested range, the bin limits and standard must be established with a demonstration that the standard is achievable today.

Please refer to the DAQ's Response to Comment #14 above and the DAQ Response to Mr. Kotcon's Comment #6 below for additional discussion concerning the UDAF.

Michael Nasi, Jackson Walker LLP – 25:05

Echoes Steve Nelson's comments. Will be the first national carbon dioxide limit.

DAQ's Response to Mr. Nasi's Comments

No response required.

Michelle Bloodworth, America's Power – 30:13

Speaking in support of the permit for Longview Power.

DAQ's Response to Mr. Bloodworth's Comments

No response required.

Chris Hamilton, West Virginia Coal Association – 35:28

Appreciates opportunity to participate in support of permit for Longview Power.

DAQ's Response to Mr. Hamilton's Comments

[42] WVDEP-DAQ, Engineering Evaluation of R13-3495, October 8, 2020, page 6.

No response required.

Patrick Morrisey, West Virginia Attorney General – 40:43

This application should be advanced. Thanks everyone for taking the time to be involved in this process. Urges to move forward.

DAQ's Response to Mr. Morrisey's Comments

No response required.

Carol Miller, Congresswoman – 46:07

Speaking in support of Longview's application.

DAQ's Response to Ms. Miller's Comments

No response required.

James Kotcon, West Virginia Chapter of the Sierra Club – 50:10

1. *Will submit written comments before November 9. Does DEP recognize that there is absolutely no need to regulate greenhouse gas emissions except to limit climate change? This permit recognizes that that is the issue we are trying to resolve here.*

   DAQ's Response to Mr. Kotcon's Comment #1

   U.S. EPA has mandated that states are required to develop carbon dioxide emission standards in accordance with the emission guidelines outlined in the ACE Rule. See DAQ Response to Comment #3 of the written comments. U.S. EPA listed numerous benefits of reducing carbon dioxide emissions which are outlined in the regulatory impact analysis[43], which includes climate benefits and human health co-benefits from the successful implementation of the ACE Rule across the United States.

2. *Given that the West Virginia Legislature has not yet approved the rules to implement the Affordable Clean Energy Act, does DEP actually have any legal authority to issue and enforce this permit?*

   DAQ's Response to Mr. Kotcon's Comment #2

   45CSR13 requires that DAQ review and issue a permit for all permit applications that indicate that the source will not exceed an applicable standard or exceed an ambient air

[43] U.S. EPA, Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, June 2019, Chapter 4

quality standard.[44] This applies to all permit applications including applications to establish a limit on a voluntarily basis. Please referrer to DAQ's Response to Comment #3 for additional information.

3. *Is this the first permit under the Affordable Clean Energy Act in the U.S.? If not, what precedence does DEP rely on for this permit? If it is, is it DEP's intent to use the Longview permit for other coal-fired power plants in West Virginia?*

DAQ's Response to Mr. Kotcon's Comment #3

The Longview permit will be the first permit under the ACE Rule in the U.S. that DEP is aware of. Any future applications will be evaluated on a case-by-case basis.

Any additional response from the DAQ on the intent that this approach used to develop a CO_2 standard would be applied to other units would not be appropriate since the West Virginia Legislature has not yet approved a rule for West Virginia to develop a plan to comply with the ACE Rule.

Neither the WVDEP nor the DAQ has made Longview Power any guarantees that the proposed standard in the permit will conform or be grandfathered into any rule that the West Virginia Legislature may approve for West Virginia to comply with the ACE Rule. Longview Power has taken the risk to submit this voluntary permit application at this time and the DAQ is obligated to process the application in accordance with 45CSR13.[45]

4. *In their application Longview used data from a number of years prior to implementing some of the heat rate improvement installations in 2018, so is it appropriate to include uncontrolled emissions to calculate limits for the controlled emissions after this permit takes affect? That troubles me.*

DAQ's Response to Mr. Kotcon's Comment #4

The selected baseline period is 2016 to 2nd Quarter of 2020. Longview Power had either installed or implemented the heat rate improvements that were within the scope of the BSER candidate technologies in the emission guidelines prior to 2016.

It is worth reiterating that the BSER for CO_2 emissions under the ACE emission guidelines is HRI from identified candidate technologies to more efficiently convert heat input to electrical output to consume less fuel per kWh of electricity generated and, as a result, emits lower amounts of CO_2 per kWh generated[46]. The comment indicates "uncontrolled" and "controlled" emissions; however, the identified BSER is not a traditional add-on control device to reduce emissions.

[44] 45 CSR §13-5.7.
[45] 45 CSR §13-5.7.
[46] 84 FR 32534 (July 8, 2019)

Longview has made additional improvements that were implemented during the selected baseline period. Some of these improvements take advantage of the BSER candidate technologies or increased the potential HRI of BSER candidate technologies. It should be clear that Longview Power has made these additional improvements prior to U.S. EPA proposing or promulgating the ACE Rule.

The emission data from the baseline period includes the benefit of these additional improvements which was used in the development of the individual load bin limits. Excluding emission data because the dataset did not contain all the improvements made at a unit regardless of the BSER candidate technologies is not reasonable.

5. *Has DEP or Longview considered cofiring biomass as part of its permit? Is there any mechanism in the permit to allow or encourage the use of biomass fuels in addition to cofiring with coal?*

DAQ's Response to Mr. Kotcon's Comment #5:

The use of biomass fuels is not identified as BSER HRIs in the emission guidelines. U.S. EPA concluded that biomass co-firing did not meet compliance measure criteria because "biomass firing in and of itself does not reduce emissions of CO_2 emitted from that source. Specifically, when measuring stack emissions, biomass emits more CO_2 per Btu than fossil fuels, thereby increasing the CO_2 emission rate at the source."[47] There are other pollutant impacts and regulatory issues to co-firing with biomass that are outside of the scope of the Longview Power application and which would be required to be addressed under the DAQ's major source permitting rule.[48] In the ACE Rule, U.S. EPA did not make a final decision concerning the role of New Source Review reforms for sources implementing any of the BSER candidate technologies identified in the emission guidelines.[49]

The permit does not specifically prohibit Longview Power from firing other fuels to comply with the proposed standard. However, Longview Power would have to address the applicability of 45CSR14[50] for any physical changes or changes in method of operation to accommodate these other fuels and any limitation under their Permit R14-024G that may conflict or restrict these other fuels.

[47] 84 FR 32547, 32557-32558. (July 8, 2019)
[48] 45 CSR 14, PERMITS FOR CONSTRUCTION AND MAJOR MODIFICATION OF MAJOR STATIONARY SOURCES FOR THEPREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY
[49] 84 FR 32521. (July 8, 2019)
[50] 45 CSR 14

6. *Longview assumes that the efficiency of their facility declines with age and that might seem intuitively obvious, but does DEP have any data from a modern coal-fired power plant such as Longview, one that is well maintained, to show that this is inevitable? Is there any reason to think that with proper maintenance the emissions level has to continuously increase?*

DAQ's Response to Mr. Kotcon's Comment #6:

The DAQ was reluctant to consider other plant data (heat rate) as a benchmark in developing the standard or in specifically justifying Longview Power's degradation rate. In comparison of best heat rate with Longview Power's unit, AEP's John W. Turk Plant in Arkansas is one of the best performing units. Both units are comparable in age with less than a one-year difference. The Turk unit was designed to operate as an ultra-super critical unit, which is more efficient than a super critical unit.

The Arkansas' Office of Air Quality provided the DAQ with the following chart of the heat rate of the Turk Plant. The chart indicates that the Turk Plant is degrading at a rate of 48 Btu/kWh on a gross generation basis per year. This rate is significantly higher than what Longview Power proposed, which equates to 35 Btu/kWh on a gross generation basis per year.

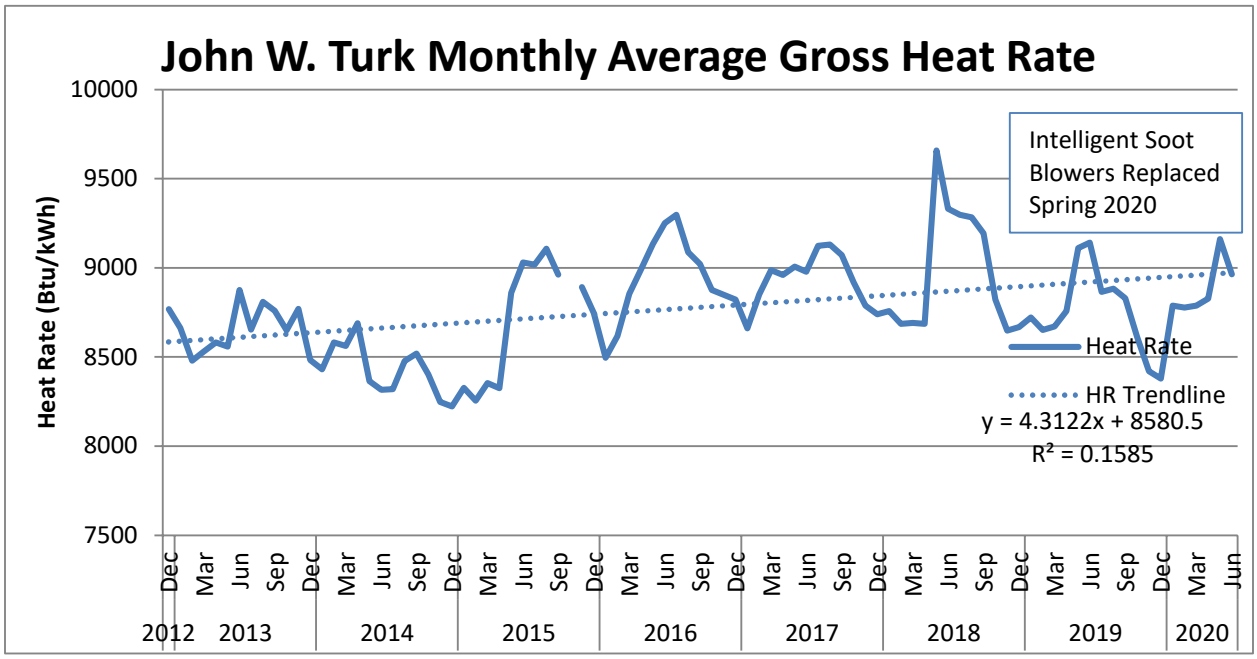


Figure 8: Chart of Heat Rate of the John Turk Plant[51]

Before making any conclusions, the DAQ contacted AEP, the owner and operator of the Turk Plant, to identify key differences in the design of the Turk Plant with respect to the Longview Power Unit. The DAQ obtained and processed the Clean Air Markets Division

[51] Arkansas Department of Energy and Environment, Division of Environmental Quality, September 29, 2020.

(CAMD) data on the Turk Plant into load bins representing baseload operation in similar fashion to DAQ's approach in developing the bin limits for Longview Power.

The DAQ developed the following chart of the Turk Plant at its upper (baseload) operating bin, which is the upper one fifth of the unit's operating range.[52]

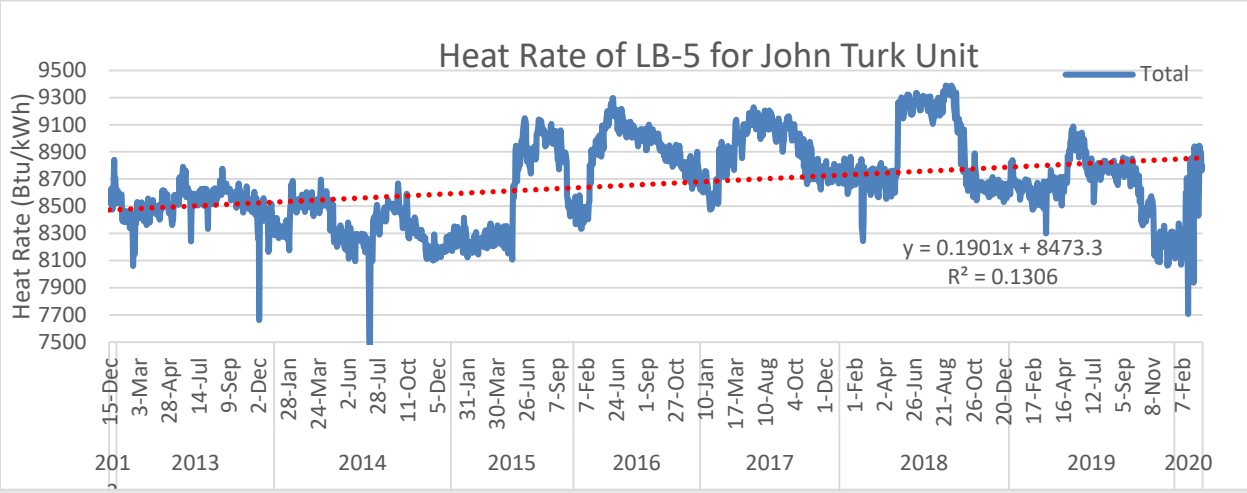


Figure 9: Chart of the Heat Rate of LB-5 for the John Turk Unit

The DAQ enhanced the resolution of the chart by calculating the heat rate of LB-5 using the reported hourly operating data and averaging the heat rate daily. The added trendline estimated the degradation rate for this bin to be 69 Btu/kWh on an annualized basis.

It should be noted that the Turk Plant operates at different steam pressures and temperatures than Longview Power. The Turk Plant consumes sub-bituminous coal as its primary fuel which has a lower heating value than the bituminous coal burned at Longview Power.[53] The Turk Plant uses a dry lime flue gas desulfurization system to control sulfur dioxide (SO_2) and uses steam-driven feed water pumps. These designs and operating characteristics make it difficult to compare these the two units.

The DAQ downloaded the CAMD data for 12 other units and processed these data sets in a similar manner. The DAQ selected these units by sorting the U.S. EPA National Electric Energy Data System (NEEDS) database of EGUs by plant type: steam coal; online year: 2003 and newer; capacity (MW): 500 or greater than; and, a heat rate (Btu/kWh): 9,773 or less.

[52] John W. Turk Plant, ORRIS No. 56564, Reported Emissions data to U.S. EPA CAMD.
[53] Energy Information Administration, Form 923 for 2019, Form EIA-923 detailed data with previous form data (EIA-906/920)

Table 3: List of the Newest, Best Preforming Coal-Fired EGUs in the U.S.							
Plant Name	**ORIS Plant Code**	**Unit ID**	**State Name**	**Capacity (MW)**	**Heat Rate (Btu/kWh)**	**On Line Year**	**Fuels**
Cross	130	3	South Carolina	600	9772	2007	Bituminous
James E. Rogers Energy Complex	2721	6	North Carolina	844	9090	2012	Bituminous, Natural Gas
Weston	4078	4	Wisconsin	550	9679	2008	Subbituminous
Prairie State Generating Station	55856	PC1	Illinois	815	9391	2012	Bituminous
Prairie State Generating Station	55856	PC2	Illinois	815	9346	2012	Bituminous
Elm Road Generating Station	56068	18	Wisconsin	633	9552	2010	Bituminous, Subbituminous
Elm Road Generating Station	56068	19	Wisconsin	633	9475	2011	Bituminous, Subbituminous
Plum Point Energy Station	56456	BLR1	Arkansas	680	9682	2010	Subbituminous
John W Turk Jr Power Plant	56564	1	Arkansas	609	9102	2012	Subbituminous
Sandy Creek Energy Station	56611	S01	Texas	933	9330	2013	Subbituminous
Longview Power Plant	56671	UHA01	West Virginia	700	8904	2011	Bituminous
Iatan	6065	2	Missouri	882	9502	2010	Subbituminous
Trimble County	6071	2	Kentucky	732	9716	2011	Bituminous, Subbituminous

About half of these units had a calculated heat rate curve that indicates the units are experiencing degradation. The other half indicates that their heat rate curve is improving (decreasing). Focusing on units burning only bituminous coal, the comparable units were reduced to four units at three different facilities.

Table 4 List of the Newest Best Preforming EGUs in the US using Bituminous Coal						
Plant Name	**ORIS Plant Code**	**Unit ID**	**State Name**	**Capacity (MW)**	**Heat Rate (Btu/kWh)**	**Online Year**
Cross	130	3	South Carolina	600	9772	2007
Prairie State Generating Station	55856	PC1	Illinois	815	9391	2012
Prairie State Generating Station	55856	PC2	Illinois	815	9346	2012
Longview Power Plant	56671	UHA01	West Virginia	700	8904	2011

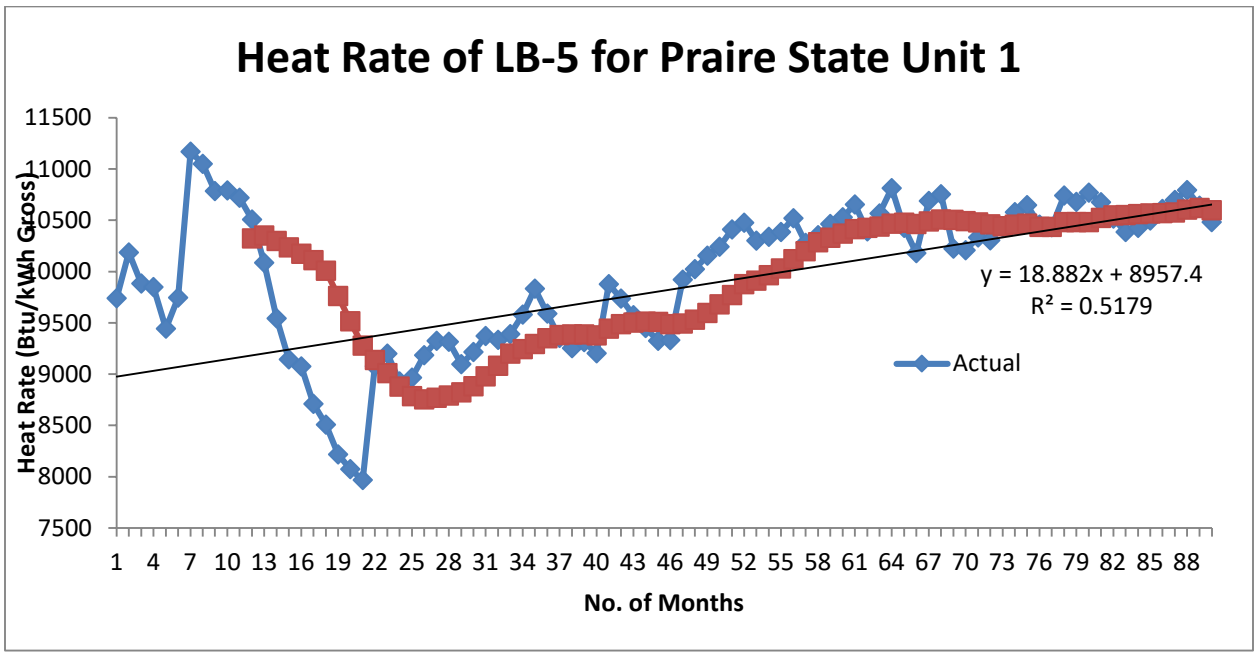


Figure 10: Heat Rate of LB-5 for Prairie State Unit 1

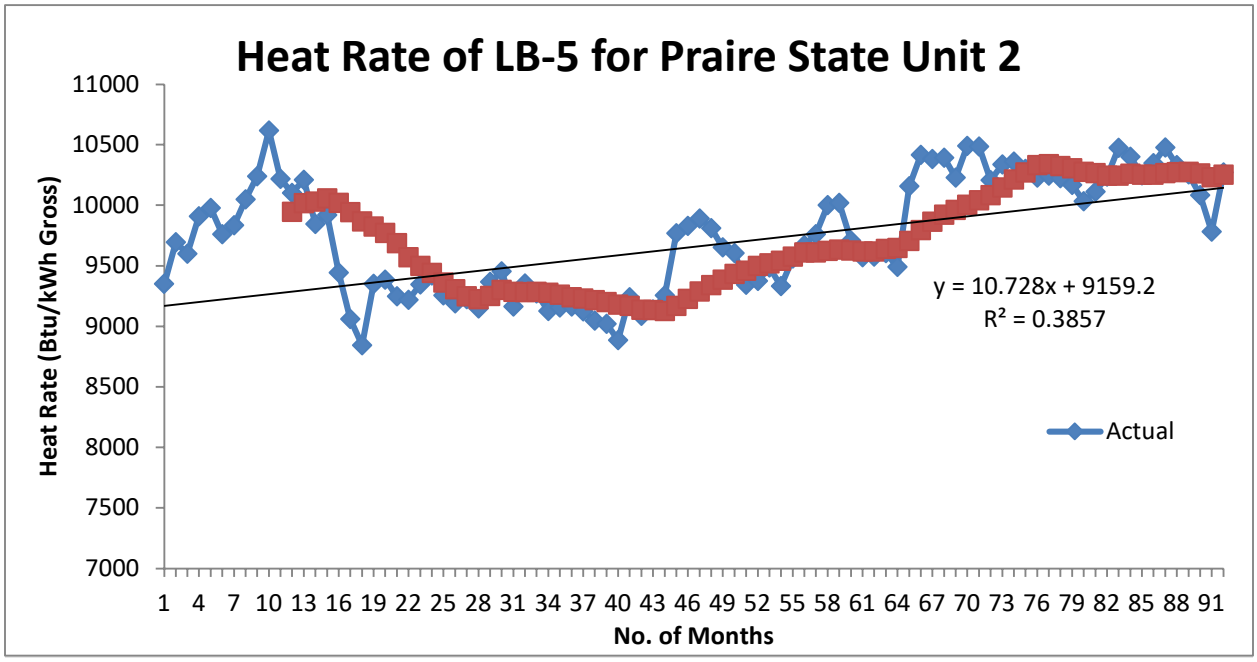


Figure 11: : Heat Rate of LB-5 for Prairie State Unit 2

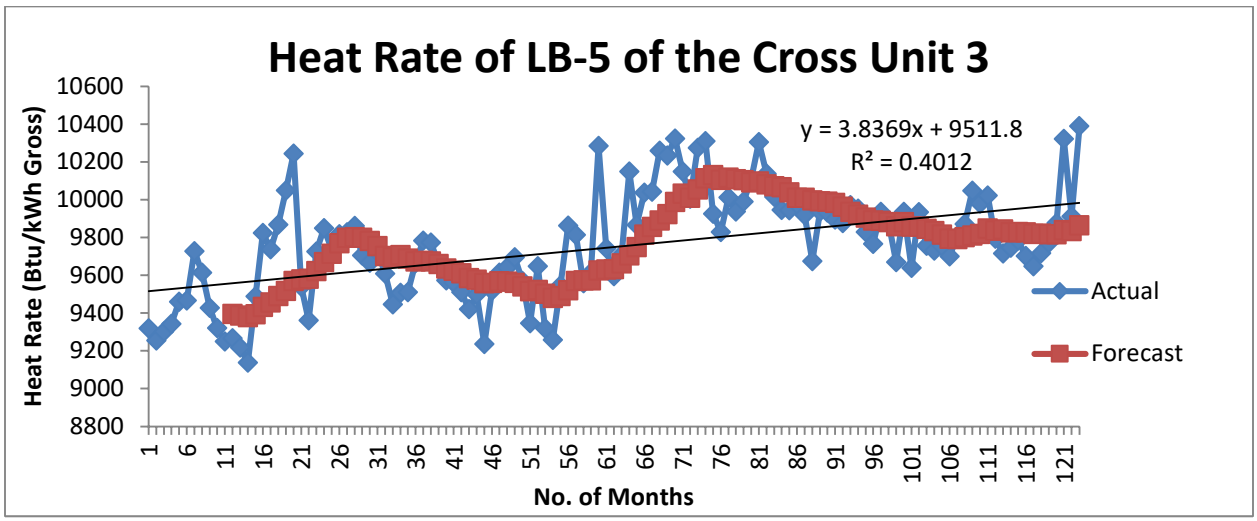


Figure 12: Heat Rate of LB-5 for Cross Unit 3

The forecast curve in each of these was performed used a moving (rolling) average of the actual heat on an interval of 12 months.

The charts for all these units clearly indicate a degradation rate higher than what Longview Power proposed. The DAQ believes these charts (Figures 9 through 12) answer the commenter's questions. It should be noted that the DAQ could not explain or understand the heat rate curves for all of these best performing newer units and, therefore, did not rely on these charts to justify the use of the proposed degradation rate in the UDAF in the permit. The DAQ has no means to determine or verify that maintenance practices for these other units are being implemented in a sound and timely manner in an effort to minimize the effects of unit degradation, because they are outside of the units regulated by the State of West Virginia. The DAQ, therefore, does not have the in-depth knowledge of these units, as it does with the EGUs within its jurisdiction. There could be other changes or factors at these facilities that could be affecting the unit heat rate or CO_2 emission rate which are unknown to the DAQ.

7. *Has DEP when they established their six different bins recognized that a lower capacity or lower bin level seems to be increasingly likely? The U.S. Energy Information Agency concluded just this week that solar energy is the cheapest electric generation in the United States. The competitiveness of Longview seems likely to go down and what basis do we have for using these lower generating capacity load bins for estimating greenhouse gas emissions? In particular load bin 0, which is established in section 4.1.1.a.i. of the permit, has a limit of 9,864 pounds per megawatt hour. That is more than five times the emissions rate for the highest load bin 6. That bin applies whenever the plant is operating at less than 313 megawatts. So, if the plant is only operating at 40 percent of its capacity, they are allowed to let their emissions go through the roof at five times the rate. I have quite a number of other questions and I hope to ask them after.*

DAQ's Response to Mr. Kotcon's Comment #7

The DAQ recognized that the heat rate is different at these different loads which results in different CO_2 rates from the unit. These lower load bin limits were developed using actual unit emissions data while the unit operated in these ranges, the DAQ considers the emission rates of these load bins as unit-specific operating characteristics. U.S. EPA clearly stated that the standard should reflect the unit-specific operating factors and characteristics.[54]

DAQ believes that market conditions will ultimately decide at which load(s) Longview Power will be operating. The weighted average approach for establishing a standard allows units like Longview Power the most flexibility to operate regardless of load or operating conditions. The limit or standard is based on actual performance in all operating ranges. The DAQ believes establishing a single standard over the entire operating range would have the potential for compliance issues and/or require re-development of the standard when operating modes change. It should be noted that not all of the BSER candidate technologies that U.S. EPA identified in the emission guidelines will provide HRI at all operating loads.

As market conditions change, Longview Power will have to make decisions on whether to operate and how much to invest in the unit to maintain a competitive operating performance level. The CO_2 weighted average standard established in the permit is what Longview Power will have to achieve when operating regardless of which load the unit is operating at. The specific bin limits for these lower bins were developed in the same manner as the limits for the upper load bins using all the emissions data available during the baseline period. The weighted average standard is weighted based on hours of operation in each of the respective operating load bins over the compliance period. The standard automatically adjusts based on the actual load operations of the unit.

The DAQ was focused on establishing a constraining standard while allowing for a reasonable amount of degradation in the future. Setting a single standard would either not be constraining today or would not be achievable in the future. Likewise, setting a single standard to cover all the operating loads would have the same issues.

The startup process for these types of units is not as simple as just pushing a button or turning a knob. The unit must be preheated, which involves burning some sort of fuel for an extended period before any energy output (electrical generation) occurs from the unit. CO_2 emissions are being emitted during this phase even when no electrical generation is occurring. The emission guidelines have no provisions to allow for work practice measures in lieu of a numerical emission standard. Load Bin 0 (LB-0) accounts for the time the unit is being heated on startup fuel when no generation is occurring and until the unit reaches a stable operating load. During this load range (0 – 313 MWh), operators are performing

[54] 84 FR 32552. (July 8, 2019)

several startup tasks to get the unit past startup and up to a minimum operating load waiting for PJM to dispatch the unit. During this phase, any electric generation from the unit is being consumed by the unit or lost, which means Longview Power is not generating revenue while operating in this load bin. The bin limit for LB-0 is significantly higher than the other bins because the amount of energy generated is significantly less in this operating range (0 – 313 MWh).

The CO_2 emission rate during startup events could easily drive or dictate a higher standard without the bin approach. To avoid this and to ensure all the CO_2 emissions are being counted, the DAQ elected to establish a separate load bin standard to account for periods or events (startups and shutdowns) that occur below the normal operating range of the unit.

During this phase of very low generation, mathematically the CO_2 rate is high. As noted in Figure 13 of the evaluation[55], the mass emissions of CO_2 emitted while operating in LB-0 is a small fraction of the total CO_2 emitted from this source. The emission guidelines do not allow work practice limitations during startup or shutdown conditions and require a numerical limit at all times.[56] The following table was developed to better demonstrate the issues associated with establishing an emission standard to cover periods of startup and shutdown events.

Row Labels	Hours of operation with No Generation	Total Hours of Op. in LB-0	% of Time of No Generation while OP in LB-0	CO2 with no Generation	% of Mass Rate of CO2 in LB-0 with No Generation
2012	80	336.5	23.8%	9,517.10	26.0%
2013	99	158.9	62.3%	8,959.70	47.0%
2014	126	206.6	61.0%	9,428.70	38.5%
2015	218	395.6	55.1%	18,446.30	43.2%
2016	74	95.9	77.2%	5,934.50	54.7%
2017	121	183.2	66.1%	9,411.20	46.0%
2018	58	84.3	68.8%	5,195.60	53.7%
2019	69	104.0	66.3%	6,108.70	49.5%
2020	20	32.2	62.2%	1,706.60	48.4%

This table shows that most of the time spent in Load Bin 0 occurs without any electric generation being conducted with over half of the CO_2 emissions being emitted as well.

Elizabeth Lawson – 55:28

Lives west of Morgantown but can see Longview from the top of her property. Longview Power should not be allowed to increase their greenhouse gas emissions under the proposed ACE rule. This permit application would allow them to increase their CO_2 emissions by 59

[55] WV DEP-DAQ, Engineering Evaluation of R13-3495, October 8, 2020, page 27.
[56] 40 CFR §60.5755a(a)(1)

pounds per megawatt hour and continue increasing emissions by four tenths of a percent in future years. Why do they need to increase emissions? Is this just to benefit investors? Will Longview's proposed emission rates include the averages from the years before they installed pollution control equipment? This is not acceptable. We have to reduce greenhouse gas emissions. Please deny this permit application. It does not create jobs and benefits no one, but far away investors.

DAQ's Response to Ms. Lawson's Comments

The baseline period used to develop the bin limits was selected to only include the time after Longview Power had installed and implemented the additional BSER technologies that were not part of the unit's original design. See the DAQ's Response to Ms. Rosser's Comments for additional information on the reasons for the increase in emissions.

> Section 5.7 of 45 CSR 13 states:
> (t)he Secretary **shall issue such permit** or registration unless he or she determines that the proposed construction, modification, registration or relocation will violate applicable emission standards, will interfere with attainment or maintenance of an applicable ambient air quality standard, cause or contribute to a violation of an applicable air quality increment, or be inconsistent with the intent and purpose of this rule or W. Va. Code § 22-5-1, et seq., in which case the Secretary shall issue an order denying such construction, modification, relocation and operation. (emphasis added).

There is no evidence that Longview will not meet all applicable emission standards, will interfere with attainment or maintenance of any ambient air quality standard, cause a violation of an applicable air quality increment or in any other way be inconsistent with 45 CSR 13 or W. Va. Code § 22-5-1, et seq., therefore, the DAQ cannot deny this permit.

Clinton Crackel, CoalZoom.com and Saving Coal – 57:41

Don't oppose the use of coal. Extremely valuable resource. Take coal plants and modify them with up to date technology to capture and divert virtually all of the emissions and convert those emissions into industrial, agricultural and household products. Would not invest in solar or wind power.

DAQ's Response to Mr. Crackel's Comments

No response required.

Joe Robinson – 1:02:06

Been involved with combustion and emission chemistry. Sulfur dioxide is 100 percent harmless. Carbon dioxide is not detrimental to our planet. Only two real pollutants sulfuric acid and nitrogen oxide. Coal is a blessing. Oil and gas are a curse.

DAQ's Response to Mr. Robinson's Comments

No response required.

Jason Bostic, West Virginia Coal Association – 1:08:23

Complement and commend work of the Division of Air Quality in developing the permit application.

DAQ's Response to Ms. Bostic's Comments

No response required.

Stuart Spencer – 1:12:45

From Arkansas. Supports Division of Air Quality's work on this permit.

DAQ's Response to Ms. Spencer's Comments

No response required.

Duane Nichols, Mon Valley Clean Air Coalition – 1:17:26

Scientific greenhouse gas effect. Water vapor from burning coal contributes to global warming. Obstructs the views to the community. Analysis doesn't take into account other impacts. Longview already receiving a tax break from Monongalia County. Longview has an opportunity to reduce emissions in the coming years. BSER candidate technologies applied to coal-fired EGUs are to lower carbon dioxide emissions from such units, that is the principle here. That is not happening in this analysis.

DAQ's Response to Mr. Nichols' Comments

The standard set in the permit is based on the application of the BSER candidate technologies. The emission guidelines allow the states to consider other factors. The data used to establish the bin limits included the time the unit operated with other HRI implemented. Had there been additional feasible BSER candidate technologies that could be applied at Longview Power, the reduction in emissions would have been reflected in the

developed standard. As documented in the engineering evaluation[57], that was not the case for Longview Power because there were no additional feasible BSER technologies that had not already been implemented at Longview Power.

What local government does to attract or retain companies in their jurisdiction, such as tax breaks, does not fall under the purview or jurisdiction of the DAQ.

See the DAQ's Response to Ms. Rosser's Comments for additional information on the reasons for the increase in emissions.

Kayla Kessinger – 1:23:51

Member of West Virginia House of Delegates. Comments in support of Longview Power and permit.

DAQ's Response to Ms. Kessinger's Comments

No response required.

Ashley Deem – 1:26:23

Echoes many comments in support of Longview Power and the permit.

DAQ's Response to Ms. Deem's Comments

No response required.

Rupie Phillips – 1:27:12

Represents southern West Virginia coalfields as a member of West Virginia State Senate. Complements Longview Power.

DAQ's Response to Ms. Phillips' Comments

No response required.

Greg Thomas – 1:30:29

Taxpayer, small business owner. Positive thing for our state.

DAQ's Response to Ms. Thomas' Comments

No response required.

[57] WVDEP-DAQ, Engineering Evaluation for R14-3495, October 8, 2020, page 19.

Evan Hansen, House of Delegates – 1:32:48

Trying to figure out what is going on here where you have members of the Coal Association asking DEP to grant a voluntary permit and to be the first in the country to regulate carbon dioxide. Things seem to be flipped on their head. Also trying to figure out from DEP, what is the rush? Why has this permit application been submitted now? Especially when the DEP rule has not even been approved yet. There has been mention of Senate Bill 810 that passed the Legislature last session. That bill requires DEP to propose a legislative bill for consideration during the 2021 Legislative Session, but that hasn't happened yet. Rules often change dramatically on their way to the Legislature. That rule hasn't even hardly begun its journey yet. Why has Longview invested so much time and resources into its permit application when it is not required to do so? Why are so many groups lining up behind a voluntary permit for carbon dioxide emissions to address climate change even before the rule has been approved by the Legislature. Again, my two questions for the DEP, what's going on here and what's the rush?

DAQ's Response to Mr. Hanson's Comments

West Virginia Code and 45CSR13 require that DAQ render a final decision on each application within 90 days once the application is determined to be complete.[58, 59] Thus, the DAQ is obligated to make a final decision on all complete applications in a timely fashion.

During the 2020 Legislative Session, the West Virginia Legislature approved Senate Bill 810, which requires the DEP to develop and submit a partial plan to the U.S. EPA by September 1, 2020 should any EGU owner/operator elect to voluntarily prepare to move forward with a compliance plan for one or more of their EGUs with the ACE Rule.[60] Longview Power submitted a permit application on June 1, 2020 with the intent to use the permit as a means to establish a CO_2 standard for their EGU as a voluntary compliance plan as allowed in Senate Bill 810. The DAQ has made every effort to satisfy the mandate set in the bill and in 45CSR13.

The federal regulation listed several forms that U.S. EPA would accept as a state plan for states to establish or adopt an emission guideline promulgated by U.S. EPA, which includes permits.[61] Regardless of the form used by a state, the state plan or partial state plan must demonstrate that it meets the requirements set forth in the emission guidelines and other requirements set forth by the U.S. EPA Administrator.

As result of Mr. Hanson's Comments, Mr. Steven Nelson, Chief Executive Officer for Longview Power, provided the following response.

[58] W. Va. Code § 22-5-11(d).
[59] 45 CSR §13-5.7.a
[60] West Virginia Code §22-5-20, Air Pollution Control Act, March 25, 2020.
[61] 40 CFR 60.27a(g)(2)(ii).

On July 8, 2019, the United States Environmental Protection Agency (U.S. EPA) published the Affordable Clean Energy rule (ACE) consisting of emission guidelines for greenhouse gas (GHG) emissions from existing electric utility generating units (EGUs) under the Clean Air Act (CAA), section 111(d)at 84 Fed. Reg. 32520. In this rulemaking, the U.S. EPA also finalized new implementing regulations that apply to ACE and any future emission guidelines promulgated under CAA § 111(d). The U.S. EPA promulgated the ACE regulation under 40 C.F.R. Part 60, Subpart UUUUa, Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units and the implementing regulations under 40 C.F.R. Part 60, Subpart Ba, Adoption and Submittal of State Plans for Designated Facilities.

The federal emission guidelines inform states on the development, submittal, and implementation of State Plans to establish performance standards for GHG emissions from certain coal fired EGUs. The U.S. EPA determined that heat rate improvement (HRI) is the best system of emission reduction (BSER) for reducing GHG, specifically carbon dioxide (CO_2) emissions from existing coal fired EGUs meeting the applicability criteria.

Any State with one or more designated facilities that commenced construction on or before January 8, 2014 is subject to ACE and is required to submit a State Plan to the U.S. EPA that implements the emission guidelines of 40 C.F.R. Part 60, Subpart UUUUa. West Virginia has one or more designated facilities that meet the applicability criteria and therefore must develop and submit a State Plan(s) to the U.S. EPA. These plans must also be supported by state permits, of which Longview R13-3495 meets that requirement.

Although states are given flexibility on when to implement the ACE Rule, beginning the implementation of this technically complex rule for a single member of a large fleet nearly 17 months after a the Rule's promulgation does not constitute a "rush." It is also important to note that West Virginia Senate Bill 810, which was referenced by the commenter, did not just required the West Virginia DEP to prepare a legislative rulemaking to address how the Rule would be implemented across the fleet, it required the submittal of a complete or partial State Plan by September 1, 2020, which is what gave rise to the partial/segmented plan development for the Longview plant.

Moreover, the need to reduce carbon footprint while maintaining adequate reliability and resilience in the country's electric power supply is directly addressed in the basic form of the ACE rule. The value of coal-fired

generation in a lower carbon future is to secure reliability and resilience in way that no other technology can supply – including batteries. The recent experience in California, growing concerns in SPP, MISO and PJM, and the history of Germany's renewable energy experiences have demonstrated the need for an effective "all-the-above" energy strategy that adequately values and retains the thermal coal fleet. If we are to ensure that coal can continue to meet this challenge, optimizing coal in terms of affordability, reliability, environmental compliance is necessary. The cornerstone of that goal in the context of both the ACE Rule and power market viability is efficiency. As the country's most efficient coal fired facility, Longview is an ideal candidate to demonstrate a viable, practical and legal means of attaining the goal of best achievable CO_2 emissions, while ensuring the affordability, reliability and resilience of our power supply."

Jordan Burgess – 1:36:04

Voiced support for the permit application by Longview Power and ACE Rule.

DAQ's Response to Mr. Burgess' Comments

No response required.

Questions and Answers Phase of the Public Meeting – 1:37:55

Question from Duane Nichols:

I would like to ask whether the coal source is relevant at all to the proceedings of our West Virginia DEP, whether the fuel in terms of its quality, in terms of its carbon to hydrogen ratio, is relevant? I recognize that Longview has gone through a radical change in the quality of its fuel over lifetime. It used really fine coal to come in on a conveyor belt and used a coal that was a high ash or high mineral matter coal. Now, after a few years of using Cumberland mined coal, it is a very different coal. It has better BTU value, it has much, much less mineral matter. It seems to me, this is relevant, yet I did not see that in the fact sheet. Thank you.

DAQ's answer by Ed Andrews:

Thank you, that is a very good question. You are absolutely right; the coal quality very much affects the CO_2 rate. It affects the parasitic load of the unit. And these are all very important factors. To address that issue, we developed the provision to allow for a coal adjustment factor to adjust the standard based on fuel switching.

Question from Jim Kotcon:

As I review the draft permit, it does not appear to have an expiration date. Does DEP plan to have one and have they considered limiting this permit to something like six or twelve months so that a final rule can be adopted by the Legislature?

DAQ's answer by Ed Andrews:

DAQ permits issued under State Rules 13, 14, and 19 do not have expiration dates. The one exception is temporary permits issued under Rule 13. As long as the source continues to operate under the terms and conditions of the permit and makes no physical or operational changes, the permit remains valid.

Only operating permits issued under Title V (Rule 30) have expiration dates after 5 years. Longview Power will be required to incorporate the terms and conditions of R13-3495 into its Title V Operating Permit.

Question from Jim Kotcon:

Quick follow up, does that mean that this would basically regulate Longview for the life of the plant?

DAQ's answer by Ed Andrews:

Essentially, unless there are other regulatory actions taken by U.S. EPA that revises emission guidelines.

Question from Angie Rosser:

Some questions posed in the comments tonight, I was wondering if those will be addressed in a written response or should those be addressed now? I am thinking of mainly Dr. Kotcon's questions and Delegate Hansen's questions.

DAQ's answer by Ed Andrews:

If they want to pose those questions. Those are part of the official record as comments regarding the application. We are obligated to provide a written response to those. If they want to ask them again during this phase, we will try to provide answers to some of them.

Question from Jim Kotcon:

I'm actually dying to hear the answers to Delegate Hansen's questions. What's going on and what's the rush? More specifically, why is Longview asking for the permit?

DAQ's answer by Ed Andrews:

We can't speculate exactly why Longview – it is basically a voluntary application. There is no requirements that we have under the Air Pollution Control Act or the Clean Air Act to deny the application because there is no regulatory rule on West Virginia's part requiring a source like Longview to submit an application. So, it is truly all voluntary. Why the big rush – I can't answer that question myself. I am just assigned the application to review it.

Summary of the Responses

Several of the commenters noted the CO_2 limits were increasing over time and felt that the emission rates should be established to reduce CO_2 emissions from present levels. The DAQ must work within the constraints of the emission guidelines set forth in the ACE rule and the authority granted to the DAQ via the West Virginia State Code and air quality rules.

The conclusion that there is no potential for further HRI by applying BSER to Longview Power is consistent with the assumption that the U.S. EPA provided in the Regulatory Impact Analysis (RIA) where it identified four groups of EGUs based on heat rate performance from most efficient to least efficient based on the NEEDS database v6. The U.S. EPA states, "Group 1 represents the most efficient units in the fleet. Those units are assumed to have little to no potential for further HRI applying the BSER technologies.[62]" Group 1 was defined in Table 1-1 of the RIA as EGUs having a heat rate range of less than or equal to 9,773 Btu/kWh[63]. The heat rate for Longview Power from the NEEDS_v6 database is 8,904 Btu/kWh[64] and, therefore, is one of the Group 1 most efficient coal-fired EGUs in the country as identified by U.S. EPA.

Longview Power is a young unit (e.g. less than 10 years old) when compared with the rest of the coal-fired EGU fleet in the U.S. Natural unit degradation will occur. Neither Longview Power nor the DAQ can prevent this from occurring or precisely predict what the unit degradation rate will be in the future; however, the DAQ has adequately justified its inclusion and development of the UDAF in both the Engineering Evaluation and in this Final Determination document.

Several of Longview Power's other HRIs involve monitoring critical pieces of equipment as part of its own Operations and Maintenance practices. The purpose of these improvements (monitoring programs) is to identify failures or degradation earlier so that proper outage planning can be effective in restoring the performance of these systems to maintain the unit's overall heat rate. These measures do not improve the unit's heat rate but allow Longview Power the opportunity to identify equipment issues while operating rather than conducting inspection outages to identify the problem. Thus, Longview Power will be able to minimize the time that a piece of equipment is operating in a degraded or impaired operation and directly reinvest in the unit where equipment needs attention.

[62] Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, Section 1.6.2, Page 1-12
[63] *Ibid.*, Page 1-13.
[64] https://www.epa.gov/sites/production/files/2020-10/needs_v620_10-05-20_0.xlsx
.

The DAQ believes that U.S. EPA's intention for the emission guidelines in the ACE Rule is geared toward older EGUs (e.g., over 25 years of age) to improve their heat rate by implementing the BSER candidate technologies, which will reduce CO_2 emissions. Some of the technology that was included in the Longview initial construction is more advanced than what U.S. EPA determined as BSER.

Setting a less complex standard would result in one of two situations. Either the standard would not be constraining today or would be unreasonable in the future. Longview has elected to start complying with the limits in this permit starting in 2021, which is three and half years ahead of the schedule set in the ACE Rule.

CHANGES TO THE DRAFT PERMIT

The DAQ determined that no changes to the draft permit are necessary after reviewing and responding to all of the comments received.

NOTIFICATIONS

Upon the Director's acceptance of this final determination, a copy of the final determination and final permit will be posted on the DAQ's website, which is at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

Additionally, a copy of the final determination and permit will be emailed to the applicant, each commenter, U.S. EPA and all attendees of the October 27th public meeting.

FINAL DETERMINATION

It is the view of the writer that after consideration of all comments received, all available information indicates the Longview Power LLC application to establish a voluntary carbon dioxide emissions standard for its coal-fired EGU near Maidsville, Monongalia County, West Virginia, should meet the emissions limitations and conditions set forth in the permit. It is, therefore, the recommendation of the undersigned that the WVDEP-DAQ issue Permit R13-3495 to Longview Power LLC.

Edward S. Andrews

Digitally signed by Edward S. Andrews
Date: 2020.12.23 13:19:07 -05'00'

Edward S. Andrews, P.E.
Engineer

Appendix A

Of

Final Determination for R13-3495

Tables of the Monthly CO_2 Rates from 2019 through 2nd Quarter 2020

And

Descriptive Statistics of the Monthly Data

Table 1A - List of the Monthly CO_2 Rates of the suggested shorten baseline period

Shorted Baseline Period	LB-1	LB-2	LB-3	LB-4	LB-5
2019	lb of CO2/MWh-Net				
Jan	**2,069**	**2,093**	**1,899**	**1,896**	**1,869**
Feb				**1,909**	**1,852**
Mar	**2,129**	**2,057**	**1,999**	**1,920**	**1,884**
Apr			**2,030**	**1,953**	**1,894**
May	**2,032**	**1,945**	**1,969**		**1,880**
Jun	**2,373**	**2,032**	**1,988**	**1,937**	**1,882**
Jul			**1,947**	**1,928**	**1,884**
Aug	**2,203**	**1,934**	**2,013**	**1,969**	**1,914**
Sep	**2,090**	**2,055**	**1,954**	**1,950**	**1,885**
Oct			**1,995**	**1,954**	**1,903**
Nov	**2,130**	**2,068**	**2,038**	**2,031**	**1,913**
Dec			**1,994**	**1,983**	**1,915**
2020					
Jan			**2,035**	**1,979**	**1,920**
Feb			**2,001**	**1,980**	**1,920**
Mar	**2,132**	**2,086**	**2,026**	**1,964**	**1,920**
Apr	**2,112**	**2,061**	**1,991**	**1,943**	**1,877**
May	**2,219**	**2,077**	**2,016**	**1,964**	**1,903**
Jun	**2,050**	**2,012**	**1,984**	**1,918**	**1,867**

Table 2A – Descriptive Statistics of the Load Bin from the suggested Shorten Baseline Period

Load Bin	LB-1	LB-2	LB-3	LB-4	LB-5
Mean (lb/MWh- Net)	2,140	2,038	1,993	1,952	1,893
Standard Error	29.07391	16.2746	8.686419	7.512851	4.934106
Median (lb/MWh- Net)	2,129	2,057	1,995	1,952	1,890
Standard Deviation (lb/MWh- Net)	96	54	36	32	21
Sample Variance	9298.213	2913.488	1282.716	1015.973	438.2173
Kurtosis	2.724655	0.405797	1.723216	1.025533	-0.94505
Skewness	1.492306	-1.22246	-1.12849	0.494319	-0.23421
Range (lb/MWh- Net)	342	159	139	135	69
Minimum (lb/MWh- Net)	2,032	1,934	1,899	1,896	1,852
Maximum (lb/MWh- Net)	2,373	2,093	2,038	2,031	1,920
Count	11	11	17	18	18
Confidence Level(95.0%)	64.7807	36.26207	18.41439	15.85073	10.41005