west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345
Phone: 304 926 0475 $ Fax: 304 926 0479

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Pursuant to 45 CSR §14-17.7, the Division of Air Quality presents the

FINAL DETERMINATION

for the

CONSTRUCTION of MAJOR SOURCE

for

Mountain State Clean Energy LLC

Maidsville Facility

located in

Maidsville, Monongalia County, West Virginia

Permit Application Number: R14-0038

Facility Identification Number 061-00134

Date: January 5, 2022

Promoting a healthy environment.

BACKGROUND INFORMATION

Application No.:	R14-0038
Plant ID No.:	061-00134
Applicant:	Mountain State Clean Energy LLC
Facility Name:	Maidsville
Location:	Maidsville
NAICS Code:	221112
Application Type:	PSD Major Source Construction
Received Date:	December 10, 2019
Revised Application Received:	March 14, 2020, and September 21, 2021
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	$14,500.00
Fee Deposit Date:	January 10, 2020
1st Complete Date:	May 5, 2020
2nd Complete Date:	September 21, 2021
Due Date:	March 20, 2022
Applicant Ad Date:	December 12, 2019
Applicant 2nd Ad Date:	March 12, 2021
Newspaper:	*Dominion Post*
UTM's:	Easting: 542.78 km Northing: 4,377.20 km Zone: 17
DAQ Ad Date:	October 1, 2021
Newspaper:	*Dominion Post*
Description:	Construction of an EGU, which includes two combustion turbines with heat recovery steam generators, two fuel gas heaters, cooling tower, one auxiliary emergency generator, one fire water pump and an ammonia storage vessel.

NOTICES AND PUBLICATION

Pursuant to 45 CSR 14-17-5 the West Virginia Department of Environmental Protection (DEP), Division of Air Quality (DAQ) sent a copy of the advertisement, preliminary determination, and draft permit to representatives of the applicant, US EPA Region 3, County Commission for Monongalia County, the Executive Director of the Morgantown Monongalia Metropolitan Planning Organization, and Interstate Planning Commission, Pennsylvania Department of Environmental Protection, Allegheny County Health Department and the Federal Land Managers overseeing Class I Areas on September 30, 2021 via email. On October 1, 2021, the DAQ went to public notice in the Dominion Post with a preliminary determination to issue the Prevention of Significant Deterioration (PSD) Permit to Mountain State Clean Energy LLC for the proposed construction of a major source near Maidsville, Monongalia County, West Virginia. The Application, Draft Permit, Preliminary Determination, PSD Modeling Report, and documents generated or reviewed by the DAQ were made available under "Popular Searches" at the following web link:

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

Pursuant to 45 CSR 14-18.1., the Director determined that holding a public meeting was appropriate for this application. Beginning at 6pm on October 19, 2021, the DAQ conducted a virtual public meeting. Notice for the public meeting was incorporated into the legal advertisement for the preliminary determination, the notice was sent via email to anyone who had expressed interest in the application during its review.

In addition to the requirements of the public notice procedures,[1] the DAQ forwards a copy of all notices of "Intent to Approve" to the DEP's Public Information Office to be released to all subscribers of the DEP Enhanced Mailing List. Initially, only the Monongalia County subscribers to the Enhanced Mailing List received the notice on September 30, 2021. This notice should have been sent to all subscribers. The issues with the Enhanced Mailing List were resolved, and the notice was sent out to all subscribers on October 8, 2021.[2]

Comments on the Draft Permit were accepted until 5:00 PM on November 1, 2021.

This document will summarize the comments received on the draft permit, any actions taken because of the comments, and any changes to the final permit of Permit Application R14-0038.

COMMENTS ON THE DRAFT PERMIT

During the public comment period, comments were received from the parties listed below. Each will be briefly summarized here. All original comments and any associated DAQ response are in the publicly available file, which is in the DEP's Application Extender at the following link:

https://documents.dep.wv.gov/AppXtender/DataSources/DEPAX16/account/login?ret=Lw==

EPA's Comments

On October 29, 2021, via email, Ms. Mary Cate Opila, P.E., Ph.D. Chief, Permitting Section from EPA's Region III Office, provided comments on the preliminary determination and modeling demonstration. DAQ's response to these comments will be sent to EPA at the time the final decision is made with regards towards this application. The DAQ's responses to these comments are attached to the end of this final determination.

Written Comments

[1] 45 CSR §13-7 and 45 CSR §14-17
[2] https://apps.dep.wv.gov/MLists2/Archive/view_text.cfm?ListID=1&MessageID=31697

During the comment period from October 1 through November 1, the DAQ received 64 emails and 1 letter regarding the agency's review and findings of the applicant's proposed project. Of the 64 comments, 56 emails and one letter were in support of the proposed project and do not require a written response from the agency. Two other emails did not provide any comments that pertain to the air quality issues related to this specific project and therefore any response is outside the purview of the DAQ. Responses to the remaining issues identified by these commentors are attached at the end of this final determination.

Oral Comments

The DAQ conducted a virtual public meeting on October 19, 2021, to allow the public the opportunity to provide oral comments for the record regarding the proposed project . During this meeting, seven speakers made comments for the record.

Comments from the Applicant

The applicant provided comments on the draft within the comment period. In these comments, all but two of these comments are recognized as typographic errors. One of these comments was that the applicant questions the control technology for the emergency generator and fire water pump in Table 1.0 of the permit. The application did not completely justify that oxidation catalyst was not technically feasible. The DAQ should have identified this lack of justification during the application process. Thus, the selected BACT controls for the emergency engines will remain good combustion practices with oxidation catalyst.

The applicant questioned the need for the leak detection and repair requirements in Section 7.0 of the permit. The applicant did not provide any justification why the proposed leak detection and repair measures are not necessary as an effort to minimize equipment leaks of natural gas (reduce fugitive greenhouse gas emissions from equipment leaks). The DAQ has an obligation to require all feasible control technologies that reduce emissions of a NSR Pollutant under the major source permitting rule.[3]

CHANGES TO THE DRAFT PERMIT

One comment suggested that annual emission limits should be established for each specific model CT instead of the worst case between the two models. The DAQ had established hourly mass emission limits for the specific model CT in Condition 4.1.1.b. The request is reasonable and Condition 4.1.1e. through 4.1.1.h. was revised to reflect annual emissions by specific model CT. The DAQ used the same approach that the applicant used in developing the annual emissions except that the emissions for the individual model CT was determined instead of the highest rate of the two CTs. This development included emissions from SUSD events based on the individual model CT.

[3] 45 CSR 14.

The following table summarizes the established limits.

Table 1 Revised Annual Limits for the CTs

Pollutant	Limit Originally Proposed (tpy)	MHPS M501JAC Limit (tpy)	GE 7HA.03 Limit (tpy)	Condition No.
NOx	158.6	146.5	154.4	4.1.1.e.
CO	136.9	104.9	132.8.	4.1.1.f.
VOC	70.2	63.0	65.3	4.1.1.g.
PM/PM_{10}/$PM_{2.5}$	101.2	99.3	99.5	4.1.1.h.
CO_2e	N/A	2,227,260	2,563,571	4.1.1.j.

Several Commentors expressed concern that degradation rate-based limits in Condition 4.1.2. would allow the applicant to continue to increase the CO_2e emissions from the CTs. Rate-based limits requires the company to maintain the high-level performance (energy efficiency) for the units regardless of total emissions emitted during a given period. However, DAQ did recognize that the permit did not contain a reasonable cap for CO_2e emissions on an annual basis. Thus, Condition 4.1.1.j. was established to limit the annual discharge of CO_2e by specific model of CT.

One comment suggested that the averaging period for the ammonia slip limit should correspond with the NO_x limit since the ammonia injection is needed to control NO_x emissions from the CTs. The DAQ agreed with this comment by changing the averaging period to 3-hours in Condition 4.1.4.c.

One comment suggests that the averaging period in Table 4.3.7 of Condition 4.3.7. for Indicator 2 for the subsequent PM_{10}/$PM_{2.5}$ (Condition 4.3.2.) testing should be changed from annual to a 3-hour average. The DAQ disagrees with this change. However, there was some merit to it because the trigger for the subsequent PM_{10}/$PM_{2.5}$ testing was using the ammonia slip to justify if a subsequent testing demonstration is needed. Thus, the DAQ has changed the trigger for Indicator 2 for subsequent PM_{10}/$PM_{2.5}$ testing in Table 4.3.7. from 5 ppm to 2 ppm. The DAQ selected this concentration based on comments received.

EPA was concerned about the fence line used in the modeling demonstration in the application, which extended a significant distance from the proposed footprint of the emission units. The DAQ determined a condition is necessary to ensure that the applicant installs and maintains a fence or physical barrier system to prevent the public for accessing this area. Thus, Condition 8.1.2. was established with a reporting requirement in Condition 8.4.1.

During the comment period, the DAQ discovered potential issues with SCR designs and a need to tune the ammonia injection system. Not all ammonia injection grids allow for the adjustment or control of the injection rate of ammonia. Without the ability to control the injection rate of ammonia, the permittee will be limited in controlling NO_x and ammonia slip.

To be capable of properly tuning/adjusting the ammonia injection, a permanent sampling grid system is needed downstream of the SCR. It is not feasible to manually traverse a sampling probe on a large, combined cycle system for ammonia injection grid tuning.[4] To ensure that these issues will not be overlooked by the applicant during the final design and construction phase, Condition 4.1.4.c. was updated with the following sentence:

"As part of this SCR system, the permittee shall install an ammonia injection grid system that injection of ammonia can be adjusted to account for the actual exhaust flow characteristics and a permanent sampling grid that covers a cross-sectional area of the SCR at the outlet of the SCR."

One commentor suggested increasing the frequency of minimum fuel sampling from once per year to once per calendar quarter to determine compliance with the sulfur content in the fuel. Condition 4.2.3. adopts the provisions from Acid Rain Program for gas-fired units to determine the sulfur content and heating value of the fuel.[5] This language covers several different options which can require more frequent sampling. The DAQ believes that its not warranted to change the minimum fuel sampling requirements in Condition 4.2.3. The NSPS Subpart KKKK requires initial and annual testing to demonstrate compliance with either the SO2 standard or sulfur content of the fuel. These NSPS requirements are incorporated into the permit in Condition 4.3.1. It was noticed that the sampling frequency in 40 CFR 60.4415(a)(2) was "periodically". The DAQ believes that actual testing using fuel sampling needs to consist of at least 3 samples (e.g., 3 test runs). Therefore, Condition 4.3.1. was revised to define the minimum number of samples of 3 for determining the sulfur content in the fuel.

Other changes to the permit consist of correcting errors identified by the comments made by the public and the applicant.

Overall, none of these changes increase the allowable emissions or relaxes what the DAQ had determined was BACT for the proposed emission units in the application.

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 website, which is at:

http://www.dep.wv.gov/daq/Pages/NSRPermitsforReview.aspx

[4] Presentation by L. J. Muzio, Fossil Energy Research Corp, 2019 Reinhold NOx-Combustion-CCR Round Table, February 11, 2019, Slide 18, https://img1.wsimg.com/blobby/go/a0d620c8-0573-41fa-99b0-5485d856a21c/downloads/MP313.pdf?ver=1631764217020

[5] Appendix D to 40 CFR 75.

Additionally, a copy of the final determination and permit will be emailed to the applicant, EPA, all commentors and the attendees of the public meeting.

FINAL DETERMINATION

It is the view of the writer that, after consideration of all comments received, all available information indicates Mountain State Clean Energy LLC's proposed construction of a major source near Maidsville, Monongalia County, WV, should meet the emissions limitations and conditions set forth in the permit and should comply with all currently applicable state and federal air quality management rules and standards. It is, therefore, the recommendation of the undersigned that the WVDEP-DAQ issue Permit R14-0038.

Edward S Andrews

Digitally signed by: Edward S Andrews
DN: CN = Edward S Andrews email = edward.s.andrews@wv.gov C = US O = WVDEP/Division of Air Quality OU = Permitting/New Source Review Workgroup
Date: 2022.01.05 11:30:59 -05'00'

Edward S. Andrews, P.E.
Engineer

Response to EPA's Comments on Permit Application R14-0038

Comment I.A.
Page 38 of the Fact Sheet submitted with the draft permit describes the suggested approach for limiting startup-shutdown (SUSD) emissions. This involves 30 day rolling total limits based on SUSD emissions multiplied by a factor of 1.5. Comparable units in the RACT, BACT, LAER Clearinghouse (RBLC) include SUSD BACT limits for NOx and CO in the form of lb/event or lb/hr limits, for example the combustion turbines of the New Covert Generating Facility in Covert, Michigan. Please provide an explanation for how the suggested SUSD limits compare to lb/event or lb/hr BACT limits, and why the suggested method should be considered BACT.

WVDAQ Response to I.A.:
The New Covert Generating permit has a NOx BACT limit of 249.0 pph during startup and shutdown events.[6] Also, the permit defines the end of startup and beginning of shutdown when the loads at 50%. The permit limits the number of hours SUSD to 692 hours per 12-month rolling period,[7] which equates to 86.1 tons of NOx in any 12-month per period. However, this permit does not limit or restrict the duration or length of these SUSD events and therefore the permitted combustion turbines at the New Covert Generating Facility would be allowed to have 86 tons of NOx in a 30-day period. The New Covert Generating SUSD BACT limit is significantly higher than the limit the DAQ proposed to establish for MSCE, which is 2.68 tons of NO_x for the MHPS M501JAC or 2.97 tons of NO_x for the GE 7HA.03.

Michigan also established a CO limit of 1,164 pph for SUSD in the New Covert Generating Permit,[8] which equates to 402.7 tons of CO during any 12-month period. The New Covert Generating permit also has an annual CO limit of 357 tpy, which is less than the maximum allowed for SUSD at New Covert. The 30-day rolling total CO limits proposed by the DAQ were 6.05 tons for the MHPS M501JAC and 11.36 tons for the GE 7HA.03, which are significantly less that what Michigan had established for the New Covert Generating Facility.

The combustion turbines at the New Covert Generating Facility are MHPS M501GAC which have a combined cycle performance rating of 427 MW. MSCE proposed MHPS M501JAC with a combined cycle performance rating of 630 MW. Both combustion turbines are MHPS M501 and are air cooled units. However, they are very different units. The inlet temperature to the turbine section is one of the differences that effects SUSD emissions. The turbine section of the GAC series turbine is designed to handle exhaust temperature of $1{,}500^0$ C at a flow rate of 1,364 lb/s. The turbine section for the JAC series can handle $1{,}650^0$ C at a flow rate of 1,685 lb/s.

The DAQ's intent in establishing a 30-day rolling total limit for SUSD emissions is to regulate emissions from SUSD in a relatively short-term period (30 days) than on an annual basis (e.g., 12-month rolling) and allow the applicant a reasonable amount of flexibility to conduct start-up or shutdown operations based on electricity market conditions.

[6] Michigan Department of Environment, Great Lakes, and Energy Air Quality Division (EGLE), State Registration Number N6767, FG-TURB/DB1-3 Flexible Group Condition, I Emissions Limits, page 19.
[7] EGLE, State Registration Number N6767, FG-TURB/DB1-3 Flexible Group Condition, III Process/Operational Restriction(s) 5, page 21.
[8] EGLE, State Registration Number N6767, FG-TURB/DB1-3 Flexible Group Condition, EGLE, State Registration Number N6767, FG-TURB/DB1-3 Flexible Group Condition, III Process/Operational Restriction(s) 5, page 21.

There are other issues to consider when comparing or even measuring SUSD emissions of NO_x and CO with other CTs which are, response time delay (recording of initial fuel flow to measuring actual concentrations of NO_x, CO, & O_2 readings from the CEMs), using f-factor in the calculations during period of incomplete combustion, operation, and design of the units.[9] Establishing individual lb per type of event may look great on paper and easiest way to determine if it is stringent or not. A work practice of limiting the duration of these events on an individual basis may appear to be a way of establishing a BACT. To comply with a time-based restriction, the operator will be solely focused on minimizing the length of the actual event without any regard to the emissions (i.e., no attention of using good combustion during the SUSD events).

The individual time-based limits force the operator to attempt to startup the unit within a specified time and without any regards to actual emissions during the event and hope to avoid equipment damage of the CT. The 30-day rolling total allows the applicant to plan startup and shutdown with the flexibility to manage the type of events to maintain compliance with the limits. Also, the 30-day limits address the question of whether the permittee is gaming the type of startup within the definition and focusing on actual emissions.

Comment I.B.

Similarly, for instances where the recommended BACT emission limit is less than stringent than BACT limits in the RBLC, the example in the case of CO or VOC (pg. 33 of the FACT Sheet), please provide an explanation for how the suggested limits compare, and why the suggested limits should be considered BACT.

WVDAQ Response to Comment I.B.
The BACT determination referenced by the commentor that established a lower CO BACT for a natural gas fired CCCT of (0.9 ppm at 15% O_2) was for CPV's Towantic Energy Center, located in Oxford, CT for a GE 7HA.01 natural gas fired CCCT. The selected technology for this determination was an oxidation catalysis.[10] The Towantic Energy Center facility is located in a non-attainment area for ozone and a maintenance area for carbon monoxide (CO).[11] According to the application available online, the applicant proposed CO BACT at 1.0 ppm at 15% O_2.[12]

According to RBLC and online application for the Towantic Energy Center, the facility was significant for VOCs under PSD and a VOC BACT was proposed with a VOC BACT determination made. The WVDEP believes that control technology for VOCs would have undergone LAER review instead of BACT review because the project had the potential for VOCs

[9] Cynthia E. Mulkey, Florida State University Libraries, Evaluation of Nitrogen Oxide Emissions during Startup of Simple Cycle Combustion Turbines 2003, pages 20-21.
[10] RBLC ID CT-157, CT-158.
[11] EPA ECHO https://echo.epa.gov/detailed-facility-report?fid=110044175843
[12] https://portal.ct.gov/-/media/CSC/1_Dockets-medialibrary/Docket_192B/CPVInterrogatoryResponses/192bCPVAttachment2Middlebury9ipdf.pdf

greater than 40 tpy and the project is in an ozone non-attainment area, and the limit established would be a LAER limit not a BACT limit.

The GE 7HA model CTs are all very similar. The Towantic 7HAs are .01 water cooled units with a design heat input of 2,544 MMBtu while MSCE proposed .03 air cooled units with a design heat input of 3,875 MMBtu/hr. This is a 52% increase in heat input over the .01 model CT with an increase of 45% in electric output.

Base elevation and ambient air conditions affect CT performance. The base elevation of Oxford, CT is 104 meters and MSCE's elevation is at 350 meters. OEMs usually taken these differences into consideration when providing potential customers emission characteristics on their model CTs.

A requirement that was not identified in the RBLC is that the Towantic Energy Center has transient emission limits for NOx at 93 lb/hr, CO at 242 lb/hr, and VOCs at 60 lb/hr.[13] The DAQ is not allowing MSCE any alternative limit for transient load changes. These hourly alternative rates are significantly higher than limits MSCE's GE 7HA.03 in Condition 4.1.1.b. which is based on BACT levels determined by the DAQ.

When considering these alternative limits for the CPV Towantic Energy Center, the DAQ's determination for CO and VOC BACT are smore stringent with respect to comparable sources made by fellow state agencies.

Comment I.C.

The proposed H_2SO_4 BACT limit from the permit application (pg 72) which says "proposes BACT for H_2SO_4 emissions from the turbine to be combustion of low sulfur fuel and an emission limit of 0.001 lb/MMBtu.", does not seem to appear in the permit. The proposed BACT limit should be accurately incorporated into the permit. Is the limit used in the permit '0.4 gr Sulfur/100 scf" equivalent to the proposed limit in the permit application and what was the rational for making that change?

WVDAQ Response to Comment I.C.

The permitting authority has the responsibility for establishing BACT, not the applicant. The applicant is required to conduct a "top down" review in the BACT analysis to identify the control technology. During the review of the BACT analysis, the DAQ either concurs or disagrees with the applicant's analysis and then establishes the BACT with respect to the selected technology.

For H_2SO_4 BACT in this application, the DAQ agrees with the applicant on the control technology, which is using low sulfur fuel. The H_2SO_4 emission rates proposed by both

[13] Connecticut Department of Energy and Environmental Protection, Permit 144-0023 & 144-0024, Part III, B.1. page 5.

combustion turbine manufacturers were based on sulfur loading of 0.4 grains of sulfur/100 scf of gas.

The proposed combustion process will not affect or control the formation of H_2SO_4. Using Gibbs Minimization to predict the conversion of sulfur entering the combustion process into products of sulfur dioxide and sulfur trioxide, the sulfur trioxide conversion is 1.5% of the total sulfur. However, the typical SCR and oxidation catalyst can convert the SO_2 to SO_3 at rates up to 50%.[14] Using Gibbs Minimization to predict the reactions across the catalyst, the conversion rate would be over 80%.

A sulfur loading at 0.4 gr per 100 scf with 100% of the sulfur oxidating into SO_2 would equate to a sulfur dioxide emission rate of 5.71 e-5 lb SO_2 per MMBtu. Assuming an 80% conversion rate across the SCR and using a MW ratio of 1.53 (64.06 MW of SO_2/98.07 MW H_2SO_4), the H_2SO_4 emission rate would be 0.001 lb of H_2SO_4/MMBtu.

Catalyst manufacturers have been working on minimizing the conversion rate of SO_2 to H_2SO_4 and believe this conversion rate ranges from 50 to 15%. At the lower end of the conversion rate, with the sulfur loading below 0.4 gr in the fuel gas, can lead to non-detectable readings during performance testing. To ensure that the BACT level of control is being met on a continuous basis, the DAQ has defined the H_2SO_4 BACT in terms of grains of sulfur per 100 cubic feet of gas, which is measurable without creating a new measurement method. It should be noted that the DAQ will require MSCE to attempt to measure actual H_2SO_4 to demonstrate compliance with the short-term mass limit.

[14] Email from John Wayne to Edward Andrews, Dual Functioning Catalyst (SCR + Ox Cat), October 29, 2021.

COMMENT:
Source Relationship with Longview Power:

As noted in the report prepared by Ambient Air Quality Services, Inc (dated March 2021), the Mountain State Clean Energy Center (MSCEC) will be located on the property of the Longview (coal-fired) power plant. We assume that MSCEC and Longview should be treated as on entity for modeling (and PSD) purposes. This has implications with regards to establishing the modeled ambient air boundary and assessing model culpability for any modeled NAAQS or possibly PSD increment violations. Note that WV DEP should take steps to address any modeled NAAQS or PSD increment violations from the final modeling analysis regardless of if the applicant's modeled impacts are determined to be insignificant.

WVDAQ Response: *MSCEC and Longview are under the same ownership and control and are generally being treated as one facility except for the cumulative/culpability analysis. The ambient air boundary is appropriately based on treating MSCE and Longview as one facility. Of critical importance is that the permit application is for a modification, which is treated separately from the existing source. The project sources (i.e., the sources for which the permit application addresses) are modeled and treated separately from the existing Longview sources. The modeling analysis demonstrates that the applicant's modeled impacts are insignificant and WV DEP will evaluate any remaining modeled violations.*

COMMENT:

Ambient Air Boundary:

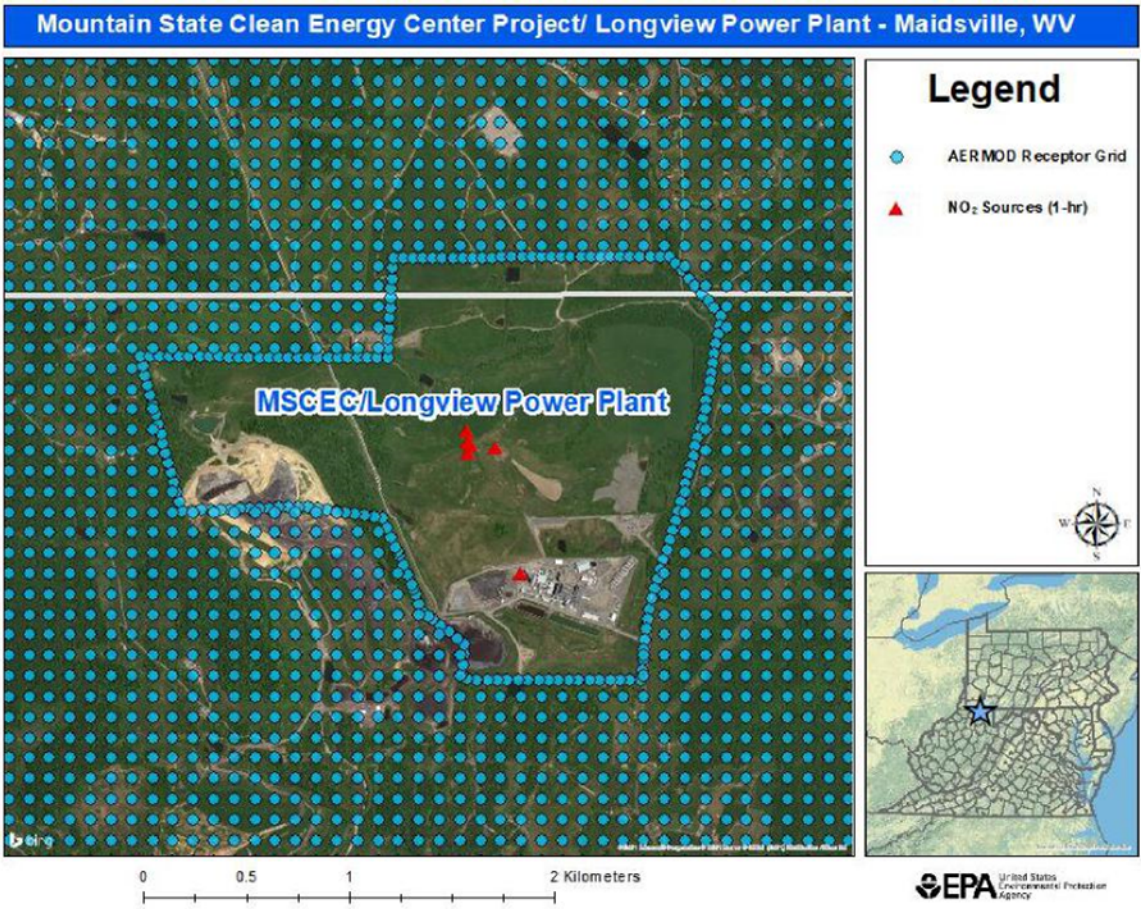
MSCEC/Longview should have constructed its model receptor grid in accordance with the facility's ambient air boundary. We note that the modeling receptor grid construction appears to support a single facility encompassing the Longview power plant and the proposed MSCEC. Ambient air is defined in 40 CFR §50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access."[1]

Figure 1 (next page) shows the model receptor grid used in the modeling analysis prepared by Ambient Air Quality Services, Inc and included in the electronic modeling files shared with the EPA. The area devoid of model receptors is the area considered to be under control of the facility where the general public is precluded access. This area is quite extensive. The boundary marked by the receptor grid surrounding the facility is approximately 9 km in length.

True ambient air boundaries are usually marked by some physical barrier that would preclude public access and/or other independent entities from accessing the facility's property. There are several areas devoid of model receptors that do not appear to meet this condition. There appears to be significant earth disturbance activity on the western side of the property that would not

support the existence of a (permanent) fence to prohibit general public access. A fence is noted surrounding portions of the existing Longview power plant. Viewing Google maps, the fence appears to turn northward off of Seece Lane (along the southern boundary of the facility) just beyond an entrance marked "Gate 1". Additionally, there appears to be a service road along Ft Martin/Bobtown Roads near the Pennsylvania/West Virginia boundary with signs indicating access for Chevron Appalachia, LLC and Diversified Production, LLC (possible gas production companies) to points in neighboring Dunkard Township in Green County, Pennsylvania. While the access road appears to be gated, there does not appear to be a fence that would prevent public access from this portion of the facility's property.[1] See: https://www.epa.gov/nsr/ambient-air-guidance

Figure 1. MSCEC/Longview Ambient Air Boundary

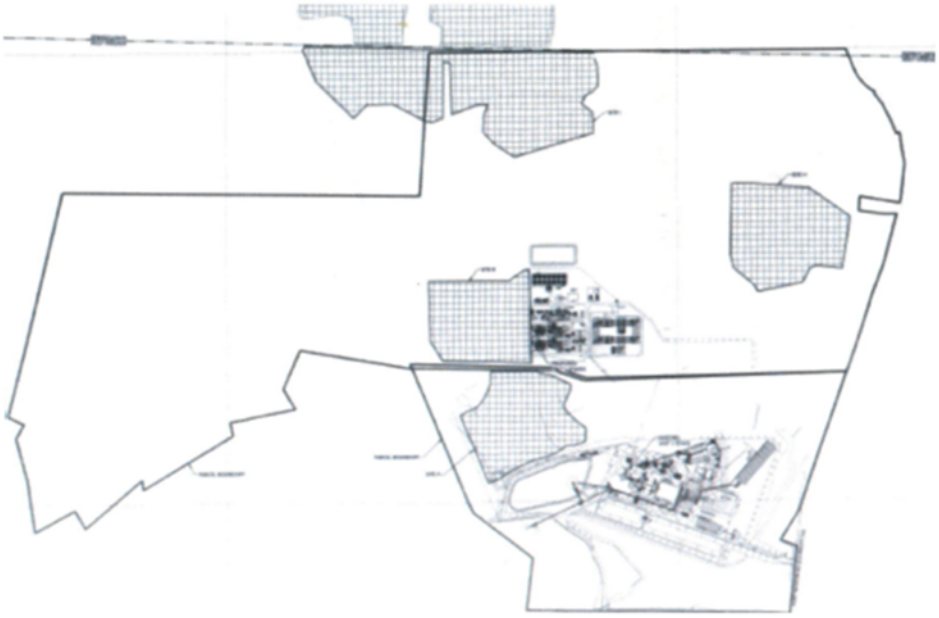


EPA believes the facility's ambient air boundary is not properly defined by the model receptor grid. In all likelihood, the boundary demarcated by the model receptor grid reflects the facility's property boundary and not the true ambient air boundary. To meet EPA's current definition of

ambient air, the facility must have control of the area devoid of model receptors and have sufficient access restrictions (possibly including a physical barrier such as a fence) to preclude the public and/or other non MSCEC/Longview personnel from accessing its property.

WVDAQ Response:

The DAQ has elected to require Mountain State Clean Energy, prior to the commencement of operation of the CCGT, to install or further define a physical barrier encompassing the approximate perimeter as presented below.



By enhancing existing fencing, or otherwise restricting access at or near the boundary demarcated by the model receptor grid above, the ambient air boundary would be adequately managed to meet EPA's current definition of ambient air, and preclude the public and/or other non MSCEC/Longview personnel from accessing its property. Any further reductions in perimeter scope or length, or restrictions other than physical fencing, would need formal approval by WVDEP DAQ and must follow appropriate procedures throughout. Lacking any revisions to the boundary and approved by WVDEP DAQ, MSCE would augment the existing physical barriers to include, at a minimum, the footprint defined above.

To ensure that the applicant installs and maintains a fencing or barrier system, Condition 8.1.2. will be established the permit to make such a system permanent and enforceable.

COMMENT:

Startup/Shutdown Modeled Emissions

- Modeled annual emissions for the entire facility reflect 234 start-ups (187 hot startups, 36 warm startups, and 11 cold startups) and 234 shutdowns. Are there permit limitations that would ensure that the annual modeled emission rates correctly reflect these described operations?

WVDAQ Response:
Condition 4.1.1.e. through 4.1.1.i. established annual emissions limits for the combustion turbines on a 12-month rolling basis. These annual limits are based on the applicant's projected operation that included the number of SUSD events as mentioned. Because of the difference in emissions for SUSD events between model combustion turbines, the DAQ believed short-term limits were need as well. These short-term SUSD limits for the combustion turbines are established in Condition 4.1.3. The SUSD annual emissions were determined based on the individual manufacturer's emission rate by event type used the number of projected annual event by type of event. This total annual SUSD rate was divided by the ratio of 12.17 which is the ratio of 365 (days/year)/30 (days) with multiplier of 1.5 to account for variability in events in a given 30 days period.

Table 2Development of SUSD Limits for the CTs

SUSD Emissions Limits	Per CT		30d Max (Ave+50%) tons		30d All Starts Cold	
	MHPS	GE	MHPS	GE	MHPS	GE
NO_X Emissions, tpy	21.74	24.11	2.68	2.97	1.99	3.63
CO Emissions, tpy	49.08	92.18	6.05	11.36	7.50	19.09
VOC Emissions, tpy	34.22	31.39	4.22	3.87	3.26	6.71
PM Emissions, tpy	0.39	2.24	0.05	0.28	0.04	0.33
SO_2 Emissions, tpy	0.18	0.19	0.02	0.02	0.02	0.03

The last two columns in the above table were used to demonstrated that the 30-day limit was constraining using 30 cold starts in a 30-day period. These limits for both model of CTs was constraining except for the NO_x limit for the MHSP M501JAC. For 30 cold starts, there need to be 30 corresponding shutdowns. Adding the NOx emissions for 30 corresponding shutdowns to the MHPS NOx total, the NOx emissions would be increased by 1.7 tons, which increases the total to 3.69 tons of NOx for the MHPS. Thus, all these limits would be constraining.

The annual limits as established in Condition 4.1.1. and short-term emissions limits by model CT and restrictions in Condition 4.1.3. reflect the projected number of SUSD events by type of event. One Commentor suggested that the DAQ should consider established annual limits based on

specific model CT, which the DAQ has developed in the finial permit, see WVDAQ Response to Comment 10 in this final determination.

COMMENT:

NAAQS Modeling Analysis

1-Hour NO_2:

The modeling analysis notes there are modeled 1-hr NO_2 violations within the modeling domain, but that MSCEC does not significantly contribute to the modeled violations. Source culpability is assessed via the MAXDCONT keyword (and output file) within the AERMOD dispersion model. Model files were provided and reviewed by EPA to confirm this claim.

The construction of the final 1-hr NO_2 NAAQS analysis was somewhat cumbersome. Given the grid size and the AERMOD rank assessment (365^{th} rank), the final MAXDCONT file contained 1,353,240 lines of model results (1,350,376 receptors to analyze). EPA reviewed the file and confirmed the source group attributed to the MSCEC emission sources contribution did not exceed the 1-hr NO_2 significant impact level or SIL for any of the modeled 1-hr NO_2 violations.

EPA has several comments regarding the 1-hr NO_2 NAAQS analysis:

- The source group used in the modeling analysis to determine culpability only included MSCEC sources (2 combustion turbine stacks, an emergency generator, a fire pump, and gas heater sources). Given that MSCEC and Longview are being treated as one facility, shouldn't the Longview power plant be included in the source group to assess culpability of the NAAQS violating receptors?

WVDAQ Response: *No, the Longview power plant should not be included in the source group to assess culpability of the NAAQS violating receptors. Although MSCEC and Longview are under the same ownership and control, these two entities are not being treated as one facility for culpability determinations. Of critical importance is that the permit application is for a modification, which is treated separately from the existing source. The project sources (i.e., the sources which the permit application addresses) are modeled and treated separately from the existing Longview sources. For any culpability analyses, the project source impacts are compared to significant impact levels (SILs) and do not include Longview (existing) sources. Appendix W of 40CFR51, Table 8-2, identifies nearby sources to be included in NAAQS compliance PSD demonstrations. Footnote 4, which applies to nearby sources, of this table states " Includes existing facility to which modification is proposed if the emissions from the existing facility will not be affected by the modification." Thus, Appendix W states that nearby sources include the existing facility, which in this case includes Longview Power. Nearby sources are not combined with the project source, in this case MSCE, when determining whether the project source/applicant, causes or contributes to a modeled violation. MSCE appropriately included only the MSCE project sources in the culpability analysis.*

COMMENT:

- The AERMOD analysis did not appear to incorporate a formal background 1-hr NO_2 concentration. It appears the 1-hr NO_2 design value for the Charleroi, PA monitor was utilized in the final modeling analysis and added onto the summary tables included in the report. Use of an AERMOD background concentration would have allowed for a smaller MAXDCONT output file via the THRESH command. Not including a background within AERMOD would also have made it easier to identify violating receptors in the AERMOD MAXDCONT and plot file model outputs.

WVDAQ Response: *The ambient air quality analysis does include a "formal" background 1-hr NO_2 concentration. Appropriate background concentrations can be included within AERMOD or added to AERMOD modeled values outside of AERMOD. MSCE appropriately added a uniform 1-hr NO_2 design value concentration to the AERMOD modeled concentrations.*

COMMENT:

- The Charleroi monitor's 2017-19 design value is 33 parts per billion (ppb) according to EPA's design value spreadsheets[2]. The annual 98th% ranks listed in Table 7-12[3] do not seem to match those in EPA's spreadsheet (but the overall design value does match so the results shouldn't change). By EPA's calculation, background 1-hr NO_2 concentrations should be 62.0 µg/m^3; it appears a background value of 62.7 µg/m^3 is being used in the modeling analysis.

WVDAQ Response: *MSCE appropriately utilized a 1-hr NO_2 background value of 62.7 µg/m^3 in the air quality modeling analysis.*

COMMENT:

- Model stack velocities for the natural gas heaters and the fire pump appear excessive. The model stack velocities are 96.32 m/s and 42.98 m/s respectfully. Please check and verify that these stack velocities are correct.

WVDAQ Response: *MSCE has provided manufacturer specification sheets and related design calculations that support the model stack velocities for the natural gas heaters (22.38 m/s) and fire water pump (42.98 m/s). Both velocity values match the values in the modeling input file for the final 1-hr NO_2 NAAQS refined-grid modeling run from 3/15/2021, which is the final modeling run.*

COMMENT:

Modeled 1-hr NO_2 NAAQS Violations:

The current modeling analysis appears to show modeled violations of the 1-hr NO_2 NAAQS. MSCEC was found to not significantly contribute to these model violations. This may need to be reevaluated if changes are necessary in response to EPA's comments on the model receptor grid (ambient air boundary definition) and the MSCEC/Longview source groupings.

If the MSCEC does not significantly contribute to the modeled 1-hr NO_2 violations, WV DEP should still take steps to address these modeled violations. EPA notes the following model refinements that may alleviate or eliminate the modeled 1-hr NO_2 violations:

> **Off-Site Source Emission Rate Revisions:** Nearby source emissions were set too conservatively. From page 7-4 of the March 2021 report, *"[T]he inventory was converted to maximum permitted emissions through a review of the Title V permit for each source and through the use of the offsite emission inventory previously developed for the Longview Power Unit 1 PSD application."* Recent revisions to Appendix W, Guideline to Air Quality Models allow for the use of emission rates (for "nearby" source) to reflect actual emissions. See Table 8-2 and section 8.2.2(c) of Appendix W for a more complete explanation.

WVDAQ Response: *MSCE used a conservative, appropriate, nearby source emissions inventory in the modeling analysis. Although Appendix W does have recent revisions that allow adjustment from permitted emission rates it does not allow true actual emission rates. The flexibility afforded by Appendix W is based on actual operating levels at nearby sources. Obtaining this information, even if available, is often cumbersome and time consuming. MSCE used an appropriate inventory and documented that MSCE does not cause or contribute to any modeled violations.*

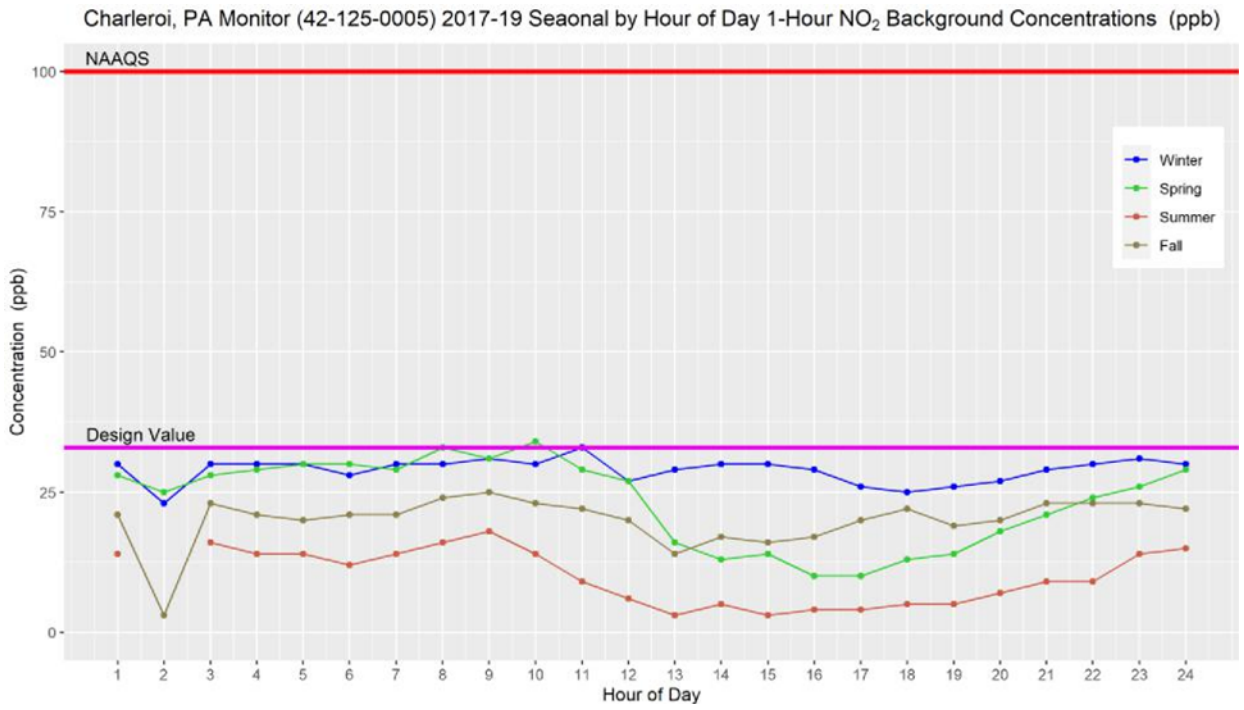
COMMENT:

> **Use An Alternative Background Concentration:** The modeling analysis utilized a conservative background concentration; the 2017-19 1-hr NO_2 design value. A more refined background concentration could be used as outlined in EPA's March 1, 2011, Clarification memo[4]. If Charleroi is used, using an hourly varying season by hour of day could be an option.
>
> Figure 2 shows Charleroi's 2017-19 season by hour of day background 1-hr NO_2 values (in ppb) along with the monitor's design value. Using the season hour of day varying background concentrations may provide some lower background concentrations versus using the monitor design value. This may reduce final model concentrations.
>
> **WVDAQ Response**: *MSCE utilized an appropriate, conservative, uniform background 1-hr NO2 value in the modeling analysis. WVDAQ notes and acknowledges*

that other methods may be appropriate if an applicant or WVDAQ finds it desirable to refine the background concentration values.

EPA Region 3 Comments to the Modeling Analysis for the Mountain State Clean Energy Center in Monongalia County, near Maidsville, West Virginia
Comments Prepared October 2021

Figure 2. Charleroi, PA 1-hr NO_2 Background Values[5]



Source Refinement: Based on EPA's modeling analysis appears to identify 1 source that appears to be causing model violations is the stack identified as MYLAR. We believe this source is the Mylar Pharmaceutical facility in Morgantown, WV.

EPA looked at the modeled information for the Mylar stack. It appears the location information may be incorrect. The model location appears to be about 450m west of the Mylar Pharmaceutical company's actual location. Google maps places the facility at the intersection of Chestnut Ridge Road and the entrance road to the North Elementary School. Additionally, the stacks appear to sit on top of a large building structure. This brings up the possibility of building downwash, but it also increases the release point or stack height in the model. Additional

source refinement including corrections to the stack location and release height may change final model concentrations.

WVDAQ Response: *WVDAQ has confirmed via GIS analysis using aerial photography that the locations of Mylan used by MSCE in the modeling analysis appear correct.*

PM Modeling Analyses

Modeled emission rates for PM-10 and PM-2.5 were generally consistent throughout the NAAQS and PSD simulations. We have the following general comments pertaining to the PM simulations:

COMMENT:

- MSCEC's modeled stack velocity for its emergency generator seems unrealistically high. In the PM simulations the emergency generator's stack velocity is set at almost 285 m/s. This is approximately 83% the speed of sound. The stack velocity is also inconsistent with the velocity used in the NO_2 simulations.

WVDAQ Response: *MSCE provided manufacturer specification sheets and related design calculations that support the modeled stack velocity for the emergency generator. This velocity of 284.9 m/s is the same velocity used in all final NO_2 modeling runs*

COMMENT:

- As noted previously, the modeling does not include the Longview power plant source(s) in any of the culpability analyses for violations of the PM NAAQS and/or PSD increments. Generally, all source emissions are included to determine if the source is contributing above the applicable SILs.

WVDAQ Response: *See prior response relating to source culpability. MSCE appropriately included the MSCE project sources for comparison to the applicable SILs in determining culpability for modeled violations.*

COMMENT:

- The off-site inventory (summarized in Table 7-6 of the final modeling report) has several sources with stack parameters that seem unusual and/or excessive. The stack temperature for Mylan is listed at almost 950 K (~1,250 °F). Additionally, stack velocities for several sources exceed 50 m/s. The stack velocity for Morgantown Energy is listed as 62 m/s, which seems excessive for this type of source.

WVDAQ Response: *The WVDAQ has verified that the Mylan stack temperature of 950 K is reasonable and appropriate and is consistent with the engine specification sheet. The WVDAQ*

has reviewed the stack velocity for Morgantown Energy and determined that the appropriate velocity is approximately 20 m/s. The WVDAQ has performed additional analysis using this revised velocity for Morgantown Energy. Although the modeled impacts from Morgantown Energy do increase, the overall cumulative concentration is virtually identical, and the conclusion of the analysis remains the same. Also, even if the overall modeled concentration would increase, the contribution from MSCE remains the same.

COMMENT:

- The off-site inventory also lists several stacks that exceed 65 meters. There doesn't appear to be any information regarding if these stacks exceed good engineering practice or GEP stack heights. Please provide information to show that these stacks comply with GEP.

WVDAQ Response: *MSCE modeled all off-site inventory sources at the appropriate stack heights – the modeled stack heights do not exceed GEP stack heights. Four off-site sources have stacks that exceed 65 meters: 1) American Bituminous – Grant Town Power; 2) Longview Power Unit 1; 3) Morgantown Energy; 4) Fort Martin Power. Grant Town Power, Longview Unit 1, and Morgantown energy previously received PSD permits and completed PSD review documenting the creditable stack heights that MSCE used in the modeling analysis. Grant Town Power and Fort Martin Power have completed 1-hr SO_2 DRR modeling and included BPIP analysis documenting the creditable stack heights used by MSCE in the modeling analysis.*

Responses to Written Comments Made by the Public

Comment 1 from Duane Nichols and Donna Weems:
The truck traffic on Ft. Martin Road is already an extreme challenge for the local residents. This is a nuisance to residents of Ft. Martin, having 300 plus diesel coal trucks per day laboring up the Ft. Martin hill. These people cannot sit out on their porch because of the noise. Add ash hauling, add additional traffic for another plant, etc. The air pollution from local traffic needs to be explicitly considered as part of the analysis because of its unique status! This traffic is part of the environmental justice considerations for this proposed new plant.

WVDAQ Response:
The proposed operation does not require daily fuel deliveries or ash removal by trucks.

Comment 2 from Duane Nichols and Donna Weems:
The steam plumes from these plants which we readily see in the sky are primarily water vapor, but these small water droplets absorb acid gases and fine particulate matter emitted from the combustion boilers of all the power plants. These clouds also obscure the sunlight and increase rainout over our area. The finest particles (PM 2.5) are the greatest concern. Free radicals as active chemical species are spread in our environment and interact with living tissue to cause a variety of damages. The steam plumes disturb the regional environment with emissions from the cooling towers, fans, and associated effluents from water treatment — these are environmental justice issues.

WVDAQ Response:
The maximum water content of pipeline quality natural gas is typically 7 lb of water per one million cubic feet of gas or 0.016 % on a mass basis, which is established by the pipeline operator. This proposed power plant does not require a wet scrubber to control sulfur dioxide. The amount of water released by the combustion turbines will be significantly less than the coal fired EGUs at the Fort Martin and Longview Power Stations. Water is not a regulated air pollutant. The comment does not clearly identify a concern or issues with $PM_{2.5}$ with the proposed emissions units.

Comment 3 from Duane Nichols, Donna Weems, and Aileen Curfman:
We believe that having three large fossil fuel power plants together here raises air pollution and environment justice issues for the Ft. Martin community, the Bakers Ridge area, University High School, the WVU Medical Center, the Forks of Cheat Forest, and the entire region. The original Ft. Martin plant generates 1100 megawatts of electricity, the Longview coal-fired plant generates 700 MW, and the proposed "clean energy" plant is rated at 1200 MW. So, the steam plumes and GHG will be very significant. These are environmental justice issues affecting young students, affecting residents of all economic classes, affecting patients in medical treatment, and affecting the elderly in care facilities and in their own homes.

The concern is for both long term exposures, as some of us are exposed for decades, as well as for short term events such as weather inversions where naturally occurring temperature profiles

trap pollutants for hours in specific areas, particularly the valleys. The steam plumes actually affect the local weather conditions.

We believe that this proposed project with the numerous issues that offend the public interest should be set aside for a detailed environmental justice analysis. Help should be requested from the US EPA. An analysis needs to be performed by a trained staff using a decision matrix or other technique. Public hearings may be necessary. The WV agency, not the applicant, should be responsible for performing this study. (Diverse statements or activities by the applicant are inadequate to a just and rational analysis.)

WVDAQ Response:
Environmental Justice (EJ) Background

Executive Order 12898 (Clinton, 1994)

- *To the greatest extent practicable and permitted by law … each Federal agency shall make achieving environmental justice part of its mission. Addressing disproportionately high adverse effects on minority populations and low-income populations …*
- *Requires federal agencies to develop strategies for addressing EJ and to conduct activities and programs so that there is no discrimination based on race, color, national origin*
- *"Environmental justice" defined as: the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.*
- *"Fair treatment" means that no group should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies.*
- *"Meaningful involvement":*
  - *Opportunity for people to participate in permitting process; decision-makers will seek out and facilitate the involvement of those potentially affected.*
  - *Community concerns will be considered in the decision-making process and could influence decision*

Executive Order 14008 (Biden, 2021)
Updates 1994 EO
Establishes White House EJ Advisory Council and White House EJ Interagency Council
Requires Council on Environmental Quality to create screening and mapping tools
Note: in another Executive Order – EO 13985 – the term "equity" is defined as "the consistent and systematic fair, just, and impartial treatment of all individuals, including… persons who live in rural areas…"
Directs EPA

- *Strengthen enforcement of violations with disproportionate impacts on underserved communities*

- *Create a community notification program and provide real-time data*

Environmental Justice Screening
In conducting an Environmental Justice review, applicant and regulating agency should look at the impacts on the following demographic indicators:

1. *Low-income population - household income is less than or equal to twice the federal "poverty level."*
2. *People of color*
3. *Population with less than high school education*
4. *Linguistically isolated population*
5. *Population under age 5*
6. *Population over age 64*

Applying the EPA Environmental Justice Screening Tool [ejscreen.epa.gov] to applicant's facility location shows:

1. *Low-income population – 49% - 72nd percentile (state)*
2. *People of color – 3% - 39th percentile*
3. *Population with less than high school education – 19% - 75th percentile*
4. *Linguistically isolated population – 0%*
5. *Population under age 5 – 5% - 46th percentile*
6. *Population over age 64 – 20% - 62nd percentile*

The commentors do not specifically identify how the afore mentioned groups were not allowed to participate or were disconnected from the agency's public review process because of race, color, national origin, or income with respect to this permit application. The DAQ followed the public review procedures of 45 CSR 13 and 45 CSR 14. In addition, the DAQ ensured that all subscribers to the DEP List Server received a notification of the public review period and the public meeting. The results of the EPA's EJ Screening Tool, which are presented above, does not indicate that any further review is warranted.

The air quality assessment performed by the applicant, and confirmed by the DAQ, used actual recorded meteorological data from the Morgantown Airport (local weather) in determining the potential impact from the proposed emission units.

Comment 4 from Duane Nichols and Donna Weems:
The misleading name itself is another serious environmental justice issue probably intended to deflect criticism and give the public a false sense of air quality.

WVDAQ Response:
Commentor failed to identify how the name of the company presents a serious environmental justice issue. Further, facility names are not, in this sense, within the DAQ's jurisdiction.

Comment 5 from Paula Hunt:
While not as polluting as coal-fired power stations, such as the immediately adjacent Longview power plant, located on the MSCE property in Maidsville, and the nearby Fort Martin power station, also located in Maidsville, gas-fired power plants do emit pollutants. Obviously, this is why MSCE needs an air-quality permit from the state of West Virginia.

MSCE is located in Monongalia County, which is immediately adjacent to Fayette County, Pennsylvania, officially part of the Pittsburgh metropolitan statistical area and a county in nonattainment for the 8-Hour Ozone Standard (https://www.dep.pa.gov/Business/Air/BAQ/Regulations/pages/attainment-status.aspx). The three power stations in Maidsville – this Project (MSCE), Longview, and the Fort Martin power station – are all located less than 2½ miles upwind of Fayette County, PA. The Pennsylvania DEP will only be notified of this new significant air-pollution source after the West Virginia DEP approves it, which appears to be a foregone conclusion.

WVDAQ Response:
An Ozone Analysis was conducted by the applicant and reviewed by the DAQ to determine if the proposed emission units have the potential to adversely affect the ozone attainment status. The result of this analysis shows that MSCEs proposed emissions of NOx and VOCs could result in an increase of 1.25 parts per billion of ozone.[15] Adding this increase to the 2020 Ozone Design Values for the monitors in Greene, Washington, and Westmoreland Counties in PA, the 8-hour ozone design value for these monitor sites would be equated to or less than 64.3 ppb of ozone, which is less than NAAQS of 70 ppb. The PA DEP was provided notice regarding this application by the WV DAQ. In addition to the PA DEP, the Allegheny County Health Department was provided notice and has primary responsibility for developing the plan to bring that area into attainment status. Neither agency provide any comments concerning emissions from MSCE to the DAQ.

Comment 6 from Paula Hunt:
Mountain State Clean Energy, formerly Longview II, is part of Mountain State Energy Holdings LLC, formerly named Longview Intermediate Holdings C LLC. Mountain State/Longview Holdings emerged from a second bankruptcy in July 2020, before submittal of MSCE's new

[15] Jon McClung, P.E., Memo to Ed Andrews Re: Air Quality Analysis – Mountain State Clean Energy, LLC PSD Permit Application No. R14-0038 – Plant ID No. 061-00134, September 23, 2021, page 6.

source air-quality permit application. In January 2021 Moody's Investors Service assigned the holding company a relatively low credit rating of Caa1 due to:

"… Longview's overall weak credit position due to weak wholesale power prices in PJM Interconnection, L.L.C. (PJM, Aa2 stable). The PJM region is plagued by persistent excess capacity, tepid electric demand and sustained low natural gas prices, all of which compress electric energy margins. As a merchant coal-fired generation power plant, Longview faces elevated carbon transition risk, with the potential for adverse federal policy for the US coal power industry and rising investor concern regarding ESG considerations contributing to heightened refinancing risk for the project (https://www.yahoo.com/now/mountain-state-energy-holdings-llc-012605916.html dated January 2021)."

"Weak wholesale power prices," "persistent excess capacity" on the PJM grid, and "tepid electric demand": it sounds like we do not need another greenhouse gas-emitting power plant here. Mountain State Clean Energy is propped up by the Taxpayers of Monongalia County, West Virginia. MSCE (as well as Longview) is located on property owned by the County Development Authority, and property taxes to the County are significantly slashed through a Payment in Lieu of Taxes scheme worked out by MSCE and the politicians. Adding yet another unneeded power plant with additional environmental degradation and questionable financing does great harm to the people of West Virginia.

This air-quality permit allows MSCE to emit over 5 million tons of greenhouse gases as CO2. Why are we building new power plants burning fossil fuels in this day and age? Other sources of power generation are less costly and damaging overall. The climate-change writing has been on the wall for years. When will West Virginia read it?

WVDAQ Response:
The DAQ can only review an application under the State Rules and Federal Regulations under which it has authority. Issues of credit rating, financing, taxation, or the "need" for the source are outside the authority of the WV DAQ.

Comment 7 from Paula Hunt:
Most of the BACT listed in Table 16 on Page 30 of the draft permit appears to be "good combustion practices" (in other words: "do nothing"), and other control technologies are dismissed as technologically or environmentally infeasible. This is ridiculous. Add-on controls are feasible and should be used to further reduce PM, scrubbers can and should be used for H2SO4, and carbon capture can and should be used for GHG/CO2.

Additional controls are needed for NOx as well. NOx, CO, VOCs, PM/PM10/PM2.5, H2SO4, and CO2 all exceed PSD/NSR Significance Levels.

Pollutant	MSCE Air Permit (tons/year)	PSD/NSR Significance Level (tons/year)

NOx	158.6	40
CO	136.9	100
VOC	70.2	40
SO_2	19.9	40
$PM/PM_{10}/PM_{2.5}$	101.2	25/15/10
H_2SO_4	18.7	7
HAPs	23.54	25
CO_2 equivalents	5,135,318.3	75,000

- CO, NOx, and ammonia slip should be tested quarterly on the CEMs, especially since the BACT chosen for MSCE is mostly left to good combustion practices, and CO is an indicator of good combustion.

- Sulfur content of the fuel (Section 4.2.3.e) should also be tested quarterly, rather than just annually, since this is also part of the listed BACT.

- Incremental degradation allowances for greenhouse gas emissions/CO_2 (Section 4.1.2) should not be permitted.

- Fugitive emissions (Section 7.1.1.d) should be repaired within 7 days, not left for up to 30 days. If infeasible, etc., they should be left no longer than six months, not up to two years as stated in the draft permit.

WVDAQ Response:
Commentor assumed all add -on control technologies are feasible. Applicant followed the Top-Down approach to evaluate each control technology with respect to the pollutant. The DAQ reviewed this analysis and concurred with the applicant outcome of the selected control technology.

Because MSCE proposed emissions rates were above the PSD Significance Level as illustrated by the comment, MSCE was required to conduct a control technology evaluation using the top-down approach to determine the best available control technology (BACT) for each pollutant that was above the significance level.

The permit requires continuous measurement of CO, NOx, and ammonia slip. The permit requires annual Relative Accuracy Testing Audit (RATA) to be conducted to ensure that these monitors are producing valid results, which is a requirement developed by the EPA. In addition, there are daily checks and quarterly audit that will have to be preformed by MSCE to ensure the monitors are operating properly and maintaining a valid calibration, which are part of the quality assurance procedures.

MSCE have several options in demonstrating the sulfur content in their fuel, which EPA has developed as an acceptable means to determine the sulfur content for these types of sources. Should MSCE conduct fuel sampling under Condition 4.2.3.e., then only one sample is required.

However, Condition 4.3.1. is for annual demonstration for NSPS Subpart KKKK. The DAQ has replaced the term "periodically" in Condition 4.3.1.e. with a sentence to require no less than 3 samples be taken during the testing period.

The DAQ has adopted the provisions from the Acid Rain Program because the actual source of fuel for MSCE is not known or may be supplied by multiple different suppliers.[16] These provisions from Acid Rain allows the source several different options to determine the sulfur content in the fuel. The commentor did not provide any justification why more frequent sampling is necessary beyond what is required by applicable regulation(s).

The permit requires that MSCE monitor parameter(s) that indicate if the OEMs combustion systems are operating in Conditions 4.1.4.f., which is to be used to show that good combustion practices are being implemented.

Regarding the suggestion to reduce the repairing frequency of gas leaks, please refer to WVDAQ Response to Comment 12.

Comment 8 from Aileen Curfman
The permit refers to a 1200 MW power plant in one place, and a 1300 MW plant elsewhere. Which is it? Since emissions standards (Table 4.1.1.a.), e.g., for NOx and GHG, are based on pounds/MWh and compliance is based on pounds per hour (Table 4.1.1.b., Sections 4.4.4 and 4.4.5), knowing the correct capacity in MW is essential.

WVDAQ Response:
The proposed plant will have a nominal generation rating of 1,275 MWh on a net generation basis. The permit establishes short term limits for NOx on a concentration and mass basis, which are based on the design of the units. The only NOx limit in the permit in terms of lb/MWh is the NOx standard from NSPS Subpart KKKK.

The CO2 limits in this permit are energy efficiency standards in terms of lb CO_2 per MWh. The CO2 emissions in the application were determined by the maximum amount of natural gas that can be consumed by the emission units.

Comment 9 from Aileen Curfman and James Kotcon:
The permit does not specify what combustion turbine will be used. This choice should be clearly stated in the permit. How can the DAQ evaluate what emissions are acceptable if the system they are evaluating is not specified?

WVDAQ Response:
The applicant provided detailed emission characteristics of both models of combustion turbines. Both sets of these emission characteristics were evaluated during the permit review process.

[16] Appendix D of 40 CFR 75.

Because of the significant differences between the emission characteristics of the two proposed models, the permit has two sets of limits for short-term mass limits; startup and shutdown events; and carbon dioxide performance standard.

Comment 10 from James Kotcon:
We recommend that the revised Draft Permit should specify that only the least-impacting combustion turbine is authorized. In any event, a separate annual emissions limit should be specified depending on which combustion turbine is chosen, as the emissions proposed for the GE turbine differ from those for the Mitsubishi model by 6-8 % (up to 47 % for H_2SO_4).

WVDAQ Response:
It is the understanding that these two manufacturers (GE and MHPS) use different design and combustion controls to minimize the emissions generated by the CTs. These design and combustion control measures are exactly known to the DAQ. The MSCE has not selected the specific model combustion turbine for their project at this time.

The DAQ does agree that because of the difference in mass emissions that annual limits should be established by model of CTs. Thus, annual emission limits in items e through i. will be revised to reflect the annual emissions per model of CT. This change will not affect the sulfur dioxide emission limit because MSCE has elected to cap sulfur dioxide emissions to 39.8 tons per year regardless of the model of CT.

Comment 11 from James Kotcon
The narrative on page 5 (sixth sentence) of the Draft Permit mentions three Heat Recovery Steam Generators (HRSGs), however only two are mentioned in the table cited above. The text indicates that each HRSG will have its own stack, thus it is unclear whether the permit anticipates three stacks or only two.

WVDAQ Response:
The preliminary determination stated that the applicant proposed only one HRSG for each CT for a total of 2 HRSGs for the project.[17] A HRSG is not an emission unit by itself. It is a key component needed for the combined cycle operation with the purpose of extracting the heat energy in the exhaust from the CTs and transferring the heat energy into steam. The CTs with duct burners are the equipment generating emissions. The error in Table 1.0 of the permit will be corrected.

Comment 12 from Aileen Curfman and James Kotcon:
The permit does not require leaks and fugitive emissions to be repaired as soon as possible after detection. Thirty days is too long to expose the community to gas leaks.

[17] Preliminary Evaluation for Permit Application R14-0038, September 29, 2021, page 7

Page 49, Section 7.1.1.d. Allowing 30 days to repair fugitive emissions, or in some cases up to two years, is not acceptable. We recommend that repairs be done as soon as practicable, and not later than 3 days after detection whenever it is safe to do so. Larger leaks should be given priority and repaired sooner.

WVDAQ Response:
It should be noted that a repair is not considered repaired until the repair has been verified to not be leaking, which means that a leak detection team must re-monitor the component once the repair has been completed. Three days to complete after detection is not reasonable and is more stringent than other types of facilities that are subject to regulation that require LDAR programs.[18]

The intent of the frequency of the survey and timing to make repairs is to encourage the permittee to conduct leak detection surveys prior to a planned unit outage. This should allow the permittee sufficient time to identify the type of repair needed, resources needed to make the repair, and if necessary, the piping segment or equipment could be isolated and vented during a unit outage.

EPA has proposed changes to NSPS Subpart OOOOa, which includes the timing to repair leaks at well pads and compressor stations for the oil and gas industry. EPA proposed making the first attempt within 30 days after detection of the leak and complete/final repair within 30 days of first attempt.[19]

The DAQ believes that GHG Fugitive BACT is in line with EPA's proposed changes to NSPS OOOOa. Thus, the DAQ affirms that the timing to repair leaks within 30 days is BACT.

Comment 13 from James Kotcon:
Page 49, Section 7.0. We recommend that "fugitive emissions" be defined to include those from upstream pipelines, compressors, wells and related facilities. As previously stated, without this power plant, those facilities would likely never be installed. At a minimum, the applicant should be required to monitor these facilities to quantify their fugitive emissions.

WVDAQ Response:
This request to include sources located beyond the fence line of the facility does not meet the definition of stationary source from the Clean Air Act and is not practically enforceable.

Comment 14 from Aileen Curfman:
The permit contains unit degradation provisions that appear to assume that pollution controls will deteriorate with age of the facility. Instead, proper maintenance should be required so that pollution controls will remain effective.

[18] Subparts VV and VVa of 40 CFR Part 60.
[19] https://www.federalregister.gov/documents/2021/11/15/2021-24202/standards-of-performance-for-new-reconstructed-and-modified-sources-and-emissions-guidelines-for

WVDAQ Response:
The degradation schedule used in the development of the carbon dioxide standard is reflective of proper maintenance being performed. BACT for carbon dioxide is low carbon fuel and combustion optimization. This combustion optimization is dependent on unit performance. Rotating machinery will experience some degree of wear over time, which will be seen in a reduction in unit performance (e.g., more fuel is required to be consumed to make the same amount of electricity). The energy efficiency of the unit will decrease over time.

A mass limit over time for carbon dioxide cannot be linked to actual performance of the unit and therefore is not considered to be BACT for GHGs. This approach is acceptable for limiting emissions without any regard towards a unit's performance or efficiency over the life of the unit.

If the DAQ considered a single limit, this single limit would have degradation built into the limit (e.g., higher limit at day one). Therefore, the source would not be forced to focus on the unit's performance until later which may be too late to minimize the degradation rate of the unit.

The electricity generation market determines the operational load of the power plant. Low operating loads are inherently less energy efficient for a combined cycle unit. These choices have the undesired effect of reducing the unit's energy efficiency, over time, even with good maintenance practices.

Comment 15 from Aileen Curfman:
The emission limits are higher than limits required for similar power plants. The industry has the technology to do better. The permit should require that the higher standards should be met.

WVDAQ Response:
The major source permitting rule does not require that actual emission limits be lower than the previous determinations. BACT is usually set on a capacity basis, such as pounds of a pollutant per MMBtu produced, to properly compare types of sources.

Comment 16 from Aileen Curfman:
Similarly, the permit regards Marcellus gas as a low carbon fuel, but in reality, the emissions from gas cause significant global warming. Recognition of Best Available Control Technology would require the use of renewal forms of energy that do not result in greenhouse gas accumulation.

WVDAQ Response:
The major source permitting program under the Clean Air Act requires that the individual sources be evaluated for each pollutant for which the project is significant.

It is not the role of the DAQ to dictate the process or fuel type that an applicant proposes. The duty of the agency is to evaluate the permit application in accordance with the applicable State Rules and Federal Regulations.

Comment 17 from Aileen Curfman
The permit considers only the emissions from the power plant itself and ignores emission from infrastructure that would bring the gas to the power plant. Emissions from vehicle traffic to the power plant are also ignored. These should be included in the emissions that result from this plant.

WVDAQ Response:
The major source permitting rule focuses on emissions from emission units that are part of the project and under control of the applicant. Emission units associated with the pipeline segment are not part of the project and not under control of the applicant and therefore do not meet the definition of stationary source for this application.

Comment 18 from Aileen Curfman:
The evaluation of the cost-effectiveness of greenhouse gas emissions controls does not include costs to the community that result from these emissions. Many of these, such as health issues, impose a quantifiable financial cost. When these costs are included in the equation, it becomes clear that carbon capture and release technology should be required.

WVDAQ Response:
The requirement under the major source permitting rule is to identify and implement the control technology that is technically and economically feasible. The add-on controls for GHGs from the CTs are not feasible.

Comment 19 from James Kotcon:
The table at the bottom of page 5 of the Draft Permit refers to a "…reciprocating, compression ignition engine (RICE)". This acronym generally refers to a "Reciprocating internal combustion engine". Are these the same thing? If not, what kind of emissions unit does the air permit refer to? Note that section 5.0 (page 41) also refers to this as an "internal combustion engine.

WVDAQ Response:
This is typographical error as pointed out by the commentor. The fire water pump and emergency generator are reciprocating internal combustion engines (RICE) and the type of RICE is compression ignition. This error has no impact on the applicable rules or regulations as identified in the permit.

Comment 20 from James Kotcon:

Pages 21-22, Section 4.1.4.f. Editorial. Paragraphs 2-5 of this section have several run-on sentences, and sentences missing words, or with such poor grammar as to be unintelligible. We recommend careful editing and that a revised draft be circulated for public comment.

WVDAQ Response:
The paragraph in question was revised as follows:

"For demonstration of good combustion practices, the permittee shall operate the CT with the OEM's proprietary combustion system excluding the following events: SUSD events, equipment performance demonstrations that requires the OEM's combustion system to be disabled to conduct a valid demonstration, and tuning of the unit."

The intent of the condition is to require the permittee to always operate the proprietary combustion system of the CTs except during SUSD events, equipment testing and during combustion tuning.

Comment 21 from James Kotcon:
Page 24, Section 4.2.1.1. Editorial. The first sentence of the last paragraph should be revised to read: "Monitor(s) that collect data that ~~is~~ are used to determine CO2 emissions shall be maintained in a manner that monitoring availability is at least 95% during the operating hours ~~ly~~ in the reporting period as defined in Condition 4.5.3."

WVDAQ Response:
Condition 4.2.1.1. was revised as suggested.

Comment 22 from James Kotcon:
Page 31, Section 4.3.7. Editorial. This section is also unintelligible due to poor grammar.

WVDAQ Response:
Revised Condition 4.3.7. to the following:

> *"The permittee shall conduct subsequent testing as outlined in the following table. When either indicator is met, the permittee shall conduct the testing specified in the corresponding condition in accordance with the timing requirement in the table.*

Table 4.3.7. Subsequent Testing Schedule

Condition No.	Indicator 1	Indicator 2	Timing
4.3.2.	Annual fuel gas Sulfur Content is	Annual average ammonia slip is	Within 120 days after the end of the year

	greater than 0.3 gr/100 scf	greater than 2 ppm at 15% O_2	
4.3.3.	Annual fuel gas Sulfur Content is greater than 0.4 gr/100 scf	Annual average inlet temperature to the SCR is less than 600 F excluding temperatures recorded during startup and shutdown events.	Within 120 days after the end of the year
4.3.4.	Monthly average CO Concentration is above 2 ppm @15% O_2	Replacement of the Oxidation Catalyst	Within 90 days of triggering the indictor

Comment 23 from James Kotcon:
Page 49, Section 7.1.1.c. Editorial corrections needed. Is this missing some verbs and prepositions?

WVDAQ Response:
Condition 7.1.1.c. was revised as follows:

"c. The fugitive emission components at the facility shall include all above grade components and equipment associated with the natural gas fuel supply piping, located on property of MSCE, that is connected to all the natural gas combustion sources covered under this permit."

Comment 24 from James Kotcon.
The PD/FS (page 8) indicates that "No auxiliary boiler will be constructed for this project" because the plant will interconnect with and provide steam from the existing Longview Power Plant. What happens if Longview shuts down, either temporarily due to mechanical issues, or over the long-term due to financial problems? It is worth noting that Longview has been in bankruptcy twice within the last eight years, creating a serious question as to its economic viability.

WVDAQ Response.
It is the responsibility of the permittee to determine operational viability. The auxiliary boiler is permitted and can still operate, even if Longview is not generating power (temporary or otherwise). If Longview (EGU) were to be permanently shut down and the permit made inactive, MSCE could request that the auxiliary boiler permit conditions be moved to MSCEs permit.

Comment 24 from James Kotcon:

The PD/FS (page 42) indicates that the Class I Area SIL Analysis used the AERMOD model to estimate pollutant levels associated with the Class I Areas such as Dolly Sods and Otter Creek Wilderness Areas. Protecting these Wilderness Areas is a major concern for the West Virginia Chapter of Sierra Club. But the models only estimated levels at receptors approximately 50 km from the MCSE project, and these Areas are outside that range. While this may be adequately protective in flatter terrain, we note that both Wilderness Areas occur at elevations significantly higher than the terrain within 50 km of MCSE. While the 50-km limit may be appropriate for accurate estimation of pollutant levels using AERMOD, National Park Service Guidance clearly states (especially for very large sources) that "any reasonably expected impacts for class I areas must be considered irrespective of the 50-km model limitation."[20] As such, estimates or pollutant levels at 50 km are not an adequate basis for concluding that Class I Areas are not impacted, and WV-DAQ must require MCSE to more fully evaluate potential Class I Area impacts before issuing any final permit.

WVDAQ Response:
West Virginia Legislative Rule 45CSR14 at §45-14-10 states that all estimates of ambient concentrations required under section 9 (of 45CSR14) shall be based on the applicable air quality models, data bases, and other requirements specified in the Appendix W of 40 CFR Part 51. Section 4.2.c of Appendix W states:

To determine if a compliance demonstration for NAAQS and/or PSD increments may be necessary beyond 50 km (i.e., long-range transport assessment), the following screening approach shall be used to determine if a significant ambient impact will occur with particular focus on Class I areas and/or the applicable receptors that may be threatened at such distances.
i. Based on application in the near-field of the appropriate screening and/or preferred model, determine the significance of the ambient impacts at or about 50 km from the new or modifying source. If a near-field assessment is not available or this initial analysis indicates there may be significant ambient impacts at that distance, then further assessment is necessary.
MSCE appropriately applied this screening approach, as required by 45CSR14 and Appendix W, to demonstrate that modeled impacts are not significant at or about 50 km and no further analysis is required.

In addition, the appropriate Federal Land Managers (FLMs) were consulted by WV DAQ and the FLMs determined that a Class I analysis was not required.

Comment 25 from James Kotcon
The table on page 5 of the Draft Permit indicates that the Mechanical Draft Cooling Tower would have a Design Capacity of 270,000 gal/min. This translates into a water demand of over 600 cfs. The WV-DEP's TAGIS system indicates that the 7Q10 flow of the Monongahela River at Morgantown is only 42 cfs. Even considering the additional flow from the Cheat River, the total 7Q10 is less than 100 cfs. A revised draft permit should describe what happens if there is

[20] Permit Application Guidance for New Air Pollution Sources. Natural Resources Report NPS/NRAQD/NRR-93/09. Available at: http://npshistory.com/publications/air-quality/nrr-93-09.pdf

not enough water during drought conditions to supply MSCE. In particular, the Draft Permit should identify how emissions are affected if low flow conditions in the Monongahela River occur, and the pollution prevention requirements that would apply during such events.

WVDAQ Response:
The flow rate of 270,000 gal/min is the circulation capacity of the cooling tower, which is not the make-up water rate. The make-up water rate is for the losses encountered by the cooling tower to the atmosphere, which MSCE will have to supply for continuous operation of the facility. The source of the make-up water is not an air quality related issue.

Comment 26 from James Kotcon:
Page 55, Section 8.1.a.i. The proposed design capacity of 270,000 gal/min for the cooling tower seems likely to greatly exceed the PM limit of 2.16 lb/hour. Assuming 400 ppm TDS in the cooling water, the actual emission rate is likely to be 4 times that level. That TDS level seems especially likely during the higher flow periods when the Monongahela River actually carries that much water. (See comment 7). A revised Draft Permit should specify how the applicant will comply with the proposed limit.

WVDAQ Response:
Currently, MSCE is planning on signing a services agreement with Longview Power which will include providing make-up water for the proposed cooling tower. The source of the Longview Power's make-up water is Dunker Creek and not the Monongahela River.

Condition 8.2.1. requires monitoring of the TDS or conductivity of the cooling water daily. In addition, MSCE will be required to determine actual PM emissions monthly and on a 12-month rolling total.

Per Condition 8.3.1, the permittee is required to demonstrate the effectiveness of the drift eliminator

Comment 27 from James Kotcon:
On page 17 of the Draft Permit, footnote f indicates that "Calculations of CO_{2e} emissions shall use the 100-year global warming potential values… 25 for CH_4…". The use of this parameter dramatically underestimates the short-term warming potential for methane. The value of 25 is based on the 2014 IPCC Report and is now known to be inadequate. Given that methane persists in the atmosphere for only a decade or two, and that the planet is rapidly running out of time to control emissions, a 20-year GWP value is more appropriate. EPA estimates this to be 84-87 times the value for CO_2.[21] Furthermore, even the estimated 100-year value is an underestimate, as it fails to account for production of ozone by methane emissions. The above source estimates the GWP to be 28-36. This is particularly important for fugitive emissions and upstream

[21] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#Learn%20why

emissions discussed below. We recommend that WV-DAQ use a 20-year GWP as the basis for calculating CO_{2e} for methane emissions.

WVDAQ Response:
This facility is subject to the Greenhouse Gas Reporting Rule.[22] This rule has established the global warming potential of methane at 25.[23]

Comment 28 from James Kotcon:
. Page 18. Editorial. Delete the words "that either" from footnote 2 of Table 4.1.1.b. They needlessly confuse the sentence.

WVDAQ Response:
The DAQ agrees with the comment and the change will be incorporated into the final permit.

Comment 29 form James Kotcon:
Page 18. 4.1.1.e. Editorial. Revise the second sentence in section (e) to read: " Compliance with this limit shall be determined by the monthly NOx rate in terms of tons per month using the CEMS emission data and ~~the determine~~ the 12-month rolling total by the 15th of the preceding month." Similar editorial revisions are needed in sections f and g.

WVDAQ Response:
The DAQ agrees with the comment and the condition will be revised as follows:
"Compliance with this limit shall be determined by summing the 12 previous monthly NOx rates. These monthly NOx rates shall be in terms of tons per month, which shall be determined by using the CEMS emission data. Such determination shall be performed no later than the 15th of the preceding month."

This change will be applied to items f. and g. of Condition 4.1.1. and items h. and i.

Comment 30 from James Kotcon:
Page 20, Section 4.1.3.b. The second sentence is a run-on sentence, and so grammatically flawed as to be incomprehensible. We recommend that it be revised to read as follows:
"Shutdown ends either when 1) the fuel flow to the unit is at zero and the HRSG stack NOx and CO emissions are zero or 2) once the ~~unit reaches the~~ HRSG stack NOx and CO steady state emissions are in compliance with the short-term limits in Table 4.1.1.a. for at least one 15-minute block for both pollutants. In the latter case, ~~then~~ shutdown end time is the time at the beginning of this 15-minute block of steady state emissions.

[22] 40 CFR 98
[23] Table A-1 to Subpart A to Part 98 – Globe Warming Potentials

WVDAQ Response:
The DAQ agrees with the comment. After review of US EPA's comment I.A., the DAQ become aware of the delay between the flow meter and the CEMs in the stack. Fuel flow must be at zero before the NOx and CO CEMS reads zero. Thus, omitting the fuel flow to zero definition is appropriate, which simplifies the sentence in question to the following in Condition 4.1.3.b.:

"Shutdown ends either when the HRSG stack NOx and CO are at zero or when the unit reaches the HRSG stack NOx and CO steady state emissions are in compliance with the short-term limits in Table 4.1.1.a. for at least one 15-minute block for both pollutants. Shutdown end time is the time at the beginning of this 15-minute block of steady state emissions"

Comment 31 from James Kotcon:
Page 20, Section 4.1.3.e. Editorial. This sentence appears to contain a double negative and is unclear.

WVDAQ Response:
The commentor is correct. The first word of the sentence "No" will be replace with "Any" in Condition 4.1.3.e. of the permit.

Comment 32 from James Kotcon:
Page 21, Section 4.1.4.b. refers to an "ammonia slip limit in Condition 4.1.3.c."; however, that section does not describe an ammonia slip limit. Should this reference be to 4.1.4.c.?

WVDAQ Response:
The commentor is correct that in Condition 4.1.4.b. the ammonia slip limit should reference Condition 4.1.4.b. The correction was made to the finial permit as suggested.

Comment 32 from James Kotcon:
Page 19, Section 4.1.2. This section of the Draft Permit establishes and justifies an incremental degradation of the units over their lifetime, thereby allowing a >10 % increase in GHG emissions by Year 31 of operation. This directly contradicts the need to reduce GHG emissions, and furthermore, is based on faulty assumptions. The use of incremental degradation ignores the data from the operations of the adjacent Longview Power Plant (where emissions did not increase, and actually declined in recent years). The use of a Unit Degradation rate ignores any on-going maintenance by MCSE and ignores any regulatory mandate to reduce GHG emissions. For example, President Biden's proposed Build Back Better Act would mandate a 4 % per year reduction in GHG emissions from utility generators. Unit degradation is a characteristic of inadequate maintenance, and on-going maintenance is a reasonable expectation for operation of pollution controls. Previous recent air permits for gas-fired power plants in WV (R-14-0030, R-14-0035, R-14-0036) do not include a Unit Degradation rate for GHG emissions, and we do not understand why this was invented for MSCE. <u>We recommend that this section be omitted altogether.</u>

WVDAQ Response:
Unit degradation will occur. Maintenance only minimizes the rate of degradation of unit performance.

The DAQ believes that setting a life-long achievable CO2 limit would not encourage MSCE to implement a good maintenance program and focus on maintaining unit performance from day one.

VA DEQ permitted two combined cycle facilities using the same approach, which was noted in the preliminary determination.

The CO_2 BACT limits in R14-0030D, R14-0035, and R14-0036 require compliance to be based on initial manufacturer's design for combined cycle operation MW gross output at either 59^oF or 32^oF ambient temperature, with duct firing, and evaporator off and operating at base load. Compliance with these BACT limits is demonstrating that the initial design CO_2 rate, at the abovementioned conditions, meets the permit limit.

The CO_2 BACT in MSCE's Permit requires MSCE to determine the actual CO_2 emitted at all phases of unit operation, which includes startup and shutdown events and regardless of the operating loads. There is a clear distinction between these limits. The standard in these other permits (R14-0030D, R14-0035, and R14-0036) does consider startup and shutdowns emissions; varying loads; and degradation over the life of the units.

The DAQ considers the CO_2 BACT limits in R14-0038 appropriate for the proposed type of source.

Comment 33 from James Kotcon:
Page 19, Section 4.1.2. Leaving aside the issue of unit degradation, the GHG emissions rates are unclear and appear to be much too high. The PD/FS at Table 20 indicates that the 95th percentile was used, however, the rate for the Mitsubishi Turbine in Table 20 does not match that given in Table 21. Furthermore, the values provided, when multiplied by 1300 MW times 8760 hours per year, do not generate values that match the projected emissions in Table 12 of the PD/FS (2,563,571.2 tpy for each Combustion Turbine). Since compliance is based on a 12-month rolling average, the use of a 95th percentile to calculate limits for an annual emissions rate is insufficiently protective, as it allows greater emissions than would be warranted. We recommend that a revised Draft Permit be circulated for public comment, and that the basis for these estimates be clearly explained so that they are more transparent to the public.

WVDAQ Response:
Applicant provided emissions and operating data for each of the proposed 34 operating modes. Using this data, a CO_2 rate was calculated (mass CO_2 divided by the gross generation per unit). These individual rates were evaluated to determine whether the rate would exceed the NSPS standard of 1,000 lb/MWh.[24] At the 95th percentile, the GE 7HA.03 would have a limit greater

[24] Table 2 of Subpart TTTT and 40 CFR 60.5525.

than the NSPS Standard, which was determined not be acceptable. The DAQ investigated the basis of the provided CO_2 rates and discovered a 20.75% margin of compliance was applied to the CO2 rate for each operating mode. Thus, each of the mass CO_2 rates for each model CT was divided by 1.2 to remove the 20% margin of compliance for the CO_2 mass rate.

The CO_2 rate for each of the operating modes of both CTs was recalculated. The average and the standard deviation were calculated for these two models of CTs. Then the 95th percentile was calculated for the operating modes, which was determined by using the average plus 2 times the standard deviation.

Currently, there are no M501JAC or 7HA.03 in operation. Thus, there is no actual operating data available to use in developing a CO_2 BACT standard on an energy output basis.

Comment 34 from James Kotcon:
Page 19, Section 4.1.2. There does not appear to be any basis for WV-DAQ's decision to use a 95th percentile. The Moundsville Power (R-14-0030) BACT limit was 793 lb/MWh. The GHG limit proposed by the applicant for the ESC Harrison Power plant was 802 lb/MWh (Gross), their final permit (R-14-0036) limit was 826 lb/MWh. The limit proposed by the applicant for the ESC Brooke County, LLC facility was 735 lb/MWh, their final permit (R-14-0035) limit was 829 lb/MWh. It is not clear why the final permit levels were LESS stringent than those the applicant originally proposed. The applicant emissions levels were based on manufacturers' specifications, so that proposed increase in allowable emissions is a disturbing outcome that is contrary to the whole concept of "Best Available Control Technology". Moundsville, Harrison, and Brooke County all use the GE 7HA.01 Combustion Turbines proposed for MSCE. Thus, all recent permits restrict GHG emissions to levels significantly lower than that indicated for either Combustion Turbine model proposed for MSCE. The limit proposed for the Greenville Power Station in Virginia was 812 lb/MWh net output, and the use of a net output basis indicates that the limit for Greenville is a more stringent basis than the gross output basis for MSCE. We recommend that a revised Draft Permit establish GHG emissions levels significantly lower than those proposed here, and should demonstrate improved performance, rather than the consistent weakening of the standards that WV-DAQ has proposed.

WVDAQ Response:
For Moundsville, Harrison and Brooke determinations, only certain operating loads were considered for BACT, not the full operating range. The Greenville Permit was for a 3x1 configuration. This configuration requires a larger steam turbine than for a 2x1 configuration. The steam turbine for the 3x1 could be equipped with a second reheat section, which allows for the selection of a more efficient steam turbine.

The Greenville Units are owned by Virginia Electric and Power and operated by Dominion Generation, which have multiple transmission, generation, and retail assets under their control. Thus, Dominion has greater ability to control and/or set the operating level for its generation units in the PJM market.

The DAQ is permitting new, more efficient EGUs over the unit's entire operating range instead of just the optimum generation load, which would allow an inefficient EGU to operate to make up the lost generation.

Comment 35 from James Kotcon:
The BACT analysis for GHG emissions does not appear to consider biofuels or other true low-carbon fuel sources. By recycling carbon dioxide from the air, biofuels would produce no net increase in GHG emissions. Potential nearby sources (landfills, sewage treatment facilities, anaerobic digesters, etc.) may not be adequate to completely fuel a 1300-MW plant, but co-firing with reasonably available sources would offset a portion of the MSCE emissions. The potential to offset fossil natural gas and potentially prevent methane escape to the atmosphere, provides an enhanced reduction of Net GHG emissions. If coupled with Carbon Capture and Sequestration, biofuels present a real opportunity to create "negative" emissions. Consideration of the Social Cost of Carbon, as described above (Comment C), would likely make such biofuels a cost-effective option for GHG reductions. We recommend that a revised BACT analysis consider incorporating biofuels to reduce net GHG emissions.

WVDAQ Response:
MSCE did not propose to consume gas generated from these waste processing sources in the application. It is not the role of the DAQ to suggest or dictate an applicant's process or choice of fuel supply.

Comment 36 from James Kotcon:
Page 21, Section 4.1.4.c. It is not clear why the 5-ppm ammonia slip limit is based on a 24-hour rolling average when the NOx limit is based on a 3-hour rolling average. Ammonia is a strong irritant with acute effects. Zero-Slip technologies are available, and some reports state that emissions of 2 ppm or less have been guaranteed by some vendors.[25] We recommend that this section specify the 5-ppm limit for the ammonia slip limit be based on a 3-hour average. Similar amendments are needed in Section 4.2.6 (page 28).

WVDAQ Response:
The DAQ agrees that the averaging period for the ammonia slip should be consistent with the averaging period of the short-term NO_x limit, a 3-hour average. In Conditions 4.1.4.c.and 4.2.6., the reference to 24 or daily was replace with "3" for a 3-hour average.

Comment 37 from James Kotcon:
Table 4.3.7 implies that the ammonia slip standard is based on a 5-ppm annual average. This should be clarified to be consistent with section 4.4.4.c and section 4.2.6. We recommend the use of a 3-hour average.

[25] *See* https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/reports/l2069.pdf

WVDAQ Response:
The use of the ammonia slip data in Condition 4.3.7 is to determine if the excess ammonia slip is at a level to justify conducting another $PM_{2.5}$ and PM_{10} performance demonstration.

The purpose of this trigger is to require subsequent PM testing based on appropriate indicators and realistic averaging periods. A better approach than setting a short-term averaging period is to set the ammonia slip trigger level at 2 ppm, as was suggested earlier by the commentor, on an annual average basis, which would encourage MSCE to minizine the ammonia slip on an annual basis to avoid annual PM testing.

Indicator 2 for Condition 4.3.2 of Table 4.3.7. will be adjusted from 5 ppm to 2 ppm.

DAQ Response to Oral Comments Made during the Public Meeting on October 19, 2021

WVDAQ Response to Betsy Lawson's Oral Comments:
Ms. Lawson remarks requires no response.

WVDAQ Response to Bryan Raber's Oral Comments:
Mr. Raber remarks requires no response.

WVDAQ Response to Shane Ferguson's Oral Comments:
Mr. Ferguson remark requires no response.

WVDAQ Response to Natalie Stone's Oral Comments:
Ms. Stones remarks requires no response.

WVDAQ Response to James Kotcon's Oral Comments:
Please see WVDAQ Responses to Comment 4, 11, 24, 25, 32
Commentor mentioned issue with the rated output of the facility listed in the draft permit. The ambient conditions will affect the actual output of facility (e.g., changes in the air density).[26] *Depending on the pollutant, the mass emission rates were based on controlled concentrations and actual exhaust flow rates corrected to standard conditions. The applicant provided emissions and operating conditions at average, summer, and winter conditions to account for the changes in ambient conditions that affect the output of the facility.*

WVDAQ Response to Charles Shobe's Oral Comments:
Mr. Shobe's first comment states that MSCE did not perform a quantitative analysis relating to the land cover/land use analysis. Regarding Comment 1, two issues are packed into Mr. Shobe's comment. Issue one is the selection of either the urban or rural option in AERMOD. Issue two is whether the data used to drive the analysis supporting the selection of the urban/rural option is representative. The two issues are related but distinct. MSCE performed two distinct analyses relating to the land cover/land use data – one qualitative and one quantitative.

The qualitative analysis that MSCE appropriately performed is related to issue two, data representativeness, and not to issue one, selection of urban/rural option. Page 6-3 of the permit application states that "Satellite imagery from Google Earth for current conditions (2016) was inspected and compared to 2011 satellite imagery to determine the representativeness of the 2011 land use data." The qualitative analysis is tied exclusively to whether the 2016 satellite imagery is representative of the 2011 satellite imagery so that the 2011 land use data may be used in the analysis, since 2011 land use data are the data that are available. This visual analysis and conclusion are appropriate and documented by the narrative and images in the permit application.

Mr. Shobe's comment that MSCE did not perform a quantitative analysis is targeted at issue one – selection of the urban/rural option. MSCE did, in fact, perform an appropriate quantitative analysis to select the urban or rural option. In applying AERMOD, the user needs to select either the urban or rural option, which is based on the land use within 3 km of the modeled

[26] Preliminary Determination for R14-0038, page 7.

source. West Virginia Legislative Rule 45CSR14 at §45-14-10 states that all estimates of ambient concentrations required under section 9 (of 45CSR14) shall be based on the applicable air quality models, data bases, and other requirements specified in the Appendix W of 40 CFR Part 51. Section 7.2.1.1 of Appendix W indicates that if land use of certain urban types account for 50 percent or more of the land use within 3 km of the source one should use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients. MSCE did conduct a quantitative assessment, as documented on Page 6-6 of the Permit Application (21 September 2021), which states that "The land use analysis followed the procedures recommended by the U.S. EPA (U.S. EPA 2000) and the typing scheme developed by Auer (Auer 1978). The Auer technique established four primary land use types: industrial, commercial, residential, and agricultural. Industrial, commercial, and compact residential areas are classified as urban, while agricultural and common residential areas are considered rural. For air quality modeling purposes, an area is defined as urban if more than 50 percent of the surface within 3 kilometers of the source falls under an urban land use type. Otherwise, the area is determined to be rural. Although Morgantown, WV is in close proximity to the proposed site and represents a portion of the area that is classified as urban, a review of the gridded digital land use data and the 7.5USGS topographic maps indicates that 98% of the area within the 3-kilometer radius is classified as rural for air quality modeling purposes (urban classifications were assumed to be category 22 (high intensity residential) and category 23 (commercial/industrial/transportation)). Based on the rural land use designation, AERMOD was used in the default (rural) mode to predict the ambient air concentrations associated with emissions from the proposed project." MSCE appropriately applied this quantitative land use classification method, as required by 45CSR14 and Appendix W, to demonstrate that the appropriate AERMOD option was selected.

The sensitivity analysis Mr. Shobe references in Appendix I is related to the representativeness of the meteorological data. This analysis is recommended to be performed in certain circumstances by the AERMOD Implementation Guide (EPA-454/B-21-006, July 2021, (https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_implementation_guide.pdf). This analysis is intended to determine the sensitivity of the modeled concentrations to the meteorological data input variables related to surface characteristics of albedo, Bowen ratio,

and surface roughness length, and not to the emission rates from the MSCE turbines or other MSCE emission sources. The analysis performed by MSCE quantified, in terms of changes in the design concentration, the significance of the differences in each of the sets of surface characteristics. MSCE appropriately prepared two meteorological data sets, one with surface characteristics of the project site and one with surface characteristics of the meteorological data collection site, and then performed AERMOD runs with constant emission rates to determine the difference (sensitivity) that the two sets of surface characteristics make in the predicted concentrations. Although the emission rates were updated by MSCE after the sensitivity analysis was performed, the revised emission rates would not change the conclusion of the sensitivity analysis – that the meteorological data from the collection site is representative of the MSCE project site. MSCE did appropriately use the revised emission rates in all modeling runs to compare to applicable standards.

WVDEP Response to Duane Nichols' Oral Comments:
Please see WVDEP Response to Comment 3 for environmental justice concerns, Comment 4 for name of the facility. The commentor mentioned that diesel exhaust from the local truck traffic was not taken into consideration in the air quality assessment. The background concentration from the design value of the representative ambient air monitors was added to the predicted concentrations to determine compliance with the NAAQS. This approach of adding the design value is used to account for emissions from other sources such diesel exhaust from mobile sources.

WVDEP Response to Aileen Curfman's Oral Comments:
Please see WVDEP Response to Comments 14 and 17 for upstream pipeline sources, Comment 15 for concerns about higher limits than other permitted sources, and Comment 18 for not accounting for the social cost of carbon.

Questions:
Mr. Nichols asked whether the actual coal truck traffic to Longview Power was taken into consideration in this decision? No. there is no applicable regulation which requires the coal truck traffic on Ft. Martin Road to be taken into consideration in making a final decision on MSCEs application for a natural gas fired combined cycle combustion turbine facility.

Mr. Shobe asked about the locations of other ambient air monitoring sites in the river valley area of Morgantown and Fairmont in addition to the air monitor at the Morgantown Airport. There are no other ambient air monitoring sites in the Morgantown Area. There is a PM2.5 monitor at the Marion Health Care Hospital in Fairmont. This monitoring site currently has incomplete data (use of monitoring site was suspended during the COVID-19 pandemic to protect the health of the patients). EPA has an interactive map of the monitoring network which provides the location and design values of the monitor based on pollutant with respect to averaging period for the NAAQS.[27]

Mr. Nichols asked if the TDS from the Monongalia River was evaluated respect to emissions from the cooling tower. Please see WVDEP Response to Comments 25 and 26.

[27] https://epa.maps.arcgis.com/apps/MapSeries/index.html?appid=bc6f3a961ea14013afb2e0d0e450b0d1