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**U. S. Steel Mon Valley Works**  
**Clairton Plant**

August 27, 2018

Ms. Jayme Graham  
Air Quality Program Manager  
Allegheny County Health Department  
301 39<sup>th</sup> Street, Bldg. No. 7  
Pittsburgh, PA 15201-1891

Via email and hard copy

Dear Ms. Graham:

RE: United States Steel Corporation – Mon Valley Works – Clairton Plant  
Enforcement Order #180610  
Assessment of Coke Battery Emission Points

Pursuant to Paragraph 81(a) on page 83; and Paragraph 2 on pages 26-27 of the Enforcement Order, dated June 28, 2018 (“Order”), United States Steel Corporation (“U. S. Steel”, “we” or “our”) provides its assessment of the coke battery emission points at the Clairton Plant.

## **BACKGROUND**

U. S. Steel notes that the Allegheny County Health Department’s (“ACHD” or “Department”) unilateral issuance of the Order is not necessary or appropriate given our long history of working with the ACHD collaboratively including working directly to develop approvable State Implementation Plans. Moreover, we reiterate our objections to the flawed process as well as the legal and factual basis on which the ACHD based its Order. Indeed, it was not until August 21, 2018 when the Department provided the basis by which we are to be measured in achieving the two consecutive quarters of improvement standard in the Order. As you can imagine, it is difficult to determine what actions are adequate to meet a standard not defined until six days before our plan is due. Please note that while U. S. Steel is providing the assessment as a good faith effort to comply with the Order, U. S. Steel is not waiving any of our objections to the Order.

As the Department has frequently acknowledged, the Clairton Plant is subject to the most stringent regulations when compared to all other coke plants in the country. ACHD’s regulations exceed both the Federal and State air emission requirements. U. S. Steel’s compliance rate with the Federal standards is well above 99%.<sup>1</sup> In addition, as the Department has also acknowledged, the Clairton Plant is subject to a higher level of inspections – resulting in tens of thousands of inspections annually by ACHD and its Method 303 contractors - more than any other coke making facility in the state or in the nation.

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<sup>1</sup> U. S. Steel also notes that the compliance rates asserted by the Department in the Order are not correct.

U. S. Steel maintains a strong commitment to environmental improvements and emission reductions. Most recently, this has been demonstrated by U. S. Steel's compliance and performance regarding the Consent Judgment between the Department and U. S. Steel, as entered by the Court of Common Pleas in March 2016 ("2016 Consent Judgment"). U. S. Steel has achieved (by the Department's own calculations) a facility-wide underfire stack combustion compliance rate in excess of 99% in the first quarter of 2018, superior to the target of 98.5% anticipated by the agreement.<sup>2</sup> To ensure compliance with and in the spirit and intent of the 2016 Consent Judgment, U. S. Steel is committed to spend over \$65 million in environmental projects to reduce emissions, of which \$37 million of projects have already been implemented. The projects completed to date include, among others, the improvements to the desulfurization process and significant battery refractory upgrades that resulted in hundreds of tons of reductions of sulfur oxides and PM2.5 while reducing visible emissions. The emission reductions achieved and realized since entering the 2016 Consent Judgment validate U. S. Steel's commitments and the effectiveness of the 2016 Consent Judgment. In addition, other unquantifiable significant internal and external resources have been and continue to be expended to ensure compliance with the 2016 Consent Judgment. For these reasons, we respectfully maintain that the 2016 Consent Judgment has been and will continue to be effective in improving the overall environmental performance of the Clairton Plant. We also note that any projects implemented to comply with the Order must be considered in concert with our commitment to comply with the 2016 Consent Judgment, as agreed by the Allegheny County Health Department and entered by the Court of Common Pleas on March 24, 2016.

U. S. Steel notes that some of the projects provided herein were under evaluation and consideration, and, in some cases, were in the beginning stages of implementation, prior to our receipt of the Order. As U. S. Steel understands from communications with the Department subsequent to the Department's issuance of the Order, the Department desires that U. S. Steel begins implementation of the projects provided in the assessment within 30-days of approval of the assessment and that emissions reductions be achieved within the first calendar quarter after approval of the assessment. It is in this spirit that U. S. Steel is providing the assessment. U. S. Steel also completed an assessment of the compliance data to determine, in conjunction with the emissions estimates, where improvement and emissions reductions would result in the greatest environmental benefit. U. S. Steel also has other longer-term projects under consideration. The stringent deadlines in the Order for demonstrating emissions reductions effectively disqualifies these types of potentially beneficial projects from being included in the proposed measures to reduce emissions because of the necessary lead time for design, development, approval and implementation of these type of projects. However, U. S. Steel remains open to further discussions of these types of projects with the Department and possibly including them in the emissions assessment.

As required by the Order, U. S. Steel assessed sulfur oxides, PM2.5 and visible emissions.

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<sup>2</sup> The Department indicated in the Order that it was not taking any action in the Order regarding emission sources that are governed by the 2016 Consent Judgment. See, e.g., Para. 48 of the Order at p. 15. Based on this language, U. S. Steel expects that the underfire stack emissions need not be regulated by the Order or included in the quarterly compliance metric.

## **I. Emissions Assessment**

For fugitive emissions, and pursuant to the Department's clarifications, we evaluated emissions from the coke battery fugitive sources, which consist of:

- Charging,
- Door leaks,
- Charging port leaks,
- Offtake leaks,
- Soaking,
- Pushing,
- Traveling.

Given the time constraints, U. S. Steel used published and historic emission factors for the fugitive sources identified above.

The following emissions were estimated using available published emission factors as submitted to the Department in the 2017 Air Emissions Inventory.

### **Charging**

Table 1, below, provides an assessment of emissions associated with charging based upon available information:

**Table 1 – Charging Emissions Assessment**

<i>Source of Charging Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Charging - Battery 1	0.0202	*
Charging - Battery 2	0.0258	*
Charging - Battery 3	0.0210	*
Charging - Battery 13	0.0192	*
Charging - Battery 14	0.0209	*
Charging - Battery 15	0.0157	*
Charging - Battery 19	0.0166	*
Charging - Battery 20	0.0155	*
Charging – B Battery	0.0617	*
Charging – C Battery	0.0615	
<i>Charging – Plantwide Total</i>	<i>0.2781</i>	*

\* Source 2017 Air Emissions Inventory, based upon USEPA's AP-42, SO2 fugitive emissions associated with charging are de minimis.

While U. S. Steel strives for compliance with all applicable requirements and believes emission reductions are generally desirable, considering the location of the sources of charging emissions

and the amount of emissions associated with the activity, reductions in charging emissions along with an improved compliance rate alone is not expected to result in any appreciable or quantifiable reduction in sulfur oxides, PM2.5 or visible emissions or improvement in ambient air quality. Nonetheless, as part of the assessment and in a good faith effort to respond to the Order, U. S. Steel completed a review of emissions and available environmental performance data to determine appropriate actions to reduce emissions associated with charging. Based on this review, U. S. Steel will focus on charging practices on Batteries 1, 13, 14, 15, B, and C to satisfy the Order. Please see Part 2 of this response which details the proposed plan.

Door Leaks

Table 2, below, provides an assessment of emissions associated with door leaks based upon available information:

**Table 2 - Door Leak Emissions Assessment**

<i>Source of Door Leak Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Door Leaks - Battery 1	0.8313	*
Door Leaks - Battery 2	0.8106	*
Door Leaks - Battery 3	0.8503	*
Door Leaks - Battery 13	0.6049	*
Door Leaks - Battery 14	0.6276	*
Door Leaks - Battery 15	0.6624	*
Door Leaks - Battery 19	0.8692	*
Door Leaks - Battery 20	0.8865	*
Door Leaks - Battery B	0.8850	*
Door Leaks - Battery C	0.4540	*
<i>Door Leaks – Plantwide Total</i>	<i>7.4817</i>	<i>*</i>

\* Source 2017 Air Emissions Inventory, based upon USEPA's AP-42, SO2 fugitive emissions associated with door leaks are de minimis.

As part of the assessment, U. S. Steel completed a review of available compliance data to determine appropriate actions to reduce emissions associated with door performance. Based on this review, U. S. Steel will focus on door performance on Batteries 1, 2, 3, and B to satisfy the Order. Please see Part 2 of this response which details the proposed plan.

Charging port leaks

Table 3, below, provides an assessment of emissions associated with charging port leaks based upon available information:

**Table 3 – Charging port leaks Emissions Assessment**

<i>Source of Charging port leak Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Charging port leaks - Battery 1	0.0006	*
Charging port leaks - Battery 2	0.0011	*
Charging port leaks - Battery 3	0.0017	*
Charging port leaks - Battery 7	0.0000	*
Charging port leaks - Battery 8	0.0000	*
Charging port leaks - Battery 9	0.0000	*
Charging port leaks - Battery 13	0.0011	*
Charging port leaks - Battery 14	0.0000	*
Charging port leaks - Battery 15	0.0005	*
Charging port leaks - Battery 19	0.0038	*
Charging port leaks - Battery 20	0.0030	*
Charging port leaks - Battery B	0.0003	*
Charging port leaks - Battery C	0.0018	*
<i>Charging port leaks – Plantwide Total</i>	<i>0.0137</i>	<i>*</i>

\* Source 2017 Air Emissions Inventory, based upon USEPA's AP-42, SO2 fugitive emissions associated with charging port leaks are de minimis.

While U. S. Steel strives for compliance with all applicable requirements and believes emission reductions are generally desirable, considering the location of the sources of charging port emissions and the amount of emissions associated with the activity, reductions in charging port emissions along with an improved compliance rate alone is not expected to result in any appreciable or quantifiable reduction in sulfur oxides, PM2.5 or visible emissions or improvement in ambient air quality. Nonetheless, in a good faith effort to comply with the Order, U. S. Steel is proposing hiring, training, and work practice improvements that will address charging port emissions in addition to other fugitive emissions points at all batteries.

Offtake Leaks

Table 4, below, provides an assessment of emissions associated with offtake leaks based upon available information:

**Table 4 – Offtake Leaks Emissions Assessment**

<i>Source of Offtake Leak Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Offtake Leaks - Battery 1	0.0212	*
Offtake Leaks - Battery 2	0.0229	*
Offtake Leaks - Battery 3	0.0306	*
Offtake Leaks - Battery 13	0.0176	*

Offtake Leaks - Battery 14	0.0213	*
Offtake Leaks - Battery 15	0.0224	*
Offtake Leaks - Battery 19	0.0540	*
Offtake Leaks - Battery 20	0.0488	*
Offtake Leaks - Battery B	0.0158	*
Offtake Leaks - Battery C	0.0060	*
<i>Offtake Leaks – Plantwide Total</i>	<i>0.2606</i>	<i>*</i>

\* Source 2017 Air Emissions Inventory, based upon USEPA’s AP-42, SO2 fugitive emissions associated with offtake leaks are de minimis.

As part of the assessment, U. S. Steel completed a review of available compliance data to determine appropriate actions to reduce emissions associated with offtake performance. Based on this review, U. S. Steel will focus on offtake performance on Batteries 13, 14, and 15 to satisfy the Order. Please see Part 2 of this response which details the proposed plan.

Soaking

Table 5, below, provides an assessment of emissions associated with soaking based upon available information:

**Table 5 – Soaking Emissions Assessment**

<i>Source of Soaking Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Soaking - Battery 1	0.4693	8.2336
Soaking - Battery 2	0.4693	8.2336
Soaking - Battery 3	0.4693	8.2336
Soaking - Battery 13	0.0568	0.3876
Soaking - Battery 14	0.0568	0.3876
Soaking - Battery 15	0.0568	0.3876
Soaking - Battery 19	1.0153	1.9431
Soaking - Battery 20	1.0153	1.9431
Soaking - Battery B	2.9163	4.0206
Soaking - Battery C	1.6420	2.3211
<i>Soaking – Plantwide Total</i>	<i>8.1670</i>	<i>36.0913</i>

- Source 2017 Air Emissions Inventory

As part of the assessment, U. S. Steel completed a review of available environmental performance data to determine appropriate actions to reduce emissions associated with soaking performance. Based on this review, U. S. Steel will focus on work practice training and execution for soaking performance to satisfy the Order. U. S. Steel also notes that soaking emissions on Batteries 1, 2, and 3 are addressed in the 2016 Consent Judgement and should not be included in the assessment. The Department indicated in the Order that it was not taking any action in the Order regarding emission sources that are governed by the 2016 Consent Judgment. See,

e.g., Para. 48 of the Order at p. 15. Based on this language and the fact that the Department observed no deviations from the soaking standard from these batteries during the first quarter of 2018, U. S. Steel expects that these emissions need not be regulated by the Order or included in the quarterly compliance metric. Please see Part 2 of this response which details the proposed plan regarding soaking at the other seven batteries.

Pushing

Table 6, below, provides an assessment of fugitive emissions associated with pushing based upon available information:

Table 6 – Pushing Fugitive Emissions Assessment

<i>Source of Pushing Fugitive Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Batteries 1-3	37.6627	1.0225
Batteries 13-15	32.1831	0.8728
Batteries 19-20	32.1711	0.8781
Batteries B	4.6262	2.9859
Batteries C	14.4322	2.2520
<i>Pushing Fugitives – Plantwide Total</i>	<i>121.0752</i>	<i>8.0113</i>

- Source 2017 Air Emissions Inventory

As part of the assessment, U. S. Steel completed a review of available environmental performance and operating data to determine appropriate actions to reduce emissions associated with pushing. Based on this review, U. S. Steel will focus on work practice training and execution for pushing performance to satisfy the Order. U. S. Steel also notes that pushing emissions on Batteries 1, 2, and 3 are addressed in the 2016 Consent Judgement should not be included in the assessment. The Department indicated in the Order that it was not taking any action in the Order regarding emission sources that are governed by the 2016 Consent Judgment. See, e.g., Para. 48 of the Order at p. 15. Based on this language and the fact that during the first quarter of 2018, U. S. Steel achieved a compliance rate in excess of 98% during the 2,200+ pushing observations at these batteries, U. S. Steel expects that these emissions need not be regulated by the Order or included in the quarterly compliance metric. Please see Part 2 of this response which details the proposed plan regarding pushing at the other seven batteries.

Traveling Hot Car

Table 7, below, provides an assessment of emissions associated with traveling hot car based upon available information:

Table 7 – Traveling Hot Car Emissions Assessment

<i>Source of Traveling Hot Car Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
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PEC Traveling Hot Car - Batteries 1-3	2.2296	19.2204
PEC Traveling Hot Car - Batteries 13-15	1.8521	15.9660
PEC Traveling Hot Car - Batteries 19-20	1.9341	16.6737
PEC Traveling Hot Car - Batteries B	0.0000	0.0000
PEC Traveling Hot Car - Batteries C	1.8948	16.3347
<b>Total - PEC Traveling Hot Car</b>	<b>7.9106</b>	<b>68.1947</b>

- Source 2017 Air Emissions Inventory

As part of the assessment, U. S. Steel completed a review of available environmental performance and operating data to determine appropriate actions to reduce emissions associated with traveling emissions. Based on this review, U. S. Steel will focus on work practice training and execution for travel performance to satisfy the Order. Please see Part 2 of this response which details the proposed plan.

### TOTAL COKE BATTERY FUGITIVES

<i>Source of Emissions</i>	<i>PM2.5 (tpy)</i>	<i>SO2 (tpy)</i>
Total Coke Battery Fugitive Emissions	145.2	112.3

- Source 2017 Air Emissions Inventory

U. S. Steel notes that the coke battery underfire opacity is the best measure for determining the environmental performance of the facility. Moreover, improvements in the underfire stack opacity, because of their emissions characteristics, have resulted in the greatest benefit to ambient air quality when compared to the fugitive emissions.

## II. PROPOSED MEASURES TO REDUCE SO2, PM2.5 AND VISIBLE EMISSIONS

Based on the assessment of emissions and compliance review, we propose the following plan to satisfy the requirements of the Order.

### Proposed Plan for Emission Reductions - Summary Table

We have developed a multi-faceted plan comprised of increased staffing, enhancing work practices, training, and increased monitoring. The plan also includes capital improvements that are already in progress or authorized. Due to the limited time provided to perform engineering and other studies, we are not able to include longer-term improvement projects.

<b>PROPOSED PROJECT/MEASURE</b>	<b>STATUS/TARGET COMPLETION DATE</b>	<b>ENVIRONMENTAL IMPACT</b>	<b>Where SO2/PM2.5/visible emission reductions are expected</b>
Environmental Employee Stand Downs	In progress with a targeted completion date of 9/30/2018. To date,	Increased focus on work practices / reduction in visible	Battery Wide – Charging, Doors, Charging Ports,

<b>PROPOSED PROJECT/MEASURE</b>	<b>STATUS/TARGET COMPLETION DATE</b>	<b>ENVIRONMENTAL IMPACT</b>	<b>Where SO<sub>2</sub>/PM<sub>2.5</sub>/visible emission reductions are expected</b>
with a focus on work practices	approximately 82% of the affected employees have completed the Stand Down.	emissions, PM <sub>2.5</sub> and SO <sub>2</sub>	Offtakes, Pushing, Travel, Soaking*
Continuous Improvement to the Environment (CITE) Training (2-days) for all coking operations personnel with greater than one year of service time	In Progress. To date, approximately 140 affected employees have completed the training; with an additional 60 affected employees are scheduled to have the training within the next 90-days. The targeted completion date for all affected employees is 12/31/2019.	Increased focus on work practices / reduction in visible emissions, PM <sub>2.5</sub> and SO <sub>2</sub>	Battery Wide – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
Recruit, Hire, On-Board and Train Additional Full Time Coking, Heating and Patching Managers	In Progress with a targeted completion date of 12/31/2019.**	Additional resources committed to proactively reducing instances of visible emissions, PM <sub>2.5</sub> and SO <sub>2</sub> emissions	Battery Wide – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
Recruit, Hire, On-Board and Train Additional Full Time Coking Utility Personnel	In Progress with a targeted completion date of 12/31/2019	Additional resources committed to proactively reducing instances of visible emissions, PM <sub>2.5</sub> and SO <sub>2</sub> emissions	Battery Wide – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
Recruit, Hire, On-Board and Train Additional Full Time Heating and Patching Utility Technicians	In Progress with a targeted completion date of 12/31/2019	Additional resources committed to proactively reducing instances of visible emissions, PM <sub>2.5</sub> and SO <sub>2</sub> emissions	Battery Wide – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
Increased Inspections/Monitoring	In Progress	More consistent, compliant operations	Battery-Wide Fugitive Emissions
SCOT Plant Tail Gas Reroute Project	To be completed on or before 10/4/2018	Reduction in SO <sub>2</sub> emissions by approximately 80 tons per year.	Battery Wide – COG Combustion Sources*

<b>PROPOSED PROJECT/MEASURE</b>	<b>STATUS/TARGET COMPLETION DATE</b>	<b>ENVIRONMENTAL IMPACT</b>	<b>Where SO2/ PM2.5/visible emission reductions are expected</b>
100 and 600 VCU Tray Upgrade Project	Completed after 1 <sup>st</sup> Qtr 2018	Significant reduction (approximately 50%) in H <sub>2</sub> S grains in the COG resulting in reductions of over 200 tons of SO <sub>2</sub> annually.)	Battery Wide – Underfire Stacks*
Reduced SO <sub>2</sub> Limits	Effective 10/4/2018	Reduced potential to emit/ improved dispersion modeling	Facility Wide – Combustion Sources*
#2 Control Room Switching Valves Project	In progress with a targeted completion date of 12/31/2020	Reduction in H <sub>2</sub> S grains in underfire COG	Battery Wide –COG Combustion Sources*
End Flue Replacements on Batteries 1-3	In progress with a targeted completion of end of 2019. 174 endflues have been replaced since entering the 2016 Consent Judgment; with additional 32 endflues scheduled to be replaced within the next 90-days.	Reduction in visible emissions, SO <sub>2</sub> and PM <sub>2.5</sub>	1-3 Batteries – Charging, Doors, Charging Ports, Offtakes, Travel***
10 Thru wall Replacements on Battery 19	9/30/2019	Reduction in visible emissions, SO <sub>2</sub> and PM <sub>2.5</sub>	19 Battery – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
2 Thru wall Replacements on Battery 20	9/30/2019	Reduction in visible emissions, SO <sub>2</sub> and PM <sub>2.5</sub>	20 Battery – Charging, Doors, Charging Ports, Offtakes, Pushing, Travel, Soaking*
Improved work practice evaluation on 1st and 2nd Unit Battery Operations	In progress, with full implementation expected by 12/31/2019	Work practice focus - reduction in visible emissions	Facility Wide – Charging, Doors, Charging Ports, Offtakes, *
B-Battery coke side door/frame campaign	In progress with a targeted completion date of 6/30/2019	Reduction in visible emissions and PM <sub>2.5</sub>	B-Battery – Doors
Upgraded Door Seals on Batteries 1-3	In progress with a targeted total implementation date of 12/31/2021. We have scheduled to complete 18 door seals on these	Reduction in visible emissions and PM <sub>2.5</sub>	1-3 Battery – Doors

<b>PROPOSED PROJECT/MEASURE</b>	<b>STATUS/TARGET COMPLETION DATE</b>	<b>ENVIRONMENTAL IMPACT</b>	<b>Where SO2/ PM2.5/visible emission reductions are expected</b>
	batteries within the next 90-days.		
Complete a charging evaluation on Batteries 13, 14 and 15	In progress with a targeted completion date of 12/31/2018	Reduction in visible emissions and PM <sub>2.5</sub>	13-15 Battery – Charging
Complete a charging evaluation on B & C Batteries	In progress with a targeted completion date of 12/31/2018	Reduction in visible emissions and PM <sub>2.5</sub>	B & C Batteries – Charging
Complete a charging evaluation on #1 Battery	In progress with a targeted completion date of 12/31/2018	Reduction in visible emissions and PM <sub>2.5</sub>	1-Battery – Charging
Install new process control system at No. 1 and No. 2 Control Rooms	12/31/2019	Improved overall reliability of gas processing system	Facility Wide – COG Combustion Sources*

\*These actions will also result in reduced emissions and improved opacity at the underfire stacks as part of our commitment to comply with the 2016 Consent Judgment.

\*\* While full implementation is not anticipated until late 2019, we have targeted to have new employees hired and trained within the next 90-days.

\*\*\*These actions will also result in improvements in soaking and pushing at Batteries 1-3 as part of our commitment to comply with the 2016 Consent Judgment.

We continue to evaluate projects and methods of practice that would reduce emissions. U. S. Steel is open to discussing longer term projects with the ACHD, particularly if the emission reductions to be achieved by these projects would be recognized by the ACHD in terms of complying with the Order. However, under the current Order, any longer-term projects would not be used to determine compliance with the Order.

Ms. Jayme Graham (ACHD)  
August 27, 2018  
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U. S. Steel requests a meeting with the Department to review this submission. Please contact Mike Dzurinko at (412) 233-1467 to schedule a meeting. In the interim, if you have any questions regarding this correspondence, please contact Mike Dzurinko or me.

Sincerely,

Michael S. Rhoads

cc: Chip Babst (Babst Calland)  
Tishie Woodwell (USS)  
David Hacker (USS)  
Mike Dzurinko (USS)  
Jonelle Scheetz (USS)