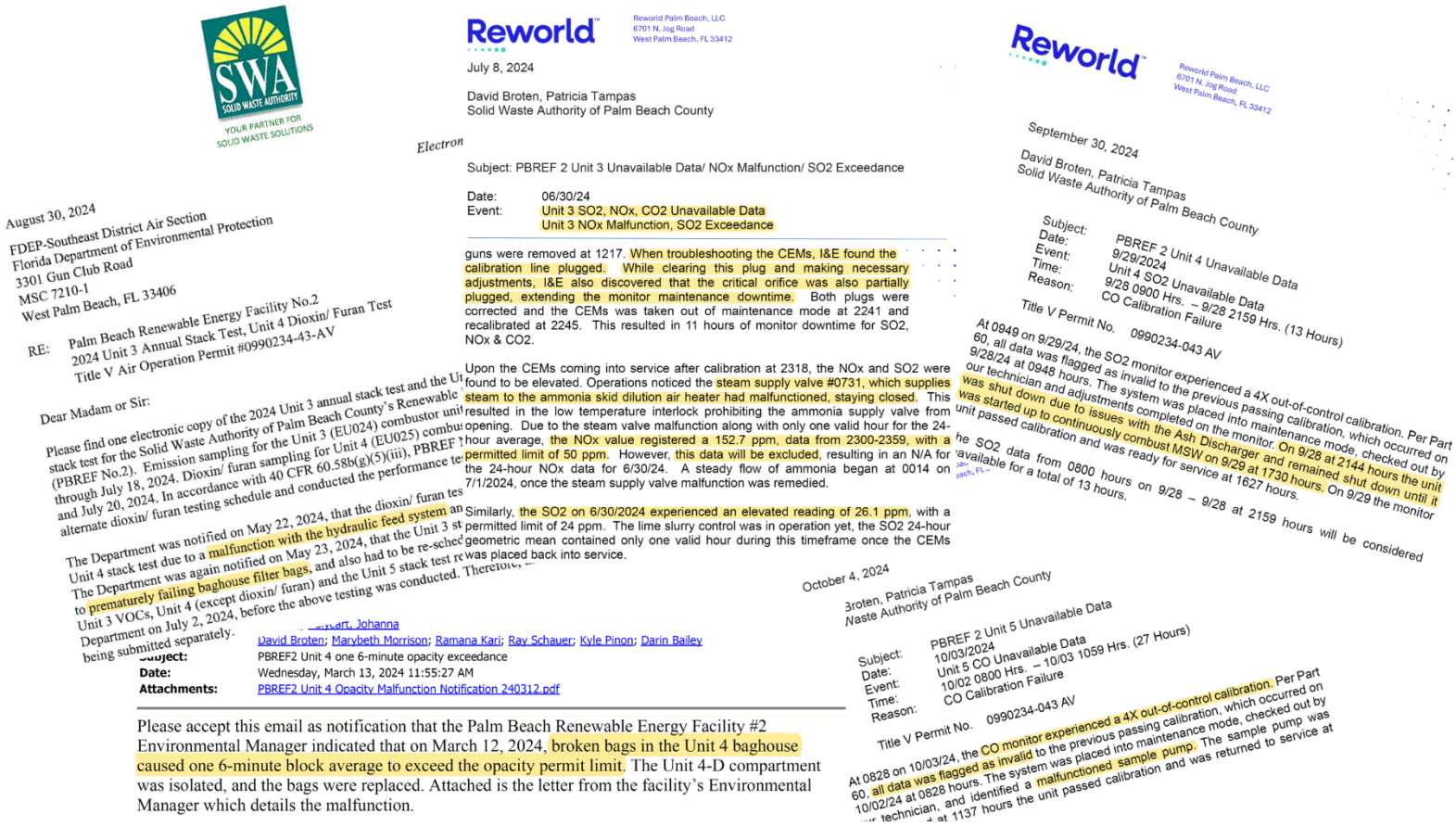
Operating Track Record of the "Cleanest and Greenest" Trash Incinerator in the United States

A Critical Review of Select Air Permitting files from Florida Department of Environmental Protection on Palm Beach Renewable Energy Facility 2 in West Palm Beach, Florida

January 24, 2025



August 30, 2024

FDEP-Southeast District Air Section
Florida Department of Environmental Protection
3301 Gun Club Road
MSC 7210-1
West Palm Beach, FL 33406

RE: Palm Beach Renewable Energy Facility No.2
2024 Unit 3 Annual Stack Test, Unit 4 Dioxin/ Furan Test
Title V Air Operation Permit #0990234-43-AV

Dear Madam or Sir:

Please find one electronic copy of the 2024 Unit 3 annual stack test and the Ur
stack test for the Solid Waste Authority of Palm Beach County's Renewable
(PBREF No.2). Emission sampling for the Unit 3 (EU024) combustor unit
through July 18, 2024. Dioxin/ furan sampling for Unit 4 (EU025) combus
and July 20, 2024. In accordance with 40 CFR 60.58b(g)(5)(iii), PBREF
alternate dioxin/ furan testing schedule and conducted the performance te

The Department was notified on May 22, 2024, that the dioxin/ furan tes
Unit 4 stack test due to a malfunction with the hydraulic feed system an
The Department was again notified on May 23, 2024, that the Unit 3 st
to prematurely failing baghouse filter bags, and also had to be re-sched
Unit 3 VOCs, Unit 4 (except dioxin/ furan) and the Unit 5 stack test re
Department on July 2, 2024, before the above testing was conducted. Therefore,
being submitted separately.

Reworld

Reworld Palm Beach, LLC
6701 N. Jog Road
West Palm Beach, FL 33412

July 8, 2024

David Broten, Patricia Tampas
Solid Waste Authority of Palm Beach County

Electron

Subject: PBREF 2 Unit 3 Unavailable Data/ NOx Malfunction/ SO2 Exceedance

Date: 06/30/24
Event: Unit 3 SO2, NOx, CO2 Unavailable Data
Unit 3 NOx Malfunction, SO2 Exceedance

guns were removed at 1217. When troubleshooting the CEMs, I&E found the calibration line plugged. While clearing this plug and making necessary adjustments, I&E also discovered that the critical orifice was also partially plugged, extending the monitor maintenance downtime. Both plugs were corrected and the CEMs was taken out of maintenance mode at 2241 and recalibrated at 2245. This resulted in 11 hours of monitor downtime for SO2, NOx & CO2.

Upon the CEMs coming into service after calibration at 2318, the NOx and SO2 were found to be elevated. Operations noticed the steam supply valve #0731, which supplies steam to the ammonia skid dilution air heater had malfunctioned, staying closed. This resulted in the low temperature interlock prohibiting the ammonia supply valve from opening. Due to the steam valve malfunction along with only one valid hour for the 24-hour average, the NOx value registered a 152.7 ppm, data from 2300-2359, with a permitted limit of 50 ppm. However, this data will be excluded, resulting in an N/A for the 24-hour NOx data for 6/30/24. A steady flow of ammonia began at 0014 on 7/1/2024, once the steam supply valve malfunction was remedied.

Similarly, the SO2 on 6/30/2024 experienced an elevated reading of 26.1 ppm, with a permitted limit of 24 ppm. The lime slurry control was in operation yet, the SO2 24-hour geometric mean contained only one valid hour during this timeframe once the CEMs was placed back into service.

Reworld

Reworld Palm Beach, LLC
6701 N. Jog Road
West Palm Beach, FL 33412

September 30, 2024

David Broten, Patricia Tampas
Solid Waste Authority of Palm Beach County

Subject: PBREF 2 Unit 4 Unavailable Data
Date: 9/29/2024
Event: Unit 4 SO2 Unavailable Data
Time: 9/28 0900 Hrs. – 9/28 2159 Hrs. (13 Hours)
Reason: CO Calibration Failure

Title V Permit No. 0990234-043 AV

At 0949 on 9/29/24, the SO2 monitor experienced a 4X out-of-control calibration. Per Part 60, all data was flagged as invalid to the previous passing calibration, which occurred on 9/28/24 at 0948 hours. The system was placed into maintenance mode, checked out by our technician and adjustments completed on the monitor. On 9/28 at 2144 hours the unit was shut down due to issues with the Ash Discharger and remained shut down until it was started up to continuously combust MSW on 9/29 at 1730 hours. On 9/29 the monitor unit passed calibration and was ready for service at 1627 hours.

he SO2 data from 0800 hours on 9/28 – 9/28 at 2159 hours will be considered vailable for a total of 13 hours.

October 4, 2024

Broten, Patricia Tampas
Waste Authority of Palm Beach County

Subject: PBREF 2 Unit 5 Unavailable Data
Date: 10/03/2024
Event: Unit 5 CO Unavailable Data
Time: 10/02 0800 Hrs. – 10/03 1059 Hrs. (27 Hours)
Reason: CO Calibration Failure

Title V Permit No. 0990234-043 AV

At 0828 on 10/03/24, the CO monitor experienced a 4X out-of-control calibration. Per Part 60, all data was flagged as invalid to the previous passing calibration, which occurred on 10/02/24 at 0828 hours. The system was placed into maintenance mode, checked out by our technician, and identified a malfunctioned sample pump. The sample pump was at 1137 hours the unit passed calibration and was returned to service at

Laykart, Johanna
David Broten; Marybeth Morrison; Ramana Kari; Ray Schauer; Kyle Pinon; Darin Bailey
Subject: PBREF2 Unit 4 one 6-minute opacity exceedance
Date: Wednesday, March 13, 2024 11:55:27 AM
Attachments: PBREF2 Unit 4 Opacity Malfunction Notification 240312.pdf

Please accept this email as notification that the Palm Beach Renewable Energy Facility #2 Environmental Manager indicated that on March 12, 2024, broken bags in the Unit 4 baghouse caused one 6-minute block average to exceed the opacity permit limit. The Unit 4-D compartment was isolated, and the bags were replaced. Attached is the letter from the facility's Environmental Manager which details the malfunction.

Commissioned by The Goldstein Environmental Law Firm, P.A., on behalf of the City of Miramar, Florida

Principal Author:

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An online copy of this report is available at:
www.energyjustice.net/fl/wpb2history.pdf

SUMMARY

From December 1981 until February 12, 2023, Miami-Dade County relied on burning much of its municipal solid waste (MSW) at the trash incinerator known as the Miami-Dade County Resource Recovery Facility or "Covanta Dade" in the City of Doral. The incinerator was owned by the county but privately operated by Covanta (now renamed "Reworld" as of April 2024), just as the Palm Beach County incinerators are county-owned and now privately operated by Covanta (now Reworld).

On February 12, 2023, a fire broke out and burned for three weeks, causing the permanent closure of the incinerator. Miami-Dade County has since been planning to build a new $1.6 Billion incinerator capable of burning 4,000 tons/day, which would be the largest in the U.S. and one of the largest in the world. Currently, the largest incinerator in the U.S. burns up to 3,500 tons/day.

Maimi-Dade County claims new incinerators are clean and safe. The newest trash incinerator built in the U.S., which came online in early 2015, is Palm Beach Renewable Energy Facility 2 built adjacent to Palm Beach County's older incinerator. **Miami-Dade County's website boasts that "[t]he Renewable Energy Facility in West Palm Beach is a $672,000,000, state-of-the-art waste-to-energy facility – the most advanced, efficient, cleanest and greenest waste-to-energy power plant in the world."**[1]

This impression of the county apparently comes from its chosen solid waste consultant, Arcadis, a firm with a strong pro-incineration bias reflected in their work across the United States. On September 19, 2023, Arcadis testified before the County Commission that the new trash incinerator in Palm Beach County used state-of-the-art incinerator technology. The facility began commercial operations on July 18, 2015, and, according to Arcadis, has "worked fabulously for them ever since."[2]

This report reviews the actual operating history of this trash incinerator, the newest in the U.S. and the only one operating under what were modern emissions standards at the time it was permitted.[3] **This report catalogues 176 incidents (emissions limit exceedances, emissions equipment malfunctions, lost emissions data, and more) at the Palm Beach Renewable Energy Facility 2 trash incinerator in its first decade of operation.**

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[1] Miami-Dade County, "The Future of Solid Waste in Miami-Dade." See section under "Waste-to-energy around the world." https://www.miamidade.gov/global/solidwaste/sustainable-solid-waste/wte-home.page

[2] Christopher Tillman testified for Arcadis, stating: "We, you know, we work with other municipalities on this and other types of solid waste issues. And one thing, one very, very important point I'd like to make is that a modern waste-to-energy, a modern mass burn waste-to-energy plant is not an incinerator of the 1970s. Your [resource recovery] facility was an old what we call an RDF [refuse-derived fuel] facility. It was built in 1978, and it was an older, outmoded technology. That is not what we're talking about here. A modern mass burn waste-to-energy facility would be something like what they have in West Palm Beach, which they just built in 2015. It went operational in 2015, and it has worked fabulously for them ever since." Find the full conversation on pages 7-9 of the transcript here: https://drive.google.com/file/d/1cgO1vzcVWN-Bdc_VzZ9wfKuhY4WZdmiE

[3] Note that the U.S. Environmental Protection Agency (EPA) is required to update emissions standards for Large Municipal Waste Combustors and other industries every five years. However, EPA had not done so since 2006 and had to be sued in federal court to enforce the requirements of the Clean Air Act. EPA finally proposed a new rule in January 2024, and this rule was court ordered to be completed by the end of 2024. However, on December 17, 2024, the environmental organizations that sued to enforce the law agreed to delay the new rules until December 22, 2025. See: https://www.wastedive.com/news/epa-large-municipal-waste-combustor-rule-deadline-incinerator-regulations/736160/ It is unclear whether the rule will be finalized and enforced under a Trump administration. Even if it were finalized in December 2024, the new regulations would not be in effect until around 2028. Large Municipal Waste Combustors are trash incinerators where each burner can burn more than 250 tons/day – a size which pertains to all of the incinerators discussed here. See: https://www.epa.gov/stationary-sources-air-pollution/large-municipal-waste-combustors-lmwc-new-source-performance

OFF TO A BAD START

Palm Beach Renewable Energy Facility 2 (PBREF#2) has three burners, each capable of burning 1,000 tons of waste per day. Since the older incinerator at the adjacent Palm Beach Renewable Energy Facility 1 plant has two burners, the three burners at PBREF#2 are referred to as Units 3, 4, and 5. Unit 3 started burning waste in January 2015 and Units 4 & 5 started in March 2015, and the plant is considered to have started commercial operation in July 2015.

PBREF#2 began experiencing emissions control problems within a week of commercial operations in July of 2015. First, Unit 3 malfunctioned when a draft fan tripped due to above-standard flue gas temperatures, resulting in a 4-hour exceedance of carbon monoxide above PBREF#2's air emissions permit limit. Two days later, Unit 4's inlet probe (which monitors carbon dioxide (CO_2), carbon monoxide, sulfur dioxide, and nitrogen oxides) malfunctioned, resulting in a loss of inlet sample readings. One day after Unit 4's inlet probe malfunctioned, Unit 4's nitrogen oxides outlet probe – as well as Unit 3's carbon monoxide inlet and nitrogen oxides outlet probes – also malfunctioned, resulting in lost sample readings. Before the end of the year, there would be two more probe malfunctions for Units 3 and 5, as well as an opacity exceedance at Unit 4.

NOT JUST A LEARNING CURVE: EXCESS EMISSIONS AND MISSING DATA CONTINUE

This wasn't just a matter of a learning curve, where operations smooth out after a rocky start. Quarterly operating reports show excessive exceedances of opacity (darkness of air emissions, a proxy for particulate matter pollution) in late 2019, and excessive exceedances of nitrogen oxides and sulfur dioxide emissions in mid-2022.

There was also an unusual amount of down time in 2022 and 2023 for the plant's continuous emissions monitors for sulfur dioxide, nitrogen oxides and opacity.

While the incinerator was required to operate continuous monitors for mercury from 2016 through 2018, they had an extraordinary amount of down time, with three quarters reporting that these monitors were not operating 32 to 43% of the time, even though two quarters managed to report down time as low as 0.09% and 0.11%. By way of comparison, down time for continuous monitoring of carbon monoxide, sulfur dioxide, nitrogen oxides and opacity averaged 0.61% and no quarterly report evaluated for this report exceeded 8.73% during a quarter.

VIOLATIONS IDENTIFIED

The following violations were found in the review of documents for this report:

<u>2016</u>: according to a letter regarding the 2017 annual compliance test failure, the particulate matter and ammonia test had also failed in 2016 and were granted a retest. However, no indication of a formal violation was identified in the document search.

2017: the annual compliance test in April 2017 failed for particulate matter (PM) and ammonia was determined to be a **High Priority Violation, for which the Solid Waste Authority was fined $850** for the following reasons:

1) The facility operated for 1 month (714.2 total hours) from the Violation Date (3/24/2017) to the scheduled outage on 4/24/2017.
2) Because the PM limit established in Specific Condition B.13 of Permit No. 0990234-037-AV is based on a BACT Determination pursuant to CAA Title I, Part C (Prevention of Significant Deterioration, PSD), this meets Criterion 2 of the High Priority Violation Determination.

2017: permit limit exceedance: on 8/30/2017, "the ID fan tripped which caused a master fuel trip on Unit 5 resulting in one (1) 4- hour block average of CO to exceed the 100 ppmvd permit limit." No indication of a formal violation was identified in the document search.

2019: Procedural violations determined in Jan 2020:

1) 3-year opacity zero alignment check on COMS may not have been performed in 2018, as required by 40 CFR 60, Appendix F, Procedure 3, Section 10.3 (3).
2) The SO_2 outlet monitor for PBREF-2 span range was 0-500ppm instead of the 50% of the maximum uncontrolled SO_2 emissions of 400ppm [40 CFR 60.58b(e)(12)(ii)]
3) PBREF-1 and PBREF-2 data were not properly invalidated and reported, as defined in 40 CFR 60 Appendix F, Procedure 1, Section 4.3.1.

2022: letter dated 9/22/2022: "Based on the information the facility has provided during the site visit on August 4, 2022 and the action plan submitted on September 20, 2022 the facility was determined to have returned to compliance with all permit conditions." We were unable to identify the document referred to in this letter.[4]

2022: from an incident/malfunction report dated 10/24/2022:

> "On 7/6/2022, Unit 4 recorded an SO_2 24-hour geometric average from 0000-2359 hours of 26.3 ppm, corrected to 7% 02. Unit 4 was experiencing unusually elevated inlet SO_2 levels in the flue gas beginning at approximately 1415 hours. Facility personnel responded to the rapidly increasing inlet SO_2 by reducing the boiler load, initiating, and then increasing gas flow to the boiler and placing the lime system in manual control in order to override system interlocks. Inlet and outlet SO_2 values continued to increase until approximately 1640 hours at which time the boiler's **CEMS analyzers reached an over-range condition and flagged the SO_2 data as "Data Error" thereby excluding the data from compliance averaging periods**. Inlet and outlet SO_2 levels continued at CEMS over-range levels until approximately 1820 hours when the **unusually high SO_2-containing fuel** had been processed through the boiler." [Emphasis added.]

It is concerning that where emissions are actually found to be excessive, and attributed to burning waste that is high in sulfur, the high emissions are discounted as a data error and are excluded from

[4] https://depedms.dep.state.fl.us:443/Oculus/servlet/shell?command=view&[guid=75.283993.1]&[profile=profile]

the data used to determine compliance. Continuous emissions monitors (CEMS) should not be programmed to flag high emissions as errors. This situation means that there is no way to know how high emissions actually get when there are unusually high emissions.

When CEMS data is unavailable, Reworld's incident notifications to the DEP almost routinely state that the boiler was operating normally and all air pollution control equipment was functioning properly and no excess emissions were expected.

DATA GAPS AND LIMITATIONS

All data presented in this report is from the Florida DEP, and primarily represents information provided to DEP by Palm Beach County's Solid Waste Authority (the incinerator's owner) or Reworld (formerly Covanta), the company hired to operate the incinerator.

DEP makes their files available online through a system called OCULUS.[5] While this transparency is much better than most states, it is very challenging for the general public to navigate and learn how to find a given facility's files. Moreover, the files are poorly categorized, making it difficult to focus in on any given set of files.

Making it far more challenging to navigate is that the Palm Beach County Solid Waste Authority's waste complex operates several waste facilities under a single permit number. In most states, each facility would have its own permit number, but in DEP's file system, the Palm Beach Renewable Energy Park ("PBREP") has two trash-burning incinerators with five burners between them, two landfills, a sewage sludge ("biosolids") processing facility, and a couple dozen ancillary pollution point sources. Naming conventions in DEP's OCULUS are inadequate to distinguish between facilities in many cases, requiring one to go in and out of thousands of documents to figure out which ones pertain to which facility. There is not even a consistent naming convention to easily identify the periodic quarterly and annual reports. Due to these challenges, we could only identify 27 of the 37 (73%) of the quarterly reports that should be available, and cannot provide comprehensive trendlines for compliance data we compiled.[6]

Due to the challenges and limitations of this data review, this report should not be considered comprehensive, but just a sampling of the available data available on emissions monitoring gaps, violations, and other mishaps at this incineration facility.

[5] https://depedms.dep.state.fl.us/Oculus/

[6] The air-related files for the "Palm Beach Renewable Energy Park" can be found here: https://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/AIR_0990234/facility!search Note that this does not include other file types like regulation under DEP' waste program, and that the 2,842 files available in this search (as of this writing) pertain to all facilities at the complex, including the older incinerator (REF 1), the landfills, and the sewage sludge "biosolids processing facility" (BPF). One must be careful to distinguish when using these files to examine any one of the facilities at that site.

ACRONYMS

BACT	Best Available Control Technology
CEM / CEMS	Continuous Emissions Monitor / Continuous Emissions Monitoring System
CGA	Cylinder Gas Audit
CO	Carbon monoxide
CO_2	Carbon dioxide
DEP	Florida Department of Environmental Protection
Hg	Mercury
MCC	Motor Control Center
MSW	Municipal Solid Waste
NH_3	Ammonia
NOx	Nitrogen oxides
NSPS	New Source Performance Standards
ppm	parts per million
ppmdv/ppmvd	parts per million dry volume
REF1 / PBREF1	Palm Beach Renewable Energy Facility #1 (the old trash incinerator)
REF2 / PBREF2	Palm Beach Renewable Energy Facility #2 (the new trash incinerator)
SCR	Selective Catalytic Reduction (a modern control system for NOx emissions that involves spraying ammonia or urea into the exhaust, then using vanadium pentoxide catalyst to further reduce NOx emissions; PBREF 2 is the only trash incinerator to use this in the U.S.)
SDA	Spray Dryer Absorber ("scrubbers" that spray lime into incinerator exhaust to reduce SO_2 emissions)
SO_2	Sulfur dioxide

VIEWING SOURCE DOCUMENTS

Source documents for incidents in the chart below are available by clicking on the date for each incident. When visiting each link, click through the "Public OCULUS Login" button to download and view the source document. If the document does not automatically download or display, click the Adobe symbol under "File Type." If seeing a prompt to get Adobe Reader (and if you already have it installed), you may need to then click on the document name in the left sidebar.

2015-2024 Incidents, Exceedances, Violations, and other Mishaps at Palm Beach Renewable Energy Facility #2 Trash Incinerator

Date (link)	Summary	Unit	Pollutant	Notes
7/7/2015	On July 6, 2015, there was a malfunction with Unit 4 inlet analyzers for CO2, NOx, and SO_2 which resulted in 4 hours of invalid data. A piece of debris was found lodged in the solenoid valve allowing calibration gas to leak by the valve.	Unit 4	CO2, NOx, SO_2	solenoid valve blocked by debris caused calibration gas leak
7/20/2015	Unit 3 ID Fan drive tripped due to high temperature. The air conditioner tripped in the MCC room causing the variable frequency drive to overheat, thus causing the fan to trip.	Unit 3		ID fan trip
7/28/2015	On 7/22/2015 at approximately 09:55 Unit 4 inlet probe malfunctioned, resulting in a loss of inlet sample readings for CO2, CO, SO_2 and NOx. Troubleshooting the cause of the loss of sample readings followed. Several maintenance components within the probe were cleaned such as the fast loop eductor and dilution manifold. The probe filter and critical orifice were also replaced. Several leak checks were performed on the umbilical also. These troubleshooting strategies had no positive results in restoring the probes functionality.	Unit 4	CO2, CO, SO_2, NOx	probe inlet
9/14/2015	On September 11, 2015, the Unit 3 outlet SO_2 and NOx probe malfunctioned as indicated by a slow response to calibration and low calibration gas flow. Through troubleshooting, it was discovered that there was a small crack in a piece of stainless steel tubing associated with the probe. This probe malfunction resulted in four hours of unavailable NOx and SO_2 data.	Unit 3	SO_2, NOx	probe outlet
10/22/2015	On October 21, 2015 the Unit 5 CO probe plugged. This malfunction resulted in 2 hour of unavailable data.	Unit 5	CO	probe plugged
10/23/2015	On October 22, 2015 there was a sudden increase in furnace pressure, ID fan speed, and baghouse differential pressure on Unit 4. It is believed that there may have been a small explosion in the furnace which resulted in a one (1) 6-minute opacity exceedances of 10.5%.	Unit 4		furnace pressure increase, maybe from small explosion
1/28/2016	January 27, 2016, there was a loss of air pressure at PBREF#2 which tripped Units 3, 4 and 5. There were no excess air emissions above the Title V air permit limits as a result of the malfunction on Units 3 and 5, however, Unit 4 experienced a CO 4-hour block average of 109.3 ppmvd. The permit limit is 100 ppmvd 4-hour block for CO.	Units 3, 4, and 5	CO	air pressure loss
1/28/2016	The mercury analyzer (SICK MERCEM) was experiencing erratic readings, elevated at times, but reading values with an error message for heater trouble. After some troubleshooting a thermocouple was replaced to erase the heater error. Additional adjustments were made to lamp intensity as well as some cleaning to the reflector lens.	Unit 5	Hg	thermocouple

Date (link)	Summary	Unit	Pollutant	Notes
2/1/2016	Units 3, 4, and 5 tripped due to loss of instrument air when a solenoid valve failed to open. Boiler 3 and 5 were brought back online and Boiler 4 tripped. FD fan tripped on Boiler 4 due to high temperature. I&E troubleshooting fan high temperature issue. The malfunction caused the 4 hour block for CO to exceed the permit limit of 100 ppmvd.	Units 3, 4, and 5	CO	solenoid valve
2/18/2016	On February 17, 2016 the Unit 5 CO2 probe malfunctioned which caused elevated CO values. The system was put into maintenance mode and the CO2 probe was cleaned and calibrated. This malfunction resulted in 3 hour of unavailable data.	Unit 5	CO	probe
3/18/2016	The wet scrubber, known as the Wet Whirl, in the ash management building is currently out of service. On January 30, 2016 the conduit feeding the electric to the motor was struck and damaged by a vehicle operating within the building. There was significant damage to electrical system and parts had to be ordered.	Wet Whirl Scrubber	ash	electric conduit
3/23/2016	On March 22nd, 2016, the Unit 4 Opacity Monitor had two (2) six minute periods of unavailable data.	Unit 4	opacity	
4/18/2016	On April 15, 2016 there was an opacity exceedance on Unit 3.	Unit 3	opacity	
4/18/2016	On April 16, 2016, there was a loss of hydraulic pressure to the grates and charging hoppers on Unit 3. This malfunction resulted in 1 4-hour block to exceed the permit limit of 100 ppmvd.	Unit 3	CO	
4/21/2016	On April 20, 2016, the PBREF No. 2 Hg CEMS began malfunctioning giving erratic readings. The facility operator has tried troubleshooting the problem, but has not been successful in resolving the erratic readings.	Unit 5	Hg	
5/2/2016	On April 30, 2016, at the PBREF#2, an air heater tube ruptured on Boiler 4 releasing steam into the gas stream downstream of the baghouses. This steam release caused two invalid periods of opacity data before the unit was shut down.	Unit 4	opacity	air heater tube rupture
5/5/2016	On May 4, 2016 there was a malfunction of the level control to the steam coil gas heater resulting in the ammonia injection system to shut down. This malfunction resulted in the NOx 24-hour average to exceed the permit limit of 50 ppmvd.	Unit 4	NOx	ammonia injection system
5/6/2016	As Unit 4 was returning to service the atomizer tripped stopping slurry and water control, thus increasing SDA outlet temperature. Several attempts were made to restart the atomizer with each failing. The in-service atomizer was replaced with the spare atomizer. After resetting the power to the atomizer at the main breaker, the atomizer was successfully restarted.	Unit 4		atomizer failure
5/16/2016	On May 14, 2016, at the PBREF#2, within the Boiler 5 Finishing Heat Exchanger, air heater tube(s) ruptured, releasing steam into the gas stream. This steam release caused four invalid periods of opacity data. The unit was shut down and the Finishing Heat Exchanger was bypassed.	Unit 5	opacity	air heater tube rupture
5/20/2016	PBREF#2 invalid SO_2 lb/hr data on Unit 3	Unit 3	SO_2	

Date (link)	Summary	Unit	Pollutant	Notes
5/23/2016	The mercury analyzer (SICK MERCEM) was experiencing communication failure, erratic readings and was unable to calibrate. KVB Enertec on site troubleshooting the communication failure between the Hg analyzer and the DAHS.	Unit 5	Hg	analyzer communication failure
5/31/2016	Unit 4 NH_3 (CTM 027- Ammonia slip) compliance test result, conducted on April 22, 2016, was 3.34 lb/hr, exceeding the 2.76 lb/hr permit limit. Please note however, that the NH_3 ppmvd value on this unit was 9.35 ppmvd, which is below the 10 ppmvd permit limit.	Unit 4	NH_3	**permit limit exceedance**
7/5/2016	On July 4, 2016, the Unit 5 ash discharger plugged. This malfunction resulted in one 4-hour block to exceed the permit limit of 100 ppmvd.	Unit 5	CO	ash discharger plug
7/5/2016	On July 3, 2016 there was a loss of NOx outlet data on Unit 4. This malfunction resulted in nine hours of unavailable data. During this time the boiler was operating normally as indicated by CO and outlet SO_2 values. Therefore, it is not anticipated that the 24-hour average NOX value would be above the permit limit.	Unit 4	NOx	probe outlet malfuntion
7/18/2016	On July 16, 2016, the Unit 5 ID Fan tripped. This malfunction resulted in two (2), 4-hour block averages of CO to exceed the permit limit of 100 ppmvd.	Unit 5	CO	ID fan trip
10/21/2016	Palm Beach Renewable Energy Facility No. 2 (PBREF #2) indicated that on October 20, 2016, two 4- hour blocks of CO exceedances occurred on Boiler #4. The first 4- hour block was due to an ID fan trip.	Unit 4	CO	ID fan trip
1/23/2017	Notice of lost opacity data EU 025	Unit 4	opacity	
2/20/2017	The daily calibration check failed on the Unit 4 inlet probe. During the attempt to manually calibrate the analyzers it was noted that there was no response to calibration gas. Typical plan of action would be to clean or replace the sample probe filter and flow calibration gas again. This was done without success. The probe critical orifice and fast loop eductor were cleaned and replaced. Unfortunately, this did not solve the problem either. Troubleshooting continued for several hours in an attempt to understand why the probe was not responding to calibration gas. During another line check in the probe enclosure it was found that a piece of stainless tubing had a small crack in the back of a bend. The tubing was removed, a new piece bent and installed.	Unit 4		probe inlet tubing crack
5/11/2017	PBREF-2 Boiler #4 (EU025) failed 2 of 3 runs during the 2017 stack testing for PM and Ammonia. This facility was granted a retest in 2016 for the same unit and same parameters. Based on the BACT determination (0990234-032-AC and PSD-FL-413C), the PM limits are 4.7 lb/hr (12.0 ug/dscm) and the Ammonia limits are 2.76 lb/hr (10 ppm @ 7% O2). Based on Specific Condition B.30 of Permit -038-AV, the facility is required to perform an annual stack test to demonstrate compliance with the emission limits. These units are also subject to 40 CFR 60, Subpart Eb - NSPS for Large Municipal Solid Waste Combustors.	Unit 4	PM, NH_3	**permit limit exceedance**

Date (link)	Summary	Unit	Pollutant	Notes
8/9/2017	On August 5, 2017, there has been a loss of data on the Boiler 5 mercury analyzer which was reporting null or negative readings. The facility attempted to trouble shoot with remote assistance from SICK MERCEM, but was not able to resolve the issue.	Unit 5	Hg	
8/10/2017	On August 9, 2017 there was a 3 hour period of invalid data on Unit 3 SO_2 and NOx monitors due to scheduled quarterly maintenance	Unit 3	SO_2, NOx	
8/21/2017	On 8/5/2017, the mercury analyzer (SICK MERCEM) reported null or negative readings. Upon discovery of the issue, facility staff and remote assistance troubleshooting from SICK was unable to resolve the issue. On 8/9/2017, A SICK MERCEM technician arrived on-site for further troubleshooting. After multiple attempts of powering down and restarting the analyzer, it was discovered that the main motherboard was faulty. Upon ordering and replacement of the motherboard, it was also discovered that the power supply board received alarms related to the heat controller. The alarm prevented the system from collecting sample gas data. The heat controllers were verified to be in working condition, and the analyzer was manually programmed to gather sample data.	Unit 5	Hg	motherboard faulty; heat controller alarms
8/25/2017	On August 24, 2017, there was a loss of 28 hours of data on the Boiler 5 mercury analyzer.	Unit 5	Hg	
8/31/2017	On August 30, 2017, the ID fan tripped which caused a master fuel trip on Unit 5 resulting in one (1) 4- hour block average of CO to exceed the 100 ppmvd permit limit.	Unit 5	CO	**permit limit exceedance**
9/6/2017	The mercury analyzer (SICK MERCEM) was reporting null or negative readings as of 9/5/2017 at approximately 0656. Unit 5 Boiler returned to operation following startup at approximately 0656 on 9/5/2017. The Hg monitor displayed standard alarms upon Unit 5 startup, but was not in operation. Upon restarting the SICK Hg monitor using SICK guidelines and procedure, the monitor did not show any improvement. Following troubleshooting, it was determined that a heat controller component was malfunctioning. The heat controller component was replaced and put back into service. After multiple successful recalibrations, the SICK Hg monitor was put back into service, but the valid data was not being recorded by the CEMS DAHS. Further troubleshooting will be required to correct the CEMS DAHS recording issue.	Unit 5	Hg	heat controller
9/12/2017	On September 8, 2017, there was a loss of data on the Boiler 5 mercury analyzer.	Unit 5	Hg	
9/29/2017	On September 27, 2017, there has been a loss of data on the Boiler 5 mercury analyzer. The operator has tried to troubleshoot the problem, but has not been successful	Unit 5	Hg	
10/2/2017	On September 28, 2017, the daily average for Unit 5 SO_2 lb/hr was invalid due to excessive drift in the flow meter which was confirmed during a flow velocity traverse on the ID fan on October 1, 2017.	Unit 5	SO_2	flow meter excessive drift

Date (link)	Summary	Unit	Pollutant	Notes
10/10/2017	The mercury analyzer experienced a “hardware fault” error resulted in unavailable data from October 8th at 09:29 through October 9th, 2017 at 12:33 for a total of 26 hours	Unit 5	Hg	hardware fault error
10/26/2017	October 25 through October 26, 2017, there was a loss of data on the Boiler 5 mercury analyzer for a total of 16 hours.	Unit 5	Hg	
11/9/2017	PBREF NO. 2 U4 NOX INVALID DATE, EU 025	Unit 4	NOx	
11/13/2017	The Unit 5 Mercury analyzer did not display a fault or warning, however the PBRRC EHS Technical Specialist noticed that the DAHS was not recording the mercury data while he was completing the CEMS CGA on Unit 5 November 8. The facility attempted to trouble shoot the analyzer, but was not able to resolve the issue. A SICK MERCEM technician arrived on site the following day. The analyzer malfunction resulted in 36 hours total down time.	Unit 5	Hg	
11/27/2017	On November 26 through November 27, 2017, there was a loss of data on the Boiler 5 mercury analyzer totaling 30 hours. During this time, the boiler was operating normally and all air pollution control equipment was functioning properly	Unit 5	Hg	
12/18/2017	On December 17 through December 18, 2017, there was a loss of data on the Boiler 5 mercury analyzer totaling 17 hours. During this time, the boiler was operating normally and all air pollution control equipment is functioning properly.	Unit 5	Hg	
12/18/2017	On December 17, 2017, there was a loss of data on the Boiler 4 inlet SO_2 analyzer totaling approximately 4 1/2 hours. The Unit 4 stack SO_2exhaust monitors were fully functioning and showed that there were not any exceedances during this time.	Unit 4	SO_2	
12/29/2017	The original notification of the Hg malfunction resulting in unavailable data was sent to the Department on December 27, 2017. The monitor has been repaired and began collecting data on December 28, 2017 at 11:39am. The total hours of unavailable data for this malfunctions is 133 hours.	Unit 5	Hg	
1/2/2018	On December 30, 2017 through January 01, 2018, there was a loss of data on the Boiler 5 mercury analyzer totaling 52 hours. During this time, the boiler was operating normally and all air pollution control equipment is functioning properly.	Unit 5	Hg	
1/23/2018	Unit 5 Hg analyzer experienced a "hardware fault" error on 1/20/2018. Loss of data for 61 hours.	Unit 5	Hg	hardware fault error
1/29/2018	On January 26, 2018, there was a loss of data on the Boiler 5 mercury analyzer totaling 5 hours.	Unit 5	Hg	
1/29/2018	There was a loss of data on the Boiler 5 mercury analyzer totaling 5 hours.	Unit 5	Hg	
2/8/2018	On February 7, 2018, at 2:29am, there was a loss of data on the Boiler 5 mercury analyzer. The operator restarted the monitor and it is currently working normally. The monitor malfunction resulted in 5 hours of unavailable data.	Unit 5	Hg	
2/9/2018	The Unit 5 Hg analyzer experienced a hardware fault beginning February 8, 2018, at 4:19am, resulting in unavailable data.	Unit 5	Hg	

Date (link)	Summary	Unit	Pollutant	Notes
2/15/2018	The Unit 5 Mercury (Hg) monitor experienced a 'hardware fault' error on 2/8/2018 at 04:19 and was returned to service on 2/14/2018 at 12:00. Details on the event are described below: Upon discovering the 'hardware fault error' on 2/8/2018, PBRRC EHS and I&E attempted to troubleshoot the SICK MERCEM monitor. A lamp ignition failure was noted in the digital log historian. The standard procedure for monitor failures began with restarting the monitor. Fuses for the main motherboard failed upon restart of the monitor, and were replaced. Inconsistently, fuses failed upon restarting the monitor. Unable to determine a root cause for the fuse failures, a SICK MERCEM technician was notified the same day. Due to conflicts in SICK scheduling, the SICK technician was unable to arrive until 2/12/2018. Upon the SICK technician's arrival, multiple attempts to determine the root cause of the initial fuse failures were unsuccessful. Fuses were replaced, and did not fail for the entirety of the SICK technician service call (3 day duration). The original lamp ignition failure was determined to be due to a malfunctioned lamp control module. The lamp control module was replaced on 2/14/2018 and the monitor returned to service at approximately 12:00. The malfunctioned lamp control module was replaced recently and was still under warranty at the time of failure.	Unit 5	Hg	hardware fault
2/26/2018	The Unit 5 Hg analyzer experienced a hardware fault beginning February 23, 2018, at 22:58pm, resulting in unavailable data.	Unit 5	Hg	hardware fault
3/10/2018	The Unit 5 Hg analyzer experienced a hardware fault beginning March 10, 2018, at 14:21pm, resulting in unavailable data	Unit 5	Hg	hardware fault
3/27/2018	The Unit 5 Mercury (Hg) monitor experienced a 'hardware fault' error on 3/26/2018 at approximately 14:10 and has returned to service on 3/27/2018 at approximately 11:27 (21 hours down)	Unit 5	Hg	hardware fault
4/2/2018	On March 30, 2018, Unit 4 CO, NOx and SO_2 lb/hr was invalid for a total of 45 hours due to a malfunction of the stack exhaust pressure transducer.	Unit 4	CO, NOx, SO_2	stack exhaust pressure transducer malfunction
4/3/2018	On April 2, 2018, Unit 4 CO, NOx and SO_2 lb/hr was invalid for a total of 8 hours due to a malfunction of the stack exhaust pressure transducer.	Unit 4	CO, NOx, SO_2	stack exhaust pressure transducer malfunction

Date (link)	Summary	Unit	Pollutant	Notes
4/23/2018	PBREF2 Boiler 3 experienced a CO spike on 4/22/2018 at around 03:14. The control room operator informed the crane operator to select a different area of the pit for MSW fuel feed. In addition, standard operating procedures to adjust air flow and initiate gas guns were followed. Typically, the re-balance of air flow is sufficient to decrease CO to acceptable levels. However, Boiler 3 currently has an over-grate air (OGA) fan which has malfunctioned. The lack of an operational OGA fan prevented CO from being meaningfully affected by air adjustments from over-fire air (OFA) alone. During normal gas gun operations, the burners are ignited and gas guns are inserted into the boiler. Multiple internal system safety checks are performed in order to verify the burners and ignitors are in good operating condition before guns are allowed to be inserted. On 4/22/18, at around 13:24, the attempt to insert gas guns failed due to trips from the internal system safety checks. Multiple attempts to restart the gas gun insertion finally resulted in successful gas gun firing at approximately 13:35. The above malfunctions caused one, 4-hr average CO period to exceed the permit limit of 100ppmvd. The new maximum 4 hour block average is 68.7 ppmvd.	Unit 3	CO	OGA fan malfunction
5/21/2018	On 5/19/2018, Boiler 4 experienced above normal NOX from the period of 0:00 to 13:20. The control room operator informed the crane operator to select a different area of the pit for MSW fuel feed. In addition, standard operating procedures to adjust air flow and initiate gas guns were followed. The air pollution systems at PBREF2 have minimum operating temperatures. Specifically, the spray dry absorber (SDA – for SO_2 control) has a minimum operating temperature of 312F at the inlet and 270°F at the outlet. An additional restriction, is the ammonia injection (SCR system - for NOX control) will not operate unless SO_2 is below a certain concentration (45 ppm) to protect against fouling of the catalyst. Typically, the flue gas in the boilers are high in temperature and allow the SDA, and in turn the SCR, to operate normally.	Unit 4	NOx	fuel content
6/6/2018	There was a probe malfunction on Unit 5 due to particulate plugging. This resulted in 3 hours of unavailable NOx and SO_2 data while the probe was repaired. It is not expected that there were any pollutant exceedances during this time as boiler operations and pollution control systems were functioning normally.	Unit 5	NOx, SO_2	probe particulate plugging
6/26/2018	The Unit 5 Hg analyzer experienced a hardware fault beginning June 25, 2018, at 07:06, resulting approximately 6 hours of unavailable data	Unit 5	Hg	hardware fault
8/30/2018	PBREF No. 2 Unit 5 Hg analyzer experienced a hardware fault malfunction beginning August 29, 2018, at 09:47, resulting approximately 6 hours of unavailable data.	Unit 5	Hg	hardware fault malfunction

Date (link)	Summary	Unit	Pollutant	Notes
9/17/2018	On September 16, 2018, there was a loss of NOx and SO_2 data on the Boiler 3. While the malfunctioning opacity monitor was being replaced (notification is attached), the system was in maintenance mode. During this time, the boiler was operating normally and all air pollution control equipment were functioning properly.	Unit 3	NOx, SO_2	malfunctioning opacity monitor was being replaced
9/17/2018	On Saturday, 9/15/2018 at 22:18 through 9/16/2018 at 13:42, the Unit 3 opacity data was invalid due a malfunctioning opacity monitor. The malfunctioning monitor, serial number 1235735, was replaced on 9/16/18 with a spare monitor, serial number 1244635.	Unit 3	opacity	opacity monitor malfunction
9/27/2018	There was a 4-hour block CO exceedance on Unit 3 on September 27, 2018, due to a malfunctioning variable frequency drive (VFD) of the ID fan causing the boiler to experience a major fault trip (MFT). The gas guns could not ignited due to the loss of air. In addition, the MFT shut down the PAC flow. Because the gas guns were unavailable for shutdown, combustion continued for 83 minutes after the MFT, even though no additional fuel was introduced. The CEMS continued to record the PAC flow averages after the MFT until steam flow ceased. PBRRC staff was able to show compliance with the PAC flow 8-hour block by recalculated the PAC flow using hourly averages, eliminating the time after the MFT and combustion ceased.	Unit 3	CO	ID fan trip
10/1/2018	On Thursday, 9/27/2018 through Monday, 10/1/2018, the Unit 5 opacity monitor experienced 66 six-minute periods of unavailable data due a malfunctioning opacity monitor evaluation unit (Durag DR-290 AW). The opacity monitor normally experiences self-initiating calibrations one time per day at a fixed time. However, on Thursday 9/27/2018, after Boiler 5 came back on line after an outage, the opacity monitor self- initiated calibrations for a total of 5 times, each calibration resulted in a six-minute period of loss of data. Friday through Monday, the self- initiating calibrations increased in frequency. Initially, there was no error code indicating a malfunction, until Monday, 10/1/2018 at approximately 3:30am, error codes were discovered that indicated communication failures and display module error. The evaluation unit for the opacity monitor was replaced and the opacity monitor passed calibrations at approximately 10:48 on 10/1/2018	Unit 5	opacity	opacity monitor malfunction

Date (link)	Summary	Unit	Pollutant	Notes
10/16/2018	There was a 4-hour block CO exceedance on Unit 5 on October 15, 2018, due to a malfunctioning variable frequency drive (VFD) of the ID fan causing the boiler to experience a master fuel trip (MFT). The gas guns could not ignited due to the loss of air. Please note that Condition B.17.c., Special Provisions for CO, of permit 0990234-037-AV allows for a CO exceedance of 15 hours for induced draft fan malfunction. In addition, the MFT shut down the PAC flow through a safety interlock. Because the gas guns were unavailable for shutdown, combustion continued for 317 minutes after the MFT, even though no additional fuel was introduced. The CEMS continued to record the PAC flow averages after the MFT. PBRRC staff was able to show compliance with the PAC flow 8-hour block by recalculated the PAC flow using hourly averages, eliminating the time after the MFT.	Unit 5	CO	ID fan trip
1/16/2019	The Unit 3 Inlet probe experienced plugging of the probe filter, which caused invalid data for the periods of 1/15/2019 16:00 to 1/15/2019 18:00. The probe was unplugged, the filter and O-ring was replaced, and the U3 inlet system returned to service on 1/15/2019 at 18:25. Due to the Unit 3 Inlet probe malfunction, Unit 3 Inlet CO, NOx, and SO_2 data was unavailable from 1/15/2019 at 16:00 through 1/15/2019 at 18:00. Total downtime for this event is 2 hours.	Unit 3	CO, NOx, SO_2	probe inlet filter plugged
2/21/2019	The variable frequency drive (VFD) of the ID (induced draft) fan tripped (Malfunctioned) at approximately 1740 on 2/20/2019. This malfunction caused Boiler 3 to experience a master fuel trip (MFT). Due to the loss of air, gas guns could not be ignited during the boiler shutdown. The control room operator successfully attempted to restart the ID fan approximately 15 minutes after the initial fan trip (fan requires a 15 minute wait time prior to start). The startup of the ID fan allowed combustion to resume and stable combustion was achieved approximately at 2000. The above boiler malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The CO daily average for 23 operating hours is 20.8 ppmvd, and the highest 4 hour block during operation is 36.6 ppmvd. The above exceedance is within the allowed fifteen hours per occurrence for CO as per section B.17 of the Title V Air Operating Permit, number 0990234-040-AV.	Unit 3	CO	ID fan trip
3/12/2019	There was a 4-hour block CO exceedance on Unit 5 on March 11, 2019, due to a malfunctioning variable frequency drive (VFD) of the ID fan causing the boiler to experience a master fuel trip (MFT). The gas guns could not ignited due to the loss of air. Please note that Condition B.17.c., Special Provisions for CO, of permit 0990234-040-AV allows for a CO exceedance of 15 hours for induced draft fan malfunction.	Unit 5	CO	ID fan trip

Date (link)	Summary	Unit	Pollutant	Notes
4/15/2019	The SDA atomizer experienced loss of power on 4/14/2019 at approximately 2021. I&E was called on-site to attempt repairs. During troubleshooting, it was discovered that the main power plug to the atomizer had melted and needed to be replaced. Boiler 5 was forced to shutdown for atomizer repairs. Following atomizer repairs, an electrical relay was also discovered to have malfunctioned, and was replaced. Boiler 5 startup occurred the following day with no additional issues to the SDA atomizer.	Unit 5	SO_2	atomizer; electric relay malfunction
5/3/2019	There was a 4-hour block CO exceedance on Unit 3 on May 2, 2019. A high inverter temperature alarm of the induced draft (ID) fan caused the boiler to experience a master fuel trip (MFT). The gas guns could not ignited due to the loss of air. This malfunction is within the 15 hours allowed for a CO exceedance caused by an ID fan malfunction as specified in Condition B.17.c., Special Provisions for CO, of permit 0990234- 040-AV. Please note that this malfunction occurred during the second run of EPA Method 5/29 of the 2019 annual stack test. The run was paused during the malfunction. The control room operator was able to restart the ID fan and the run was completed before an identical high inverter temperature alarm of the ID fan caused a MFT again. The third Method 5/29 test run is anticipated to be completed this afternoon (5/3/2019). The high inverter temperature alarm is currently under investigation.	Unit 3	CO	ID fan trip
5/31/2019	On May 30, 2019, there was a malfunction with the Boiler 5 opacity monitor that resulted in 42 six- minute periods of unavailable data.	Unit 5	opacity	monitor malfunction
6/24/2019	The Unit 3 stack probe experienced a worn critical orifice, which was replaced after all readings at the Unit 3 stack location were noticed to be elevated. A successful calibration was completed after the orifice replacement, and normal operating emissions values were observed for all Unit 3 stack readings. Due to troubleshooting and re-calibration, Unit 3 Stack NOx, and SO_2 data was unavailable from 6/21/2019 at 10:31 through 6/21/2019 at 12:39. Total downtime for this event is 1 hour.	Unit 3	NOx, SO_2	probe stack orifice worn

Date (link)	Summary	Unit	Pollutant	Notes
6/28/2019	The Boiler 5 ID (induced draft) fan tripped (Malfunctioned) at approximately 20:51 on 6/27/2019. This malfunction caused Boiler 5 to experience a master fuel trip (MFT). Due to the loss of air, gas guns could not be ignited during the boiler shutdown. The control room operator successfully attempted to restart the ID fan approximately 25 minutes after the initial fan trip (fan requires a 15 minute wait time prior to start) at 21:16. Combustion never reached stability, as the ID fan once again tripped at approximately 22:56. After investigation, it was determined that the ID fan tripped due to high inverter temperature. The air conditioning in the motor control center (MCC) room had malfunctioned, which caused the high inverter temperature. The ID fan speed / load has been restricted to 80% to prevent overheating of the inverter, and repairs to the air conditioning in the MCC is currently underway. On 6/28/2019 at approximately 04:00 a successful startup was conducted on Boiler 5, which continues to be in stable operation as of 10:00.	Unit 5	CO	ID fan trip
8/21/2019	The intent of this letter is to correct the duration and times of the unavailable data, and to add CO as a parameter affected for the notification letter sent on 8/12/19: The daily average for Unit 3 CO, NOX, SO_2 lb/hr was invalid due to excessive drift in the flow monitor. Unit 3 came online from a forced outage on 8/10/19 at approximately 09:57. The flow monitor showed elevated stack gas velocities for the duration of 8/10/19 and 8/11/19. The flow monitor was recalibrated on 8/12/2019 at approximately 08:24, and currently measures normal exhaust flue gas velocities. The attached data shows normal CO, NOx, and SO_2 ppmvd hourly averages, and the invalidated abnormal lb/hr hourly data.	Unit 3	CO, NOx, SO_2	flow monitor drift
10/15/2019	Unit 4 has just completed the fall boiler outage. Upon startup, it was noted that the opacity monitor read negative values. On 10/14/19, during the periods of 9:30-10:24 (9 periods) and 14:06-14:24 (3 periods), the opacity monitor was cleaned and recalibrated. Currently, the monitor reads positive values in general agreement with opacity values based on process knowledge. There were a total of 12 six-minute periods of unavailable data	Unit 4	opacity	opacity monitor dirty
11/22/2019	On 11/20/19, the Unit 5 inlet probe showed fluctuating values during the fourth quarter scheduled maintenance event. At approximately 16:13, CEM Solutions began troubleshooting for approximately 5 hours, when it was determined that the vacuum line was intermittently leaking. The line was bypassed and successful calibrations completed at approximately 21:30	Unit 5		vacuum line leak

Date (link)	Summary	Unit	Pollutant	Notes
12/5/2019	The CEMS calibration gas for the daily calibration of the CEMS system was replaced on 12/3/2019 after the morning calibrations. On 12/4/2019, all units experienced CEMS daily calibration failures at approximately 0600-0700 due to the installation of incorrect calibration gas bottles. The correct calibration bottles were installed and recalibrations were conducted. No additional CEMS system hardware changes or repairs were necessary for a successful recalibration. The calibration failure on 12/4/19 was due to the use of wrong calibration gas cylinders. Data was invalidated from 12/4/19 starting at the beginning of the failed daily calibration, until the completion of the respective successful calibration. Training is currently in progress for CEMS technicians to minimize unavailability incidents. Unit 3 is currently in an outage so no unavailable data is reported.	Units 4 and 5		calibration gas bottles wrong type
12/16/2019	2019 INTERNAL ENVIRONMENTAL AUDIT FINDINGS FOR PBREF-1 AND PBREF-2: 1. Three year opacity Zero Alignment check on Continuous Monitor Systems (COMS) may not have been performed in 2018 2. Reset PBREF No. 2 SO_2 stack monitor range from 500 ppm to 200 ppm. 3. ... after a 4x Out of Control (OOC) daily calibration drift (CD) check failure, a portion of the data was not properly invalidated and reported.	Units 3, 4, and 5		VIOLATION, see NONCOMPLIANCE 1/3/2020
12/20/2019	Unit 3 experienced two significant CO spikes on 12/19/2019 at 01:01 and 02:03. During both events, the CRO made several air adjustments, followed by firing gas guns. The actions taken by the CRO was able to reduce CO to normal operating levels following both spike events. Upon further investigation, it was discovered that the 3A sifting conveyor water level transmitter was providing a false-high reading, indicating that the water level in the quench tank was full. During this period, the sifting conveyor water level was actually below normal operating levels, causing the water-air seal of the boiler to be intermittently lost. This loss of water-air seal caused cold tramp air to enter the boiler, producing cold furnace CO spikes.	Unit 3	CO	sifting conveyor water level transmitter
12/30/2019	Unit 3 experienced significant CO spikes on 12/27/2019 beginning at approximately 17:18. During this event, the CRO made several air adjustments, followed by firing gas guns. The actions taken by the CRO was able to reduce CO to normal operating levels following the spike event. Upon further investigation, it was discovered that the recently installed settling basin above-ground plumbing (which serves to replace the previous underground plumbing) had become plugged with material. This plug stopped the flow of supply water to the discharger quench tank, causing the water-air seal of the boiler to be intermittently lost. This loss of water-air seal caused cold tramp air to enter the boiler, producing cold furnace CO spikes.	Unit 3	CO	settling basin plugged

Date (link)	Summary	Unit	Pollutant	Notes
1/3/2020	Federally Reportable Violation - Procedural Violation - Continuous parameter monitoring report - Facility has already completed necessary corrective actions to return to compliance. - The violation does not meet one of the six criteria for HPV [High Priority Violation] classification.			
1/3/2020	On 1/2/20 starting at approximately 11:59, the Unit 4 CO monitor began reading negative values. The alarms on the monitor indicated “High AGC Intensity” and “Low Motor Speed”. This combination of alarms was not experienced previously at the facility. A third party vendor was consulted to assist facility staff in troubleshooting the unusual alarms. After several hours of unsuccessful troubleshooting, it was finally discovered that the chopper motor had seized, and needed replacement. The chopper motor, IR source, preamp board, were all replaced during the troubleshooting process. At approximately 19:05, a successful calibration was completed. Since no parts are considered major components of the CO monitor, a RATA is not necessary to be conducted. No alarms are presently active and no additional repairs are expected from this event.	Unit 4	CO	chopper motor failure
1/23/2020	The after a successful daily calibration on 1/22, the Unit 5 flue probe experienced a sudden drop in all measured values at approximately 07:00. Facility I&E staff began troubleshooting, and determined that the root cause was a faulty check valve in the calibration line which caused ambient air to leak into the probe. The check valve was replaced and all values returned to normal. All calibrations passed as of 1/23/2020.	Unit 5	CO	calibration line valve fault
1/24/2020	After a successful daily calibration on 1/23, the Unit 5 flue probe experienced a sudden drop in all measured values at approximately 07:00. Facility I&E staff began troubleshooting, and determined that the root cause was a faulty check valve in the calibration line which caused ambient air to leak into the probe. The check valve was replaced and all values returned to normal. All calibrations passed as of 1/24/2020.	Unit 5	CO	calibration line valve fault
1/27/2020	After a successful daily calibration on 1/25, the Unit 5 flue probe experienced a sudden drop in all measured values at approximately 07:00. This caused the CO corrected to 7%O2 value to drastically increase due to near-zero CO2%V values. Zero percent CO2 values is not realistic due to normal boiler operating conditions. Facility I&E staff conducted a calibration gas cycle, which restored normal flue gas flow. All values returned to normal.	Unit 5	CO	calibration line valve fault
2/3/2020	On 2/1/2020 at approximately 0700, the Unit 3 CO monitor has experienced a 4X calibration failure. In this event, the last known good data prior to successful calibration on 1/31/20 at approximately 0800. Data was invalidated from 1/31/20 at 0800 until the completion of a successful calibration on 2/1/20 at approximately 1000.	Unit 3	CO	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
2/10/2020	On 2/9/2020 at approximately 0700, the Unit 3 CO monitor has experienced a 4X calibration failure. In this event, the last known good data was prior to successful calibration on 2/8/20 at approximately 0700. Data was invalidated from 2/8/20 at 0700 until the completion of a successful calibration on 2/9/20 at approximately 0800. In addition, on 2/9/2020 at approximately 1600, the CO monitor experienced an IR source failure. The IR source was replaced, and a successful calibration was completed at approximately 1900.	Unit 3	CO	calibration failure
2/11/2020	On 2/10/2020 at approximately 08:00, the Unit 3 stack CO2 monitor experienced a sudden drop from normal operating values. During troubleshooting, it was discovered that this was due to an IR source failure. The IR source was replaced, and a successful calibration was completed at around 10:14. This event caused approximately 2 hours of unavailable data. Since the NOX and SO_2 ppmvd@7%O2 require CO2 data for the diluent correction calculation, the CO2 unavailable data also caused unavailable data for NOX and SO_2. It is not expected that any exceedances occurred for NOX or SO_2, since all uncorrected data indicated normal operating concentrations. In addition, on 2/10/2020 at approximately 11:00, the CO monitor temperature alarm was active. The temperature monitor was faulty and was replaced. Successful calibration was completed by 12:42. This event caused approximately 1 hour of unavailable data.	Unit 3	CO, NOx, SO_2	IR source failure, termperature alarm fault
2/11/2020	Successful calibrations after the 1st day of quarterly maintenance was completed at approximately 17:50. Shortly after, Unit 5 flue probe experienced unrealistic readings in all measured values at approximately 17:53. Upon troubleshooting, it was discovered that the flue probe contained a minor leak at the filter connection. The leak was repaired and a successful calibration was conducted at 21:08. The NOX and SO_2 inlet values were also affected by this event, however, these parameters are only used for process control purposes. All NOX and SO_2 limits were still within normal operating limits.	Unit 5	CO?, NOx SO_2	probe flue leak at filter connection
2/19/2020	At around 08:40, Unit 3 CO increased to abnormal levels despite the use of gas guns and air changes. It was suspected that the probe was unresponsive. Upon further troubleshooting, it was suspected that a calibration solenoid which controls the flow of calibration gas had malfunctioned, and the solenoid allowed leaking of calibration gas. The solenoid was replaced by 10:28 and the probe was returned to service. The NOX and SO_2 inlet values were also affected by this event, however, these parameters are only used for process control purposes. All NOX and SO_2 limits were still within normal operating limits.	Unit 3	CO, NOx, SO_2	calibration solenoid malfunction

Date (link)	Summary	Unit	Pollutant	Notes
2/24/2020	On 2/19/20 starting at approximately 06:35, the Unit 4 CO monitor began reading elevated CO values. All combustion controls and indicators showed normal operation. The use of gas guns and air adjustments had no affect on the elevated CO. Upon investigation, it was discovered that a pattern of high CO spikes were consistent with durations of Unit 4 stack daily calibrations. This is suspected to be caused by plugged fast loop orifices, causing calibration gas to remain in the lines for an extended period of time, affecting actual measured values. Replacement of the fastloop on 2/20/20 caused a significant decrease in spikes observed, and was confirmed as a root cause solution of the CO spike.	Unit 4	CO	fast loop orifices plugged
4/21/2020	The opacity values for Unit 4 on 4/20/2020 was unavailable during window cleaning for the period of 08:00–08:06 and monitor troubleshooting during the period of 09:42- 11:00. The opacity data was also invalid during the period of 09:00 to 09:42 due to the finishing heat exchanger leak. The leak contributed to higher than normal levels of condensation in the process stream, creating condensate on the optical lenses of the Durag opacity monitor. It was previously believed on 4/19 that the heat exchanger was isolated by closing the inlet valve, however, it was discovered during the event on 4/20 that water was being back fed to the heat exchanger through the outlet. The outlet valve was closed at approximately 10:00 to stop the supply of back-fed water. The opacity values decreased to normal operating opacity values and remained within acceptable values for the remainder of the day.	Unit 4	opacity	finishing heat exchanger leak
6/15/2020	On June 12, 2020, there was a SO_2 exceedance on Boiler 3. It was determined that the lime supply valve tripped on low SDA outlet temperature and stopped the lime slurry delivery to the SDA, resulting in the SO_2 24- hour geometric mean to exceed the permit limit. The SDA outlet temperature was low because the boiler started up at 11:00 am from a planned outage.	Unit 3	SO_2	lime supply valve tripped due to low temps
6/15/2020	On June 13, 2020, there was a SO_2 exceedance on Boiler 5. It was determined that the lime supply valve tripped on low SDA outlet temperature and stopped the lime slurry delivery to the SDA, resulting in the SO_2 24- hour geometric mean to exceed the permit limit. The SDA outlet temperature was low because the boiler started up at 18:00 from a planned outage. Additionally, the low temperatures also caused the SCR ammonia injection system was to trip resulting in high NOx spikes.	Unit 5	SO_2, NOx	lime supply valve & SCR ammonia injection system tripped due to low temps

Date (link)	Summary	Unit	Pollutant	Notes
6/16/2020	On 6/14/20 at approximately 05:30, the Unit 5 SO_2 monitor experienced a 4X calibration failure. In this event, the last known good data was prior to successful calibration on 6/13/20 at approximately 0530. Data was invalidated from 6/13/20 at 0530 until the completion of a successful calibration on 6/14/20 at approximately 0740. Note that the boiler was not in operation prior to 6/13/20 at 18:00. An exceedance was noted during this time on 6/13/20. Please refer to the submitted notification for additional details. No exceedance is expected for the time period on 6/14/20, as all combustion and air pollution control systems were in stable and good operating condition during this time.	Unit 5	SO_2	calibration failure
6/17/2020	As a follow-up to the U5 CO invalid data on 6/14/2020, it was discovered that the recently installed fast-loop orifice contained a manufacturing defect. The fast-loop orifice is a component which cycles fresh stack gas through the CEMS probe quickly in order to achieve fast response times. The defective fast-loop orifice was replaced, and symptoms experienced on 6/14/2020 were resolved. The system was in maintenance mode on 6/16/2020 from around 0800 to 1200 during troubleshooting and replacement of the fast loop orifice, causing 4 hours of unavailable data.	Unit 5	CO	fast -loop orifice defective
6/26/2020	On 6/25/2019 at approximately 17:43, Unit 4 SDA lime supply valve tripped on low outlet temperature which stopped the lime slurry delivery to the SDA. The trip caused SO_2 to become elevated, and caused the SO_2 ppm average to be 60.5 ppm for the 17:00 hour. In order to restore lime slurry flow, the slurry supply valve was forced open by the control room operator by putting the valve in manual control mode and opening the valve. Upon further review, it was determined that the root cause of the trip was due to the low SDA temperatures (<270 degrees F) caused by the continuously high slurry flow in response to prolonged high inlet SO_2 conditions (normally <150 ppm, recently >300ppm). High slurry flows caused the SDA temperature to decrease steadily over time, which caused the slurry supply valve to trip due to low outlet SDA temperature. One of the main reasons for the low temperature supply valve trip is due to equipment safety to protect the downstream air pollution control equipment. When the slurry valve was locked out, the SDA temperature returned to safe operating temperatures, which enabled the control room operator to allow the supply valve to openly flow slurry again.	Unit 4	SO_2	lime supply valve tripped due to high and low temps
8/3/2020	On 8/1/20 at approximately 07:21, the Unit 4 CO monitor experienced a 4X calibration failure. In this event, the last known good data was prior to successful calibration on 7/31/20 at approximately 0721. Data was invalidated from 7/31/20 at 0800 until the completion of a successful calibration on 8/1/20 at approximately 0744.	Unit 4	CO	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
9/21/2020	On 9/20/2020, Boiler 4 experienced higher than normal CO values around 05:18. The cause was determined to be tramp air entering the feed chute as a result of blockage above the feed pushers. To clear the blockage, a feed pusher was activated. However, a failed feed pusher cylinder caused the feed pusher to be stuck in place, exacerbating the tramp air. The tramp air caused a decrease in furnace temperatures (1425F to 1246F), which led to high CO values (311.5 hourly average for the 0500 hour).	Unit 4	CO	feed pusher cylinder failure
12/14/2020	The Boiler 3B gas gun tripped (Malfunctioned) during high CO spikes (~2800ppm) on 12/12/2020. Gas guns are often used to assist furnace combustion during unstable or high CO incidents. The unavailability of 3B gas gun caused the 4-hr block to be in exceedance during this 4-hr block period. When gas guns were restored at 05:37, CO levels returned to normal but the 4-hr block average was already unrecoverable. The above boiler malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The CO highest 4 hour block during operation is 95.1 ppmvd	Unit 3	CO	gas gun trip
12/28/2020	Unit 3 experienced significant CO spikes on 12/25/2020 beginning at approximately 04:23. During this event, the CRO made several air adjustments, steam flow reduction, followed by attempts to fire gas guns. Multiple attempts of lighting gas guns were not successful. The actions taken by the CRO was able to reduce CO to normal operating levels following the spike events at approximately 05:37. Upon further investigation, it was discovered that the 3A and 3B gas gun airflow dampers had malfunctioned during this CO event. Specifically, under automatic control, the gas gun dampers failed closed, and had to be forced from the closed position in automatic mode to the open position in manual mode. Since use of the gas guns require the damper controls to be in automatic mode and in open position, this also prevented the use of gas guns to control the CO event. The loss of supplemental airflow to the upper portion of the furnace in combination with the inability to operate the gas guns caused high CO during this period.	Unit 3	CO	gas gun trip - dampers failed in closed position

Date (link)	Summary	Unit	Pollutant	Notes
1/4/2021	The daily average for Unit 4 CO, NOX, SO_2 lb/hr was invalid due to excessive drift in the flow monitor. Unit 4 flow monitor shows stack gas velocities which are unreasonable given ID fan speeds and operational knowledge. The induced draft (ID) fan of each unit controls the overall draft and velocity of flue gas through the ductwork. During the period of 1/02/21 through 1/04/21, the stack gas velocity is shown to be approximately 10 feet per second (15%) higher than either Units 3 or 5. This is unlikely, given that the steam load, combustion, and operation of the ID fan is similar across all units. Although the flow monitor successfully passed a daily automatic calibration every day throughout the event, this calibration is an 'electronic' calibration that only verifies the electrical response/health of the unit. The flow monitor was cleaned and manually recalibrated on 1/4/2021 at approximately 10:30. Currently, Unit 4 flow measures normal exhaust flue gas velocities (<50 feet per second). The attached data shows normal CO, NOx, and SO_2 ppmvd hourly averages, and the invalidated abnormal lb/hr hourly data. It is not expected that there was any exceedance during this time since the CO, NOX and SO_2 ppmvd averages were within permit limits and not affected by stack gas flow calculations.	Unit 4	CO, NOx, SO_2	flow monitor dirty
1/11/2021	The Boiler 3 ID (induced draft) fan tripped (Malfunctioned) due to variable frequency drive (VFD) fault alarm at approximately 04:58 on 1/9/2021. This malfunction caused Boiler 3 to experience a master fuel trip (MFT). Due to the loss of air, gas guns could not be ignited during the boiler shutdown. The control room operator successfully restarted the ID fan approximately 15 minutes after the initial fan trip (fan requires a 15 minute wait time prior to start). Combustion was stable at 05:24. The above boiler malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed fifteen hours per occurrence for CO as per section B.17 of the Title V Air Operating Permit, number 0990234-041-AV.	Unit 3	CO	ID fan trip
1/20/2021	Upon experiencing vibration issues with the PBREF2 Ash Management Building Wet Whirl Blower, a vibration test was conducted today on 1/19/21. Following the results of vibration testing at around 11:00am, it has been determined that the blower must be removed from service to prevent further equipment damage until repairs can be made. At this time, it is currently anticipated that repairs will be completed in 1-2 days upon receipt of replacement parts (currently, delivery is expected 1/20/21). Based on current information, normal operation of the wet whirl blower should resume by 1/22/21.	Wet Whirl Blower	ash	blower vibration

Date (link)	Summary	Unit	Pollutant	Notes
1/25/2021	The Boiler 3 primary air damper on Zone 4 right experienced an unknown control logic error which caused the damper to close shut. This malfunction caused Boiler 3 to experience a disturbance to combustion air, which was the leading factor to the CO spike event on 1/22/2021 at around 09:00. Following the CO spike, the CRO made several air adjustments and inserted gas guns to stabilize combustion. After combustion stabilized the unit was brought offline for additional investigations, but did not yield any immediate findings. The boiler was brought back to operation, and no exceedance has occurred since, as of 1/25/2021. Further investigation is on-going to correct the Zone 4 primary air damper control logic, including instrumentation checks which could affect process controls. The above air damper malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed three hours per occurrence as per section B.17 of the Title V Air Operating Permit, number 0990234-041-AV.	Unit 3	CO	air damper control logic error
1/26/2021	The Boiler 5 ID (induced draft) fan tripped (Malfunctioned) due to variable frequency drive (VFD) temperature alarm at approximately 21:33 on 1/25/2021. This malfunction caused Boiler 5 to experience a master fuel trip (MFT). Due to the loss of air, gas guns could not be ignited during the boiler shutdown. The control room operator successfully restarted the ID fan approximately 15 minutes after the initial fan trip (fan requires a 15 minute wait time prior to start). Combustion was stable at 22:03. The above ID fan malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed three hours per occurrence as per section B.17 of the Title V Air Operating Permit, number 0990234-041-AV.	Unit 5	CO	ID fan trip - temp alarm

Date (link)	Summary	Unit	Pollutant	Notes
1/29/2021	On 1/27/2021, Boiler 3 experienced several CO spike events beginning at 16:09. Upon experiencing the CO spikes, the CRO made several air adjustments and increased the O2 setpoint. Gas guns were inserted to stabilize combustion at 18:16. Stable combustion was achieved at 19:58. Upon investigation, it is believed that a hole in the 3B discharger was allowing tramp air to enter the boiler. The tramp air is believed to be the primary root cause of the CO exceedance. A temporary increased O2 setpoint was maintained to control CO until the boiler was shutdown so repairs could be made on the discharger. The boiler was shutdown on 1/29/2021 at 07:45. Preparation for the discharger repair is currently underway as of 1/29/2021, and is anticipated to be fully completed during this outage. The above discharger malfunction caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed three hours per occurrence as per section B.17 of the Title V Air Operating Permit, number 0990234-041-AV.	Unit 3	CO	discharger hole
2/11/2021	On 2/10/2021 at approximately 06:40 the Unit 5 CO flue experienced a calibration failure. This invalidated data from the previous successful calibration on 2/9/2021 at 13:05 to the successful recalibration on 2/10/2021 at 09:50. It was discovered that the calibration failure was due to a malfunctioned IR source. The system was in maintenance on 2/10/2021 from around 0800 to 0950 during this time until IR source was replaced and successful calibration was completed. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained with supplemental natural gas as needed.	Unit 5	CO	IR source failure
2/22/2021	On 2/20/2021 at approximately 07:00 the PBREF2 Unit 5 CO, NOx, and SO_2 experienced unavailable data due to a PLC error which prevented the daily calibration from initiating. At around 0700, the daily calibration did not complete successfully. I&E was notified, and troubleshooting began. At around 11:18, the PLC was identified as the cause of the unsuccessful calibration, and a restart of the PLC was completed. The PLC restart resolved the issue, and allowed the daily calibration to be successfully conducted. After the PLC restart, the daily calibration began 11:22 and was completed at around 12:00. Data was unavailable for the period between the normal start time of the daily calibration (around 0700) and the completion of the successful passing calibration (around 1200). It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 5	CO, NOx, SO_2	PLC error

Date (link)	Summary	Unit	Pollutant	Notes
3/18/2021	On 3/17/2021, Boiler 3 experienced a Zone 2 left side sifting hopper plug around 15:00. The plugged material led to grates piling, causing poor combustion. Operations began to clear the plug immediately. The poor combustion caused a large CO spike event at 15:28. Upon experiencing the CO spike, the CRO made several primary air adjustments and secondary air adjustments. After sufficient air adjustments and the clearing of the hopper plug was completed, stable combustion was achieved around 16:30. The above sifting hopper plug caused one, four hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed three hours per occurrence as per section B.17 of the Title V Air Operating Permit, number 0990234-041-AV.	Unit 3	CO	hopper plug
5/21/2021	Notification that the Palm Beach Renewable Energy Facility #2 EHS specialist indicated that there was a 24 hour NOx exceedance on Unit 4 on May 20, 2021 upon start up after an outage. Covanta staff is currently investing the cause of this exceedance. A detailed report will be provided once the investigation is complete. **NOTE: REPORT NOT IN FILE**	Unit 4	NOx	
6/1/2021	On 5/28/2021 the PBREF2 Unit 5 NOx and SO_2 experienced unavailable data from 0900 to 2300. At approximately 08:56, PBREF2 Unit 5 CEMS were placed in maintenance mode due to a high cooler temperature alarm on the NOx analyzer. I&E reached out to tech support and began troubleshooting the issue. Following tech support guidance, I&E replaced the sample cooler but then experienced a high-pressure alarm (~660mmHg). A service call was initiated at approximately 17:00, the technician arrived onsite at 21:45. The NOx pump was swapped with the spare after finding the diaphragm badly worn. Capillary O-rings and tightness of fittings were also checked. Pump pressure dropped to 230mmHg. After confirming parameters and taking the unit off maintenance mode, a successful calibration was performed.	Unit 5	NOx, SO_2	NOx pump diaphragm worn out
6/28/2021	On 6/27/2021 the PBREF2 Unit 5 NOx experienced a 4X out of control calibration at approximately 8:44 am. Per part 60, the data is flagged as invalid to the previous valid calibration on 6/26/2021 at approximately 6:06 am. Following the failed calibration on 6/27/2021, I&E placed the monitor in maintenance mode and began to troubleshoot the issue. I&E found a plugged sample line. Once the line was cleaned, a successful calibration was completed on the monitor, and returned to service. This caused unavailable data for a total of 14 hours for the NOx U5. (Unit 5 Boiler was offline from 6/26/2021 12:00 to 6/27/2021 04:00.)	Unit 5	NOx	sample line plugged

Date (link)	Summary	Unit	Pollutant	Notes
7/21/2021	Upon completion and review of the second quarter 2021 report, it was noted that PBREF2 Unit 5 SO_2 experienced one, 24-hour geometric mean period to exceed the permit limit of 24 ppmvd and 25 lb/hr. Due to the previously reported CEMS Malfunction (sample cooler malfunction) on 5/28/2021 which caused unavailable data for 15 hours, the short averaging period for SO_2 registered a 24.8 ppmvd and 28.8 lb/hr when using the available 9 hours of data. However, on 6/3/2021 the Unit 5 CEMS experienced a 4X out-of-control calibration due to a broken solenoid valve which resulted in an unavailable data notification to FDEP. It is believed that until the solenoid valve was replaced on 6/3/2021, the failing solenoid valve allowed the calibration gas to remain in the line producing artificially high SO_2 values. Therefore, when the data is excluded for the calibration period 0500 to 0700 on 5/28/2021, the new SO_2 24-hour geometric means are 21.5 ppm and 25.0 lb/hr. Unit 5 was operating normally during this time, and the SO_2 setpoint was reduced to 12 ppm for the remainder of the day. Had the CEMS monitor been available for the entire 24-hour averaging period and not operated with a faulty solenoid valve, it is expected the SO_2 would have remained below the permit limit.	Unit 5	SO_2	solenoid valve
8/3/2021	On 07/24/2021 at approximately 01:08, the Control Room received an alarm that the PBREF2 Unit 3 CO flue CEM experienced a hardware failure. Unit 3 Boiler remained operational with good combustion practices. When the I & E technicians arrived for their shift, at approximately 07:00, diagnosis of the CO monitoring system was initiated, and the analyzer was placed in Maintenance Mode at approximately 08:05. After trouble shooting the analyzer, the vacuum pump was repaired, and the correlation motor and the IR source were replaced. The analyzer was removed from Maintenance Mode at approximately 13:24 on 07/24/2021. Due to the monitor equipment failures, the calibration subsequently failed at 06:21 – 06:52 on 7/24/2021, thus data is flagged as invalid to the previous valid calibration at 06:21 – 06:52 on 7/23/2021 per 40 CFR Part 60, Appendix F. A calibration was completed successfully at 14:02 on 7/24/2021. Therefore, the CO data was unavailable for the period between 07/23/2021 (06:00 – 23:00) – 07/24/2021 (00:00 – 13:00) for a total of 32 hours. The repairs do not require a Performance Specification 4 recertification of the analyzer. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 3	CO	vacuum pump failure

Date (link)	Summary	Unit	Pollutant	Notes
9/20/2021	Notification that the Palm Beach Renewable Energy Facility #2 Regional Environmental Specialists indicated that September 17, 2021, there may have been a temperature exceedance on Unit 3 . The plant operator is currently investing this potential temperature exceedance. A report will be provided once the investigation is complete. **NOTE: REPORT NOT IN FILE**	Unit 3	temperature	
9/22/2021	At 1140 hrs on 9/20/21, Boiler 5 experienced an ash discharger chute plug. The unit was shut down to clear the plug. At 1701 hrs the plug was cleared, and the control room operator (CRO) began feeding MSW to the boiler. Combustion was stable at 1734 hrs. There were not any permit exceedances during the period of Boiler shutdown and startup. At 2020 hrs, Boiler 5 experienced a feed chute plug, which caused loss of fuel feed to the boiler. This malfunction caused unstable combustion resulting in a CO spike. The CRO ignited the auxiliary gas burners at 2045 hrs in an effort to control the CO spike. Personnel cleared the feed chute plug and the CRO began feeding MSW at 2212 hrs. Combustion stabilized and the auxiliary gas burners were removed at 0005 hrs on 9/21/2021. This malfunction caused one 4-hour block average CO period to exceed the permit limit of 100 ppmvd. The above exceedance is within the allowed three hours per occurrence as per section B.17 of the Title V Air Operating Permit, number 0990234-043-AV.	Unit 5	ash, CO	ash discharger chute plug, feed chute plug
10/12/2021	On 10/11/2021, upon completion of the daily calibration at 06:52, the PBREF2 Unit 3 CO CEMS recorded elevated CO values due to calibration gas remaining in the system. The calibration gas did not fully purge the system. Investigation was started around 07:00, and the unit 3 inlet was placed in maintenance mode to trouble shoot the elevated CO at 08:00. The investigation found that the inlet CO monitor probe dilution block (which includes an eductor nozzle and critical orifice) and the dilution bypass block (which includes an eductor nozzle) were plugged. The repairs consisted of replacing both blocks allowing the gas to flow freely to the analyzer. Data was unavailable for the period between the end of the calibration at 06:53 and completion of repairs at 10:37. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 3	CO	probe inlet blocked

Date (link)	Summary	Unit	Pollutant	Notes
10/25/2021	Upon completion and review of the third quarter report, it was discovered that PBREF2 Unit 5 experienced 2 incidents of unavailable data that were not identified. On September 26 the U5 CO, SO_2, and NOx CEMS experienced a 4X calibration failure invalidating data back to the previous passing calibration on September 25. Upon investigation, I&E discovered there was a PLC output card failure. A new card was installed on September 26 and the monitors returned to service. The CEMS was successfully calibrated at 1400 Hrs (SO_2 and NOx)and 1710 Hrs (CO). On September 30, the U5 CO, SO_2, and NOx CEMS experienced a 4X calibration invalidating data back to the previous passing calibration on September 29. Upon investigation, I&E found the computer PLC had experienced a computer error. The computer was rebooted, and the monitors were returned to service. The CEMS system was successfully calibrated at 0939 Hrs. The Unit 5 was shutdown at 0800 Hrs and startup commenced at 1700 Hrs on September 30 due to a grate cooling water valve failure.	Unit 5	CO, NOx, SO_2	PLC card failure
11/15/2021	On 11/14/2021 at approximately 1831 Hrs, the Unit 3 Inlet monitors experienced an IR source failure, and the monitor was placed into maintenance mode at approximately 2115 Hrs. The IR source was replaced, and the system was removed from maintenance mode at approximately 2134 Hrs. The inlet CO2, CO, NOx and SO_2 data was affected during this time period. This event resulted in 2 hours of unavailable data. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained with supplemental natural gas as needed.	Unit 3	CO, CO2, NOx, SO_2	IR source failure
12/17/2021	On 12/16/2021, the PBREF2 Unit 3 SO_2 experienced a 4X out-of-control calibration at 05:37 hours. Per part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 12/15/2021 at approximately 10:51 hours. Following the failed calibration on 12/16/2021, I&E placed the monitor in maintenance mode and confirmed that the SO_2 solenoid was plugged and there was a failed SO_2 pump. The repairs were completed, and a successful calibration was performed and the SO_2 monitor was placed back into service at 09:26 on 12/16/2021.This caused invalid data for a total of 22 hours for SO_2 on Unit 3.	Unit 3	SO_2	solenoid plugged, pump failure

Date (link)	Summary	Unit	Pollutant	Notes
1/14/2022	On 1/14/2022, the PBREF2 Unit 3 SO_2 experienced a 4X out-of-control calibration at 0537 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 1/13/2022 at approximately 0537 hours. Following the failed calibration on 12/14/2022, I&E placed the monitor in maintenance mode for the monthly PM. After confirming parameters and taking the unit off maintenance mode, a successful calibration was performed at 1010 hours. A total of 28 hours of data is excluded.	Unit 3	SO_2	calibration failure
2/3/2022	On 2/2/2022, the PBREF2 Unit 4 CO2 experienced a 4X out of control calibration at approximately 06:38 hours affecting the corrected NOx and Corrected SO_2 values. Per part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 2/1/2022 at approximately 06:38 hours. The source of the calibration failure could not be determined; however, the monitor was re-calibrated successfully at 08:11 hours. This occurrence resulted in 25 hours of unavailable data for NOx and SO_2 on Unit 4. The attached data shows the invalidated NOx, and SO_2 ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	CO, CO2, NOx, SO_2	calibration failure
2/9/2022	On 2/8/2022 at approximately 07:21 Hrs, the PBREF2 Unit 4 inlet CO monitor experienced a 4X out of control calibration. Per 40 CFR Part 60, the data is flagged as invalid to the previous valid calibration at 06:37 Hrs on 8/7/2022. Following the failed calibration on 2/8/2022, I&E placed the analyzer in Maintenance Mode at 07:30 Hrs, and determined that the analyzer had a vacuum pump failure and an IR source failure. Both components were replaced and the system was removed from Maintenance Mode at approximately 08:49 Hrs. The analyzer was successfully calibrated at 09:12 Hrs. The CO data was unavailable for a total of 26 hours. The repairs do not require a Performance Specification recertification of the analyzer. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	CO	IR source failure, vacuum pump failure

Date (link)	Summary	Unit	Pollutant	Notes
2/11/2022	On 2/9/2022, the PBREF2 Unit 4 NOx experienced a 4X out of control calibration at approximately 06:38 hours affecting the corrected NOx values. Per part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 2/8/2022 at approximately 06:38 hours. The source of the calibration failure could not be determined; however, the monitor was re-calibrated successfully at 07:57 hours. This occurrence resulted in 19 hours of unavailable data for NOx on Unit 4 because the unit experienced a controlled shutdown at 01:39 Hrs on 2/9/2022 to clear a discharger plug. The controlled shutdown did not result in any permit limit exceedances. The attached data shows the invalidated NOx ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained during the period of operation.	Unit 4	NOx	calibration failure; discharger plugged
2/14/2022	On 2/13/2022, the PBREF2 Unit 4 CO2 experienced a 4X out of control calibration at approximately 06:38 hours affecting the corrected NOx and corrected SO_2 values. Per part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 2/12/2022 at approximately 06:37 hours. The source of the calibration failure could not be determined; however, the monitor was re-calibrated successfully at 09:48 hours. This occurrence resulted in 26 hours of unavailable data for NOx and SO_2 on Unit 4. Unit 4 was shutdown at 11:09 hrs for an ash conveyor drive chain failure. Repairs were completed, and startup was initiated at 14:22 hours. The attached data shows the invalidated NOx, and SO_2 ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	CO2, CO, SO_2, NOx; ash	calibration failure; conveyor drive chain failure
2/14/2022	The Unit 4 experienced one 6-minute block average above the permit limit of 10% during the malfunction event. The opacity spike resulted in a 6-minute block average of 32.4%. The malfunction event was caused by failure of one or more bags in the Unit 4-D baghouse compartment. The compartment was isolated, and operational controls were adjusted to prevent recurrence of the elevated opacity reading. The defective bags will be evaluated and replaced, as needed. The above exceedance is within the allowed three hours per occurrence as per section III.B.17 of the Title V Air Operating Permit, number 0990234-043-AV.	Unit 4	opacity	baghouse failure

Date (link)	Summary	Unit	Pollutant	Notes
2/24/2022	On 2/22/2022, the PBREF2 Unit 4 NOx and SO_2 monitors experienced a 4X out of control calibration at approximately 06:38 hours. Per part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 2/21/2022 at approximately 06:37 hours. The source of the calibration failure could not be determined; however, the monitor was re-calibrated successfully on 2/22/2022 at 07:51 Hrs for NOx and 08:22 Hrs for SO_2. This occurrence resulted in 25 hours and 26 hours of unavailable data for NOx and SO_2 on Unit 4, respectively. On 2/22/2022, a conference call was initiated with CEMTEK and corporate CEMS experts to discuss possible causes for the frequent calibration failures. CEMTEK recommended change out of the critical orifice, the turbo-valve (fast loop valve) and also a pressure test of the umbilical. Following the call, I&E cleaned the critical orifice and the turbo-valve. These corrections were put in place to eliminate fluctuations in dilution gas pressures during the daily calibrations. On 2/23/2022, the PBREF 2 Unit 4 SO_2 and NOx monitors experienced another 4X out of control calibration at approximately 06:38 hrs. This time the critical orifice and turbo-valve were replaced, and the CO2 scrubbing towers and gas line were cleaned. Following these corrective actions, a successful calibration was completed at 11:31 on 2/23/2022. The data was flagged as invalid from the last failed calibration on 2/23/2022 to the previous calibration which occurred on 2/22/2022 at 07:51 Hrs for NOx and at 08:22 for SO_2. On 2/24/2022, CEMTEK analysts will be on site to perform a full evaluation of the CEMS hardware and software to determine additional potential causes of the frequent calibration errors. These occurrences resulted in 53 hours of unavailable data for NOx and SO_2. The attached data shows the invalidated NOx, and SO_2 ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	CO2, CO, SO_2, NOx; ash	orifice & turbovalve failure
2/24/2022	On 1/23/2022, the PBREF2 Unit 3 NOx monitor experienced a 4X out-of-control calibration at 0537 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 1/22/2022 at approximately 0537 hours. Following the failed calibration on 2/23/2022, I&E successfully completed a new calibration at 0814 hrs. A total of 26 hours of data is excluded. CEMTEK, will be onsite on 2/24/2022 to diagnose the CEMS hardware and software systems. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 3	NOx	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
2/28/2022	On 2/25/2022 at approximately 06:40 Hrs Unit 5 Inlet NOx monitor experienced a 4X calibration failure. On 2/25/2022 at 07:16 Hrs, the Unit 5 Inlet NOx, SO_2 and CO monitoring system was placed in maintenance mode for troubleshooting. I&E replaced a failed pump, worn permeation tube, fast loop orifice and cleaned the inlet filter. The Unit 5 inlet monitoring system was removed from maintenance mode at 12:30 Hrs on 2/25/2022, resulting in 4 hrs of unavailable data for CO during the maintenance period on 2/25/2022. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained with supplemental natural gas as needed.	Unit 5	CO, NOx, SO_2	calibration failure; pump failed, permeation tube & fast loop orifice worn out, inlet filter dirty
4/5/2022	On 4/4/2022, the PBREF2 Unit 4 SO_2 monitor experienced a 4X out-of-control calibration at approximately 0609 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/3/2022 at approximately 0609 hours. The source of the calibration failure could not be determined; however, the monitor was recalibrated successfully on 4/4/2022 at 0736 hours. This occurrence resulted in 24 hours of unavailable data. On 4/5/2022, the PBREF2 Unit 4 SO_2 monitor experienced another 4X out-of-control calibration at 0609 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/4/2022 at approximately 0736 hours. Following the failed calibration on 4/5/2022, I&E completed a successful calibration at 0749 hours, and then at 0912 hours, I&E placed the SO_2 monitor into maintenance mode for troubleshooting and a second calibration. The technicians determined that several solenoid valves associated with the SO_2 monitor were not functioning as required, which would have contributed to the failed calibration. The valves were repaired, and a successful calibration was completed at 1029 hours. This occurrence resulted in 25 hours of unavailable data. These two occurrences resulted in 49 hours. The attached data shows the invalidated SO_2 ppmvd hourly averages.It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	SO_2	solenoid valves

Date (link)	Summary	Unit	Pollutant	Notes
4/15/2022	On 4/14/2022, the PBREF2 Unit 4 CO2, NOx, and SO_2 monitors experienced a 4X out-of-control calibration at approximately 0745 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/13/2022 at approximately 0745 hours. The monitors were placed into maintenance mode at 08:33 hours to troubleshoot the calibration issues. The fast loop and critical orifice on each monitor were changed out, and the monitors were removed from maintenance mode at approximately 11:27 hours. The Unit 4 monitors were successfully recalibrated at approximately 12:06 hours. This occurrence resulted in 28 hours of unavailable data. The attached data shows the invalidated NOx and SO_2 ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained	Unit 4	CO, CO2, NOx, SO_2	fast loop & critical orifices failed
4/19/2022	On 4/18/2022 at approximately 08:30 Hrs Unit 5 Inlet CO monitor experienced a 4X calibration failure. On 4/18/2022 at approximately 08:30Hrs, the Unit 5 Inlet CO monitoring system was placed in maintenance mode for troubleshooting. I&E replaced a failed I/O expander board. The Unit 5 inlet CO monitoring system was removed from maintenance mode at approximately 10:30 Hrs on 4/18/2022, and a successful calibration was completed at 10:59. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/17/2022 at approximately 08:30 Hrs; however, the Unit 5 was shutdown through 19:04 Hrs in association with the turbine generator trip on 4/16/2022. This event resulted in 16 hrs of unavailable data for CO. The I/O expander board replacement will not require a Performance Specification 4 recertification of the analyzer. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained with supplemental natural gas as needed.	Unit 5	CO	I/O expander board failed
4/20/2022	On 4/19/2022, the PBREF2 Unit 3 NOx monitor experienced a 4X out-of-control calibration at approximately 0745 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/18/2022 at approximately 0730 hours for Unit 3. The Unit 3 monitor was placed into maintenance mode at 0917 hours. The Unit 3 monitor was removed from maintenance mode at 0930 hours and recalibrated. The Unit 3 NOx monitor was successfully calibrated at 0956 hours. The Unit 3 NOx occurrence resulted in 26 hours of unavailable data. The cause for the calibration failures was not determined. CEMTEK, CEMS contractor, was onsite at the time of the calibration failures and they are continuing to troubleshoot the CEMS system.	Unit 3	NOx	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
4/20/2022	On 4/19/2022, the PBREF2 Unit 4 NOx and SO_2 monitors experienced a 4X out-of-control calibration at approximately 0800 hours. Per Part 60, the data is flagged as invalid to the previous valid calibration, which occurred on 4/18/2022 at approximately 0800 hours for Unit 4. The Unit 4 monitors were placed into maintenance mode at 0917 hours. The Unit 4 monitors were removed from maintenance mode at 0930 hours and recalibrated. The Unit 4 SO_2 calibration was successfully calibrated at 1025 hours, but the Unit 4 NOx calibration failed again. The Unit 4 NOx monitor was placed back into maintenance mode at 1020 hours to troubleshoot the NOx calibration issues. The Unit 4 NOx monitor was removed from maintenance mode at 1046 hours and successfully recalibrated at approximately 1105 hours. The Unit 4 NOx occurrence resulted in 27 hours of unavailable data. The Unit 4 SO_2 occurrence resulted in 26 hours of unavailable data. The cause for the calibration failures was not determined. CEMTEK, CEMS contractor, was onsite at the time of the calibration failures and they are continuing to troubleshoot the CEMS system.	Unit 4	NOx, SO_2	calibration failure
4/21/2022	On 4/18/2022 and 4/19/2022, the PBREF2 Unit 5 CO monitor experienced a period of unavailable data during which the CO monitor was recording values of 0.0 ppmvd. Per Part 60, the data is flagged as invalid during this period of time. The Unit 5 CO monitor was successfully recalibrated on 4/19/2022 at 1718 hours. Following the recalibration, the Unit 5 CO values began recording at the expected values. The Unit 5 CO occurrence resulted in 21 hours of unavailable data. The cause for the unavailable data was not determined. CEMTEK, CEMS contractor, was onsite during this time period, and they are continuing to troubleshoot the CEMS system. The attached data shows the invalidated CO ppmvd hourly averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 5	CO	calibration failure
5/4/2022	On 5/3/2022 at 09:00 Unit 4 SO_2 and NOx monitors experienced a 4X out of control (OOC) calibration failure. The monitors completed a successful recalibrated at 10:57 on 5/3/2022. However, due to the 4X OOC, per 40 CFR, Appendix F, data is flagged as invalid back to the previous valid calibration at 09:28 on 5/2/2022. Therefore, making a total of 25 hours of SO_2 and NOx data unavailable for 5/2/2022 through 5/3/2022. I&E continues to investigate the cause of the frequent monitor OOC episodes along with the facility CEM contractor, CEMTek. CEMTek is currently onsite troubleshooting the monitors and performing quarterly preventative maintenance activities. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 4	NOx, SO_2	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
5/16/2022	Unit 3 SO_2 lb/hr on 5/13/2022 was elevated above the permitted limit of 25.0 lb/hr @ 7% O2 for the for the 00:00 – 23:00 timeframe. The data is showing a SO_2 24-hour geometric mean of 27.7 lb/hr @ 7% O2. The facility is investigating the cause of the high 24-hour SO_2 geometric mean lb/hr daily reading since the SO_2 daily ppm @ 7% O2 remained beneath its permitted limit at 20 ppm @ 7% O2. Upon comparing SO_2 values for Unit 5 on the same day, the Unit 3 SO_2 lb/hr data appears suspect. The facility is reviewing the lb/hr calculations and placed a request with CEMTek (the NetDAHS contractor) to do the same. At the same time, the facility is investigating other potential causes.	Unit 3	SO_2	
5/18/2022	Units 3 and 5 experienced elevated NOx and SO_2 readings throughout the day on 4/15/2022 and 4/16/2022. This caused the 24-hour arithmetic average for NOx to go above the permitted limit of 50 ppmvd @ 7% O2 for the 00:00-23:00 timeframe for Unit 3 on 4/16/2022 and Unit 5 on 4/15/2022 & 4/16/2022. In addition, the 24-hour geometric mean for SO_2 went above the permitted limit of 24 ppmvd @ 7% O2 for the 00:00-23:00 timeframe for Unit 3 on 4/16/2022 and Unit 5 on 4/15/2022. The 4/16/2022 emission spikes on U3 resulted in a NOx 24-hour average of 65 ppmvd @ 7% O2 and SO_2 24-hour geometric mean of 30 ppmvd @ 7% O2. The 4/15/2022 emission spikes on U5 resulted in a NOx 24-hour average of 53 ppmvd @ 7% O2 and SO_2 24-hour geometric mean of 25 ppmvd @7% O2, and on 4/16/2022 a NOx 24-hour average of 90 ppmvd @ 7% O2.	Unit 3, 5	NOx, SO_2	steam pressure control valve malfunction
5/18/2022	Unit 5 Inlet CO was unavailable for 4 hours on 4/15/2022 from 20:00 – 23:00 due to the monitor reading approximate zero values during this timeframe. A faulty I/O expander board can cause erratic Inlet CO readings, such as this, and reset to normal readings, as seen on 4/15/2022. As previously reported on 5/18/2022 Unit 5 Inlet CO monitor I/O expander board was replaced, which includes the optics and collection chamber that performs the analyzing. The I/O expander board replacement does not require a Performance Specification 4 recertification of the analyzer. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 5	CO	I/O expander board fault

5/18/2022	Units 3 and 5 experienced elevated NOx and SO_2 readings throughout the day on 4/15/2022 and 4/16/2022. This caused the 24-hour arithmetic average for NOx to go above the permitted limit of 50 ppmvd @ 7% O2 for the 00:00-23:00 timeframe for Unit 3 on 4/16/2022 and Unit 5 on 4/15/2022 & 4/16/2022. In addition, the 24-hour geometric mean for SO_2 went above the permitted limit of 24 ppmvd @ 7% O2 for the 00:00-23:00 timeframe for Unit 3 on 4/16/2022 and Unit 5 on 4/15/2022. The 4/16/2022 emission spikes on U3 resulted in a NOx 24-hour average of 65 ppmvd @ 7% O2 and SO_2 24-hour geometric mean of 30 ppmvd @ 7% O2. The 4/15/2022 emission spikes on U5 resulted in a NOx 24-hour average of 53 ppmvd @ 7% O2 and SO_2 24-hour geometric mean of 25 ppmvd @7% O2, and on 4/16/2022 a NOx 24-hour average of 90 ppmvd @ 7% O2. In reviewing the operational data, trends of the 150-pound steam pressure control valve can be seen fluctuating throughout the day on 4/15/2022 and progressively worsening. Two significant pressure drops occurred at 05:30 and 11:00 on 4/15/2022. This malfunctioning steam valve impacted the steam supply to the heat exchanger which allows the aqueous ammonia mixture to maintain a temperature above the dew point. As the ammonia vaporizer temperature fluctuates, this in turn upsets the NOx control delivery. This pressure steam valve continued to fluctuate the morning of 4/16/2022, with the start of the malfunction at 01:39 and ultimate catastrophic failure of the steam valve which tripped the turbine at 04:40. At 04:50, the control room operator manually tripped all 3 units to cease operation and prevent damage to the boilers and facility. For Unit 5 4/15/2022, upon excluding 2 hours of NOx data during the first significant steam pressure control valve malfunction from 05:00 – 06:00 and an additional 2 hours during the second major malfunction occurrence from 11:00 – 12:00, the new U5 NOx arithmetic average is below the permit limit, with a value of 30 ppmvd @ 7% O2. In an attempt to mitigate emissions, operations reduced the steam flow and SO_2 setpoints, placed the gas burners in service and changed the fuel feed location. The facility adhered to best management practices to minimize emissions during this facility-wide upset. The lime delivery systems for all units were operating normal at the time of this incident. As a corrective action to the elevated SO_2, the facility high SO_2 response procedures are under review. No exclusion applies to the SO_2, therefore the U5 SO_2 geometric mean remains at 25 ppmvd @ 7% O2. For Unit 3 and Unit 5 on 4/16/2022, upon excluding 3 hours of NOx data during the initial significant pressure valve malfunction on 4/16/2022 from 03:00 – 04:00 the new NOx arithmetic average for U3 with a value of 30 ppmvd @ 7% O2 and the new NOx arithmetic average for U5 calculates to a value of 25 ppmvd @ 7% O2, both are below the limit. U3 began operation at 20:59. When excluding the 21:00, 1-hour of data during the start-up period for U3 SO_2,	Units 3 and 5	NOx, SO_2	steam pressure control valve failure tripped turbine

Date (link)	Summary	Unit	Pollutant	Notes
	the U3 SO_2 geometric mean has a value of 32 ppmvd @ 7% O2. With U3 and U5 not operating for most of 4/16/2022 due to the valve malfunction, this allowed only 8 operating hours for U3 and 5 operating hours for U5 to make up the above 24-hour averages. The 4/15/2022 U5 and 4/16/2022 U3 NOx exceedances are within the allowed 3 hours per occurrence per section B.17 of the Title V Air Operating Permit, number 0990234-043-AV. All U3 and U5 NOx and SO_2 emissions surrounding this event will be reported accordingly per Title V Air Operating Permit, number 0990234-043-AV, Appendix RR.			
5/23/2022	Unit 5 Inlet CO was unavailable for 3 hours on 5/22/2022 from 09:00 – 11:00 as a result of the control room screen and the CEMS Software Program (NetDahs) showing the CEMS experienced a Hardware Failure. I&E placed the Inlet CO CEMS in maintenance mode from 09:20 – 09:38 to troubleshoot the cause of the hardware fault alarm. The CEMS Inlet CO passed calibration at 09:24 – 09:38, however the control room display along with NetDahs continued to display a hardware failure for the CEMS Inlet CO. A manual calibration was initiated at 10:05 – 11:09, which failed. The monitor was placed back into maintenance mode at 11:19 and the analyzer was reset and placed back into service at 12:08. A subsequent calibration passed from 12:21 – 12:43 and the hardware failure was no longer present on the displays. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 5	CO	hardware failure error

Date (link)	Summary	Unit	Pollutant	Notes
5/24/2022	Unit 3 SO_2 lb/hr on 5/13/2022 was elevated above the permitted limit of 25.0 lb/hr @ 7% O2 for the 00:00 – 23:00 timeframe. The data had shown a SO_2 24-hour geometric mean of 27.7 lb/hr @ 7% O2. However, upon investigation, it was found noted in the CEMS logbook that maintenance was performed on the U3 Corrected Stack Flow monitor on 5/15/2022 because of higher than normal flow values. At 04:34 hours, on 5/15/2022, I&E placed the U3 Corrected Stack Flow monitor in maintenance mode and discovered that the readings were higher due to dirty stack flow monitor mirrors. The mirrors were cleaned, and the flow monitor was placed back into service at 05:20 hours. Flow values returned to the expected range. The U3 flow is used to calculate the SO_2 lb/hr. Therefore, a falsely higher flow from the dirty mirrors would in turn calculate an incorrectly higher SO_2 lb/hr. After reviewing the data, it appears that the U3 stack flow monitor data was elevated starting on 5/11/2022 at 14:00. The values remained elevated until the stack flow mirror was cleaned and placed back in service on 5/15/2022 at 05:20, for a total of 87 hours. This subsequently invalidates the U3 SO_2 lb/hr during this same time. It is not expected that there was any exceedance during this time since the U3 SO_2 ppm 24- hour geometric mean remained beneath the permitted limit with all air pollution control equipment operating normal and stable combustion of the boiler was maintained.	Unit 3	SO_2	stack flow mirror dirty
5/31/2022	Palm Beach Renewable Energy Facility #2 Regional Environmental Manager indicated that Unit 5 experienced 4X calibration failures on May 27, 2022, on the NOx monitor resulting in approximately 26 hours of unavailable data, and on May 28, 2022, and on the SO_2 monitor resulting in approximately 27 hours of unavailable data. The facility is able to review and monitor the CEMs data, but due to technical difficulties resulting from the weekend storms is unable to print reports.	Unit 5	NOx, SO_2	calibration failure
6/9/2022	Unit 5 Stack NOx continuous emissions monitor experienced a 4X Out of Control (OOC) calibration during the daily calibration from 10:30 – 10:57 on 5/27/2022. The monitor completed a successful recalibrated at 13:12 – 13:30 on 5/27/2022. However, due to the 4X OOC, per 40 CFR, Appendix F, data is flagged as invalid back to the previous valid calibration at 10:30 – 10:57 on 5/26/2022. Therefore, making a total of 27 hours of NOx data unavailable for 5/26/2022 through 5/27/2022. Unit 5 Stack SO_2 continuous emissions monitor experienced a 4X OOC calibration during the daily calibration from 10:30 – 10:57 on 5/28/2022. The monitor completed a successful recalibrated at 11:23 – 11:47 on 5/28/2022. However, due to the 4X OOC, per 40 CFR, Appendix F, data is flagged as invalid back to the previous valid calibration at 10:06 – 10:30 on 5/27/2022. Therefore, making a total of 23 hours of SO_2 data unavailable for 5/27/2022 through 5/28/2022.	Unit 5	NOx, SO_2	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
7/28/2022	Upon compilation of the Title V Quarterly Excess Emission and Semi-Annul reports, it was discovered that Unit 3 experienced elevated NOx reading on 4/16/2022, in addition to the previously reported elevated ppm values during the same timeframe for the Steam Pressure Value Malfunction/Master Fuel Trip. This caused the 24-hour arithmetic average for NOx to go above the permitted limit of 37.4 lb/hr for the 00:00-23:59 timeframe for Unit 3 on 4/16/2022. For Unit 3, on 4/16/2022, upon excluding 3 hours of NOx data during steam pressure valve malfunction and Master Fuel Trip from 02:00 - 04:59 the new NOx arithmetic average has a value of 17.0 lb/hr, which is below the limit. The above U3 NOx emissions are within the 3 hours per occurrence per section B.17 of the Title V Air Operating Permit, number 0990234-043-A V	Unit 3	NOx	steam pressure control valve failure tripped turbine on 4/16/2022
7/28/2022	On the morning of 6/30/2022 the PBREF2 Unit 5 NOx monitor recorded a 4X out-of-control calibration at approximately 0608 hours. Per Part 60, all data is flagged as invalid to the previous passing calibration, which occurred on 6/29/2022 at approximately 0608 hours. After facility I&E personnel placed the analyzer in maintenance mode, flowed calibration gas to the analyzer and made appropriate adjustments, the Unit 5 NOx monitor was successfully recalibrated on 6/30/2022 at 0906 hours. The Unit 5 NOx occurrence resulted in 27 hours of unavailable data. Additionally, facility I&E personnel placed the outlet system in maintenance mode at 1108 hours due to a high flow alarm on the NOx analyzer. Pieces of tubing were found rubbing together and appropriate repairs were made. Calibration gas was flowed to verify analyzer response and a successful calibration initiated. The system was taken out of maintenance mode at 1259 hours. The attached data charts show the invalid NOx and SO_2 averages. It is not expected that there was any exceedance during this time since all air pollution control equipment was in good operating condition and stable combustion of the boiler was maintained.	Unit 5	NOx, SO_2	calibration failure; tubing rubbing together
7/29/2022	2022 Q2 Emissions Report - Time out of compliance for stack 3 SO_2 0.28% (24-hr) and stack 5 SO_2 0.44% (24-hr); excess emissions for stack 3 NOx 0.17% (24-hr and 24-lb/hr), SO_2 0.28% (24-hr); excess emissions for stack 4 SO_2 0.19% (24-hr); excess emissions for stack 5 NOx 0.68% (24-hr), SO_2 0.64% (24-hr)		SO_2, NOx	**out of compliance**

Date (link)	Summary	Unit	Pollutant	Notes
9/22/2022	On 9/20/2022 Unit 4 recorded a CO 4-hour block average from 1600-1959 hours at 116. 7 ppm, corrected to 7% 02. Unit 4 was started up at 1252 hours on 9/20/2022. Facility operations personnel experienced difficulties controlling combustion throughout the afternoon, especially on the right side of the boiler, resulting in periodic elevated oxygen and CO levels. Even though CO hourly averages were controlled below the facility permit limit of 100 ppm, corrected to 7% 02, facility operations personnel continued to troubleshoot the issue. The CO hourly average from 1900-1959 hours has been excluded from the 1600-1959 4-hour block average due to this malfunction event. With this exclusion, the new CO 4-hour block average from 1600-1959 hours is 74.9 ppm, corrected to 7% 02. The elevated CO on Unit 4 caused by the grate cooling water leaks and broken grate linkage are within the allowed 3 hours per occurrence per section B. I 7 of the Title V Air Operating Penn it, number 0990234-043- A V. All information surrounding this event will be reported accordingly per Title V Air Operating Permit, number 0990234-043-A V, Appendix RR.	Unit 4	CO	grate linkage broken, cooling water leaks
10/14/2022	9/26/2022 the PBREF2 Unit 5 inlet CO and CO2 monitors recorded an invalid calibration at approximately 0836 hours. Facility personnel investigated the cause of the invalid calibration and determined a card in the Unit 5 PLC controller had malfunctioned. Facility personnel contacted the facility's CEMS software vendor, CemTek, and installed a new PLC controller card which was reprogrammed online by CemTek. After installation and programming of the PLC card, the PLC controller was placed in service at 12:55 hours and an automatic calibration was initiated and passed at approximately 13:24 hours. Further investigation after the passing calibration revealed that the PLC controller malfunction had caused the Unit 5 opacity monitor to lock in place at 10:24 hours on 9/25/2022 and a slow decrease in recorded CO2 values was also recorded during the same time frame. All opacity and CO data has been marked as invalid from 10:24 hours on 9/25/2022 until 12:55 hours on 9/26/2022 for opacity when the PLC controller returned to service and until 13:24 hours on 9/26/2022 for CO when the analyzer passed calibration.	Unit 5	CO2, CO, opacity	PLC card failure

Date (link)	Summary	Unit	Pollutant	Notes
10/24/2022	On 7/6/2022, Unit 4 recorded an SO_2 24-hour geometric average from 0000-2359 hours of 26.3 ppm, corrected to 7% 02. Unit 4 was experiencing unusually elevated inlet SO_2 levels in the flue gas beginning at approximately 1415 hours. Facility personnel responded to the rapidly increasing inlet SO_2 by reducing the boiler load, initiating, and then increasing gas flow to the boiler and placing the lime system in manual control in order to override system interlocks. Inlet and outlet SO_2 values continued to increase until approximately 1640 hours at which time the boiler's **CEMS analyzers reached an over-range condition and flagged the SO_2 data as "Data Error" thereby excluding the data from compliance averaging periods.** Inlet and outlet SO_2 levels continued at CEMS over-range levels until approximately 1820 hours when the unusually high SO_2-containing fuel had been processed through the boiler.	Unit 4	SO_2	fuel content
10/26/2022	2022 Q3 Emissions Report - no time out of compliance; 0.14% excess emission time for CO (4-hr), 0.05% for SO_2 (24-hr)		CO, SO_2	
11/21/2022	Unit 3 Inlet CO was unavailable for 2 hours on 11/20/2022 from 00:00 – 01:59. The Inlet CO2 monitor purge occurred at 00:01 – 00:05, whereas after the purge, the CO2 readings dropped to <0.5% beginning at 00:06, causing the corrected CO to read artificially high. Several attempts to contact I&E began at 00:20. The control room operator initiated a shutdown at 00:21 due to the data unavailability along with unknown cause, per best operational practices. Unit 3 was shutdown from 01:23 until 11:46.	Unit 3	CO2, CO	
11/23/2022	Unit 3 Inlet CO was unavailable for 2 hours on 11/22/2022 from 18:00 – 19:59. The Inlet CO2 monitor purge occurred at 18:01 – 18:05, whereas after the purge, the CO2 readings dropped to <0.5% beginning at 18:06, causing the corrected CO to read artificially high.	Unit 3	CO	
11/23/2022	Unit 3 CO data unavailable for 1 hour to troubleshoot earlier data unavailable issues	Unit 3	CO	
12/7/2022	Unit 4's CEMS recorded elevated SO_2 emissions on 12/4/2022 due to a malfunction of the "B" slaker rotary feeder. This resulted in the 24-hr geometric average for SO_2 to go above the permitted limit of 24 ppm@ 7% 02 and 25.0 lbs/hr for the 00:00-23:59 timeframe. The above Unit 4 SO_2 emissions are within the allowed 3 hours per occurrence per specific condition B.l 7 of the Title V Air Operating Permit, number 0990234-043-AV.	Unit 4	SO_2	slaker rotary feeder malfunction
12/20/2022	Unit 3 SO_2 and NOx [file not available]	Unit 3	NOx, SO_2	
12/30/2022	Unit 5 CO data unavailable for 27 hours; exceedance not expected	Unit 5	CO	
2/1/2023	Units 3 and 5 CO analyzer on 1/19/23 between 11:34-13:32 (Unit 3) and 11:43-13:30 (Unit 5); Unit 3 values later corrected but Unit 5 values are invalid	Units 3 and 5	CO	

Date (link)	Summary	Unit	Pollutant	Notes
2/16/2023	Fire Notification - Fire in REF2 tipping floor pit – fire department extinguished but fire reignited the following day. No impacts to building, boilers, or pollution control devices.	Tipping Floor		tipping floor fire
3/3/2023	Units 3 and 4 CO	Units 3 and 4	CO	
3/13/2023	March 10, 2023, at 8:10 am the Unit 5 CO monitor experienced a 4X calibration failures during the morning calibration. Data was invalid from the last successful calibration on March 9 at 8:30 am, through the successful calibration on March 10, 2023, at 9:27 am, resulting in a total of 25 hours of invalid data for CO.	Unit 5	CO	
3/17/2023	"Unit 5 experienced one 6-minute block average above the permit limit of 10% during a malfunction event. The opacity spike resulted in a 6-minute block average of 25.6%. The malfunction event was caused by the failure of three (3) bags in the Unit 5-E baghouse compartment. The compartment was isolated, and operational controls were adjusted to prevent recurrence of the elevated opacity reading. The defective bags were replaced. The above exceedance is within the allowed three hours per occurrence as per section III.B.17 of the Title V Air Operating Permit, number 0990234-043-AV."	Unit 5	opacity	baghouse failure
5/3/2023	Unit 3 SO_2 Stack Flow Monitor malfunction; exceedance not expected	Unit 3	SO_2	
10/19/2023	Unit 5 SO_2 exceedance 34.4 ppmvd (limit: 24 ppmvd), 29.9 lb/hr (limit: 25 lb/hr)	Unit 5	SO_2	lower furnace draft ports inadvertently plugged after maintenance work
3/13/2024	On March 12, 2024, broken bags in the Unit 4 baghouse caused one 6-minute block average to exceed the opacity permit limit. The Unit 4-D compartment was isolated, and the bags were replaced.	Unit 4	opacity	baghouse failure

Date (link)	Summary	Unit	Pollutant	Notes
7/8/2024	On 6/30/2024 the Unit 3 Outlet CO2 and Outlet SO_2 monitor experienced a failed 4X out of control (OOC) calibration while the unit was not operating… found the calibration line plugged… critical orifice was also partially plugged. This resulted in 11 hours of monitor downtime for SO_2, NOx & CO2. Upon the CEMs coming into service after calibration at 2318, the NOx and SO_2 were found to be elevated. Operations noticed the steam supply valve #0731, which supplies steam to the ammonia skid dilution air heater had malfunctioned, staying closed. This resulted in the low temperature interlock prohibiting the ammonia supply valve from opening. Due to the steam valve malfunction along with only one valid hour for the 24-hour average, the NOx value registered a 152.7 ppm, data from 2300-2359, with a permitted limit of 50 ppm. However, this data will be excluded, resulting in an N/A for the 24-hour NOx data for 6/30/24.	Unit 3	CO2, NOx, SO_2	steam supply valve malfunction, calibration line plugged, critical orifice partially plugged
8/30/2024	The Department was notified on May 22, 2024, that the dioxin/ furan test was aborted during the Unit 4 stack test due to a malfunction with the hydraulic feed system and had to be rescheduled. The Department was again notified on May 23, 2024, that the Unit 3 stack test was aborted due to prematurely failing baghouse filter bags, and also had to be re-scheduled.	Unit 3, Unit 4	D/F	hydraulic feed system failure, baghouse failure
9/30/2024	At 0949 on 9/29/24, the SO_2 monitor experienced a 4X out-of-control calibration. Per Part 60, all data was flagged as invalid to the previous passing calibration, which occurred on 9/28/24 at 0948 hours. The system was placed into maintenance mode, checked out by our technician and adjustments completed on the monitor. On 9/28 at 2144 hours the unit was shut down due to issues with the Ash Discharger and remained shut down until it was started up to continuously combust MSW on 9/29 at 1730 hours. On 9/29 the monitor unit passed calibration and was ready for service at 1627 hours. The SO_2 data from 0800 hours on 9/28 – 9/28 at 2159 hours will be considered unavailable for a total of 13 hours.	Unit 4	SO_2	calibration error, ash discharger isssues
10/4/2024	At 0828 on 10/03/24, the CO monitor experienced a 4X out-of-control calibration. Per Part 60, all data was flagged as invalid to the previous passing calibration, which occurred on 10/02/24 at 0828 hours. The system was placed into maintenance mode, checked out by our technician, and identified a malfunctioned sample pump. The sample pump was replaced and at 1137 hours the unit passed calibration and was returned to service at 1138 hours.	Unit 5	CO	sample pump malfunction
11/13/2024	On 11/12/2024, the CO monitor experienced a 4X out-of-control calibration.	Unit 5	CO	calibration failure

Date (link)	Summary	Unit	Pollutant	Notes
11/27/2024	On 11/25/24 at 08:10 – 08:35 hrs. the PBREF2 Unit 5 CO inlet analyzer registered a 2X calibration warning. In response to this warning, I&E unsuccessfully conducted a manual calibration on the monitor at 10:44 – 11:05, resulting in a 4X calibration failure. I&E performed a subsequent passing manual calibration from 11:06 – 11:22. Then on 11/26/2024, Unit 5 CO inlet analyzer failed calibration from 08:10 – 08:35. Upon investigation, I&E found the analyzer had been locked up ("froze") since 08:08. The monitor check valve failed to open position and the sample line was also cracked, allowing tramp air to enter. This caused the false high CO reading and 4X calibration. I&E had placed the analyzer into maintenance mode at 08:35 to reset the analyzer, to replace the check valve, and to repair the damaged sample line with new hardware. The monitor was returned to service at 11:36, and a calibration was successfully performed from 11:37 – 11:58 Due to the 4X on 11/26/2026, the data is invalidated back to the last good calibration on 11/25/2024. The unit was proactively shut down from 10:03 – 12:16 until the CO monitor issue was resolved. Therefore, the total Unit 5 CO Inlet unavailable data for 11/25/2024 through 11/26/2024 was 23 hours.	Unit 5	CO	calibration failure, check valve failure, sample line cracked
12/4/2024	On 12/03/24, the SO_2 monitor experienced a 4X out-of-control calibration. Per Part 60, all data was flagged as invalid to the previous passing calibration, which occurred on 12/02/24 at 0948 hours. On 12/02 at 1441 hours the unit was shut down due to begin the start of a scheduled outage. Our technician reviewed the system and could not determine a cause for the failure. During the scheduled outage the monitor will be serviced and available prior to the starting up of the unit 4.	Unit 4	SO_2	calibration failure