UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Report Title:	Clean Air Act Inspection of Evonik
Inspection Date(s):	08/16/2021
Regulatory Program(s):	Title V
Company Name:	Evonik Corporation
Facility Name:	Evonik Corporation
Facility Location:	1200 W. Front St. Chester, PA 19013
Latitude:	39.837605 **Longitude:** -75.37294
County/Parish:	Delaware County, Chester City
AFS Number:	PA0003182
Permit Number:	23-00047
NAICS Code:	325130 **SIC:** 2819
Unique Project #:	3E21CA019A

Facility Representatives: **Point of Contact**

Nick Karaolis: Plant Manager ☐
Phone: 610-990-8091 Contact: nicholas.karaolis@evonik.com

Jacklyn Matsanka: Env. Health and Safety Engineer ☒
Phone: 610-990-8125 Contact: jacklyn.matsanka@evonik.com

Mike Mullahey: Plant Manager ☐
Phone: (xxx) xxx-xxxx Contact: mike.mullahey@evonik.com

EPA Inspectors:

Erin Willard, Air Enforcement and Compliance Assistance Branch, 3ED21
Phone: 212-814-2152 Contact: willard.erinm@epa.gov

Carly Joseph, Air Enforcement and Compliance Assistance Branch, 3ED21
Phone: 212-814-2127 Contact: joseph.carly@epa.gov

State/Local Inspectors:

Jim Layton, PADEP, Air Quality Specialist
Phone: 484 250-5039 Contact: jalayton@pa.gov

EPA Lead Inspector

Signature	**Erin Willard**	**Date**
	1650 Arch Street (3ED21)	
	Philadelphia, PA 19103-2029	
Supervisor	Hall, Kristen Digitally signed by Hall, Kristen Date: 2021.10.12 05:37:21 -04'00'	
Signature	**Kristen Hall**	**Date**

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I. Introduction

The United States Environmental Protection Agency (EPA) conducted a Clean Air Act (CAA) inspection at Evonik Corporation (Evonik or Facility) to verify compliance with applicable State and Federal regulations. The Pennsylvania Department of Environmental Protection (PADEP) was notified of the inspection on August 3, 2021 via email. On August 12, 2021, EPA notified the Facility of the planned inspection via phone and email. EPA emailed a list of records for review to Jacklyn Matsanka, prior to the inspection (see Attachment 1). These records are listed in the Records Review section of the report.

A. Summary of the Facility

The Facility is located at 1200 W. Front Street, Chester, PA 19013. Evonik was founded in 1847 in Berlin, Germany. Evonik's headquarters are currently located in Essen, North Rhine-Westphalia, Germany. Evonik operates production plants in 27 countries on six continents including the United States. The Chester location is internally known as the "Chester Precipitated Silica Plant". From 1984-1991 Evonik was a joint venture with PQ Corporation, which is located adjacent to Evonik. PQ Corporation supplies liquid sodium silicate (Na2SiO3) to Evonik and uses a pipeline to fill storage tanks on Evonik's property. Current material usage is approximately 800,000 pounds per day of Na2SiO3. Evonik has no other supplier of Na2SiO3, and if PQ Corp is not operating to supply the raw material, Evonik is also unable to operate. There are no utilities shared between the two facilities.

The facility combines Na2SiO3 with sulfuric acid to produce/precipitate out silica, with by-products of sodium sulfate, and water. The pure silica undergoes two different processes to produce four different production grades of the final product. The facility uses a series of baghouses as a control and reclaim system. The facility currently has roughly 70 employees, which is slightly lower than normal. Workers are a part of a union and therefore chose their hours for their schedule by voting in each production department on a periodic basis. For example, Mr. Karolis indicated that some production areas use a 12-hour shift while others are currently operating with a 10-hour shift.

Evonik is currently permitted under PADEP # 23-00047 (issued August 28, 2018) as a synthetic minor, with limitations for nitrogen oxides (NOx) of 24.9 tons per year and particulate matter (PM) of 99.9 tons per year.

B. Inspection Opening Conference

At 9:00 am on August 16, 2021, EPA inspectors arrived at the Facility for a CAA Inspection and conducted a brief opening conference. Evonik was represented by Nick Karaolis, Jacklyn Matsanka and Mike Mullahey. Jim Layton of PADEP was also present. EPA inspectors, Erin Willard and Carly Joseph presented their credentials and explained the purpose of the visit was to conduct a full compliance evaluation (FCE) to determine compliance with their permit and any applicable regulations. Additionally, EPA informed the facility representatives of their right to claim any confidential business information (CBI). At that time, Evonik staff indicated they may claim some photos and documentation as CBI.

II. Site Activity/Process Description

Evonik produces pure non-crystalline silicate in four product grades with different physical characteristics. The facility mixes Na2SiO3 provided by PQ with sulfuric acid and water to produce pure silica, with the byproducts sodium sulfate and water. Silica production is a batch process, with each batch taking between 3-6 hours. Each production tank has an agitator inside to mix the raw materials. Once the silica precipitation process is complete, Evonik rinses the product to remove the sulfuric acid. The slurry is then filtered to remove excess water, either in a filter press or a membrane press, and then dried in a flash or spray dryer. Each dryer has a dust collector, and none of the product captured in the dust collectors is wasted, it can be returned to the process for use. After the product is dried, it may be milled to meet different customer specifications; Evonik currently has 19 different products produced by various milling options. There are no additives necessary during the milling process. Because the product is particulate, control devices on the dryers and silos include baghouses and dust collectors. None of the tanks, including process tanks, have any type of air emission control because there are no VOCs in use at the facility.

The silica produced by Evonik is used in various industrial processes, including the manufacture of tires, where it reduces the road temperature and flexing on the tire. Evonik products are also used in food applications.

In addition to the production processes discussed above, the facility owns and operates two low NOx steam generators. Facility personnel also indicated that they are classified as a very small quantity generator (VSQG) under RCRA regulations, based on their use of some chemicals in the small QA/QC lab at the site. Because Evonik makes products used in food, the facility is also subject to inspections by the Food & Drug Administration (FDA) and the Department of Agriculture.

III. Observations

EPA inspectors were led on a walkthrough of the Facility at 10:55 am, with each of the staff listed above present. EPA inspectors noted photos would be taken during the Facility walkthrough (Attachment 2), and that the team would ask prior to taking a photo. Ms. Matsanka indicated she would take a photo for the company's records at the same time.

The inspection team began the walk through by exiting the meeting room and walking along the roadway that is located between the two sets of storage silos. Evonik staff indicated that each silo has a dedicated baghouse system at the top of each silo that captures particulate during silo filling. The silos range in size from $100m^3$ to $1000m^3$ (as a German company, many of the units used at the site are in metric format). The roadway also has two short railroad siding spurs that allow for direct loading from silos to the train cars. In order to prevent material from migrating out of the car during filling, each loading area is equipped with a vacuum system that pulls draft and deposits the material back into a dedicated baghouse for each silo. Because each silo has a dedicated baghouse, the material collected can generally be deposited back into the silo and is not wasted. The team then walked to the rear of the facility facing the river and observed multiple tanks. A set of suspension tanks is located outside, where the slurry of precipitated silica and water is held prior to drying. These tanks have a temperature of about 196°F, but are not actively heated – all the heat comes from the production process. The company has heat exchangers in various locations to help warm water for process use and conserve energy; this is an area that includes an exchanger system. Another tank contained anhydrous ammonia, which is used for pH adjustment on the wash/supernatant liquid from the process. Four silica tanks are located here, along with three "cyclators", which are wastewater treatment tanks. Prior to discharge, process water

must be pH adjusted, and have suspended solids removed. In order to achieve solids removal, flocculation chemicals are added to the water to settle out suspended silica, and the settled material is recycled back to one of the product lines for tires. The sulfuric acid tank adjacent to the waste-water treatment area holds 30,000 gallons of 93% sulfuric acid; this tank is filled daily based on production, usually between 1 and 3 times a day. Evonik staff indicated that raw material use is usually tied to the products being made, some batches take longer and therefore fewer can be completed in a day. The Na2SiO3 tanks that are filled by PQ are also located in this area.

The inspection team looked in the windows of a small QA/QC lab but did not enter the room due to the close proximity and COVID concerns. Drums were located just outside the lab door and labeled for RCRA disposal.

The inspection team then entered the production building and viewed eight large filter presses. Mr. Karolis explained that each filter has a hopper bottom where wet filter cake is collected after being pressed of most of the water. The supernatant (liquid from the wet silica) is separately piped to the wastewater treatment area for pH adjustment and flocculation.

A control room located in this area displays all baghouse pressure drop (ΔP) readings that are electronically tracked. If a baghouse ΔP approaches the set range, an alarm sounds, and if the high or low value is exceeded, the process associated with that baghouse shuts down. Records of these alarms, shutdowns and corrective actions are maintained in the PIMS system at the facility.

The team then viewed the three precipitators; these are the tanks where raw materials are combined for the batch production process to occur. The precipitators are essentially large tanks, with agitators inside. None of the precipitators have air emissions controls. Once the raw materials are combined, the contents of the tank are mixed for several hours, with no further additions or interventions needed. After the reaction is complete, the slurry is pumped into the tanks that were noted at the outset of the inspection (Suspension Tanks) where some settling occurs. After settling, the wet mixture is pumped to either a membrane filter press or a chamber filter press (8 total). The filter cake is then remixed with water to make it flowable and conveyed into a spray dryer or a flash dryer to remove all the moisture, resulting in one of the 4 categories of material.

The team left the precipitator area and viewed the spray dryer (2 spray dryers and 2 spin flash dryers) area located outside the laboratory. The facility burns natural gas in these dryers, and they operate at approximately 1300°F. Large heat exchangers associated with these dryer units preheats water for use in the precipitators, which lowers the energy demand across the process. The team viewed the room where both steam generators are located. Unit 708 is due to be replaced in kind, in November 2021. PADEP has issued Evonik a Plan Approval for this project. At this time, EPA noted that there is an analog and digital hour meter on the unit, and the hours on each meter did not match.

The inspection team viewed the packaging/pelletizer area, where finished product is placed into bags and supersacks for shipping to customers. There are 12 filling stations in this area, and each either has a small hood that pulls airborne product up and into a reclaim system, or a “clamshell” system that fully encloses each bag during a fill cycle to prevent product from becoming airborne.

The team broke for lunch, which was delivered to the site, from 12:15pm to 1:00pm

After lunch, the inspection team went back to the silos, and climbed one set to view the baghouse pressure gauges at each. Staff explained that even if the baghouse manometer is “analog” and must be recorded manually, the operation of the baghouse and the process is controlled by a computer; this

means that if there are any alarms, the computer will shut the process down and it doesn't need to be completed by a staff member. If a silo unit and its associated baghouse are not in operation (no material being added or removed), the pressure drop (ΔP) will display 0. The permit requires that silo baghouses in Group 103A with an automatic reporting gauge should operate between 1.0 and 8.0 inches of water, and baghouses without an automatically reporting gauge should operated between 1.0 and 6.0 inches of water. Silo baghouses in Group 103B are required to have a pressure drop between 0.5 and 6.0 inches. Baghouses in Group 108A (milling equipment) with an automatic reporting gauge should operate between 1.0 and 8.0 inches of water, and baghouses without an automatically reporting gauge should operated between 1.0 and 6.0 inches of water

The following is a chart of the recorded pressure drops gathered by the EPA inspection team:

Silo #	Permit Group ID	ΔP Recorded
616	103A	1.9 – 2.1
684	108A	0
677	108A	0
670	108A	0.5
690	103A	0.7
635	108A	0
1614	103A	0
4619	103B	0.7
1619	103A	1.4 – 2.3

The walkthrough concluded at 1:30 pm.

Once back in the meeting room, EPA asked for clarification on when and how the excess salt is washed from the precipitated silica. Staff explained that once the filter cake is built up on each chamber of the filter press, clean water is pumped into the filter press, where small outlet areas at the corner of each section let the water drain out, taking excess sodium sulfate with it. The resulting liquid is then treated in the wastewater treatment system.

IV. Records Review

The records review commenced immediately after the plant walkthrough at 2:30 pm. EPA inspectors reviewed documents requested in the August 13, 2021 email to Jacklyn Matsanka (see Attachment 1). Some records were provided at the time of the inspection by Jacklyn Matsanka, or at an agreed upon later date via email. EPA staff read over a deviation report from a small product leak that occurred on October 11, 2020. Additionally, EPA looked through paper records that are maintained on a daily basis for visible emissions from all silos and baghouses, tank observances, along with bag changeout records, pressure alarms and associated corrective actions.[1]

[1] EPA emailed Jacklyn Matsanka on August 19, 2021 requesting scanned copies of selected dates for pressure drop records. See Attachment 4 for a copy of the email. Records were provided to EPA on August 17, and August 25, 2021. See Attachment 3 for a discussion of the records reviewed on-site.

V. Closing Conference

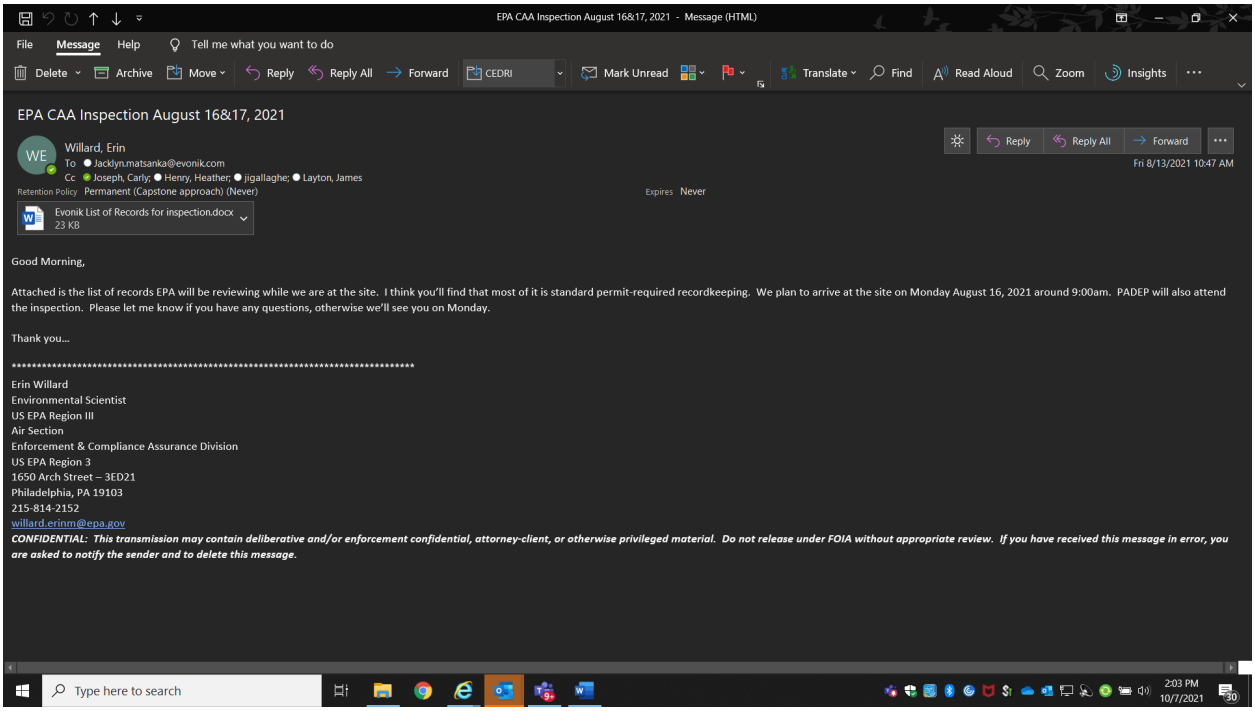
After the records review, EPA inspectors, staff Jacklyn Matsanka, Nick Karaolis, Mike Mullahey, and PADEP Inspector Jim Layton had a brief closing conference to ask additional questions and discuss observations. The EPA inspectors noted that the investigation is on-going, and any areas of concern identified in the final reports do not necessarily reflect a violation or deviation, rather, they are areas that will require further investigation. EPA also noted that they would issue an inspection report within 60 days, with a copy to the State. Simultaneously, EPA will perform a detailed review of records and may have additional questions.

No Areas of Concern were noted at the closing conference. Staff explained that the hour meter numbers that were not matching was because one set is recording the actual number of hours that the burner is operating, while the second set (with a greater value) records the number of hours that the system continues to supply steam. Because the unit supplies produced steam even after the burner is off, those meters will always have a higher number of hours.

The inspection concluded at 3:28 pm.

VI. List of Attachments

Attachment 1: Email Correspondence



Attachment 2:

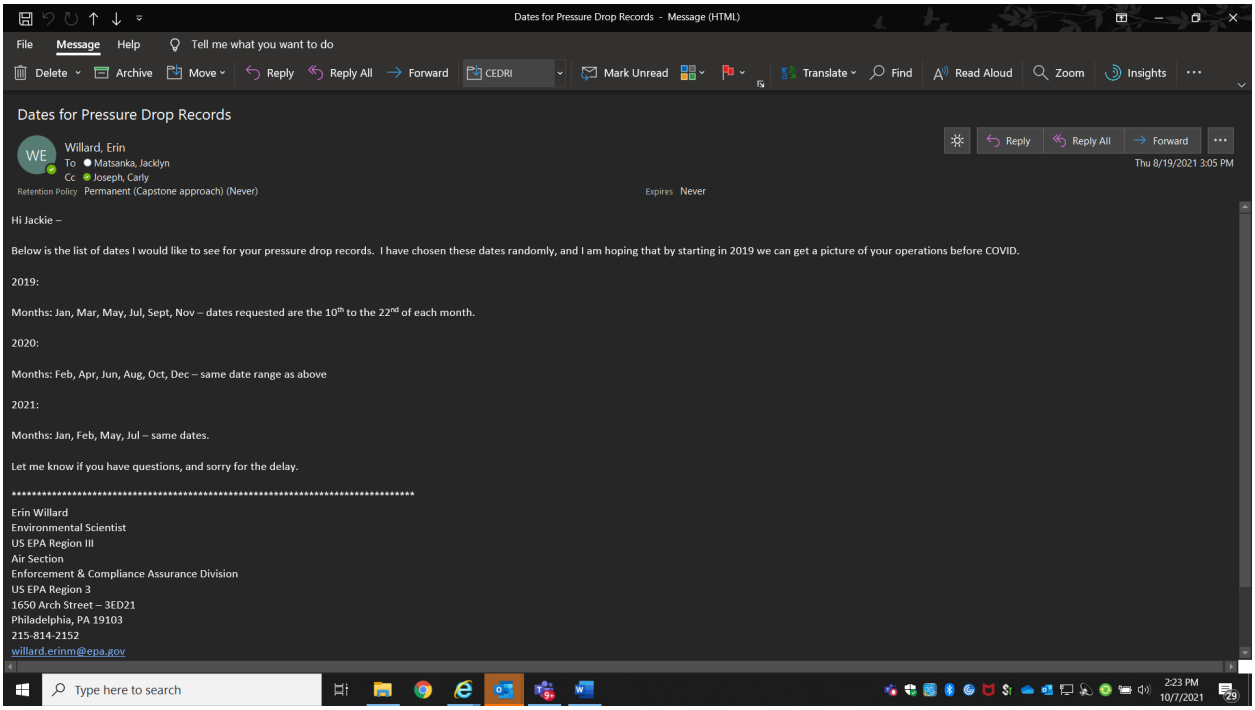
CBI	Photo #	Description	Date
No	1	Product Silos	8/16/21
No	2	Suspension Tanks and Water Tanks	8/16/21
No	3	Anhydrous Ammonia, Caustic and Sulfuric Acid Tanks	8/16/21
Yes	4	Tank 111 - Precipitator	8/16/21
Yes	5	Spray Dryer 510 with Associated Baghouse 511	8/16/21
No	6	Steam Unit 708 Plate with analog meter	8/16/21
No	7	Steam Unit 708 Plate with digital meter	8/16/21
No	8	Silo 616 Manometer	8/16/21

Attachment 3: Records Review

1. A plot plan of the facility, including each process area and the location of each emissions source including combustion sources, storage tank or vessel.
    a. Requested a copy of the initial presentation with the plot plan
2. Provide a copy of each Initial Notification, Notification of Compliance Status and deviation reports as submitted to PADEP or EPA, in accordance with the permit and each applicable state or federal rule.
    a. EPA reviewed 1 deviation report from a small product leak on 10/11/2020
3. A list of each combustion source at the facility. For boilers and engines, include the following pieces of information, along with which rule the unit is subject:
   There are only two units: 715 and 708 low Nox steam generator, superheated steam generator that is only used for a milling process and is not yet scaled up.
    a. the size in mmBTU or brake horsepower
    b. the fuel type(s)
    c. monthly fuel consumption
    d. monthly operating hours
    e. the construction date, and where applicable for engines, the model year and associated Tier certification data
    f. maintenance records, including tuneup and maintenance
    g. a discussion of the designated uses for each unit
    h. an indication of which rule(s) apply to each unit
    i. as associated with Item 11 below, provide emissions calculations by unit
    j. a list and discussion of the emissions control unit(s) for each combustion unit
4. A list of all federal rules the facility is subject to
    a. Jackie Matsanka will send the document to EPA that she uses to track all applicability analyses
5. Fugitive and visible emissions monitoring records

    a. Daily walkaround for emissions, tanks, emissions silos. These are kept in paper form. EPA provided a list of dates for these records to Evonik on August 19 for submission the following week.
6. Pressure drop records (ΔP) for each baghouse, fabric filter and dust collector. Additionally, for each unit, a list of bag changeout dates (most recent set is electronic, going back is paper, he will show us), pressure alarm occurrences (these are kept in the electronic system), inspections (paper), regular maintenance records (paper), and corrective actions taken on issues identified (paper)
    a. "Chief Chemical Operating Log" has two tabs that have the daily VE and odor checks, each day is a new spreadsheet so Evonik will have to copy days individually (EPA will send Evonik a list of dates for them to copy and send)
    b. Delta P alarm list is kept electronically, requested a list from 1/1/20 onward.
    c. Asked for a few copies of the forms they use to do facility wide inspections – Chem Op Records are just for reference because I'm not sure we will need all of them.
    d. EPA requested a few scans of the pressure drop sheets, and EPA will follow up with a list of dates for Evonik to scan and email.
7. Spray dryer visual check records, the manufacturer's specifications for maintenance on each dryer, and a record of maintenance performed
    a. The company doesn't actually have a manufacturer "specifications" – they have inputted all the maintenance requirements into SAP, PMs and work plans and that is how they follow an annual work plan for the unit.
8. A copy of each Request for Determination (RFD) and Plan Approval issued by PADEP
    a. One GP for the replacement of the steam generator which was pushed back until November 2021
    b. One RFD for new milling center. She will give me the RFDs as PDFs
    c. Remainder of RFDs are incorporated into the Permit
9. Monthly production records, including both the volume of product(s) produced, and the amount of feedstock(s) utilized.
    a. Production reports are on monthly basis
    b. Count inputs, batches, run hours
10. Copies of any performance testing completed on any unit at the facility
11. All MSDS sheets for materials present at the site.
12. A full set of emissions calculations (actual and potential), including those for VOCs, HAPs, NOx, CO, PM and SO2, on both a monthly and annual basis. Include an example calculation, the emissions factors used and the sources of those factors.
    a. AIMS sheet they use for emissions calcs includes all the calculations and has sheets that have the stack testing for the dryers, and the mills, silos
13. A list of each storage tank, vessel or silo at the facility, including the size, construction date, construction material and roof type, last date of inspection, and the current contents of the unit with the associated vapor pressure data where applicable
    a. These are on the block diagrams and Evonik will provide the sizes in gallons.

Attachment 4
Requested Pressure Drop Dates


Dates for Pressure Drop Records - Message (HTML)
File
Message
Help
Tell me what you want to do
Delete
Archive
Move
Reply
Reply All
Forward
CEDRI
Mark Unread
Translate
Find
Read Aloud
Zoom
Insights
Dates for Pressure Drop Records
WE
Willard, Erin
To Matsanka, Jacklyn
Cc Joseph, Carly
Retention Policy Permanent (Capstone approach) (Never)
Expires Never
Reply
Reply All
Forward
Thu 8/19/2021 3:05 PM
Hi Jackie –
Below is the list of dates I would like to see for your pressure drop records. I have chosen these dates randomly, and I am hoping that by starting in 2019 we can get a picture of your operations before COVID.
2019:
Months: Jan, Mar, May, Jul, Sept, Nov – dates requested are the 10th to the 22nd of each month.
2020:
Months: Feb, Apr, Jun, Aug, Oct, Dec – same date range as above
2021:
Months: Jan, Feb, May, Jul – same dates.
Let me know if you have questions, and sorry for the delay.
****
Erin Willard
Environmental Scientist
US EPA Region III
Air Section
Enforcement & Compliance Assurance Division
US EPA Region 3
1650 Arch Street – 3ED21
Philadelphia, PA 19103
215-814-2152
willard.erinm@epa.gov
Type here to search
2:23 PM
10/7/2021