



Kessler, Joseph R <joseph.r.kessler@wv.gov>

RE: R13-3625 Pre-Draft Permit 2.0

1 message

Joyce Lish <JLish@trinityconsultants.com>

Thu, Oct 26, 2023 at 1:08 PM

To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>, Carol Parnell <cparnell@formenergy.com>, Michelle Ngo <mngo@formenergy.com>, George Mesing <GMesing@trinityconsultants.com>

Joe,

Thank you for all of your assistance on this matter. I have reviewed this revised pre-draft and found that it addresses both our email comments and our discussion. Based on conversations with Form Energy, I believe we are ready to proceed with the notice.

Please let me know if you need anything further.

Joyce Lish

Trinity Consultants

4500 Brooktree Road, Suite 310

Wexford, PA 15090

Mobile: 412-737-6568

From: Kessler, Joseph R <joseph.r.kessler@wv.gov>

Sent: Thursday, October 26, 2023 9:34 AM

To: Carol Parnell <cparnell@formenergy.com>; Michelle Ngo <mngo@formenergy.com>; George Mesing <GMesing@trinityconsultants.com>; Joyce Lish <JLish@trinityconsultants.com>

Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>

Subject: R13-3625 Pre-Draft Permit 2.0

Pursuant to our discussions, attached is a revised "Pre-Draft" version of the permit. This version has been revised based on your e-mail comments and our discussion yesterday. Please review and let me know if you have any additional questions or comments.

As with the last iteration, this Pre-Draft version has not been reviewed or approved by my supervisor or the Director and is, therefore, subject to change. This version is being provided to facilitate discussions of permit structure, language, and operational flexibility only, and does not grant the applicant any authority to begin any work on the site beyond the scope granted by 45CSR13.

Thank You,

--

Joe Kessler, PE

Engineer

West Virginia Division of Air Quality

601-57th St., SE

Charleston, WV 25304

Phone: (304) 926-0499 x41271

Joseph.r.kessler@wv.gov



Kessler, Joseph R <joseph.r.kessler@wv.gov>

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[Joseph.r.kessler@wv.gov](mailto:joseph.r.kessler@wv.gov)

 **3625 Pre-Draft 2.pdf**
295K

Construction Permit



R13-3625

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45 C.S.R. 13 — Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the facility listed below is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:
Form Energy, Inc.
Weirton Plant
029-00091

Laura M. Crowder
Director, Division of Air Quality

Issued: **DRAFT**

Facility Location: 1725 Main Street, Weirton, Hancock County, WV
Mailing Address: 1725 Main Street, Weirton, WV 26062
Facility Description: Iron-Air Battery Production Plant
SIC/NAICS Code: 3691/335910
UTM Coordinates: 534.561 km Easting • 4,474.479 km Northing • Zone 17
Latitude/Longitude: 40.42022/-80.59261
Permit Type: Construction
Description: Construction of a Iron-Air Battery Production Plant.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

As a result of this permit, the source is a nonmajor or area source subject to 45CSR30. Therefore, the facility is not subject to the permitting requirements of 45CSR30 and is classified as a deferred source.

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Table 1.0: Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
<u>Anode Process Line</u>					
1S-1	1E-1	Anode Process Materials	2023	18,201 anodes/day	Dust Collector (1C-1)
1S-2	1E-2	Furnace 1 ⁽¹⁾	2023	120 kW	None
1S-3		Furnace 2 ⁽¹⁾	2023	120 kW	None
1S-4		Furnace 3 ⁽¹⁾	2023	120 kW	None
1S-4		Furnace 4 ⁽¹⁾	2023	120 kW	None
<u>Cathode 1 Process Line</u>					
2S-1	2E-1	Cathode 1 Process Materials	2023	324.5 kg/hr	Dust Collector (2C-1), RTO (2C-2)
2S-2	2E-2	Recuperative Thermal Oxidizer 1 (Control Device No.: 2C-2)	2023	8 mmBtu/hr	None
<u>Cathode 2 Process Line</u>					
3S-1	3E-2	Cathode 2 Process Materials	2023	644 OEE/hr	RTO (3C-1)
3S-2	3E-1	Isopropyl Alcohol (IPA) Storage Tanks ⁽²⁾	2023	2,200 gallons	None
				2,200 gallons	None
				2,200 gallons	None
3S-3	3E-3	Oven 1	2023	1 mmBtu/hr	None
3S-4	3E-4	Oven 2	2023	4 mmBtu/hr	None
3S-5	3E-2	Recuperative Thermal Oxidizer 2 (Control Device No.: 3C-1)	2023	8 mmBtu/hr	None
<u>Module and Cell Assembly</u>					
4S-1	4E	Assembly Process Materials	2023	517,250 cells/yr	None
<u>Auxiliary Operations</u>					
5S-1	5E-1	Chiller Cooling Tower 1	2023	4,100 gpm	Drift Eliminator
5S-2		Chiller Cooling Tower 2	2023	4,100 gpm	Drift Eliminator
5S-3	5E-2	Process Cooling Tower Closed Circuit 1	2023	1,800 gpm	Drift Eliminator

Table 1.0: Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
5S-4		Process Cooling Tower Closed Circuit 2	2023	1,800 gpm	Drift Eliminator
5S-5	5E-3	Natural-Gas Fired Boiler 1	2023	6 mmBtu/hr	None
5S-6		Natural-Gas Fired Boiler 2	2023	6 mmBtu/hr	None
5S-7		Natural-Gas Fired Boiler 3	2023	6 mmBtu/hr	None
5S-8	5E-4	Diesel-Fired Emergency Generator	2023	1,500 kW _e	None

- (1) The furnaces are electric but are given emission points as they are the source of emissions generated in the heating process.
- (2) There are three (3) separate and identical storage tanks each with a capacity of 2,200 gallons.

PRE-DRAFT

2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45 CSR § 30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments		Standards for Hazardous Air
CBI	Confidential Business Information		Pollutants
CEM	Continuous Emission Monitor	NO_x	Nitrogen Oxides
CES	Certified Emission Statement	NSPS	New Source Performance Standards
C.F.R. or CFR	Code of Federal Regulations	PM	Particulate Matter
CO	Carbon Monoxide	PM_{2.5}	Particulate Matter less than 2.5µm in diameter
C.S.R. or CSR	Codes of State Rules	PM₁₀	Particulate Matter less than 10µm in diameter
DAQ	Division of Air Quality		
DEP	Department of Environmental Protection	Ppb	Pounds per Batch
dscm	Dry Standard Cubic Meter	pph	Pounds per Hour
FOIA	Freedom of Information Act	ppm	Parts per Million
HAP	Hazardous Air Pollutant	Ppmv or ppmv	Parts per million by volume
HON	Hazardous Organic NESHAP	PSD	Prevention of Significant Deterioration
HP	Horsepower		
lbs/hr	Pounds per Hour	psi	Pounds per Square Inch
LDAR	Leak Detection and Repair	SIC	Standard Industrial Classification
M	Thousand		
MACT	Maximum Achievable Control Technology	SIP	State Implementation Plan
MDHI	Maximum Design Heat Input	SO₂	Sulfur Dioxide
MM	Million	TAP	Toxic Air Pollutant
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	TPY	Tons per Year
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	TRS	Total Reduced Sulfur
NA	Not Applicable	TSP	Total Suspended Particulate
NAAQS	National Ambient Air Quality Standards	USEPA	United States Environmental Protection Agency
NESHAPS	National Emissions	UTM	Universal Transverse Mercator
		VEE	Visual Emissions Evaluation
		VOC	Volatile Organic Compounds
		VOL	Volatile Organic Liquids

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Law W.Va. Code §§22-5-1 et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation.*

2.4. Term and Renewal

- 2.4.1. This permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any applicable legislative rule.

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3601 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.10 and 13-10.3]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses and/or approvals from other agencies; i.e., local, state and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-4]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-5.4.]

2.10. Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.

[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. [Reserved]

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. [45CSR§13-10.1]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1 State-Enforceable only.]
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45 C.S.R. 11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

- 3.2.1. **Emission Limit Averaging Time.** Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:
- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.
 - b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.
 - c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
 - d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:
 1. The permit or rule evaluated, with the citation number and language;
 2. The result of the test for each permit or rule condition; and,
 3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

- 3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. The data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.
- 3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State-Enforceable only.*]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.
- 3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
- 3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by email as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345

DAQ Compliance and Enforcement¹:

DEPAirQualityReports@wv.gov

If to the US EPA:

Section Chief, USEPA, Region III
Enforcement and Compliance Assurance
Division
Air Section (3ED21)
Four Penn Center
1600 John F Kennedy Blvd
Philadelphia, PA 19103-2852

¹ For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, notice of Compliance Status Reports, Initial Notifications, etc.

3.5.4. **Operating Fee.**

- 3.5.4.1. In accordance with 45CSR22 – Air Quality Management Fee Program, the permittee shall not operate nor cause to operate the permitted facility or other associated facilities on the same or contiguous sites comprising the plant without first obtaining and having in current effect a Certificate to Operate (CTO). Such Certificate to Operate (CTO) shall be renewed annually, shall be maintained on the premises for which the certificate has been issued or accessible/available electronically for review from the premises by company representatives when at the location, and shall be made available within a reasonable time for inspection by the Secretary or his/her duly authorized representative.
- 3.5.4.2. In accordance with 45CSR22 – Air Quality Management Fee Program, enclosed with this permit is an Application for Certificate to Operate (CTO). The CTO will cover the time period beginning with the date of initial startup through the following June 30. Said application and the appropriate fee shall be submitted to this office prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found on the reverse side of the CTO application.
- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. Any emission unit or emissions generating process that has a potential for pollutant emissions, with the exception of any *de minimis* sources as identified under Table 45-13B of 45CSR13, is only authorized at the permitted facility if the unit or process is identified under Table 1.0 of this permit. In accordance with the information filed in Permit Application R13-3625, the emission units/processes shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants, shall not exceed the listed maximum design capacities, shall use the specified control devices, and comply with any other information provided under Table 1.0.

4.1.2. **Throughput/Production Limits**

The permittee shall not exceed the annual maximum throughput/production limits given in the following table for the materials specified:

Table 4.1.2: Throughput/Production Limits

Material	Source	Limit	Units
Battery Cells	Cell and Module Assembly	517,250	units/yr
Main Powder	Anode Process Line	22,900	tons/yr
Lubricant	Cathode 1 Process Line	2,065	tons/yr
Carbon Black		610	tons/yr
IPA	IPA Storage Tank	79,125	gallons/yr
Dip Mix	Cathode 2 Process Line	250	tons/yr

4.1.3. **Anode, Cathode 1, and Cathode 2 Process Line Requirements**

The Anode, Cathode 1, and Cathode 2 Process Lines shall operate according to the following requirements:

- a. The Anode, Cathode 1, and Cathode 2 production areas shall be designed so that no fugitive particulate matter emissions are emitted into the ambient air. The production areas shall utilize hoods and evacuation systems so that particulate matter emissions from feedstock handling and mixing shall be evacuated to the appropriate dust collector as specified under Table 1.0 of this permit;
- b. VOC emissions produced by the use of the Lubricant in the Cathode 1 Process Line and the use of IPA and the Dip Mix Tank in the Cathode 2 Process Line shall be captured and sent to the appropriate RTO for destruction as specified under Table 1.0 of this permit;
- c. The maximum VOC and HAP emissions shall not exceed, where applicable, the aggregate limits given in the following table for specified emission units:

Table 4.1.3(c): Anode, Cathode 1, Cathode 2, and Cell & Module Assembly Process Line Emission Limits

Emission Source (Point)		CO		PM ⁽¹⁾		NO _x		SO ₂		VOCs		HAPs	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Anode	1E-1	n/a	n/a	1.54	6.76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	1E-2	31.31	34.29	n/a	n/a	n/a	n/a	5.43	5.95	7.98	34.93	n/a	n/a
Cathode 1	2E-1	n/a	n/a	1.25	5.49	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2E-2 ⁽²⁾	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.38	10.40	n/a	n/a
Cathode 2	3E-2 ⁽²⁾	n/a	n/a	n/a	n/a	2.25	9.86	0.85	3.72	7.60	33.40	1.56 ⁽³⁾	6.84 ⁽³⁾
Cell & Module Assembly ⁽⁴⁾		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.02	0.08	0.00	0.00

- (1) All particulate matter is considered PM2.5 or less and includes condensables.
- (2) Does not include RTO combustion exhaust emissions. These limits are given under Table 4.1.6(a).
- (3) HCl emissions only.
- (4) No external stack, emissions inside the building only.

d. 45CSR7

The particulate matter generating sources in the Anode and Cathode 1 Process Lines (excluding any natural gas combustion exhaust emissions) shall comply with all applicable requirements of 45CSR7 including, but not limited to, the following:

- (1) No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any process source operation which is greater than twenty (20) percent opacity, except as noted in subsections 3.2, 3.3, 3.4, 3.5, 3.6, and 3.7.
[45CSR§7-3.1]
- (2) The provisions of subsection 3.1 shall not apply to smoke and/or particulate matter emitted from any process source operation which is less than forty (40) percent opacity for any period or periods aggregating no more than five (5) minutes in any sixty (60) minute period.
[45CSR§7-3.2]
- (3) No person shall cause, suffer, allow or permit particulate matter to be vented into the open air from any type source operation or duplicate source operation, or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity specified under the appropriate source operation type in Table 45-7A found at the end of this rule.
[45CSR§7-4.1]
- (4) Pursuant to footnote (2) of Table 45-7A, the HCl emissions from the Cathode 2 Process Line, defined as a type 'd' source, are not subject to the mineral acid limitations under Table 45-7AB.
[45CSR§7-4.2]

e. 45CSR10

The Anode and Cathode 2 Process Lines (excluding any natural gas combustion exhaust emissions) shall comply with all applicable requirements of 45CSR10 including, but not limited to, the following:

- (1) No person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations, except as provided in subdivisions 4.1.a through 4.1.e.

[45CSR§10-3.1]

4.1.4. Natural Gas Combustion

The natural gas combustion units (3S-3, 3S-4, 5S-5 though 5S-7) shall operate according to the following requirements:

- a. Each unit shall not exceed an MDHI as given under Table 1.0 of this permit and shall be fired only by pipeline-quality natural gas (PNG);
- b. The maximum emissions shall not exceed, where applicable, the aggregate limits given in the following table for specified emission units:

Table 4.1.4(b): Natural Gas Combustion Per-Unit Emission Limits⁽¹⁾

Emission Source	CO		PM ⁽²⁾		NO _x		VOCs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Oven 1	0.08	0.10	0.01	0.03	0.10	0.43	0.01	0.02
Oven 2	0.33	1.44	0.03	0.13	0.39	1.72	0.02	0.09
Boilers	1.48	6.49	0.13	0.59	1.77	7.73	0.10	0.43

- (1) As the annual emissions are based on 8,760 hours of operation, there is no annual limit on hours of operation or PNG combusted on an annual basis for the natural gas combustion units.
- (2) All particulate matter is considered PM_{2.5} or less and includes condensables.

c. 45CSR2

The Boilers (5S-5 through 5S-7) is subject to the applicable limitations and standards under 45CSR2, including, but not limited to, the requirements as given below:

- (1) The permittee shall not cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from the fuel burning units which is greater than ten (10) percent opacity based on a six minute block average.

[45CSR§2-3.1]

- (2) The visible emission standards set forth in section 3 of 45CSR2 shall apply at all times except in periods of start-ups, shutdowns and malfunctions. Where the Director believes that start-ups and shutdowns are excessive in duration and/or frequency, the Director may require an owner or operator to provide a written report demonstrating that such frequent start-ups and shutdowns are necessary.

[45CSR§2-9.1]

4.1.5. Cooling Towers

The Cooling Towers (5S-1 through 5S-4) shall operate in accordance with the following requirements:

- a. The Cooling Towers shall use the control device specified under Section 1.0 at all times in operation, and shall not exceed the specified maximum design and operational limits given in the following table:

Table 4.1.5(a): Cooling Tower Specifications

ID No.	Max Design Capacity Water Circulation Pump (gal/min)	Total Dissolved Solids (ppm)	Mist Eliminator Max Drift Rate (%) ⁽¹⁾
5S-1	4,100	600	0.0050
5S-2	4,100	600	0.0050
5S-3	1,800	600	0.0050
5S-4	1,800	600	0.0050

(1) As based on manufacturer or vendor guarantee or applicable product literature.

- b. The maximum aggregate particulate matter emissions from operation of all of the Cooling Towers shall not exceed 0.36 lbs/hr and 1.58 TPY.

4.1.6. Thermal Oxidizers

The Recuperative Thermal Oxidizers (2S-2 and 3S-5) shall operate according to the following requirements:

- a. Each unit shall utilize recuperative oxidizer technology and shall not exceed a burner size of 8.00 mmBtu/hr, the burners shall only be fired by PNG, and each unit shall not exceed those emission limits (products of combustion only) given in the following table:

Table 4.1.6(a): Thermal Oxidizer Combustion Exhaust Emission Limits⁽¹⁾

Pollutant	PPH	TPY
CO	0.66	2.89
NO _x	0.78	3.44
PM _{2.5} /PM ₁₀ /PM ⁽²⁾	0.06	0.26

(1) Although emitted from the same emission point, these limits do not include the VOC or HAP emissions that pass through the oxidizers uncombusted. These emissions are limited under Table 4.1.3(c). VOC/HAP emissions from PNG combustion are assumed to be mostly combusted in the RTO.

(2) All particulate matter assumed PM_{2.5} or less and includes condensables.

- b. The thermal oxidizers shall be in operation at all times the waste streams from the Cathode 1 and Cathode 2 Process Lines are being to the units for destruction;
- c. The thermal oxidizers shall be designed, operated, and maintained according to good engineering practices or manufacturing recommendations so as to achieve, at a minimum, a hydrocarbon DRE of 95.00%. The design shall include an appropriate residence time for vapors in the combustion chamber so as to meet the minimum DRE;

- d. While process exhaust gases are being sent to the thermal oxidizer for destruction from the Cathode 1 and Cathode 2 Process Lines, the units shall maintain a combustion chamber temperature of no less than 1,450 degrees Fahrenheit (788 degrees Celsius). An alternate minimum firebox temperature may be used pursuant to approval from the Director based on manufacturer's recommendations or on data as generated during site-specific testing so as to ensure operation at the minimum required DRE. There is no minimum firebox temperature during the units' startup and shutdown mode, prior and when no vapors are being sent to the units for destruction;

e. **45CSR6**

The thermal oxidizers are subject to 45CSR6. The requirements of 45CSR6 include, but are not limited to, the following:

- (1) The permittee shall not cause, suffer, allow or permit particulate matter to be discharged from the flares into the open air in excess of the quantity determined by use of the following formula:

$$\text{Emissions (lb/hr)} = F \times \text{Incinerator Capacity (tons/hr)}$$

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

<u>Incinerator Capacity</u>	<u>Factor F</u>
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

[45CSR§6-4.1]

- (2) No person shall cause, suffer, allow or permit emission of smoke into the atmosphere from any incinerator which is twenty (20%) percent opacity or greater.

[45CSR6 §4.3]

- (3) The provisions of subsection 4.3 shall not apply to smoke which is less than forty percent (40%) opacity, for a period or periods aggregating no more than eight (8) minutes per start-up, or six (6) minutes in any sixty (60)-minute period for stoking operations.

[45CSR6 §4.4]

- (4) No person shall cause or allow the emission of particles of unburned or partially burned refuse or ash from any incinerator which are large enough to be individually distinguished in the open air.

[45CSR6 §4.5]

- (5) Incinerators, including all associated equipment and grounds, shall be designed, operated and maintained so as to prevent the emission of objectionable odors.

[45CSR6 §4.6]

- (6) Due to unavoidable malfunction of equipment, emissions exceeding those provided for in this rule may be permitted by the Director for periods not to exceed five (5) days upon specific application to the Director. Such application shall be made within twenty-four (24) hours of the malfunction. In cases of major equipment failure, additional time periods may be granted by the Director provided a corrective program has been submitted by the owner or operator and approved by the Director. **[45CSR6 §8.2]**

4.1.7. **Emergency Engine**

The Emergency Engine, identified as 5S-8, shall meet the following requirements:

- a. The unit shall not exceed 1,500 kW_e and meet the requirements of an Emergency ICE under 40 CFR 60, Subpart IIII. The unit shall be fired only with diesel fuel that does not exceed a maximum sulfur content of 15 ppm pursuant to §60.4207(b);
- b. The unit shall not operate in excess of 100 hours per year in non-emergency situations (there are no operational use restrictions during times of emergency). The unit shall further meet the operational use requirements given under §60.4211(f);
- c. The unit shall not exceed the emission limits given in the following table:

Table 4.1.8(c): Emergency Generator Emission Limits

Pollutant	PPH	TPY
CO	11.57	0.58
NO _x	21.16	1.06
PM ⁽¹⁾	0.66	0.03
SO ₂	2.43e-02	1.22e-03
VOCs	21.16	1.06

(1) All particulate matter assumed PM_{2.5} or less and includes condensables.

d. **40 CFR 60, Subpart IIII**

The Emergency Generator shall meet all applicable requirements under 40 CFR 60, Subpart IIII including the following:

- (1) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

[40 CFR §60.4205(b)]

- (2) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (a)(1) through (2) of this section.

[40 CFR §60.4202(a)]

- (i) For engines with a rated power greater than or equal to 37 KW (50 HP), the Tier 2 or Tier 3 emission standards for new nonroad CI engines for the same rated power as described in 40 CFR part 1039, appendix I, for all pollutants and the smoke standards as specified in 40 CFR 1039.105 beginning in model year 2007.

[40 CFR §60.4202(a)(2)]

e. **40 CFR 63, Subpart ZZZZ**

An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart IIII, for spark ignition engines. No further requirements apply for such engines under this part.

[40 CFR §63.6590(c)]

(1) A new or reconstructed stationary RICE located at an area source;

[40 CFR §63.6590(c)(1)]

4.1.8. **Haulroads and Mobile Work Areas**

Fugitive particulate emissions resulting from use of haulroads and mobile work areas shall be minimized by the following:

- (1) The permittee shall perform all necessary tasks to adequately maintain paved haulroads and paved mobile work areas (including a reasonable shoulder area) within the plant boundary; and
- (2) All unpaved roads and mobile work areas shall be graded with gravel, slag, or a similar material so as to provide a suitable surface for the use of trucks and other heavy equipment. Unpaved roads and mobile work areas shall be provided with additional material as needed to maintain the road surface.

4.1.9. **Other Control Devices**

a. **Dust Collectors**

The Dust Collectors (1C-1, 2C-1) controlling particulate matter emissions from the Anode, and Cathode 1 Process Lines shall each be designed, maintained, and operated, so as to achieve a minimum particulate matter control percentage efficiency of 99% and to not exceed a guaranteed outlet grain loading of 0.005 gr/dscf; and

b. **Operation and Maintenance of Air Pollution Control Equipment.**

The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR§13-5.11.]

4.1.10. **Emission Point Map**

The permittee shall prepare and maintain an emission point map of the facility. This map shall consist of a diagram of the location and identification of all emission points at the facility that vent to ambient air. A legend shall be prepared with the map that identifies the emission point type and source(s) contributing to that emission point. This map shall be prepared within 180 days of startup and thereafter be updated as necessary to reflect current facility operations. The map(s) shall be retained on-site and be made available to the Director upon request.

4.1.11. **Vendor Guarantees**

The permittee shall, at the time of initial startup, maintain on-site and have readily available to be made available to the Director or his/her representative upon request, a copy of the all current vendor guarantees relevant to the air emissions associated with the facility. This includes information relating to the performance of both emission units and control devices.

4.1.12. **Applicable Rules**

The permittee shall meet all applicable requirements, including those not specified above, as given under 45CSR2, 45CSR6, 45CSR7, 45CSR10, 40 CFR 60, Subpart IIII, and 40 CFR 63, Subpart ZZZZ. Any final revisions made to the above rules will, where applicable, supercede those specifically cited in this permit.

4.2. Monitoring, Compliance Demonstration, Recording and Reporting Requirements

4.2.1. **Maximum Design Capacity Compliance**

Compliance with the maximum design capacity limitations as given under Table 1.0 and Section 4.1. shall be based, when available, on a clear and visible boilerplate rating or on product literature, manufacturer’s data, or equivalent documentation that shows that the specific emission unit(s) or processing line in question is limited by design to a throughput or production rate (or bottlenecked to that capacity by another unit’s design capacity) that does not exceed the specified value under Table 1.0 and Section 4.1. Where the above is not available, if requested by the Director, compliance shall be based on a reasonable demonstration that the listed quantity represents the maximum capacity of the unit/process under the plants normal operational configuration.

4.2.2. **Maximum Design Heat Input Compliance**

Compliance with the various combustion unit MDHI limitations as given under Table 1.0 and Section 4.1. shall be based on a clear and visible boilerplate rating or on product literature, manufacturer’s data, or equivalent documentation that shows that the specific emission unit(s) in question is limited by design to an MDHI that does not exceed the specified value under Table 1.0 and Section 4.1.

4.2.3. **Quantities Monitored/Recorded**

To determine continuous compliance with maximum production, throughputs, and other limits given under in 4.1 of the permit, the permittee shall monitor and record the following:

Table 4.2.3: Facility Quantities Monitored/Recorded

Quantity Monitored/Recorded	Source	Measured Units	Period
Battery Cells	Produced Facility-Wide	units	monthly, 12-month rolling total
Main Powder	Anode Process Line	tons	monthly, 12-month rolling total
Lubricant	Cathode Process Line	tons	monthly, 12-month rolling total
Carbon Black		tons	monthly, 12-month rolling total
IPA	IPA Storage Tank	gallons	monthly, 12-month rolling total
Dip Mix	Cathode 2 Process Line	tons	monthly, 12-month rolling total

4.2.4. **Thermal Oxidizer Combustion Chamber Temperature Monitoring**

Monitoring the temperature of the Thermal Oxidizer combustion chambers shall be done in accordance with the following requirements:

- a. The combustion chamber temperatures shall be measured continuously and the sensor measuring the combustion chamber temperature shall be an integral part of each thermal oxidizer design and be certified by the manufacturer to be accurate within $\pm 1\%$ in degrees F. Accuracy of the thermocouple will be verified by a test, conducted at least annually, using a second probe inserted into the combustion chamber to verify the accuracy of the integral sensor. The validation criterion for the annual test is $\pm 25^\circ\text{F}$; and
- b. An “excursion” is defined as a temperature reading below 1,450 °F (788°C). Any excursion shall be reported in writing to the Director of the DAQ as soon as practicable, but no longer than ten (10) calendar days after the occurrence, and shall include, at a minimum, the following information: the cause or suspected cause of the event, and any corrective measures taken or planned. Any more than six (6) excursions during the biannual reporting period specified under 4.5.1(a) shall result in a cease of operations, an immediate report to the DAQ, and a full burner inspection prior to restart of production.

4.2.5. Visible Emissions Compliance Demonstrations

Visible emissions Monitoring, Compliance Demonstration, Recording and Reporting shall be in accordance with the following requirements:

- a. The opacity limitations and the associated compliance determinations are given in the following table for sources of particulate matter:

Table 4.2.6(a): Visible Emissions Compliance Demonstrations

Emission Point(s)	Opacity Limit (%)	Rule Citation	Compliance Demonstration
<u>45CSR2 Applicable Emission Points</u>			
5E-3	10%	45CSR§2-3.1	Section 4.2.5(b)(1)
<u>45CSR6 Applicable Emission Points</u>			
2E-2 3E-2	20% ⁽²⁾	45CSR§6-4.3 and 4.4	Section 4.2.5(b)(1)
<u>45CSR7 Applicable Emission Points</u>			
1E-1 2E-1	20% ⁽³⁾	45CSR§7-3.1 and 3.2	Section 4.2.5(b)(1)
<u>Cooling Towers</u>			
5E-1 5E-2	20% ⁽³⁾	45CSR§7-3.1 and 3.2	Not Required ⁽⁴⁾
<u>Natural Gas Combustion</u>			
Various	None ⁽⁵⁾	n/a	n/a

- (1) The visible emission standards set forth in section 3 of 45CSR2 shall apply at all times except in periods of start-ups, shutdowns and malfunctions.
- (2) Shall not apply to smoke which is less than forty percent (40%) opacity, for a period or periods aggregating no more than eight (8) minutes per start-up, or six (6) minutes in any sixty (60)-minute period for stoking operations.

- (3) Shall not apply to smoke and/or particulate matter emitted from any process source operation which is less than forty (40) percent opacity for any period or periods aggregating no more than five (5) minutes in any sixty (60) minute period.
- (4) Due to the nature of the particulate matter emissions from the Cooling Towers (entrained in droplets), a compliance demonstration for the Cooling Towers is not practical.
- (5) Natural gas combustion does not meet the definition of a “source operation” pursuant to 45CSR§7-2.38.

b. Visible Emissions Compliance Demonstrations

Visible emissions Monitoring, Compliance Demonstration, Recording and Reporting shall be in accordance with the following requirements:

- (1) Compliance with the visible emission requirements for the emission points subject to 45CSR7 and listed in Table 4.2.5(a) above shall be in accordance with the following: Visible emission checks shall be conducted at least once per calendar month. These checks shall be performed for a sufficient time interval, but no less than a 6-minute interval, to determine if any visible emissions are present. Each observation must be recorded as either visible emissions observed or no visible emissions observed. Visible emission checks shall be performed during periods of normal facility operation and appropriate weather conditions;
- (2) The visible emission check shall determine the presence or absence of visible emissions. The observations shall be conducted according to Section 11 of EPA Method 22. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40CFR Part 60, Appendix A, Method 22 or from the lecture portion of the 40CFR Part 60, Appendix A, Method 9 which may include online web-based training as supplied by a Method 9 training company;
- (3) If visible emissions are determined to be present at a source(s) during the testing required under 4.2.5(b)(2), the permittee shall, as soon as practicable, attempt to diagnose and correct any issue that is causing the presence of visible emissions;
- (4) If the cause of the visible emissions are not correctable within a reasonable time (not to exceed three (3) hours), the permittee shall perform a Method 9 reading as soon as practicable to confirm that visible emissions are within the applicable limits of this permit;
- (5) If, after a period of six (6) months, no visible emissions are observed under the monthly testing required under 4.2.5(b)(1), the permittee may proceed thereafter on a quarterly testing schedule. If any visible emissions are observed during a quarterly test, the permittee must revert back to a monthly test until the conditions of 4.2.5(c)(5) are met again; and
- (6) If, at any time, plant personnel observe any sustained visible emissions (lasting longer than 6 minutes) from one of the emission points subject to the visible emissions testing under Table 4.2.5(a), the permittee shall conduct a Method 22 test on that emission point pursuant to the requirements of this section.

- c. For the purpose of demonstrating compliance with the visible emissions and opacity requirements, the permittee shall maintain records of the visible emission opacity tests and checks. The permittee shall maintain records of all monitoring data required by 4.2.6

documenting the date and time of each visible emission check, the emission point or equipment/ source identification number, the name or means of identification of the observer, the results of the check(s), whether the visible emissions are normal for the process, and, if applicable, all corrective measures taken or planned. The permittee shall also record the general weather conditions (i.e. sunny, approximately 80°F, 6-10 mph NE wind) during the visual emission check(s). Should a visible emission observation be required to be performed per the requirements specified in Method 9, the data records of each observation shall be maintained per the requirements of Method 9. For an emission unit out of service during the evaluation, the record of observation may note "out of service" (O/S) or equivalent; and

- d. Any deviation of the allowable visible emission requirement for any emission source discovered during observation using 40 CFR Part 60, Appendix A, Method 9 must be reported in writing to the Director of the DAQ as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

4.3. Performance Testing Requirements

4.3.1. General Performance Testing

At such reasonable time(s) as the Secretary may designate, in accordance with the provisions of 3.3 of this permit, the permittee shall conduct or have conducted test(s) to determine compliance with the emission limitations established in this permit and/or applicable regulations.

4.3.2. Specific Performance Testing

Specific performance testing shall be in accordance with the following:

- a. Within 180 days after production begins at the facility, the permittee shall conduct, or have conducted, in accordance with a protocol submitted pursuant to 3.3.1(c), performance tests on: (1) the Anode Process Line and (2) The Cathode 2 Process Line so as to verify the emission factors used to determine specific pollutant emission rates. This testing shall be done as given under (b) through (e) below;
- b. The testing on the Anode Process Line shall be done at emission point 1E-2 and will determine (1) the CO emitted per weight iron active and (2) the kg of VOC emitted per electrode;
- c. The testing on the Cathode 2 Process Line shall be done at a point after collection of vapors from the Mixing & Dip Tank but prior to the RTO and will determine (1) the lb-NO_x/OEE and (2) the lb-SO₂/OEE;
- d. If the values determined in the performance testing are above the emission factors used in Permit Application R13-3625 (0.14% CO/active weight carbon, 0.0048 kg-VOC emitted/electrode, 1.59 lb-NO_x/OEE, 0.60 lb-SO₂/OEE), the permittee *shall not be* considered in violation *unless* the emission factors, used in conjunction with the *actual* production values, cause emission levels *to exceed the limitations* given under Table 4.1.3(c). The permittee shall, however, if the results of the performance testing shows that the emission factors are too low, do the following:
 - (i) The permittee shall, within 60 days, submit to the DAQ an appropriate permit application to adjust the emission factors to, at a minimum, those levels as confirmed in the performance testing; and

- (ii) If necessary, the permittee shall limit production where necessary to guarantee that the emissions from the Anode and Cathode 2 Process Lines do not exceed the limitations given under Table 4.1.3(c) and document these emissions until such time as the permitted is updated pursuant to 4.3.2(i) above.
- e. If the testing location on the Cathode 2 Process Line is not practical, the permittee may petition the Director for an alternative location and procedure to conduct performance testing to determine the required values.

4.3.3. Performance Testing Schedule

With respect to the performance testing required above under Section 4.3.2, the permittee shall, after the initial performance test, periodically conduct additional performance testing on the specified sources according to the following schedule:

Table 4.3.3.: Performance Testing Schedule⁽¹⁾

Test	Test Results	Retesting Frequency
Initial Baseline	<50% of emission factor	Once/5 years
Initial Baseline	between 50% and 90 % of emission factor	Once/3 years
Initial Baseline	>90% of emission factor	Annual
Annual	after 2 successive tests indicate tested value <50% of emission factor	Once/5 years
Annual	after 1 successive tests indicate tested value <90% of emission factor	Once/3 years
Annual	any tests indicates a tested value >90% of emission factor	Annual
Once/3 years	After 1 successive tests indicate tested value <50% of emission factor	Once/5 years
Once/3 years	any tests indicates a tested value <90% of emission factor	Once/3 years
Once/3 years	any tests indicates a tested value >90% of emission factor	Annual
Once/5 years	any tests indicates a tested value <50% of emission factor	Once/5 years
Once/5 years	any test indicates tested value between 50% and 90% of emission factor	Once/3 years
Once/5 years	any test indicates a tested value >90% of emission factor	Annual

(1) Regardless of the schedule in this table, the permittee may petition the Director for a different schedule or removal of testing requirements for specific pollutants if consistent results or other data suggests that the emission factors are stable and accurate and that further testing or frequent testing is not necessary.

4.3.4. Cooling Tower

For the purposes of demonstrating initial and continuing compliance with the operational limits set forth in Table 4.1.5(a), the permittee shall, for all cooling towers, within 180 days of startup, take an initial grab sample of the cooling tower circulating water and analyze such to determine the total

solids content of the cooling tower circulating water. Thereafter, the permittee shall test for solids content on an annual basis (with no more than 14 months between tests).

4.3.5. **Performance Test Methods**

The permittee shall use appropriate EPA test methods as approved in a protocol submitted pursuant to 3.3.1(c)

4.4. Recordkeeping Requirements

4.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

4.5. Additional Reporting Requirements

4.5.1. The permittee shall submit the following information to the DAQ according to the specified schedules:

a. **Biannual Monitoring Information Submission**

The permittee shall submit reports of all required monitoring on or before September 15 for the reporting period January 1 to June 30 and March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified in such reports; and

b. **Certification of Compliance**

The permittee shall submit to the Director on or before March 15, a certification of compliance with all requirements of this permit for the previous calendar year ending on December 31. If, during the previous annual period, the permittee had been out of compliance with any part of this permit, it shall be noted along with the following information: 1) the source/equipment/process that was non-compliant and the specific requirement of this permit that was not met, 2) the date the permitted discovered that the source/ equipment/process was out of compliance, 3) the date the Director was notified, 4) the corrective measures to get the source/equipment/process back into compliance, and 5) the date the source began to operate in compliance. The submission of any non-compliance report shall give no enforcement action immunity to episodes of non-compliance contained therein.

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹ _____ Date _____
(please use blue ink) Responsible Official or Authorized Representative

Name and Title _____ Title _____
(please print or type) Name

Telephone No. _____ Fax No. _____

¹ This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (I) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
- b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
- c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of USEPA); or
- d. The designated representative delegated with such authority and approved in advance by the Director.



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Form Energy Clarification

1 message

Joyce Lish <JLish@trinityconsultants.com>
To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>

Wed, Oct 25, 2023 at 2:02 PM

Joe,

Carol confirmed with her engineering group that for the Cathode 2 process, the mix & dip tanks and tunnel are all enclosed and emissions sent through the RTO.

Joyce Lish

Trinity Consultants

4500 Brooktree Road, Suite 310

Wexford, PA 15090

Mobile: 412-737-6568



Kessler, Joseph R <joseph.r.kessler@wv.gov>

FW: R13-3625 Pre-Draft Permit - FORM ENERGY COMMENTS

1 message

George Mesing <GMesing@trinityconsultants.com>

Mon, Oct 23, 2023 at 1:52 PM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Carol Parnell <cparnell@formenergy.com>, Joyce Lish <JLish@trinityconsultants.com>, Michelle Ngo <mngo@formenergy.com>

Joe,

We received clarification on my previous email, 3)a.i. below – we still believe the 1,000 units per year is incorrect, but the 517,250 cells per year is correct (as provided in the application) since there is a scaling factor involved, there was some question on accuracy, but it is correct as is. No increase in emissions etc. there.

Sorry about that.

George

From: George Mesing**Sent:** Monday, October 23, 2023 12:49 PM**To:** Kessler, Joseph R <joseph.r.kessler@wv.gov>**Cc:** Carol Parnell <cparnell@formenergy.com>; Joyce Lish <JLish@trinityconsultants.com>; Michelle Ngo <mngo@formenergy.com>**Subject:** RE: R13-3625 Pre-Draft Permit - FORM ENERGY COMMENTS

Joe,

Below are Form Energy's comments to the pre-draft R13 permit R13-3625. After your review of the comments, can we set up a call to review these items?

We went through each section and identified items that appeared incorrect or that could potentially be changed at Form Energy's request.

Review of R13-3625 for Form Energy, Inc. (Weirton)

1. UTM coordinates on page 1 of 26 need revised: Northing is correct, but Easting should be 534800.
2. Table 1, Page 4 of 27, 3E-1 Design capacity should be 3 – 2,200 gallon IPA tanks.
3. Section 4 Source-Specific Requirements
 - a. Table 4.1.2 (Throughput Limits).

- i. Cell & Module Assembly – 1000 units per year is incorrect. We think the 1,000 may have come from cell D7 from the Assembly tab in the workbook. This value should be 5,172,500 units per year (the current spreadsheet has a missed zero in the value in cell D9 in the Assembly tab of the spreadsheet) but the 5,172,500 matches up with the number of anodes and cathodes produced per year. This correction does slightly increase VOC from Assembly from 0.1 tpy to 0.8 tpy VOC, but does not change any applicable requirements. If you are OK with this, we can provide a new facility-wide summary and revised Assembly values with an update.
- b. Section 4.1.3.b. – Suggest grammar edit: “VOC emissions produced by the use of the Lubricant in the Cathode 1 Process Line and the use of IPA and the Dip Mix Tank in the Cathode 2 Process Line shall be captured and sent to the appropriate RTO for ~~combustion~~ destruction as specified under Table 1.0 of this permit.
- c. Remove the footnote (1) in the Cathode 2 Process Line row in the “lbs/hr” and “tons/year” HAP columns of Table 4.1.3(c).
- d. Section 4.1.3.d.(4) regarding Mineral acids: Suggest adding a note to this condition that states: “Since Form Energy processes are Type ‘d’, as defined in 45-7-2., section 2.39.d, these (Form Energy) processes are not subject to Table 45-7B for Mineral acids.”
- e. Since the values in Table 4.1.4.b in Section 4.1.4 from the combustion units listed are very small, and well below the Stationary Source definition thresholds (in 45-13-2.2.24) of 6 pph, and 10 tpy, and 144 lbs/day, and including 2 pph and 5 tpy HAPs, these limits can be streamlined by replacing the pollutant limits with NG throughput restrictions based on design capacities of the units.

The Thermal Oxidizers 2S-2 and 3S-2 NG Throughput Restrictions (combust natural gas only)

Combustion Unit Source ID	Natural Gas Throughput Restriction (MMSCF/year)
Oven 1 (3S-3)	8.59
Oven 2 (3S-4)	34.4
Boilers (5S-5, 5S-6, and 5S-7)	155

- f. Similar to Table 4.1.4.b., since the emissions values in Table 4.1.6.a in Section 4.1.6 from the thermal oxidizers listed are very small, and well below the Stationary Source definition thresholds (in 45-13-2.2.24) of 6 pph, and 10 tpy, and 144 lbs/day, and including 2 pph and 5 tpy HAPs, these limits (i.e., CO, NO_x, PM, and SO₂) can be streamlined by replacing the pollutant limits with NG throughput restrictions (required to support the proper operation of the recuperative TO) based on design capacities of the units **(and firing PNG only)**.

Thermal Oxidizer Source ID	Natural Gas Throughput Restriction (MMSCF/year)
TO (2S-2)	68.7
TO (3S-2)	68.7

- g. Condition 4.1.6.d. states: " While **waste streams** are being sent to the thermal oxidizer for destruction from the Cathode 1 and Cathode 2 Process Lines, the units shall maintain a combustion chamber temperature of no less than 1,450 degrees Fahrenheit (788 degrees Celsius). An alternate minimum firebox..." – Form Energy suggests changing the words "waste streams" to "...process exhaust gases...".
- h. Condition 4.2.5.a: VE compliance demonstration and Table 4.2.6(a):
1. Remove 45CSR7 M22 monitoring from IPA tank (**3E-1**) as there is no potential for VE and Assembly area (**4E-1**) since there is no stack or exterior roof penetrations or any PM expected in this area.
- i. Condition 4.3.2: Table 4.3.2 shows initial and periodic testing required for two sources: i) Anode Process Line (Dust Collector) and ii) Cathode 2 Process Line (TO). For Anode Process Line, CO and VOC from 1E-1 are proposed, but this emissions point is a baghouse stack and should likely reference PM as pollutant at this stack. Alternatively, if target testing pollutants are CO and VOC as listed for Anode Process Line, then testing should be at one of the four electric ovens (1E-2) as there are no CO emissions from the Anode Process exhausting to the baghouse. Also, since there are four ovens, each with its own exhaust stack, the emissions limits in Table 4.1.3(c) should be divided by four (as the current value reflects emissions from all four (4) ovens. Similarly for Cathode 2 Process line, 3E-1 is the IPA tank and does not have any NOx or SO2 emissions associated with it. The Cathode 2 test should potentially be focused on 3E-2 (TO stack) and include VOC, CO, SO2, and HCl.

5) Regarding Table 4.3.2 (Performance Testing Requirements) for the testing units measurement, Form Energy recommends just testing for "lbs pollutant/hr", rather than the "lbs/unit" monitored.

6) In Table 4.1.2 (Throughput/Production Limits) and Table 4.2.3 (Facility Quantities) – Remove reference to "5kW".

7) Regarding performance testing and Table 4.3.3 (schedule) – this table is confusing. Form Energy proposes the following testing schedule:

- i) If initial baseline testing is less than 50% of weight emission standard, no further testing is required unless process is modified under Reg 13. Please clarify what is meant by "weight emission standard".
- ii) If initial baseline testing is between 50% and 80% of weight emission standard, re-testing is required once/5 years, or more frequent if the process is modified under Reg 13.
- iii) If initial baseline testing is greater than 80% of weight emission standard, re-testing is required once/3 years, or more frequent if process is modified under Reg 13.

Regards,

George

From: Kessler, Joseph R <joseph.r.kessler@wv.gov>
Sent: Thursday, October 19, 2023 9:55 AM
To: Carol Parnell <cparnell@formenergy.com>; Michelle Ngo <mngo@formenergy.com>; George Mesing <GMesing@trinityconsultants.com>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>
Subject: R13-3625 Pre-Draft Permit

Pursuant to our discussions, attached is a "Pre-Draft" version of the permit. This Pre-Draft version has not been reviewed or approved by my supervisor or the Director and is, therefore, subject to change. This version is being provided to facilitate discussions of permit structure, language, and operational flexibility only, and does not grant the applicant any authority to begin any work on the site beyond the scope granted by 45CSR13.

Please review and we can schedule a future meeting to discuss your questions and comments.

Thank You,

--

Joe Kessler, PE

Engineer

West Virginia Division of Air Quality

601-57th St., SE

Charleston, WV 25304

Phone: (304) 926-0499 x41271

Joseph.r.kessler@wv.gov



Kessler, Joseph R <joseph.r.kessler@wv.gov>

R13-3625 Pre-Draft Permit

1 message

Kessler, Joseph R <joseph.r.kessler@wv.gov>

Thu, Oct 19, 2023 at 9:54 AM

To: Carol Parnell <cparnell@formenergy.com>, Michelle Ngo <mngo@formenergy.com>, George Mesing <gmesing@trinityconsultants.com>

Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>

Pursuant to our discussions, attached is a "Pre-Draft" version of the permit. This Pre-Draft version has not been reviewed or approved by my supervisor or the Director and is, therefore, subject to change. This version is being provided to facilitate discussions of permit structure, language, and operational flexibility only, and does not grant the applicant any authority to begin any work on the site beyond the scope granted by 45CSR13.

Please review and we can schedule a future meeting to discuss your questions and comments.

Thank You,

--

Joe Kessler, PE

Engineer

West Virginia Division of Air Quality

601-57th St., SE

Charleston, WV 25304

Phone: (304) 926-0499 x41271

[Joseph.r.kessler@wv.gov](mailto:joseph.r.kessler@wv.gov)

 **3625 Pre-Draft.pdf**
293K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

R13-3625 Resubmitted Permit Application Status

1 message

Kessler, Joseph R <joseph.r.kessler@wv.gov>

Thu, Oct 19, 2023 at 9:29 AM

To: Carol Parnell <cparnell@formenergy.com>, George Mesing <gmesing@trinityconsultants.com>

Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>

Resubmitted Application Status: Complete**Form Energy, Inc.****Weirton Facility****Facility ID No. 029-00091****Application No. R13-3625**

Ms. Parnell,

Your resubmitted permit application (revised and updated) for the construction of an Iron-Air Battery Production Plant in Weirton, WV was received by the Division of Air Quality (DAQ) on October 19, 2023. Upon a review of the resubmitted permit application, it has been deemed complete as of that date. The reset ninety (90) day statutory time frame began on that day. However, it is important to note that, as discussed, a pre-draft permit has been completed and will be sent to you soon for your review.

Should you have any questions, please contact me at (304) 926-0499 ext. 41271 or reply to this email.

Thank You,

--

Joe Kessler, PE

Engineer

West Virginia Division of Air Quality

601-57th St., SE

Charleston, WV 25304

Phone: (304) 926-0499 x41271

[Joseph.r.kessler@wv.gov](mailto:joseph.r.kessler@wv.gov)



Kessler, Joseph R <joseph.r.kessler@wv.gov>

FORM ENERGY WEIRTON R13 APPLICATION FINAL REVISION

1 message

George Mesing <GMesing@trinityconsultants.com>

Thu, Oct 19, 2023 at 8:25 AM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Carol Parnell <cparnell@formenergy.com>, Michelle Ngo <mngo@formenergy.com>, Joyce Lish <JLish@trinityconsultants.com>

Joe,

Please find attached the revised R13 application for the Form Energy site in Weirton. This revision includes the updated facility-wide emissions page which reflects minor additions of natural gas combustion-generated HAPs. The emissions estimation workbook was provided via a separate email from me on Wednesday, October 18.

In response to your other notes we discussed:

- 1) Form Energy would like to receive and review a pre-draft of the R13 permit. In order to stay within the timeframe discussed for issuance of the permit, they will commit to getting comments back to the DEP, DAQ within one or two days of receiving the pre-draft permit. Form Energy also understands that the review of the pre-draft version will give us the opportunity to discuss questions and comments related to the details of the pre-draft permit.
- 2) "OEE" stands for oxygen evolution electrode. It is non-confidential terminology and in Form Energy's patents. No information disclosed in our application would reveal confidential information if we used the term.
- 3) Lastly, thanks for the heads-up with respect to the forthcoming email from the DAQ about the "timing" clock for review of the permit application - as we understand (now) that correspondence is part of standard permit issuance procedure at the DEP, DAQ.

Form Energy would like to acknowledge their thanks to the DAQ and you for your help in facilitating the issuance of this permit.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

www.linkedin.com/in/gmesingtrinityconsultants/



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2023-1018 Form Energy Application Revised Final Package_Redacted 101023 Securityb.pdf
9573K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Form Energy Emissions Calculations .xls

1 message

Matthew Caprarese <mcaprarese@formenergy.com>

Mon, Aug 14, 2023 at 5:03 PM

To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>, George Mesing <gmesing@trinityconsultants.com>, Ryan Camody <rcamody@formenergy.com>

Good Afternoon Joe,

Per your request, please see the attached Form Energy emissions calculations spreadsheet. We can review during your site visit or please otherwise let me know of any questions.

Please note that tab "Facility Wide Emissions" is the roll up that matches those emission summary totals shown in the application public notice. The other tabs show the supporting detail of controlled and uncontrolled emissions by process or emission unit type.

Thanks
Matt



Matthew E. Caprarese, P.E.
Sr. Engineering Manager, Factory
1725 Main Street
Weirton, WV 26062



N4227337 EMISSIONS .xlsx
562K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

FORM ENERGY WORKBOOK - FINAL DRAFT

1 message

George Mesing <GMesing@trinityconsultants.com>

Fri, Oct 6, 2023 at 3:17 PM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Carol Parnell <cparnell@formenergy.com>, Joyce Lish <JLish@trinityconsultants.com>, Michelle Ngo <mngo@formenergy.com>

Joe,

Thanks for your patience relative to Form Energy's revised emissions estimates. Please find attached the revised emissions calculations workbook.

The overall PTE has not changed much relative to Title V thresholds – that is, all pollutants still have a PTE under 100 tpy and 10/25 tpy HAPs. The site-wide PM is lower than presented in the July 2023 application due largely to cooling tower emissions re-calculations; and the HCl emissions are lower due to corrected and updated calculation methods.

Couple items to summarize the changes and the workbook in general:

1. The revised workbook does not contain any CBI.
2. As noted in the spreadsheet, and where relevant, the emissions are based on controlled emissions. Some sources remain uncontrolled.
3. Refer to Attachment N for description on calculation methods.
4. As previously discussed, the 10 small NG-fired ovens are now four (4) electric ovens, as reflected in the revised emissions, forms, PFD, etc.
5. In addition to Anode, Cathode 1, Cathode 2, Assembly, and Central Energy Plant (CEP), we've added IPA/VOC evaporative loss emissions from three (3) 2,200 gal storage tanks (from US EPA Tanks 4.09d (working and breathing losses) and for loading AP-42 Chapter 5.2.2. In both cases (i.e., tanks and loading) it does not really amount to much, but the math is there for your review.
6. Roadway emissions for paved roads and parking areas have been added.
7. Process flow diagrams are contained in the spreadsheet – with the only change being at Anode (for the transition from gas-fired to electric units).
8. Relative to Reg 7, we understand the operations to fall under Type 'd' (that is, "...operation in which materials of any origin undergo a chemical change, and this chemical change results in the emission of particulate matter to the atmosphere..." but we would like your interpretation of that, and on applicability of Table 45-7B for mineral acids (and HCl at 210 mg/m3).

If you have any questions on the spreadsheet, don't hesitate to contact Carol P or me.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

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 **2023-1006 Form Energy Weirton PTE EMISSIONS rev.xlsx**
800K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

RE: FORM ENERGY REVISED EMISSIONS - EMERGENCY GENERATOR & FACILITY-WIDE: REVISED R13 APP

1 message

George Mesing <GMesing@trinityconsultants.com>

Wed, Oct 18, 2023 at 8:56 AM

To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>

Cc: Joyce Lish <JLish@trinityconsultants.com>, Carol Parnell <cparnell@formenergy.com>

Joe,

Attached please find the updated emissions calculations:

- The generator emissions on the CEP tab were correctly based on 100 hrs/year. The Facility Wide Emissions tab has been corrected to reflect the 100 hrs/year also.
- We believe that the IPA unloading emissions are double-counted with the tank calculations (unloading fresh IPA from delivery truck to storage tank). I have deleted this line item from the Facility Wide Emissions Tab as well as the associated unloading tab. Similar to the emergency generator, and as you eluded to, the impact of these corrections on site wide emissions is to the right of the decimal place, that is, is of no consequence, particularly considering rounding and significant figures, etc., but in any case should be corrected.

Thank you,

George

From: Kessler, Joseph R <joseph.r.kessler@wv.gov>**Sent:** Tuesday, October 17, 2023 11:16 AM**To:** George Mesing <GMesing@trinityconsultants.com>**Subject:** Re: FORM ENERGY REVISED EMISSIONS - EMERGENCY GENERATOR & FACILITY-WIDE: REVISED R13 APP

George, sorry for the confusing e-mails. Your SO2 and HAP emission factors, and your annual emissions calculations, for the emergency generator are correct. I was confused about the conversion factor. So, the only remaining issue I have with the generator emissions is that the hourly emissions on the facility wide emissions tab should be based on 100 hrs and not 8760. That and some clarification on what the IPA loading emissions represent.

Thanks

Joe Kessler

On Mon, Oct 16, 2023 at 10:35 AM Kessler, Joseph R <joseph.r.kessler@wv.gov> wrote:

And a quick question, is the IPA Loading for IPA loaded into trucks? Is that after it was used? If it is for storage tank loading I think those emissions are part of the TANKs calculations.

Joe

On Fri, Oct 13, 2023 at 4:28 PM George Mesing <GMesing@trinityconsultants.com> wrote:

Joe,

As discussed, we fixed the NOx-nmHC emissions from the emergency generator, along with the HAPs. We also inserted this revised CEP sheet from the Excel workbook into the PDF file along with the facility-wide changes in emissions due to the E generator and boiler HAP metals – all very minor.

The revised Excel workbook and application are attached. Again, thanks for your patience and assistance in getting this complex application reviewed quickly.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

www.linkedin.com/in/gmesingtrinityconsultants/



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2023-1006 Form Energy Weirton PTE EMISSIONS rev03.1.xlsx
801K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

RE: FORM ENERGY WORKBOOK - FINAL DRAFT

1 message

George Mesing <GMesing@trinityconsultants.com>
To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>
Cc: Joyce Lish <JLish@trinityconsultants.com>

Tue, Oct 10, 2023 at 10:32 AM

Good catch, Joe. Not sure what happened there. Emissions are correct in Anode tab, but just got incorrectly carried forward.

I fixed. Anything else at the moment? See attached.

George

From: Kessler, Joseph R <joseph.r.kessler@wv.gov>
Sent: Tuesday, October 10, 2023 9:59 AM
To: George Mesing <GMesing@trinityconsultants.com>
Subject: Re: FORM ENERGY WORKBOOK - FINAL DRAFT

George, please check the emissions from the Anode Process, I'm not sure they made it correctly into the Facility Wide Emissions tab. The table has an entry for "Not" that I would think would be the Anode. And there is no CO or SO2 emissions listed as I would think there would be (or from the furnaces).

Thanks,

Joe Kessler

On Fri, Oct 6, 2023 at 3:17 PM George Mesing <GMesing@trinityconsultants.com> wrote:

Joe,

Thanks for your patience relative to Form Energy's revised emissions estimates. Please find attached the revised emissions calculations workbook.

The overall PTE has not changed much relative to Title V thresholds – that is, all pollutants still have a PTE under 100 tpy and 10/25 tpy HAPs. The site-wide PM is lower than presented in the July 2023 application due largely to cooling tower emissions re-calculations; and the HCl emissions are lower due to corrected and updated calculation methods.

Couple items to summarize the changes and the workbook in general:

1. The revised workbook does not contain any CBI.
2. As noted in the spreadsheet, and where relevant, the emissions are based on controlled emissions. Some sources remain uncontrolled.

3. Refer to Attachment N for description on calculation methods.
4. As previously discussed, the 10 small NG-fired ovens are now four (4) electric ovens, as reflected in the revised emissions, forms, PFD, etc.
5. In addition to Anode, Cathode 1, Cathode 2, Assembly, and Central Energy Plant (CEP), we've added IPA/VOC evaporative loss emissions from three (3) 2,200 gal storage tanks (from US EPA Tanks 4.09d (working and breathing losses) and for loading AP-42 Chapter 5.2.2. In both cases (i.e., tanks and loading) it does not really amount to much, but the math is there for your review.
6. Roadway emissions for paved roads and parking areas have been added.
7. Process flow diagrams are contained in the spreadsheet – with the only change being at Anode (for the transition from gas-fired to electric units).
8. Relative to Reg 7, we understand the operations to fall under Type 'd' (that is, "...operation in which materials of any origin undergo a chemical change, and this chemical change results in the emission of particulate matter to the atmosphere..." but we would like your interpretation of that, and on applicability of Table 45-7B for mineral acids (and HCl at 210 mg/m3).

If you have any questions on the spreadsheet, don't hesitate to contact Carol P or me.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

www.linkedin.com/in/gmesingtrinityconsultants/



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2023-1006 Form Energy Weirton PTE EMISSIONS rev02.xlsx
799K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

RESPONSE TO SPREADSHEET QUESTIONS - FORM ENERGY

1 message

George Mesing <GMesing@trinityconsultants.com>

Thu, Oct 12, 2023 at 3:45 PM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Joyce Lish <JLish@trinityconsultants.com>, Carol Parnell <cparnell@formenergy.com>

Joe,

In response to your questions today and Tuesday regarding minor edits:

1. NG total HAPs and metals from boilers,
2. Emergency generator emissions factors (CO and PM), and
3. Anode emissions (link to Summary tab).

Please find attached the revised spreadsheet that addresses these items.

Thanks again for your diligence. Call or email Carol or me with questions.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.comwww.linkedin.com/in/gmesingtrinityconsultants/

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2023-1006 Form Energy Weirton PTE EMISSIONS rev03.xlsx

801K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

FORM ENERGY REVISED EMISSIONS - EMERGENCY GENERATOR & FACILITY-WIDE: REVISED R13 APP

1 message

George Mesing <GMesing@trinityconsultants.com>

Fri, Oct 13, 2023 at 4:28 PM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Carol Parnell <cparnell@formenergy.com>, Joyce Lish <JLish@trinityconsultants.com>, Michelle Ngo <mngo@formenergy.com>

Joe,

As discussed, we fixed the NOx-nmHC emissions from the emergency generator, along with the HAPs. We also inserted this revised CEP sheet from the Excel workbook into the PDF file along with the facility-wide changes in emissions due to the E generator and boiler HAP metals – all very minor.

The revised Excel workbook and application are attached. Again, thanks for your patience and assistance in getting this complex application reviewed quickly.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

www.linkedin.com/in/gmesingtrinityconsultants/



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2 attachments

 **2023-1013 Form Energy Application Revised Final Package_Redacted 101023 Securityb.pdf**
9570K

 **2023-1006 Form Energy Weirton PTE EMISSIONS rev03.xlsx**
801K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

FORM ENERGY WEIRTON REVISED R13 PERMIT APPLICATION

1 message

George Mesing <GMesing@trinityconsultants.com>

Tue, Oct 10, 2023 at 3:20 PM

To: "Kessler, Joseph R" <Joseph.R.Kessler@wv.gov>

Cc: Carol Parnell <cparnell@formenergy.com>, Michelle Ngo <mngo@formenergy.com>, Joyce Lish <JLish@trinityconsultants.com>

Joe,

Please find attached a cover letter and complete R13 permit application package for Form Energy, Inc. in Weirton, Hancock County, West Virginia.

Following the cover letter, the Table of Contents is the same as the July 2023 application but as indicated, the red text identifies the Attachments that have been updated. Updated emissions are presented in Attachment N and the "live" emissions calculations were provided to you under separate email, October 6, 2023.

Thanks again for your assistance in quickly reviewing this application package.

Regards,

George

George E. Mesing

Managing Consultant

P 724.935.2611 x 112

M 724.709.1530

4500 Brooktree Road Suite 310, Wexford, PA 15090

Email: gmesing@trinityconsultants.com

www.linkedin.com/in/gmesingtrinityconsultants/



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2023-1009 Form Energy Application Revised Final Package_Redacted 101023 Security.pdf
9565K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

R13-3625 Permit Application Status

1 message

Kessler, Joseph R <joseph.r.kessler@wv.gov>
To: Matthew Caprarese <mcaprarese@formenergy.com>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>

Fri, Jul 28, 2023 at 7:59 AM

RE: Application Status: Complete**Form Energy, Inc.****Weirton Facility****Facility ID No. 029-00091****Application No. R13-3625**

Mr. Caprarese,

Your application for a modification permit was received by the Division of Air Quality (DAQ) on July 7, 2023 and assigned to the writer for review. Upon a review of the information submitted, the application has been deemed complete as of the date of this e-mail. The ninety (90) day statutory time frame began on that day.

This determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit determination.

Should you have any questions, please contact me at (304) 926-0499 ext. 41271 or reply to this email.

Thank You,

--

Joe Kessler, PE
Engineer
West Virginia Division of Air Quality
601-57th St., SE
Charleston, WV 25304
Phone: (304) 926-0499 x41271
Joseph.r.kessler@wv.gov



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Fwd: FORM ENERGY - PERMIT APP FEE

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov>
To: Joseph R Kessler <joseph.r.kessler@wv.gov>

Tue, Jul 18, 2023 at 7:44 AM

FYI: this has been entered into Airtrax.

----- Forwarded message -----

From: **Scott, Kimberly A** <kimberly.a.scott@wv.gov>

Date: Mon, Jul 17, 2023 at 4:24 PM

Subject: FORM ENERGY - PERMIT APP FEE

To: Stephanie R Mink <stephanie.r.mink@wv.gov>, Nicole D Ernest <nicole.d.ernest@wv.gov>

This is the receipt of payment for:

Form Energy - \$1000 credit card

R13-3625

ID: 029-00091

CR 2400003913

deposited 07/17/2023

****Please send to engineer****

--

Kim Scott

WV Dept. of Environmental Protection

Business Operations Office

Accounts Receivable

601 57th Street SE

Charleston, WV 25304

Email: Kimberly.A.Scott@wv.gov

Telephone: 304-926-0499 ext. 41950



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Fwd: receipt attached for R13-3625

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov>
To: Joseph R Kessler <joseph.r.kessler@wv.gov>

Wed, Jul 26, 2023 at 2:58 PM

Form Energy has paid the additional fee and it has been noted in Airtrax.

Thanks
Stephanie

----- Forwarded message -----

From: **Harless, Catherine L** <catherine.l.harless@wv.gov>
Date: Wed, Jul 26, 2023 at 2:47 PM
Subject: receipt attached for R13-3625
To: <RMCAPRARESE@formenergy.co>, Stephanie R Mink <Stephanie.R.Mink@wv.gov>, Megan E Grose <megan.e.grose@wv.gov>

--

Catherine.L.Harless@wv.gov



Catherine.L.Harless
Accounting Technician III
BTO - Fiscal Services
West Virginia Department of Environmental Protection



R13-3625_0001.pdf
150K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Fwd: FORM ENERGY - PERMIT APP FEE

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov>
To: Joseph R Kessler <joseph.r.kessler@wv.gov>

Tue, Jul 18, 2023 at 7:44 AM

FYI: this has been entered into Airtrax.

----- Forwarded message -----

From: **Scott, Kimberly A** <kimberly.a.scott@wv.gov>
Date: Mon, Jul 17, 2023 at 4:24 PM
Subject: FORM ENERGY - PERMIT APP FEE
To: Stephanie R Mink <stephanie.r.mink@wv.gov>, Nicole D Ernest <nicole.d.ernest@wv.gov>

This is the receipt of payment for:

Form Energy - \$1000 credit card

R13-3625
ID: 029-00091

CR 2400003913 deposited 07/17/2023

****Please send to engineer****

--
Kim Scott
WV Dept. of Environmental Protection
Business Operations Office
Accounts Receivable
[601 57th Street SE](#)
[Charleston, WV 25304](#)
Email: Kimberly.A.Scott@wv.gov
Telephone: 304-926-0499 ext. 41950

UC Defaulted Accounts Search Results

Sorry, no records matching your criteria were found.

FEIN:
Business name: FORM ENERGY, INC.
Doing business
as/Trading as:

Please use your browsers back button to try again.

WorkforceWV	Unemployment Compensation	Offices of the Insurance Commissioner
-----------------------------	---	---



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Re: Additional Permit Application Fee (NSPS Applicability)

1 message

Matthew Caprarese <mcaprarese@formenergy.com>

Wed, Jul 26, 2023 at 3:44 PM

To: "Kessler, Joseph R" <joseph.r.kessler@wv.gov>

Cc: Stephanie R Mink <stephanie.r.mink@wv.gov>, "Schweder, Lisa" <Lisa.Schweder@terracon.com>

Thank you Joe,

All (3) administrative items we discussed this morning have been addressed:

- 1) Please see attached redacted version with updated stamps on claimed confidential versions to include date
- 2) Hard copy CBI includes cover page and has been overnighted to DAQ
- 3) Additional \$1000 NSPS fee paid via credit card today

Please confirm receipt and let us know if you have any questions or need additional information.

We appreciate your help with our application process. Enjoy your upcoming vacation!

Thanks

Matt



Matthew E. Caprarese, P.E.
Sr. Engineering Manager, Factory
1725 Main Street
Weirton, WV 26062

On Wed, Jul 26, 2023 at 11:27 AM Kessler, Joseph R <joseph.r.kessler@wv.gov> wrote:

As per our phone discussion, and pursuant to §45-22-3.4(b), an additional \$1,000 permit application fee is required based on your proposed use of a 1,500kW diesel generator at the Weirton facility. This unit would be subject to 40 CFR 60, Subpart JJJJ and this NSPS applicable unit would trigger the additional fee.

Please call Stephanie Mink (304-926-0499 x41281) to arrangement payment.

Thank You,

--

Joe Kessler, PE

Engineer

West Virginia Division of Air Quality

601-57th St., SE

Charleston, WV 25304

Phone: (304) 926-0499 x41271

[Joseph.r.kessler@wv.gov](mailto:joseph.r.kessler@wv.gov)

 2023-07-26 Redacted Application Form Energy_FINAL2.pdf
24960K



Kessler, Joseph R <joseph.r.kessler@wv.gov>

Re: WV DAQ Permit Application Status for Form Energy, Inc.; Weirton

1 message

Matthew Caprarese <mcaprarese@formenergy.com>

Mon, Jul 24, 2023 at 2:43 PM

To: "Mink, Stephanie R" <stephanie.r.mink@wv.gov>

Cc: "shalily@formenergy.com" <shalily@formenergy.com>, Beverly D McKeone <beverly.d.mckeone@wv.gov>, Joseph R Kessler <joseph.r.kessler@wv.gov>, "Schweder, Lisa" <Lisa.Schweder@terracon.com>

Good Afternoon,

Please see the attached affidavit of July 21, 2023 publication of the Form Energy permit application notice in the Weirton Daily Times.

We believe this closes the remaining item for the administrative completeness review. Please let us know if any additional information is needed.

Thanks
Matt



Matthew E. Caprarese, P.E.
Sr. Engineering Manager, Factory
1725 Main Street
Weirton, WV 26062

On Mon, Jul 17, 2023 at 1:00 PM Matthew Caprarese <mcaprarese@formenergy.com> wrote:

Good Afternoon Stephanie,

Thanks for the status update on our application. Please see the updates in red type and a highlighted question below. We appreciate the WVDEP team's help!

Copy of Class I legal advertisement affidavit.

- **Question regarding timing:** Should the newspaper notice be scheduled after the draft permit is available or can it be published now? We will likely use the Weirton Daily Times. We do not want to hold the publication to hold up processing / development of the draft permit.

Hard Copy of Confidential Business Information

- **Certified Mail No. 7021 2720 0000 1799 8829** Tracking shows that the hard copy CBI package was delivered to the DAQ address provided on July 10, 2023 at 11:31 AM

Application fee of \$1,000.00.

- **The application fee was paid in full via credit card today.**

Thanks
Matt



Matthew E. Caprarese, P.E.
Sr. Engineering Manager, Factory
1725 Main Street
Weirton, WV 26062

On Mon, Jul 10, 2023 at 9:10 AM Mink, Stephanie R <stephanie.r.mink@wv.gov> wrote:

Application Status

Form Energy, Inc.; Weirton

Facility ID No. 029-00091

Application No. R13-3625

Dear Mr. Halily:

Your application for a Construction Permit for the Weirton facility was received by this division on July 7, 2023, and was assigned to Joe Kessler. The following items were not included in the initial application submittal:

Copy of Class I legal advertisement affidavit.

Hard Copy of Confidential Business Information

- *Please submit a hard copy of the Confidential Business Information to:*
WVDEP - DAQ - Permitting
ATTN: NSR Permitting Secretary
[601 57th Street, SE](#)
[Charleston, WV 25304](#)

Application fee of \$1,000.00.

- *Credit card payments may be made by contacting the Accounts Receivable section at 304-926-0499 x 41195. DEP accepts Visa and MasterCard only.*
- *Checks may be sent by mail. You must include the Facility ID Number and Application Number on the check as an identifier. A check may be mailed to:*
WVDEP - DAQ - Permitting
ATTN: NSR Permitting Secretary
[601 57th Street, SE](#)
[Charleston, WV 25304](#)

These items are necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive notification from Joe Kessler stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

Any determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit decision.

Should you have any questions, please contact the assigned engineer, Joe Kessler, at 304-926-0499, extension 41271.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281



2023.07.21 Form Energy column_affidavit.pdf

47K

PROOF OF PUBLICATION

Weirton Daily Times
114 Lee Ave.
(304) 748-0606

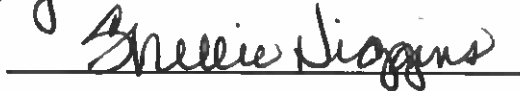
PUBLICATION FEE: \$37.93,

Perry Nardo who being duly sworn according to law, deposes and says that he is Regional Publisher of Weirton Daily Times a newspaper in the City of Weirton, State of West Virginia, hereby certify that the annexed publication was inserted in said newspaper on the following dates:

Weirton Daily Times:
21 Jul 2023



Sworn to and subscribed before me this 24th
day of July 2023



AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Form Energy, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for an Iron-Air Battery Manufacturing Facility located on 1725 Main Street in Weirton, in Hancock County, West Virginia 26062. The latitude and longitude coordinates are: 40.420222, 80.592611.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: Particulate Matter (PM) of 86.028 tpy, VOCs of 61.825 tpy, CO of 93.755 tpy, NOx of 28.749 tpy, SO2 of 10.518 tpy, Hazardous Air Pollutants (HAPs) of 0.004 tpy, and Lead of 0.00009 tpy.

Startup of operation is planned to begin on or about the First day of March 2024. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at

DEPAirQualityPermitting@WV.gov. Any questions regarding this permit application should be directed to the DAQ at

(304) 926-0499, extension 41281, during normal business hours.

Dated this the 18th day of July, 2023.

By:
Form Energy, Inc.
Soufiane Hality Vice President
1725 Main Street,
Weirton, WV 26062
WDT Jul 21, 2023



Kessler, Joseph R <joseph.r.kessler@wv.gov>

WV DAQ Permit Application Status for Form Energy, Inc.; Weirton

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov>

Mon, Jul 10, 2023 at 9:10 AM

To: "shalily@formenergy.com" <shalily@formenergy.com>, mcaprarese@formenergy.com

Cc: Beverly D McKeone <beverly.d.mckeone@wv.gov>, Joseph R Kessler <joseph.r.kessler@wv.gov>

Application Status**Form Energy, Inc.; Weirton****Facility ID No. 029-00091****Application No. R13-3625**

Dear Mr. Halily:

Your application for a Construction Permit for the Weirton facility was received by this division on July 7, 2023, and was assigned to Joe Kessler. The following items were not included in the initial application submittal:

Copy of Class I legal advertisement affidavit.**Hard Copy of Confidential Business Information**

- *Please submit a hard copy of the Confidential Business Information to:*
WVDEP - DAQ - Permitting
ATTN: NSR Permitting Secretary
[601 57th Street, SE](#)
[Charleston, WV 25304](#)

Application fee of \$1,000.00.

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WVDEP - DAQ - Permitting
ATTN: NSR Permitting Secretary
[601 57th Street, SE](#)
[Charleston, WV 25304](#)

These items are necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive notification from Joe Kessler stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

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Should you have any questions, please contact the assigned engineer, Joe Kessler, at 304-926-0499, extension 41271.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281