

**Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division for Air Quality
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601
(502) 564-3999**

**AIR QUALITY PERMIT
Issued under 401 KAR 52:040**

Permittee Name: Synthica Energy, LLC
Mailing Address: 13077 South Preston Hwy,
Lebanon Junction, KY 40150

Source Name: Synthica Energy, LLC
Mailing Address: 13077 South Preston Hwy
Lebanon Junction, KY 40150

Source Location: South Preston Hwy

Permit ID: S-23-002
Agency Interest #: 174163
Activity ID: APE20230001
Review Type: Minor Source, Construction / Operating
Source ID: 21-029-00092

Regional Office: Frankfort Regional Office
300 Sower Boulevard, 1st Floor
Frankfort, KY 40601
(502) 564-3358

County: Bullitt

Application
Complete Date: January 24, 2023
Issuance Date: March 31, 2023
Expiration Date: March 31, 2033

Rick Shewekah

**For Michael J. Kennedy, P.E.
Director
Division for Air Quality**

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Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action
S-23-002	Initial	APE20220001	1/24/2023	3/31/2023	Initial Construction Permit

SECTION A - PERMIT AUTHORIZATION

Pursuant to a duly submitted application the Kentucky Energy and Environment Cabinet (Cabinet) hereby authorizes the operation of the equipment described herein in accordance with the terms and conditions of this permit. This permit was issued under the provisions of Kentucky Revised Statutes (KRS) Chapter 224 and regulations promulgated pursuant thereto.

The permittee shall not construct, reconstruct, or modify any affected facilities without first submitting a complete application and receiving a permit for the planned activity from the permitting authority, except as provided in this permit or in 401 KAR 52:040, State-origin permits.

Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Cabinet or any other federal, state, or local agency.

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

recommended by the manufacturer and the time does not exceed the manufacturer's recommendations. [401 KAR 59:015, Section 4(2)(c)]

- c. Sulfur dioxide (SO₂) emissions shall not exceed 3.0 lb/MMBtu actual heat input. [401 KAR 59:015, Section 5(1)(a)1.]

Compliance Demonstration Method:

Compliance with the 401 KAR 59:015 PM, opacity, and SO₂ emission limitations shall be assumed while combusting natural gas.

3. Testing Requirements:

Testing shall be conducted at such times as may be requested by the Cabinet. [401 KAR 50:045, Section 1 and 401 KAR 59:005, Section 2(2)]

4. Monitoring Requirements:

The permittee shall monitor the amount of natural gas combusted (in MMscf) on a monthly basis. [401 KAR 52:040, Section 10 and 40 CFR 60.48c(g)(2)]

5. Recordkeeping Requirements:

- a. The permittee shall maintain records for a period of two years following the date of such record of the amount of natural gas combusted (in MMscf) on a monthly basis. [401 KAR 52:040, Section 10; 40 CFR 60.48c(g)(2); and 40 CFR 60.48c(i)]
- b. The permittee shall maintain records of the manufacturer's recommended procedures for startup and shutdown, any instance in which the recommended procedures were not followed, and any corrective action taken. [401 KAR 52:040, Section 10]

6. Reporting Requirements:

- a. The permittee shall submit notification of the date of construction and actual startup, as provided by 40 CFR 60.7. This notification shall include the design heat input capacity of the boiler identification of fuels to be combusted in the boiler. [40 CFR 60.48c(a) and 60.48c(a)(1)]
- b. See **Section C – General Conditions** for additional reporting requirements.

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- c. Particulate matter (PM) emissions shall not exceed the following: [401 KAR 59:010, Section 3(2) referencing Appendix A]

Process Weight Rate, P (tons/hr)	Maximum Allowable Emission Rate, E (lb/hr)
$P \leq 0.5$	2.34
$0.5 < P \leq 30$	$E = 3.59P^{0.62}$
$P > 30$	$E = 17.31P^{0.16}$

Compliance Demonstration Method:

Compliance with the applicable 401 KAR 59:010 PM emission limitation shall be assumed

- d. Hydrogen sulfide shall not exceed ten (10) grains per 100 dscf (165 ppm by volume) at zero percent oxygen except that sources whose combined process gas stream emission rate totals less than two (2) tons per day of hydrogen sulfide shall either reduce such emissions by eighty-five (85) percent or control such emissions such that hydrogen sulfide in the gas stream emitted into the ambient air does not exceed ten (10) grains per 100 dscf (165 ppm by volume) at zero percent oxygen. [401 KAR 59:105, Section 3]

Compliance Demonstration Method:

Compliance with the applicable 401 KAR 59:105 H₂S emission limitation shall be demonstrated according to **3. Testing Requirements a.**

- e. Persons responsible for a source from which hazardous matter or toxic substances may be emitted shall provide the utmost care and consideration, in the handling of these materials, to the potentially harmful effects of the emissions resulting from such activities. No owner or operator shall allow any affected facility to emit potentially hazardous matter or toxic substances in such quantities or duration as to be harmful to the health and welfare of humans, animals, and plants. Evaluation of such facilities as to adequacy of controls and/or procedures and emission potential will be made on an individual basis by the cabinet. [401 KAR 63:020, Section 3]

Compliance Demonstration Method:

Based upon the emission rates of toxics and hazardous air pollutants determined by the Cabinet using information provided in the application and supplemental information submitted by the source, the Cabinet determines the affected facility to be in compliance with 401 KAR 63:020.

3. Testing Requirements:

- a. The permittee shall conduct an initial performance test to determine the H₂S concentration (in ppmv) using U.S. EPA Reference Method 11, or an alternate method as approved by the Division, to establish an appropriate emission factor and determine compliance with the applicable 401 KAR 59:105 H₂S emission limitation. The initial performance test shall test the raw gas exiting the digester or an intermediate gas prior to H₂S removal. [401 KAR 50:055, Section 2(2)(a) and 401 KAR 59:105, Section 6]
 - 1) The performance tests shall be conducted within 60 days after achieving the maximum production rate at which the anaerobic digester and the process units which vent to the

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- flare will be operated, but not later than 180 days after the initial startup of the anaerobic digester and the associated process units. [401 KAR 50:055, Section 2(1)(a)]
- 2) The performance tests shall be conducted under normal conditions that are representative of normal operations and create the highest rate of emission. [401 KAR 50:45, Sections 5(1)]
 - 3) If the maximum gas processing rate represents the highest emission rate and the performance tests are conducted at less than the maximum processing rate, the unit shall be limited to a processing rate of no greater than 110 percent of the average processing rate during the performance tests. [401 KAR 50:45, Sections 5(2)]
 - 4) The sample shall be drawn from a point near the centroid of the gas line. The minimum sampling time shall be ten (10) minutes and the minimum sample volume shall be 0.01 dscm (0.35 dscf) for each sample. The arithmetic average of two (2) samples shall constitute one (1) run. Samples shall be taken at approximately one (1) hour intervals. [401 KAR 59:105, Section 6(1)]
- b. The permittee shall conduct subsequent performance test, as described in **3. Testing Requirements a.**, to determine compliance with the applicable 401 KAR 59:105 H₂S standard on an annual basis. If the permittee shows compliance for three consecutive years, the permittee may reduce testing to once every five years.
 - c. Testing shall be conducted at such times as may be requested by the Cabinet. [401 KAR 50:045, Section 1 and 401 KAR 59:005, Section 2(2)]
- 4. Monitoring Requirements:**
- a. The permittee shall perform a qualitative visual observation on a weekly basis of the opacity of emissions for no less than three (3) minutes at the stack while the flare is operating. If the flare is not in operation during any seven-day period, a qualitative visual observation shall be performed during the next period in which the flare is in operation. If visible emissions from the stack are observed (not including condensed water in the plume), the permittee shall determine the opacity using U.S. EPA Reference Method 9. In lieu of determining the opacity using U.S. EPA Reference Method 9, the permittee shall immediately perform a corrective action which results in no visible emissions (not including condensed water in the plume). [401 KAR 52:040, Section 10]
 - b. The permittee shall monitor the amount of biogas sent to the flare (in MMscf) and the amount of natural gas combusted (in MMscf) on a monthly basis. [401 KAR 52:040, Section 10]
- 5. Recordkeeping Requirements:**
- a. The permittee shall maintain a log of the qualitative visual observations including the date, time, initials of observer, whether any emissions were observed (yes/no), and any U.S. EPA Reference Method 9 readings taken. [401 KAR 52:040, Section 10]
 - b. The permittee shall maintain records of any maintenance performed on the flare, all times in which the flare is inoperable, and any steps taken to prevent process gases from venting to the ambient air. [401 KAR 52:040, Section 10]

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- c. The permittee shall maintain records of the amount of biogas sent to the flare (in MMscf) and the amount of natural gas combusted (in MMscf) on a monthly basis. [401 KAR 52:040, Section 10]
- d. The permittee shall maintain on file, and submit to the Division upon request, the manufacturer's specifications for the anaerobic digester, the emergency flare, and any ancillary equipment. [401 KAR 52:040, Section 10]

6. Reporting Requirements:

See **Section C – General Conditions** for general reporting requirements.

SECTION C - GENERAL CONDITIONS**1. Administrative Requirements**

- a. The permittee shall comply with all conditions of this permit. Noncompliance shall be a violation of 401 KAR 52:040, Section 3(1)(b), and is grounds for enforcement action including but not limited to the termination, revocation and reissuance, or revision of this permit.
- b. This permit shall remain in effect for a fixed term of ten (10) years following the original date of issuance. Permit expiration shall terminate the source's right to operate unless a timely and complete renewal application has been submitted to the Division at least six months prior to the expiration date of the permit. Upon a timely and complete submittal, the authorization to operate within the terms and conditions of this permit, including any permit shield, shall remain in effect beyond the expiration date, until the renewal permit is issued or denied by the Division. [401 KAR 52:040, Section 15]
- c. Any condition or portion of this permit which becomes suspended or is ruled invalid as a result of any legal or other action shall not invalidate any other portion or condition of this permit [Section 1a-11 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].
- d. Pursuant to materials incorporated by reference by 401 KAR 52:040, this permit may be revised, revoked, reopened, reissued, or terminated for cause. The filing of a request by the permittee for any permit revision, revocation, reissuance, or termination, or of a notification of a planned change or anticipated noncompliance shall not stay any permit condition [Section 1a-4, 5, of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].
- e. This permit does not convey property rights or exclusive privileges [Section 1a-8 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].
- f. Nothing in this permit shall alter or affect the liability of the permittee for any violation of applicable requirements prior to or at the time of permit issuance [401 KAR 52:040, Section 11(3)].
- g. This permit shall be subject to suspension at any time the permittee fails to pay all fees within 90 days after notification as specified in 401 KAR 50:038, Air emissions fee. The permittee shall submit an annual emissions certification pursuant to 401 KAR 52:040, Section 20.

2. Recordkeeping Requirements

- a. Records of all required monitoring data and support information, including calibrations, maintenance records, and original strip chart recordings, and copies of all reports required by the Division for Air Quality, shall be retained by the permittee for a period of at least five years and shall be made available for inspection upon request by any duly authorized representative of the Division for Air Quality [401 KAR 52:040, Section 3(1)(f), and Section 1b-IV-2 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

SECTION C - GENERAL CONDITIONS (CONTINUED)

- b. The permittee shall perform compliance certification and recordkeeping sufficient to assure compliance with the terms and conditions of the permit. Documents, including reports, shall be certified by a responsible official pursuant to 401 KAR 52:040, Section 21.

3. Reporting Requirements

- a. In accordance with the provisions of 401 KAR 50:055, Section 1, the permittee shall notify the Regional Office listed on the front of this permit concerning startups, shutdowns, or malfunctions as follows:
 - (1) When emissions during any planned shutdowns and ensuing startups will exceed the standards, notification shall be made no later than three (3) days before the planned shutdown, or immediately following the decision to shut down, if the shutdown is due to events which could not have been foreseen three (3) days before the shutdown.
 - (2) When emissions due to malfunctions, unplanned shutdowns and ensuing startups are or may be in excess of the standards, notification shall be made as promptly as possible by telephone (or other electronic media) and shall be submitted in writing upon request.
- b. The permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken shall be submitted to the Regional Office listed on the front of this permit. Where the underlying applicable requirement contains a definition of prompt or otherwise specifies a time frame for reporting deviations, that definition or time frame shall govern. Where the underlying applicable requirement does not identify a specific time frame for reporting deviations, prompt reporting, as required by Sections 1b-V, 3 and 4 of the *Cabinet Provisions and Procedures for Issuing State Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23 shall be defined as follows:
 - (1) For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in an applicable regulation) that continue for more than an hour in excess of permit requirements, the report must be made within 24 hours of the occurrence.
 - (2) For emissions of any regulated air pollutant, excluding those listed in C.3.a.(1), that continue for more than two hours in excess of permit requirements, the report must be made within 48 hours.
 - (3) All deviations from permit requirements, including those previously reported, shall be included in the semiannual report required C.3.d.
- c. The permittee shall furnish information requested by the Cabinet to determine if cause exists for modifying, revoking and reissuing, or terminating the permit; or to determine compliance with the permit [Section 1a-6 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].
- d. Summary reports of monitoring required by this permit shall be submitted to the Regional Office listed on the front of this permit at least every six (6) months during the life of this permit. For emission units that were still under construction, or which had not commenced operation at the end of the 6-month period covered by the report and are subject to monitoring requirements in this permit, the report shall indicate that no monitoring was performed during the previous six months because the emission unit was not in operation. The summary reports are due January 30th and July 30th of each year. All deviations from permit requirements shall be clearly identified in the reports. All reports shall be certified by a responsible

SECTION C - GENERAL CONDITIONS (CONTINUED)

official pursuant to 401 KAR 52:040, Section 21.

4. Inspections

In accordance with the requirements of 401 KAR 52:040, Section 3(1)(f), the permittee shall allow authorized representatives of the Cabinet to perform the following during reasonable times. Reasonable times are defined as during all hours of operation, during normal office hours, or during an emergency:

- a. Enter upon the premises to inspect any facility, equipment (including air pollution control equipment), practice, or operation.
- b. To access and copy any records required by the permit.
- c. Inspect, at reasonable times, any facilities, equipment (including monitoring and pollution control equipment), practices, or operations required by the permit.
- d. Sample or monitor, at reasonable times, substances or parameters to assure compliance with the permit or any applicable requirements.

5. Emergencies/Enforcement Provisions

- a. The permittee shall not use as defense in an enforcement action, the contention that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance [Section 1a-3 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].
- b. An emergency shall constitute an affirmative defense to an action brought for the noncompliance with the technology-based emission limitations if the permittee demonstrates through properly signed contemporaneous operating logs or relevant evidence that:
 - (1) An emergency occurred, and the permittee can identify the cause of the emergency;
 - (2) The permitted facility was at the time being properly operated;
 - (3) During an emergency, the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards or other requirements in the permit; and
 - (4) The permittee notified the Division as promptly as possible and submitted written notice of the emergency to the Division within two working days after the time when emission limitations were exceeded due to the emergency and included a description of the emergency, steps taken to mitigate emissions, and corrective actions taken.
- c. Emergency provisions listed in General Condition 5.b are in addition to any emergency or upset provision contained in an applicable requirement [401 KAR 52:040, Section 22(3)].
- d. In an enforcement proceeding, the permittee seeking to establish the occurrence of an emergency shall have the burden of proof [401 KAR 52:040, Section 22(2)].

SECTION C - GENERAL CONDITIONS (CONTINUED)**6. Compliance**

- a. Periodic testing or instrumental or non-instrumental monitoring, which may consist of recordkeeping, shall be performed to the extent necessary to yield reliable data for purposes of demonstration of continuing compliance with the conditions of this permit. For the purpose of demonstration of continuing compliance, the following guidelines shall be followed:
 - (1) Pursuant to 401 KAR 50:055, General compliance requirements, Section 2(5), all air pollution control equipment and all pollution control measures proposed by the application in response to which this permit is issued shall be in place, properly maintained, and in operation at any time an affected facility for which the equipment and measures are designed is operated, except as provided by 401 KAR 50:055, Section 1.
 - (2) All the air pollution control systems shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers. A log shall be kept of all routine and non-routine maintenance performed on each control device.
- b. Pursuant to 401 KAR 52:040, Section 19, the permittee shall certify compliance with the terms and conditions contained in this permit by January 30th of each year, by completing and returning a Compliance Certification Form (DEP 7007CC) (or an approved alternative) to the Regional Office listed on the front of this permit in accordance with the following requirements:
 - (1) Identification of the term or condition;
 - (2) Compliance status of each term or condition of the permit;
 - (3) Whether compliance was continuous or intermittent;
 - (4) The method used for determining the compliance status for the source, currently and over the reporting period, and
 - (5) For an emission unit that was still under construction, or which has not commenced operation at the end of the 12-month period covered by the annual compliance certification, the permittee shall indicate that the unit is under construction and that compliance with any applicable requirements will be demonstrated within the timeframes specified in the permit.
 - (6) The certification shall be submitted by January 30th of each year. Annual compliance certifications shall be sent to the Regional Office listed on the front of this permit
- c. Permit Shield - A permit shield shall not protect the owner or operator from enforcement actions for violating an applicable requirement prior to or at the time of permit issuance. Compliance with the conditions of this permit shall be considered compliance with all:
 - (1) Applicable requirements that are included and specifically identified in this permit; or
 - (2) Non-applicable requirements expressly identified in this permit [401 KAR 52:040, Section 11].

7. Construction Requirements:

Pursuant to a duly submitted application the Kentucky Division for Air Quality hereby authorizes the construction of the equipment described herein, emission units 01 and 02 in accordance with the terms and conditions of Permit S-23-002.

- a. Pursuant to 401 KAR 52:040, Section 12(3), unless construction is commenced on or before 18 months after the date of issuance of this permit, or if construction is commenced

SECTION C - GENERAL CONDITIONS (CONTINUED)

and then stopped for any consecutive period of 18 months or more, or is not completed within a reasonable timeframe, then the construction and operating authority granted by this permit for those affected facilities for which construction was not completed shall immediately become invalid. Upon a written request, the Cabinet may extend these time periods if the source shows good cause.

- b. Pursuant to 401 KAR 52:040, Section 12(4)(a), and 401 KAR 59:005, General provisions, Section 3(1), within 30 days following construction commencement, within 15 days following start-up and attainment of maximum production rate, or within 15 days following the issuance date of Permit S-23-002, whichever is later, the owner and/or operator of the affected facilities specified on this permit shall furnish to the Regional Office listed on the front of this permit, the following:
 - (1) Date when construction commenced.
 - (2) Start-up date of each of the affected facilities listed on this permit.
 - (3) Date when maximum production rate was achieved.

- c.
 - (1) Pursuant to 401 KAR 59:005, General provisions, Section 2(1), this permit shall allow time for the initial start-up, operation, performance testing, and compliance demonstration of the affected facilities listed herein. However, within 60 days after achieving the maximum production rate at which the affected facilities will be operated, but not later than 180 days after initial start-up of such facilities, the permittee shall conduct performance tests on the flare and furnish the Division's Frankfort office a written report of the results of such performance tests.
 - (2) Pursuant to 401 KAR 59:005, General provisions, Section 3(1)(b), unless notification and justification to the contrary are received by this Division, the date of achieving the maximum production rate at which the affected facilities will be operated shall be deemed to be 30 days after initial start-up.
 - (3) Pursuant to 401 KAR 50:045, Section 2, a source required to conduct a performance test shall submit a completed Compliance Test Protocol form, DEP form 6028, or a test protocol a source has developed for submission to other regulatory agencies, in a format approved by the cabinet, to the Division's Frankfort Central Office a minimum of sixty (60) days prior to the scheduled test date. Pursuant to 401 KAR 50:045, Section 7, the Division shall be notified of the actual test date at least Thirty (30) days prior to the test.
 - (4) Pursuant to 401 KAR 50:045, Section 5, in order to demonstrate that a source is capable of complying with a standard at all times, a performance test shall be conducted under normal conditions that are representative of the source's operations and create the highest rate of emissions. If [When] the maximum production rate represents a source's highest emissions rate and a performance test is conducted at less than the maximum production rate, a source shall be limited to a production rate of no greater than 110 percent of the average production rate during the performance tests. If and when the facility is capable of operation at the rate specified in the application, the source may retest to demonstrate compliance at the new production rate. The Division for Air Quality may waive this requirement on a case-by-case basis if the source demonstrates to the Division's satisfaction that the source is in compliance with all applicable requirements.

SECTION C - GENERAL CONDITIONS (CONTINUED)

- d. Pursuant to 401 KAR 50:055, Section 2(1)(a), an owner or operator of any affected facility subject to any standard within the administrative regulations of the Division for Air Quality shall demonstrate compliance with the applicable standard(s) within sixty (60) days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial start-up of such facility. Pursuant to 401 KAR 52:040, Section 12(4)(b), sources that have not demonstrated compliance within the timeframes prescribed in 401 KAR 50:055, Section 2(1)(a), shall operate the affected facility only for purposes of demonstrating compliance unless authorized under an approved compliance plan or an order of the cabinet.