

**COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Southwest Regional Office**

STATEMENT OF LEGAL AND FACTUAL BASIS

Buchanan Generation, LLC
Off State Route 2
One mile southwest of Marvin, Buchanan County, Virginia
Permit No. SWRO11390

In accordance with the Air Pollution Control Law of Virginia §10.1-1308 and §10.1-1322, the Environmental Protection Agency (EPA) Final Full Approval of the Operating Permits Program (Titles IV and V) published in the Federal Register December 4, 2001, Volume 66, Number 233, Rules and Regulations, Pages 62961-62967 and effective November 30, 2001, and Title 40, the Code of Federal Regulations §§72.1 through 76.16, the Commonwealth of Virginia Department of Environmental Quality issues this permit pursuant to 9 VAC 5 Chapter 80, Article 3 of the Virginia Regulations for the Control and Abatement of Air Pollution (Title V and Acid Rain Operating Permits).

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. The facility is also subject to the acid rain regulations at 9 VAC 5-80-360 through 9 VAC 5-80-700. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Buchanan Generation, LLC has applied for a renewal of the Title V Operating Permit for its peaking power plant. The Department has reviewed the application and prepared an Article 3 Federal Operating Permit.

Air Permit Writer: Mike Gregory Date: 4/29/2014
Mike Gregory
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Air Permit Manager: Rob Feagins Date: 4/29/2014
Rob Feagins

Regional Director: Allen J. Newman, P.E. Date: 4/29/2014
Allen J. Newman, P.E.

FACILITY INFORMATION

Permittee

Buchanan Generation, LLC
c/o FirstEnergy Inc
800 Cabin Hill Drive
Greensburg, PA 15601

Facility Location

Off State Route 2
One mile southwest of Marvin
Buchanan County, Virginia

Facility ID No. 51-027-0148

SOURCE DESCRIPTION

SIC Code: 4911 – Electric power generation

Buchanan Generation is a peaking electric power generation facility. It consists of two General Electric LM 6000PC SPRINT simple cycle gas turbine generator sets, using coal seam methane gas exclusively as a fuel. Each turbine has a maximum heat input of 424.6 MMBtu/hr, with a rated peak load of 50.58 MW output.

Air emissions from the facility include Particulate Matter (PM, includes PM-10), Volatile Organic Compounds (VOC), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO₂), and Carbon Monoxide (CO) from the combustion turbines, and trace amounts of Hazardous Air Pollutants (HAP) from the combustion turbines.

The facility began operation in 2002 and is considered a Title V major source because potential emissions of NO_x and CO are above the major source threshold. This facility is located in an attainment area for all pollutants. This current permit action is for renewal of the Title V permit.

COMPLIANCE STATUS

The facility is inspected at least once every other year. Previous inspections have found the facility operating in compliance. According to the application, the facility is in compliance with all applicable requirements.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity	Pollution Control Device (PCD) Description	PCD ID	Pollutant(s) Controlled
1	S001	General Electric Model LM 6000PC SPRINT combustion turbine	424.6 MMBtu/hr	Water injection	WI01	NO _x
2	S002	General Electric Model LM 6000PC SPRINT combustion turbine	424.6 MMBtu/hr	Water injection	WI02	NO _x

EMISSIONS INVENTORY

A copy of the 2013 permit application emission inventory is included in the application. Emissions are summarized in the following table:

2012 Actual Emissions	Criteria Pollutant Emission in Tons/Year			
	VOC, PM-10, SO ₂ not reported	CO	CO ₂	NO _x
Total	-	3.1	12,276	8.8

EMISSION UNIT APPLICABLE REQUIREMENTS

Combustion Turbines (1 and 2)

Limitations

Facility limitations from the state major NSR permit issued January 31, 2002 and amended September 3, 2002, November 14, 2002 and September 26, 2003.

3. The permittee shall meet all the applicable requirements of 40 CFR 60, Subpart GG Standards of Performance for Stationary Gas Turbines.
 (9 VAC 5-50-410)

4. Sulfur dioxide and particulate matter (PM) emissions from each combustion turbine shall be controlled by the use of coal seam methane gas fuel, similar to pipeline quality natural gas, with maximum sulfur content not to exceed 0.8 percent by weight. The annual average sulfur content of the coal seam methane gas fuel shall not exceed 0.5 grains per 100 dry standard cubic feet per year, calculated monthly as the average of each consecutive 12 month period.
 (9 VAC 5-80-1180, 9 VAC 5-50-20, 9 VAC 5-50-260 and 9 VAC 5-50-410)

5. Nitrogen oxide (NO_x) emissions from each combustion turbine shall be controlled by the use of water injection. When fuel is fired in a combustion turbine, water shall be injected into the combustion turbine to control nitrogen oxide emissions. The rate of water injection shall be sufficient to meet the emissions standards set forth in this permit.
 (9 VAC 5-80-1180 and 9 VAC 5-50-260)

7. Carbon monoxide (CO), volatile organic compounds (VOC), PM and formaldehyde emissions from each combustion turbine shall be minimized by the use of good combustion operating practices.
 (9 VAC 5-50-260)

8. The permitted facility shall be constructed so as to allow for emissions testing and monitoring upon reasonable notice at any time, using appropriate methods. Test ports shall be provided at the appropriate locations.

(9 VAC 5-50-30)

9. The approved fuel for the combustion turbines is coal seam methane gas. A change in the fuel may require a permit to modify and operate.

(9 VAC 5-50-260)

10. The two General Electric LM 6000PC SPRINT gas turbine generator sets shall not operate more than a combined total of 13,400 unit operating hours per year, calculated monthly as the sum of each consecutive 12-month period. The combustion turbines shall consume no more than 5,759 million standard cubic feet (MMSCF) of coal seam methane gas per year, calculated monthly as the sum of each consecutive 12-month period.

(9 VAC 5-170-160)

14. Emissions from the operation of the two (2) combustion turbines shall not exceed the limits specified below:

	(each at base/peak load)	(combined total)
	lb/hr	tons/yr
Particulate Matter	3.0	20.1
PM-10	3.0	20.1
Nitrogen Oxides (as NO ₂)	(25 ppmvd*) 39.0	247.9
Carbon Monoxide	51.0	120.6
Volatile Organic Compounds	4.0	8.2
Sulfur Dioxide	2.5	16.8
Regulated Toxic Pollutants (as VOC)		
Formaldehyde	1.1	7.4

*(ppm by volume, one hour average at 15% oxygen as a dry sample and at ambient pressure, as measured per EPA Methods 7E and 10 of 40 CFR 60 Appendix A)

The approved methods for determining compliance with this condition include compliance with conditions 3, 4, 5, 6, 7, 9 and 10; or DEQ-approved source emission

tests. DEQ reserves the authority to require source emission tests for any regulated air pollutant.

(9 VAC 5-50-180, 9 VAC 5-50-260 and 9 VAC 5-50-410)

15. Emissions of nitrogen oxides from the operation of each combustion turbine shall not exceed 121.9 ppmvd as a one hour average at 15% oxygen, adjusted to International Standards Organization (ISO) standard ambient conditions in accordance with Subpart GG of the NSPS and Condition 15 of the state major NSR permit listed above. The permittee shall provide hourly average records of the ambient temperature, ambient humidity, and combustor inlet pressure so that the NO_x emissions data can be corrected to ISO standard ambient conditions, upon the request of the DEQ, in order to demonstrate compliance with this emission standard. The permittee shall expeditiously repair or replace ambient monitoring instrumentation in the event of instrument malfunction. In the event of malfunction, equivalent data may be provided from local representative meteorological sources.

(9 VAC 5-170-160, 9 VAC 5-50-50, and 9 VAC 5-50-410)

16. Visible emissions from each combustion turbine exhaust stack shall not exceed ten (10) percent opacity as determined by EPA Method 9 (Reference 40 CFR 60, Appendix A). This condition applies at all times except during start-up, shut-down or malfunction.

(9 VAC 5-50-260)

17. Excess emissions from startup, shutdown or malfunction may be permitted, if best operational practices are followed, and if at all times the permittee maintains and operates, to the extent practicable, the affected facility, including associated air pollution equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Allowable episodes of excess emissions from startup, shutdown or malfunction shall in no case exceed 1.0 hour in any 24-hour period, unless specifically authorized by DEQ for longer duration. Excess emissions from startup and shutdown shall be included in total annual facility emissions as determined from data from continuous monitoring systems.

(9 VAC 5-50-260)

Facility limitation requirements from 40 CFR 60 Subpart GG have been incorporated in the requirements from the state major NSR permit listed above.

Facility limitation requirements from 40 CFR 60 Subpart A:

40 CFR 60.11(a)

(a) Compliance with standards in this part, other than opacity standards, shall be determined in accordance with performance tests established by §60.8, unless otherwise specified in the applicable standard.

40 CFR 60.11(b)

(b) Compliance with opacity standards in this part shall be determined by conducting observations in accordance with Reference Method 9 in appendix A of this part, any alternative method that is approved by the Administrator, or as provided in paragraph (e)(5) of this section.

40 CFR 60.11(c)

(c) The opacity standards set forth in this part shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard.

40 CFR 60.11(d)

(d) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator who may include, but is not limited to, monitoring results, and opacity observations, review of operating and maintenance procedures, and inspection of the source.

40 CFR 60.12 Circumvention

No owner or operator subject to the provisions of this part shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission, which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.

Monitoring

Facility monitoring requirements from the state major NSR permit issued January 31, 2002 (as amended September 3, 2002, November 14, 2002, and September 26, 2003.

6. Continuous monitoring systems (CEMS) shall be installed, operated and maintained to monitor and record emissions of nitrogen oxides (measured as NO₂), as ppmvd corrected to 15% O₂, from the combustion turbines. The CEMS shall be installed, calibrated, maintained, audited and operated in accordance with the requirements of 40 CFR 75. (9 VAC 5-50-20, 9 VAC 5-50-40, 9 VAC 5-50-50 and 9 VAC 5-80-420).

11. Continuous monitoring systems shall be installed and operated to monitor and record the fuel consumption in each turbine. These monitoring systems shall be operated at all times and shall be accurate to within ± 5.0 percent. The systems shall be maintained and calibrated in accordance with manufacturer's specifications. As a minimum, the monitoring systems shall be inspected at least annually. The permittee shall maintain the

records of fuel consumption at the site. These records shall be kept on file for the most current five year period and available for inspection by DEQ personnel.
(9 VAC 5-50-20, 9 VAC 5-50-40, and 9 VAC 5-50-50)

12. All continuous monitoring systems shall be installed and operational prior to conducting initial performance tests. One copy of the calibration reports of all the systems shall be submitted to the Director, Southwest Regional office within 45 days after the completion of the evaluations. Verification of operational status shall, as a minimum, include installation, operation and calibration of each device.
(9 VAC 5-50-40 and 9 VAC 5-50-50)

18. The permittee shall monitor the sulfur content of the coal seam methane gas being fired in the combustion turbines, in accordance with Subpart GG of the NSPS and subsection a. below. The permittee shall comply with the custom fuel sulfur monitoring schedule contained in subsections b. and c. of this condition. The permittee may submit subsequent custom fuel sampling schedules through the DEQ for EPA approval. The permittee shall maintain records certifying the sulfur content of the gas.

- a. Analysis for the sulfur content of the coal seam methane gas shall be conducted as referenced in 40 CFR 60.334(b)(2), using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels or an approved alternative method. The approved reference methods are: ASTM D1072-80, D3031-81, D4084-82, or D3246-81. Fuel vendor analyses by these methods may be used.
- b. Monitoring for the sulfur content of the fuel shall be conducted at least once per quarter.
- c. Should any sulfur analysis required in paragraph b. above indicate noncompliance, the permittee shall notify the Director, Southwest Regional Office. Sulfur monitoring shall be conducted each day the turbines operate during an interim period when this custom schedule is being reexamined due to noncompliance, and those results may be submitted to show compliance.
- d. If there is a change in fuel supply, the permittee must notify the Director, Southwest Regional Office of such change for reexamination of this custom schedule. A change in fuel quality may be deemed a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being reexamined.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five (5) years.
(9 VAC 5-170-160 and 9 VAC 5-50-410)

Facility monitoring requirements, including at a minimum, those from 40 CFR 60 Subpart GG, are incorporated in the state major NSR permit listed above. Requirements for monitoring the sulfur content of the fuel from condition 18 of the NSR permit, have been inserted in the Title V permit in a manner reflecting the facility's current quarterly monitoring frequency, based on previous periods of monitoring demonstrating compliance at higher frequencies.

The operating permit will contain conditions requiring the permittee to conduct monitoring in accordance with 40 CFR 70.6(a)(3)(i). The emission limitations for NO_x are exempt from Compliance Assurance Monitoring (CAM) requirements of 40 CFR 64, as they are evaluated by a CEMS which qualifies as a continuous compliance determination method.

The permit contains a requirement for performing a visible emissions evaluation (VEE) on each combustion turbine stack each time a Relative Accuracy Test Audit (RATA) is performed on the continuous emissions monitoring systems. The VEE shall be performed in accordance with 40 CFR, Part 60, Appendix A, Method 9, and shall consist of 10 sets of 24 consecutive observations (at 15 second intervals) to yield 6 minute averages. A copy of the test result shall be submitted to the Director, Southwest Regional Office within 45 days after test completion. This will satisfy the periodic monitoring requirement for the visible emission limitation included in the permit.

Recordkeeping

Facility recordkeeping requirements are included below from condition 19 of the state major NSR permit issued January 31, 2002 and amended September 3 and November 14, 2002, and September 26, 2003. Facility recordkeeping requirements from 40 CFR 60 Subpart GG are incorporated in these requirements. The Title V permit includes, but is not limited to the following requirements:

19. The permittee shall maintain records of all emission data and operating parameters for the gas turbine generator sets necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Director, Southwest Regional Office. These records shall include, but are not limited to:
 - a. The combined fuel consumption of the two combustion turbines, calculated monthly as the sum of each consecutive 12-month period,
 - b. The number of combined annual unit operating hours, calculated monthly as the sum of each consecutive 12-month period,
 - c. All the fuel analysis reports for sulfur content in accordance with Condition 18, and
 - d. Annual NO_x emission reports, calculated daily as the sum of each consecutive 365-day period.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent 5 years.

(9 VAC 5-50-50)

Facility recordkeeping requirements also include conditions 24 and 25 of the state major NSR permit issued January 31, 2002, and amended September 3 and November 14, 2002, and September 26, 2003:

24. In order to minimize the duration and frequency of excess emissions due to malfunctions of process equipment or air pollution control equipment, the permittee shall:

- a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance. These records shall be maintained on site for a period of 5 years and shall be made available to DEQ personnel upon request, and
- b. Maintain an inventory of spare parts that are needed to minimize durations of air pollution control equipment breakdowns.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five (5) years.

(9 VAC 5-50-20 E and 9 VAC 5-170-160)

25. The permittee shall have available written operating procedures for the related air pollution control equipment. Operators shall be trained in the proper operation of all such equipment and shall be familiar with the written operating procedures. The permittee shall maintain records of training provided, including names of trainees, date of training and nature of training.

(9 VAC 5-170-160)

Testing

A table of test methods has been included in the permit for any additional testing that may be performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

Facility reporting requirements from the state major NSR permit issued January 31, 2002 and amended September 3 and November 14, 2002, and September 26, 2003:

13. Quarterly reports of excess emissions shall be submitted to the Director, Southwest Regional Office in accordance with 40 CFR Part 60, Section 7(c). The report shall be postmarked by the 30th day following the end of the calendar quarter. In addition to the information required by 40 CFR Part 60, Section 7(c), each report shall include the average fuel consumption, ambient conditions, and gas turbine load during the period of

excess emissions. For the purpose of this report, periods of excess emissions are defined as follows:

- a. Any one hour period (excluding the 1 hour allowance during a 24-hour period for startup, shutdown, or malfunction) during which the continuous emission monitoring system, exceeds the nitrogen oxide ppmvd limits specified in Condition 14.
- b. Any period during which the sulfur content of the coal seam methane gas being fired in the gas turbines exceeds 0.8 percent by weight.
- c. Operating hours when monitoring data is not available.
(9 VAC 5-170-160, 9 VAC 5-50-20, 9 VAC 5-50-50 and 9 VAC 5-50-410)

Facility reporting requirements from 40 CFR 60 Subpart GG have been incorporated in the requirements from the state major NSR permit listed above.

In addition to the information included in the semi-annual monitoring report required by the Recordkeeping and Reporting section in the General Conditions of the Title V permit, the semi-annual monitoring report shall also include the following:

- a. Summary information on the number, duration and cause (including unknown cause, if applicable) of excursions or exceedances, as applicable, and the corrective actions taken; and
- b. Summary information on the number, duration and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable).

Clean Air Interstate Rule (CAIR) and NO_x Budget Trading Permit Requirements

The facility is subject to Federal CAIR regulations and the Title V permit includes the CAIR General Condition Requirements to address the same. The Title V permit also contains NO_x Budget emission limitations under 9 VAC 5-140-40, and this section represents the NO_x Budget Trading permit required by 9 VAC 5-140-200 A.

Greenhouse Gas (GHG) Requirements

Title V Greenhouse Gas Tailoring Rule, Phase 1, currently 40 CFR Parts 51, 52, 70 and 71, do not apply to the facility, as it is an existing source not currently subject to PSD for any pollutant. The facility identified that it is major for GHGs, however there are no applicable GHG permitting requirements.

Streamlined Requirements

There are no streamlined requirements.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. The acid rain operating permit regulations are combined with the Title V operating permit regulations for an acid rain facility. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions.

Comments on General Conditions

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §§2.1-20.01:2 and §§10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement NO. 3-2001”.

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excesses emissions reporting within 4 hours. Section 9 VAC 5-80-650 also requires malfunction reporting; however, reporting is required within 2 days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to this section including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations and 9 VAC 5-80-650 is from the acid rain operating permit regulations. This facility is subject to both 9 VAC 5-20-180 and 9 VAC 5-80-650. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-650. The report must be made within 4 daytime business hours of the malfunction.

U. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in section 9 VAC 5-80-650 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation see the comments on General Condition F.

STATE-ONLY APPLICABLE REQUIREMENTS

No state-only applicable requirements are applicable in this case.

FUTURE APPLICABLE REQUIREMENTS

Buchanan Generation did not identify any future applicable requirements in their application, and DEQ is unaware of any future requirements that may apply during the life of the Title V permit. Therefore, no future applicable requirements have been included in the permit.

INAPPLICABLE REQUIREMENTS

The proposed National Emission Standards for Hazardous Air Pollutants Subpart YYYYY for Stationary Combustion Turbines does not apply since the facility is not a major source of hazardous air pollutants and the combustion turbines are not new sources under the Subpart.

The startup, shut down, and malfunction opacity exclusion listed in 9 VAC 5-40-20 A 4 cannot be included in any Title V permit. This portion of the regulation is not part of the federally approved state implementation plan. The opacity standard applies to existing sources at all times including startup, shutdown, and malfunction. Opacity exceedances during malfunction can be affirmatively defended provided all requirements of the affirmative defense section of this permit are met. Opacity exceedances during startup and shut down will be reviewed with enforcement discretion using the requirements of 9 VAC 5-40-20 E, which state, "At all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions."

COMPLIANCE PLAN

Buchanan Generation is currently in compliance with all applicable requirements. No compliance plan was required in the application.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-490.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation (9 VAC)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
T1	Unit 1 - Turbine Lube Oil Tank	5-80-720 C.3.	VOC	200 gal
T2	Unit 1 - Generator Lube Oil Tank	5-80-720 C.3.	VOC	500 gal
T3	Unit 1 - Hydraulic	5-80-720 C.3.	VOC	50 gal

Emission Unit No.	Emission Unit Description	Citation (9 VAC)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
	Oil Tank			
T4	Unit 2 - Turbine Lube Oil Tank	5-80-720 C.3.	VOC	200 gal
T5	Unit 2 - Generator Lube Oil Tank	5-80-720 C.3.	VOC	500 gal
T6	Unit 2 - Hydraulic Oil Tank	5-80-720 C.3.	VOC	50 gal
T7	Oil/Water Separator - Waste Oil Tank	5-80-720 C.3.	VOC	150 gal
T8	Oil/Water Separator	5-80-720 B.2.	VOC	15,000 gal/hr
T9	Oil/Water Separator	5-80-720 B.2.	VOC	15,000 gal/hr

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice regarding the draft permit was placed in *The Virginia Mountaineer* newspaper in Grundy, Virginia on February 6, 2014. EPA was sent a copy of the draft permit and notified of the public notice. The affected states, including West Virginia, Kentucky and Tennessee, were sent a copy of the public notice. All persons on the Title V mailing list were sent a copy of the public notice by e-mail, fax or letter. The public notice ended on March 10, 2014. Comments were received by email from Catherine Jewell on March 2 and 3, 2014. DEQ responded by email on March 13, 2014, and no changes in the draft/ proposed permit are proposed.