

Facility DEC ID: 9291100096

**PERMIT
Under the Environmental Conservation Law (ECL)**

IDENTIFICATION INFORMATION

Permit Type: Air State Facility
 Permit ID: 9-2911-00096/00005
 Effective Date: 01/17/2014 Expiration Date: 01/16/2024

Permit Issued To: LINDE INC
 10 RIVERVIEW DR
 DANBURY, CT 06810

Contact: Steve Cristiano
 Linde Inc
 4501 Royal Ave
 Niagara Falls, NY 14304
 (716) 286-4600

Facility: PRAXAIR INC
 4501 ROYAL AVE
 NIAGARA FALLS, NY 14303

Description:

Project Description

Praxair Inc. plans to construct, own and operate a Steam Methane Reformer (SMR) Plant to produce gaseous hydrogen within their facility located in Niagara Falls, New York. The new SMR Plant will produce gaseous hydrogen from natural gas feedstock by the steam methane reforming (SMR) process. The purpose is to provide gaseous hydrogen to the two existing Hydrogen Liquefaction Plants currently located at this facility.

Facility Description

The existing Facility includes two Liquefaction Plants that obtain gaseous hydrogen from two neighboring Facilities. In addition the Facility also produces oxygen, nitrogen and argon from two air separation units. A nitrogen pipeline supplies nitrogen to customers off-site. It should be noted that these existing facilities are exempt from permitting under various permit exemption and listed trivial activities as listed in 6NYCRR Part 201-3.2(c) and 3.3(c) and most notably trivial exemption 6NYCRR Part 201-3.3(c)(94) Emissions of water vapor, oxygen, nitrogen, inert gases such as argon, helium, neon, krypton and xenon, hydrogen, ethane, and trace constituents included in raw materials where the constituents are less than 1 percent by weight for any regulated air pollutant, or 0.1 percent by weight for any carcinogen listed by the United States Department of Health and Human Services' Twelfth Annual Report on Carcinogens.

The proposed SMR Plant will serve as a new source of hydrogen gas to the two existing Hydrogen Liquefaction Plants.

The new Steam Methane Reformer (SMR) will produce gaseous hydrogen from natural gas feedstock. The purpose is to provide gaseous hydrogen to two existing Hydrogen Liquefaction Plants currently located at this Facility. Emissions from the new SMR Plant will be generated from the following sources: Steam Methane Reformer (SMR), Shift Reactor, Deaerator, Steam Drum and Pressure Swing Adsorption (PSA) Purification Unit. These emissions are vented through five emission points including the SMR Vent, Deaerator Vent, Blowdown Vent, Steam

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Vent and Process Vent. There are also some fugitive emissions associated with this process. The main contaminants emitted include CO and NOx.

In preparation of this permit application the following regulations were reviewed and determined not applicable to the new SMR Plant.

(A) New Source Performance Standards (NSPS) – 40 CFR Part 60 Subpart Dc-Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units between 10-100 MMBTU is not applicable to the SMR because it is a process heater and not a steam generating unit as per the definitions in 40 CFR Part 60.41(c).

“Steam generating unit means a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart.”

“Process heater means a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.”

In the SMR indirect heating is used to promote a chemical reaction of the natural gas feedstock and process steam in the presence of a catalyst to form CO₂, CO, CH₄, H₂ and N₂. Steam is produced as a byproduct of reformer heating, but that is not the main purpose of the reformer.

Therefore, the SMR is a process heater and not subject to NSPS Subpart Dc.

Also note that other NSPS Subparts D, Da and Db are not applicable because the SMR has a heat input less than 100 MMBTU/hr.

(B) National Emission Standards for Hazardous Air Pollutants (NESHAP) – 60 CFR 63 Subpart VVVVVV, Chemical Manufacturing Area Source Rule (CMAS)

A request for an Applicability Determination was submitted by Air Products on December 4, 2012 to the Air Enforcement and Compliance Assurance Branch of the United States Environmental Protection Agency’s (EPA) Region 5 Office to determine whether the CMAS rule applies to the catalyst loading and unloading activities at the SMR facilities.

The Request was submitted to EPA because hydrogen formation in SMR facilities is promoted through the use of metal bearing catalysts during reforming and shift reactions. The catalysts may contain chromium and nickel which could potentially be released during catalyst loading and unloading activities at SMR facilities.

In response EPA issued a letter on June 24, 2013 which clarifies that the CMAS rule does not apply to SMR facilities during catalyst change out activities. EPA deemed that during catalyst change out the unit would be out of service and would not meet the rule requirements for HAPs use or generation during production.

(C) 6 NYCRR Part 212 General Process Emission Sources

Part 212.1(b)(5) defines process as:

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(5) Process. Any industrial, commercial, agricultural or other activity, operation, manufacture or treatment in which chemical, biological and/or physical properties of the material or materials are changed, or in which the material(s) is conveyed or stored without changing the material(s) (where such conveyance or storage system is equipped with a vent(s) and is non-mobile), and which emits air contaminants to the outdoor atmosphere. A process does not include an open fire, operation of combustion installation, or incineration of refuse other than byproducts or wastes from processes.

The proposed SMR Plant is a combustion unit, therefore it is not applicable to the requirements of 6NYCRR Part 212. Per 6NYCRR Part 212.7(m), CO emissions from process emission sources are exempt.

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, the General Conditions specified and any Special Conditions included as part of this permit.

Permit Administrator: DAVID S DENK
 DIVISION OF ENVIRONMENTAL PERMITS
 270 MICHIGAN AVE
 BUFFALO, NY 14203-2915

Authorized Signature: _____ Date: ____ / ____ / ____

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Notification of Other State Permittee Obligations

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the compliance permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in any compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

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DEC GENERAL CONDITIONS
****** General Provisions ******
GENERAL CONDITIONS - Apply to ALL Authorized Permits.

Condition 1: Facility Inspection by the Department
Applicable State Requirement: ECL 19-0305

Item 1.1:

The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71-0301 and SAPA 401(3).

Item 1.2:

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

Item 1.3:

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

Condition 2: Relationship of this Permit to Other Department Orders and Determinations
Applicable State Requirement: ECL 3-0301 (2) (m)

Item 2.1:

Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

Condition 3: Applications for permit renewals, modifications and transfers
Applicable State Requirement: 6 NYCRR 621.11

Item 3.1:

The permittee must submit a separate written application to the Department for renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing.

Item 3.2:

The permittee must submit a renewal application at least 180 days before expiration of permits for Title V Facility Permits, or at least 30 days before expiration of permits for State Facility Permits.

Item 3.3:

Permits are transferrable with the approval of the department unless specifically prohibited by the statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.

Condition 4: Permit modifications, suspensions or revocations by the Department

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Applicable State Requirement: 6 NYCRR 621.13

Item 4.1:

The Department reserves the right to exercise all available authority to modify, suspend, or revoke this permit in accordance with 6NYCRR Part 621. The grounds for modification, suspension or revocation include:

- a) materially false or inaccurate statements in the permit application or supporting papers;
- b) failure by the permittee to comply with any terms or conditions of the permit;
- c) exceeding the scope of the project as described in the permit application;
- d) newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;
- e) noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

****** Facility Level ******

Condition 5: Submission of application for permit modification or renewal-REGION 9 HEADQUARTERS

Applicable State Requirement: 6 NYCRR 621.6 (a)

Item 5.1:

Submission of applications for permit modification or renewal are to be submitted to:

NYSDEC Regional Permit Administrator
Region 9 Headquarters
Division of Environmental Permits
270 Michigan Avenue
Buffalo, NY 14203-2915
(716) 851-7165

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ARTICLE 19: AIR POLLUTION CONTROL - AIR STATE FACILITY PERMIT

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10 RIVERVIEW DR
DANBURY, CT 06810

Facility: PRAXAIR INC
4501 ROYAL AVE
NIAGARA FALLS, NY 14303

Authorized Activity By Standard Industrial Classification Code:
2813 - INDUSTRIAL GASES

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FEDERALLY ENFORCEABLE CONDITIONS

FINAL

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NOTIFICATION OF GENERAL PERMITTEE OBLIGATIONS

This section contains terms and conditions which are federally enforceable. Permittees may also have other obligations under regulations of general applicability

Item A: Sealing - 6 NYCRR 200.5

The Commissioner may seal an air contamination source to prevent its operation if compliance with 6 NYCRR Chapter III is not met within the time provided by an order of the Commissioner issued in the case of the violation. Sealing means labeling or tagging a source to notify any person that operation of the source is prohibited, and also includes physical means of preventing the operation of an air contamination source without resulting in destruction of any equipment associated with such source, and includes, but is not limited to, bolting, chaining or wiring shut control panels, apertures or conduits associated with such source.

No person shall operate any air contamination source sealed by the Commissioner in accordance with this section unless a modification has been made which enables such source to comply with all requirements applicable to such modification.

Unless authorized by the Commissioner, no person shall remove or alter any seal affixed to any contamination source in accordance with this section.

Item B: Acceptable Ambient Air Quality - 6 NYCRR 200.6

Notwithstanding the provisions of 6 NYCRR Chapter III, Subchapter A, no person shall allow or permit any air contamination source to emit air contaminants in quantities which alone or in combination with emissions from other air contamination sources would contravene any applicable ambient air quality standard and/or cause air pollution. In such cases where contravention occurs or may occur, the Commissioner shall specify the degree and/or method of emission control required.

Item C: Maintenance of Equipment - 6 NYCRR 200.7

Any person who owns or operates an air contamination source which is equipped with an emission control device shall operate such device and keep it in a satisfactory state of maintenance and repair in accordance with ordinary and necessary practices, standards and procedures, inclusive of manufacturer's specifications, required to operate such device effectively.

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Item D: Unpermitted Emission Sources - 6 NYCRR 201-1.2

(a) Except as otherwise provided by this Part, construction or operation of a new, modified or existing air contamination source without a registration or permit issued pursuant to this Part is prohibited.

(b) If an existing facility or emission source was subject to the permitting requirements of this Part at the time of construction or modification, and the owner or operator failed to apply for a permit or registration as described in this Part, the owner or operator must apply for a permit or registration in accordance with the provisions of this Part. The facility or emission source is subject to all regulations that were applicable to it at the time of construction or modification and any subsequent requirements applicable to existing emission sources.

Item E: Recycling and Salvage - 6 NYCRR 201-1.7

Where practical, any person who owns or operates an air contamination source shall recycle or salvage air contaminants collected in an air cleaning device according to the requirements of 6 NYCRR.

Item F: Prohibition of Reintroduction of Collected Contaminants to the Air - 6 NYCRR 201-1.8

No person shall unnecessarily remove, handle, or cause to be handled, collected air contaminants from an air cleaning device for recycling, salvage or disposal in a manner that would reintroduce them to the outdoor atmosphere.

Item G: Proof of Eligibility for Sources Defined as Exempt Activities - 6 NYCRR 201-3.2 (a)

The owner and/or operator of an emission source or unit that is eligible to be exempt, may be required to certify that it operates within the specific criteria described in 6 NYCRR Subpart 201-3. The owner or operator of any such emission source must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility which contains emission sources or units subject to 6 NYCRR Subpart 201-3, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations, or law.

Item H: Proof of Eligibility for Sources Defined as Trivial Activities - 6 NYCRR 201-3.3 (a)

The owner and/or operator of an emission source or unit

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that is listed as being trivial in 6 NYCRR Part 201 may be required to certify that it operates within the specific criteria described in 6 NYCRR Subpart 201-3. The owner or operator of any such emission source must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility which contains emission sources or units subject to 6 NYCRR Subpart 201-3, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations, or law.

Item I: Required Emission Tests - 6 NYCRR 202-1.1

An acceptable report of measured emissions shall be submitted, as may be required by the Commissioner, to ascertain compliance or noncompliance with any air pollution code, rule, or regulation. Failure to submit a report acceptable to the Commissioner within the time stated shall be sufficient reason for the Commissioner to suspend or deny an operating permit. Notification and acceptable procedures are specified in 6 NYCRR Subpart 202-1.

Item J: Open Fires Prohibitions - 6 NYCRR 215.2

Except as allowed by section 215.3 of 6 NYCRR Part 215, no person shall burn, cause, suffer, allow or permit the burning of any materials in an open fire.

Item K: Permit Exclusion - ECL 19-0305

The issuance of this permit by the Department and the receipt thereof by the Applicant does not and shall not be construed as barring, diminishing, adjudicating or in any way affecting any legal, administrative or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the Department may have against the Applicant for violations based on facts and circumstances alleged to have occurred or existed prior to the effective date of this permit, including, but not limited to, any enforcement action authorized pursuant to the provisions of applicable federal law, the Environmental Conservation Law of the State of New York (ECL) and Chapter III of the Official Compilation of the Codes, Rules and Regulations of the State of New York (NYCRR). The issuance of this permit also shall not in any way affect pending or future enforcement actions under the Clean Air Act brought by the United States or any person.

Item L: Federally Enforceable Requirements - 40 CFR 70.6 (b)

All terms and conditions in this permit required by the Act or any applicable requirement, including any provisions designed to limit a facility's potential to

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emit, are enforceable by the Administrator and citizens under the Act. The Department has, in this permit, specifically designated any terms and conditions that are not required under the Act or under any of its applicable requirements as being enforceable under only state regulations.

FEDERAL APPLICABLE REQUIREMENTS
The following conditions are federally enforceable.

Condition 1: Open Fires - Prohibitions
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable Federal Requirement: 6 NYCRR 215.2

Item 1.1:

Except as allowed by Title 6 NYCRR Section 215.3, no person shall burn, cause, suffer, allow or permit the burning of any materials in an open fire.

Item 1.2

Per Section 215.3, burning in an open fire, provided it is not contrary to other law or regulation, will be allowed as follows:

- (a) On-site burning in any town with a total population less than 20,000 of downed limbs and branches (including branches with attached leaves or needles) less than six inches in diameter and eight feet in length between May 15th and the following March 15th. For the purposes of this subdivision, the total population of a town shall include the population of any village or portion thereof located within the town. However, this subdivision shall not be construed to allow burning within any village.
- (b) Barbecue grills, maple sugar arches and similar outdoor cooking devices when actually used for cooking or processing food.
- (c) Small fires used for cooking and camp fires provided that only charcoal or untreated wood is used as fuel and the fire is not left unattended until extinguished.
- (d) On-site burning of agricultural wastes as part of a valid agricultural operation on contiguous agricultural lands larger than five acres actively devoted to agricultural or horticultural use, provided such waste is actually grown or generated on those lands and such waste is capable of being fully burned within a 24-hour period.
- (e) The use of liquid petroleum fueled smudge pots to prevent frost damage to crops.
- (f) Ceremonial or celebratory bonfires where not otherwise prohibited by law, provided that only untreated wood or other agricultural products are used as fuel and the fire is not left unattended until extinguished.
- (g) Small fires that are used to dispose of a flag or religious item, and small fires or other smoke producing process where not otherwise prohibited by law that are used in connection with a religious ceremony.
- (h) Burning on an emergency basis of explosive or other dangerous or contraband materials by police or other public safety organization.
- (i) Prescribed burns performed according to Part 194 of this Title.
- (j) Fire training, including firefighting, fire rescue, and fire/arson investigation training, performed under applicable rules and guidelines of the New York State Department of State's Office of Fire Prevention and Control. For fire training performed on acquired structures, the structures must be emptied and stripped of any material that is toxic, hazardous or likely to emit

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toxic smoke (such as asbestos, asphalt shingles and vinyl siding or other vinyl products) prior to burning and must be at least 300 feet from other occupied structures. No more than one structure per lot or within a 300 foot radius (whichever is bigger) may be burned in a training exercise.

(k) Individual open fires as approved by the Director of the Division of Air Resources as may be required in response to an outbreak of a plant or animal disease upon request by the commissioner of the Department of Agriculture and Markets, or for the destruction of invasive plant and insect species.

(l) Individual open fires that are otherwise authorized under the environmental conservation law, or by rule or regulation of the Department.

Condition 9: Visible Emissions Limited
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable Federal Requirement:6 NYCRR 211.2

Item 9.1:

Except as permitted by a specific part of this Subchapter and for open fires for which a restricted burning permit has been issued, no person shall cause or allow any air contamination source to emit any material having an opacity equal to or greater than 20 percent (six minute average) except for one continuous six-minute period per hour of not more than 57 percent opacity.

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STATE ONLY ENFORCEABLE CONDITIONS

****** Facility Level ******

NOTIFICATION OF GENERAL PERMITTEE OBLIGATIONS

This section contains terms and conditions which are not federally enforceable. Permittees may also have other obligations under regulations of general applicability

Item A: Emergency Defense - 6 NYCRR 201-1.5

An emergency, as defined in 6 NYCRR subpart 201-2, constitutes an affirmative defense to penalties sought in an enforcement action brought by the department for noncompliance with emissions limitations or permit conditions for all facilities in New York State.

(a) The affirmative defense of emergency shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) an emergency occurred and that the facility owner or operator can identify the cause(s) of the emergency;

(2) the equipment at the facility was being properly operated and maintained;

(3) during the period of the emergency the facility owner or operator took all reasonable steps to minimize the levels of emissions that exceeded the emission standards, or other requirements in the permit; and

(4) the facility owner or operator notified the department within two working days after the event occurred. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and any corrective actions taken.

(b) In any enforcement proceeding, the facility owner or operator seeking to establish the occurrence of an emergency has the burden of proof.

(c) This provision is in addition to any emergency or malfunction provision contained in any applicable requirement.

Item B: Public Access to Recordkeeping for Facilities With State Facility Permits - 6 NYCRR 201-1.10 (a)

Where facility owners and/or operators keep records pursuant to compliance with the requirements of 6 NYCRR Subpart 201-5.4, and/or the emission capping requirements of 6 NYCRR Subpart 201-7, the Department will make such records available to the public upon request in accordance with 6 NYCRR Part 616 - Public Access to Records.

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Facility owners and/or operators must submit the records required to comply with the request within sixty working days of written notification by the Department.

Item C: **General Provisions for State Enforceable Permit Terms and Condition - 6 NYCRR Part 201-5**

Any person who owns and/or operates stationary sources shall operate and maintain all emission units and any required emission control devices in compliance with all applicable Parts of this Chapter and existing laws, and shall operate the facility in accordance with all criteria, emission limits, terms, conditions, and standards in this permit. Failure of such person to properly operate and maintain the effectiveness of such emission units and emission control devices may be sufficient reason for the Department to revoke or deny a permit.

The owner or operator of the permitted facility must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility regulated by this Subpart, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations or law.

STATE ONLY APPLICABLE REQUIREMENTS

The following conditions are state only enforceable.

Condition 3: Contaminant List
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement:ECL 19-0301

Item 3.1:
Emissions of the following contaminants are subject to contaminant specific requirements in this permit(emission limits, control requirements or compliance monitoring conditions).

CAS No: 000630-08-0
Name: CARBON MONOXIDE

Condition 4: Malfunctions and start-up/shutdown activities
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement:6 NYCRR 201-1.4

Item 4.1:
(a) The facility owner or operator shall take all necessary and appropriate actions to prevent the

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emission of air pollutants that result in contravention of any applicable emission standard during periods of start-up, shutdown, or malfunction.

(b) The facility owner or operator shall compile and maintain records of all equipment malfunctions, maintenance, or start-up/shutdown activities when they can be expected to result in an exceedance of any applicable emission standard, and shall submit a report of such activities to the department when requested to do so, or when so required by a condition of a permit issued for the corresponding air contamination source. Such reports shall state whether any violations occurred and, if so, whether they were unavoidable, include the time, frequency and duration of the maintenance and/or start-up/shutdown activities, and an estimate of the emission rates of any air contaminants released. Such records shall be maintained for a period of at least five years and made available for review to department representatives upon request. Facility owners or operators subject to continuous stack monitoring and quarterly reporting requirements need not submit additional reports for equipment maintenance or start-up/shutdown activities for the facility to the department.

(c) In the event that emissions of air contaminants in excess of any emission standard in this Subchapter occur due to a malfunction, the facility owner or operator shall compile and maintain records of the malfunction and notify the department as soon as possible during normal working hours, but not later than two working days after becoming aware that the malfunction occurred. When requested by the department, the facility owner or operator shall submit a written report to the department describing the malfunction, the corrective action taken, identification of air contaminants, and an estimate of the emission rates.

(d) The department may also require the owner or operator to include, in reports described under Subdivisions (b) and (c) of this Section, an estimate of the maximum ground level concentration of each air contaminant emitted and the effect of such emissions.

(e) A violation of any applicable emission standard resulting from start-up, shutdown, or malfunction conditions at a permitted or registered facility may not be subject to an enforcement action by the department and/or penalty if the department determines, in its sole discretion, that such a violation was unavoidable. The actions and recordkeeping and reporting requirements listed above must be adhered to in such circumstances.

Condition 5: Emission Unit Definition
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement: 6 NYCRR Subpart 201-5

Item 5.1:

The facility is authorized to perform regulated processes under this permit for:

Emission Unit: S-MRPLT

Emission Unit Description:

The SMR Plant is to produce gaseous hydrogen from natural gas feedstock. There are five emission sources and five emission points associated with the new SMR Plant.

The SMR Plant emission sources include the Stream Methane Reformer, Shift Reactor, PSA Purification Unit, Deaerator and Steam Drum.

Emissions from the SMR Plant are vented as follows:

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The Reformer Vent (Emission Point ID REFV) is for the combustion emissions from the Reformer (46.01 million Btu/hr firing). Its maximum nitrogen oxides (NO_x) and carbon monoxide (CO) emissions are 19.8 and 16.6 tons per year (TPY) respectively.

The Process Vent (Emission Point ID PROCV) which is for miscellaneous startup, process and safety vents. It will sometimes emit streams containing CO. The maximum CO emission from this stack is 34.8 TPY. Most of the time, there is no venting from this stack, and occasionally this stack also vents streams that do not contain pollutants. This includes hydrogen, which is vented during startups until acceptable purity is obtained. We have a strong economic incentive to minimize hydrogen venting, because costly natural gas feedstock is being consumed while no salable hydrogen product is available to the customer.

Minor amounts of methanol and ammonia are formed in the process and ultimately end up in the steam system. The majority of the methanol and ammonia formed is consumed in the SMR as part of the feed, however, some is emitted out of the Deaerator Vent (Emission Point ID DAV) from the steam stripper that is part of the boiler condensate water return system. Some methanol is also vented out of the Boiler Blow Down Vent (Emission Point ID BDV) and Excess Steam Vent (Emission Point ID XSV). The total maximum methanol and ammonia emissions from these three stacks are 3.1 TPY and 1.5 TPY respectfully.

Fugitive emissions are attributed from process components handling process streams that contain CO and VOC. The total fugitive emissions are 6.0 TPY for CO and 0.06 TPY for VOC.

Building(s): SMR

Condition 6: Compliance Demonstration
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement: 6 NYCRR Subpart 201-5

Item 6.1:

The Compliance Demonstration activity will be performed for the Facility.

Regulated Contaminant(s):

CAS No: 000630-08-0 CARBON MONOXIDE

Item 6.2:

Compliance Demonstration shall include the following monitoring:

Monitoring Type: RECORD KEEPING/MAINTENANCE PROCEDURES

Permit ID: 9-2911-00096/00005

Facility DEC ID: 9291100096

Monitoring Description:

Description: Equipment to produce hydrogen by steam methane reforming, include a steam methane reformer, a shift reactor, a deaerator, steam drum and pressure swing adsorption (PSA) purification unit.

Monitoring

1.1 The permittee shall monitor, in a satisfactory manner, the steam methane reformer combustion chamber temperature and the feedstock natural gas flow rate during each startup event. A startup event begins when feedstock natural gas is introduced to the steam methane reformer. A startup event ends when tail gas venting downstream of the PSA unit stops. In the event of a failed or aborted startup, the startup event ends when feedstock natural gas flow to the steam methane reformer stops.

Recordkeeping/Reporting/Notification

1.2 The permittee shall keep a log showing the following information for each startup event:

- The beginning date and time for the startup event.
- The duration of the startup event.
- The steam methane reformer combustion chamber temperature immediately before feedstock introduction.
- The feedstock natural gas flow rate at the time the feedstock flow rate is established.
- The feedstock natural gas flow rate immediately before the operator initiates the venting downstream of the PSA unit.

The permittee shall keep all startup events logs on file at the facility for a period of five years. A report summarizing carbon monoxide (CO) emissions for the previous twelve (12) months shall be submitted annually.

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Reporting Requirements: ANNUALLY (CALENDAR)

Reports due 30 days after the reporting period.

The initial report is due 1/30/2015.

Subsequent reports are due every 12 calendar month(s).

**Condition 7: Renewal deadlines for state facility permits
Effective between the dates of 01/17/2014 and 01/16/2024**

Applicable State Requirement:6 NYCRR 201-5.2 (c)

Item 7.1:

The owner or operator of a facility having an issued state facility permit shall submit a complete application at least 180 days, but not more than eighteen months, prior to the date of permit expiration for permit renewal purposes.

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Facility DEC ID: 9291100096

Condition 8: Compliance Demonstration
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement:6 NYCRR 201-5.3 (c)

Item 8.1:
The Compliance Demonstration activity will be performed for the Facility.

Item 8.2:
Compliance Demonstration shall include the following monitoring:

Monitoring Type: RECORD KEEPING/MAINTENANCE PROCEDURES
Monitoring Description:

Any reports or submissions required by this permit shall be submitted to the Regional Air Pollution Control Engineer (RAPCE) at the following address:

Division of Air Resources
NYS Dept. of Environmental Conservation
Region 9
270 Michigan Ave.
Buffalo, NY 14203

Monitoring Frequency: ANNUALLY
Reporting Requirements: ANNUALLY (CALENDAR)
Reports due 30 days after the reporting period.
The initial report is due 1/30/2015.
Subsequent reports are due every 12 calendar month(s).

Condition 2: Air pollution prohibited
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement:6 NYCRR 211.1

Item 2.1:
No person shall cause or allow emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic or duration which are injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property. Notwithstanding the existence of specific air quality standards or emission limits, this prohibition applies, but is not limited to, any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emission, either alone or in combination with others.

**** Emission Unit Level ****

Condition 10: Emission Point Definition By Emission Unit
Effective between the dates of 01/17/2014 and 01/16/2024

Applicable State Requirement:6 NYCRR Subpart 201-5

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Item 10.1:

The following emission points are included in this permit for the cited Emission Unit:

Emission Unit: S-MRPLT

Emission Point: BDV
 Height (ft.): 47 Diameter (in.): 2
 NYTMN (km.): 4778.232 NYTME (km.): 173.453 Building: SMR

Emission Point: DAV
 Height (ft.): 47 Diameter (in.): 2
 NYTMN (km.): 4778.232 NYTME (km.): 173.453 Building: SMR

Emission Point: XSV
 Height (ft.): 47 Diameter (in.): 2
 NYTMN (km.): 4778.232 NYTME (km.): 173.453 Building: SMR

Emission Point: PROCV
 Height (ft.): 92 Diameter (in.): 6
 NYTMN (km.): 4778.232 NYTME (km.): 173.453 Building: SMR

Emission Point: REFV
 Height (ft.): 81 Diameter (in.): 24
 NYTMN (km.): 4778.232 NYTME (km.): 173.453 Building: SMR

**Condition 11: Process Definition By Emission Unit
 Effective between the dates of 01/17/2014 and 01/16/2024**

Applicable State Requirement:6 NYCRR Subpart 201-5

Item 11.1:

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: S-MRPLT

Process: 001

Process Description:

Hydrogen is produced by the Steam Methane Reforming Process. Natural gas feedstock and steam are reacted in the presence of catalyst in a closed system within the Reformer. This reaction produces hydrogen, carbon monoxide, carbon dioxide, methane and nitrogen.

The steam is then fed to the Shift Reactor, where some of the remaining carbon monoxide is converted to hydrogen and carbon dioxide.

Methanol and ammonia is created in the Shift Reactor and then discharged via its condensate. The condensate becomes part of the hydrogen facility's steam system. From here the condensate is mixed with treated make-up water and then goes to a steam stripper. From here the remaining condensate is returned to the Steam Drum where

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ultimately it is used for the production of steam.

The majority of the steam (and associated methanol and ammonia) goes to the SMR as process steam used as a feedstock (e.g., the methanol and ammonia gets consumed in the process). A small portion of the steam is sent back to the steam stripper for use there. Any remaining steam goes to the Excess Steam Vent.

The output of the Shift Reactor then goes to the PSA Purification Unit. This unit consists of vessels filled with a granular molecular sieve material. The molecular sieve physically acts as a filter. It lets the smaller hydrogen molecules pass through, and holds back the remaining constituents and some of the hydrogen.

The throughput from the PSA Purification Unit is pure gaseous hydrogen, which is the product from the SMR Plant.

The off gas rejected by the PSA Purification Unit is called the Tail Gas. The Tail Gas is combined with some natural gas as fuel to provide the required combustion heating for the Reformer. The majority of the required heating valve is from the Tail Gas and only a small fraction (7-25% other than during startup) comes directly from the natural gas.

Emission Source/Control: 00PSA - Process

Emission Source/Control: DEAER - Process

Emission Source/Control: REFMR - Process

Emission Source/Control: SREAC - Process

Emission Source/Control: STDRM - Process

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