



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

**IDENTIFICATION INFORMATION**

Permit Type: Air State Facility  
Permit ID: 9-1452-00327/00001  
Effective Date: 09/10/2012                      Expiration Date: No expiration date

Permit Issued To: NIAGARA REFINING LLC  
5661 TRANSIT RD  
DEPEW, NY 14043

Facility: NIAGARA REFINING LLC  
5661 TRANSIT RD|(IN THE INDUSTRIAL PARK)  
DEPEW, NY 14043

Contact: MICHAEL W LINDAMAN  
NIAGARA REFINING LLC  
5661 TRANSIT RD  
DEPEW, NY 14043  
(716) 683-9170

Description:

1. Niagara Refining, LLC is the owner and operator of an ammonium paratungstate and tungsten oxide production facility. The facility is located at 5661 Transit Road in the Village of Depew, Erie County, New York.
2. This new facility includes the processing of concentrated scheelite ore to produce a sodium tungstate solution by crushing, ball milling, alkali digestion, dilution and filtration. The sodium tungstate solution generated from the concentrated ore undergoes additional processing which includes purification, filtration, solution pH adjustment, ion exchange, vaporization/crystallization, and ammonium paratungstate drying.
3. The main emissions from the new facility include ammonia, hydrogen sulfide and particulates. The ammonia emissions are reused using an ammonia recovery system that utilizes purified water for absorption. In addition, captured ammonia emissions are controlled by 94 percent using a two stage sulfuric acid ammonia scrubbing system. The ammonia scrubbing system reduces the projected potential ammonia emissions to less than 15 tons per year (tpy). The captured hydrogen sulfide emissions are controlled to 99 percent by utilizing a sodium hydroxide and sodium hypochlorite scrubbing system. The hydrogen sulfide scrubbing system reduces the projected potential hydrogen sulfide emissions to less than 10 tpy. Particulate emissions are controlled using baghouses, filter cartridges and best management practices.



4. A performance test to demonstrate compliance with the required 99 percent control efficiency of hydrogen sulfide (H<sub>2</sub>S) emissions across the gas scrubber system must be completed within 60 days after achieving the maximum production rate but not later than 180 days after initial start-up.
5. A performance test to demonstrate compliance with the required 94 percent control efficiency of ammonia emissions across the ammonia gas scrubber system and the ammonia recovery system must be completed within 60 days after achieving the maximum production rate but not later than 180 days after initial start-up.
6. On-going compliance monitoring of the control equipment and established operating limits must be completed to ensure proper operation and maintenance practices are used to minimize the impact of excess emissions on ambient air quality, the environment and human health.
7. Best management practices shall be implemented to reduce the potential for fugitive dust emissions.
8. This project was evaluated using Screen3 procedures for comparison to the hydrogen sulfide NAAQS standard of 14 ug/m<sup>3</sup> and the DAR-1 limits for hydrogen sulfide and ammonia. The results indicated the maximum impact from this source is not expected to exceed the SGC and AGC guidance limits for hydrogen sulfide and ammonia.

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:            DOUGLAS E BORSCHER  
   270 MICHIGAN AVE  
   BUFFALO, NY 14203-2915

Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_



### 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.



**LIST OF CONDITIONS**

**DEC GENERAL CONDITIONS**

**General Provisions**

- Facility Inspection by the Department
- Relationship of this Permit to Other Department Orders and Determinations
- Applications for permit renewals, modifications and transfers
- Permit modifications, suspensions or revocations by the Department

**Facility Level**

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



**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.



**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

**New York State Department of Environmental Conservation**

Permit ID: 9-1452-00327/00001

Facility DEC ID: 9145200327



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

**ARTICLE 19: AIR POLLUTION CONTROL - AIR STATE FACILITY  
PERMIT**

**IDENTIFICATION INFORMATION**

Permit Issued To: NIAGARA REFINING LLC  
5661 TRANSIT RD  
DEPEW, NY 14043

Facility: NIAGARA REFINING LLC  
5661 TRANSIT RD|(IN THE INDUSTRIAL PARK)  
DEPEW, NY 14043

Authorized Activity By Standard Industrial Classification Code:  
3399 - PRIMARY METAL PRODUCTS, NEC

Permit Effective Date: 09/10/2012  
date.

Permit Expiration Date: No expiration  
date.



**LIST OF CONDITIONS**

**FEDERALLY ENFORCEABLE CONDITIONS**

**Facility Level**

- 2 6 NYCRR 202-1.1: Required Emissions Tests
- 1 6 NYCRR 201-6.5 (g): Non Applicable requirements
- 3 6 NYCRR 211.1: Air pollution prohibited

**Emission Unit Level**

**EU=U-00APT**

- 4 6 NYCRR Part 211: Compliance Demonstration
- 5 6 NYCRR 212.4 (c): Compliance Demonstration
- 6 6 NYCRR 212.6 (a): Compliance Demonstration
- 7 6 NYCRR Subpart 257-10: Compliance Demonstration

**EU=U-00APT,EP=00001**

- 8 6 NYCRR 212.4 (a): Compliance Demonstration
- 9 6 NYCRR 212.4 (a): Compliance Demonstration

**EU=U-00APT,EP=00002**

- 10 6 NYCRR 212.4 (a): Compliance Demonstration
- 11 6 NYCRR 212.4 (a): Compliance Demonstration

**STATE ONLY ENFORCEABLE CONDITIONS**

**Facility Level**

- 12 ECL 19-0301: Contaminant List
- 13 6 NYCRR 201-1.4: Unavoidable noncompliance and violations
- 14 6 NYCRR Subpart 201-5: Emission Unit Definition
- 15 6 NYCRR 211.2: Visible Emissions Limited

**Emission Unit Level**

- 16 6 NYCRR Subpart 201-5: Emission Point Definition By Emission Unit
- 17 6 NYCRR Subpart 201-5: Process Definition By Emission Unit



**FEDERALLY ENFORCEABLE CONDITIONS**  
**\*\*\*\* Facility Level \*\*\*\***

**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.

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

If an existing emission source was subject to the permitting requirements of 6 NYCRR Part 201 at the time of construction or modification, and the owner and/or operator failed to apply for a permit for such emission source then the following provisions apply:

- (a) The owner and/or operator must apply for a permit for such emission source or register the facility in accordance with the provisions of Part 201.
- (b) The emission source or facility is subject to all regulations that were applicable to it at the time of construction or modification and any subsequent requirements applicable to existing sources or facilities.

**Item E: Emergency Defense - 6 NYCRR 201-1.5**

An emergency constitutes an affirmative defense to an action brought for noncompliance with emissions limitations or permit conditions for all facilities in New York State.

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

- (1) An emergency occurred and that the facility owner and/or operator can identify the cause(s) of the emergency;
- (2) The equipment at the permitted facility causing the emergency was at the time being properly operated;
- (3) During the period of the emergency the facility owner and/or operator took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and
- (4) The facility owner and/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 corrective actions taken.

(b) In any enforcement proceeding, the facility owner and/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 upset provision contained in any applicable requirement.

**Item F: 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 G: 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 H: 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 I: 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 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 J: 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 K: 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 L: 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 M: 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 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 2: Required Emissions Tests**



**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 202-1.1**

**Item 2.1:**

For the purpose of ascertaining compliance or non-compliance with any air pollution control code, rule or regulation, the commissioner may require the person who owns such air contamination source to submit an acceptable report of measured emissions within a stated time.

**Condition 1: Non Applicable requirements**

**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 201-6.5 (g)**

**Item 1.1:**

This section contains a summary of those requirements that have been specifically identified as being not applicable to this facility and/or emission units, emission points, processes and/or emission sources within this facility. The summary also includes a justification for classifying any such requirements as non-applicable.

40 CFR 60.380

Reason: 40 CFR 60 Subpart LL, New Source Performance Standards for Metallic Mineral Processing Plants, is applicable to facilities that process metallic mineral concentrates from ore. Niagara Refining reports Subpart LL is not applicable to this facility because the ammonium paratungstate is produced from metallic mineral concentrates that have been concentrated to approximately 50 percent prior to arrival on-site.

**Condition 3: Air pollution prohibited**

**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 211.1**

**Item 3.1:**

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 4: Compliance Demonstration**

**Effective between the dates of 09/10/2012 and Permit Expiration Date**



**Applicable Federal Requirement:6 NYCRR Part 211**

**Item 4.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT

Regulated Contaminant(s):  
CAS No: 0NY075-00-0 PARTICULATES

**Item 4.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: RECORD KEEPING/MAINTENANCE PROCEDURES

Monitoring Description:

Uncontrolled particulate emissions from truck traffic, storage piles, transfer of materials, or other facility operations cannot create a nuisance or exceed ambient air quality standards. Niagara Refining shall implement best management practices to reduce the potential impact of fugitive dust emissions on ambient air quality, the environment and human health. Such measures may include, but are not limited to, paving dirt roadways, installing a tire wash for trucks traveling on dirt roads, sweeping and cleaning paved areas, and installation of windrows.

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 5: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 212.4 (c)**

**Item 5.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT

Regulated Contaminant(s):  
CAS No: 0NY075-00-0 PARTICULATES

**Item 5.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: MONITORING OF PROCESS OR CONTROL DEVICE PARAMETERS AS SURROGATE

Monitoring Description:

(1) No person will cause or allow emissions of solid particulates that exceed 0.050 grains of particulates per cubic foot of exhaust gas, expressed at standard



conditions on a dry gas basis.

(2) On-going compliance monitoring of the particulate emission limit for each particulate emission source, including but not limited to baghouses and particulate filter cartridges, shall be monitored as stated below. A particulate emission source shall include any equipment which emits particulate emissions to the outdoor atmosphere through any conduit, chimney, duct, vent, flue, stack, or opening of any kind. The identified sources at Niagara Refining include emission sources #00087, #08151, #08152, and several filter cartridges.

(a) Each baghouse and particulate filter cartridge must be operated and maintained according to manufacturer specifications. Within 180 days of startup, Niagara Refining shall submit to the Department a preventative maintenance plan designed such that the equipment is operated and maintained to limit particulate emissions or fall-out of material.

(b) Weekly inspection of any fall-out from the baghouses and filter cartridges shall be completed whenever a process is in operation.

(c) Weekly differential pressure measurements of each baghouse which vent to the outside atmosphere shall be completed whenever a process is in normal operation.

(d) Differential pressure shall be measured between the inlet and outlet to the dust collector. The dust collectors shall be operated within the differential pressure range specified by the manufacturer.

(e) The differential pressure transducer shall be calibrated annually or as required by the manufacturer.

(f) If any visible emissions, particulate fall-out or pressure measurement is recorded outside the manufacturer range, then Niagara Refining shall inspect the source, initiate corrective action, and restore operation of the dust collector and associated capture system to its normal operation as expeditiously as practicable.

(4) Records shall be maintained to include: (i) a daily log documenting whether any visible emissions or fall-out were observed, (ii) a log of the weekly pressure drop measurements with reference to the manufacturer differential pressure range, (iii) the date and time of

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the observation or measurement, (iv) corrective action taken (if any), and (v) the cause of any visible emissions, fall-out or pressure measurements outside the manufacturer range (if known). The records shall be kept on-site and be made available to the Department upon request.

(5) At the discretion of the Department, an EPA Method 5 compliance test may be required to demonstrate compliance with the 0.05 grains/dscf emission limit.

Parameter Monitored: PARTICULATES

Upper Permit Limit: 0.05 grains per dscf

Reference Test Method: EPA Method 5

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: MAXIMUM - NOT TO EXCEED STATED VALUE - SEE MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 6: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 212.6 (a)**

**Item 6.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT

Regulated Contaminant(s):

CAS No: 007664-41-7	AMMONIA
CAS No: 007664-93-9	SULFURIC ACID
CAS No: 0NY075-00-0	PARTICULATES

**Item 6.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: MONITORING OF PROCESS OR CONTROL DEVICE PARAMETERS AS SURROGATE

Monitoring Description:

(1) No person will cause or allow emissions having an average opacity during any six consecutive minutes of 20 percent or greater from any process emission source, except only the emission of uncombined water.

(2) On-going compliance monitoring with this requirement shall be determined by the facility owner/operator conducting a daily survey of visible emissions whenever a process is in operation. A process shall include any equipment which emits air contaminants to the outdoor atmosphere through any conduit, chimney, duct, vent, flue,



stack, doorway or opening of any kind. The specific locations at Niagara Refining include emission points #00001, #00002, #0003A, #0003B, #00004, #00005, #00006, #00007, #00008, #00009 and any other general room ventilation exhaust or building opening through which air contaminants are emitted to the outdoor atmosphere.

(3) The daily survey does not require the determination of opacity levels. Rather the survey is used to document the presence or non-presence of visible emissions, excluding water vapor. Visible emission observations shall be performed, as best as possible, at a location to obtain the proper sun angle, background, and line of sight. The observer must be knowledgeable regarding the effects on the visibility of emissions caused by background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor).

(4) Upon detecting visible emissions, Niagara Refining shall inspect the source and restore operation of the emission unit (including the control device, if any, and the associated capture system) to its normal operation as expeditiously as practicable.

(5) Records of the visible emission survey shall be maintained to include: (1) a check list of whether visible emissions were observed or not, (2) the date and time of the visible emission observation, (3) the corrective action taken (if any). The records shall be kept on-site and made available to the Department upon request.

(6) The Department reserves the right to perform or require the performance of a Method 9 or Method 22 opacity evaluation from any process emission source.

Parameter Monitored: OPACITY

Upper Permit Limit: 20 percent

Reference Test Method: EPA Method 9 and 22

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: MAXIMUM - NOT TO EXCEED STATED VALUE - SEE MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 7: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR Subpart 257-10**

**Item 7.1:**





- (a) Hydrogen sulfide is determined by the Cadmium Hydroxide-Methylene Blue method and expressed as parts of hydrogen sulfide per million parts of ambient air (ppm) by volume.
- (b) All measurements are corrected to a reference temperature of 25 degrees Centigrade and to a reference pressure of 760 millimeters of mercury.

Parameter Monitored: HYDROGEN SULFIDE

Upper Permit Limit: 14 micrograms per cubic meter

Reference Test Method: Cadmium Hydroxide-Methylene Blue method

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: MAXIMUM - NOT TO EXCEED STATED VALUE - SEE MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 8: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 8.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT

Emission Point: 00001

Regulated Contaminant(s):

CAS No: 007783-06-4

HYDROGEN SULFIDE

**Item 8.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

ROUTINE HYDROGEN SULFIDE PERFORMANCE TESTING AND ESTABLISH OPERATING LIMITS

(1) A performance test to demonstrate compliance with the required 99 percent control efficiency of hydrogen sulfide (H<sub>2</sub>S) emissions across the gas scrubber system must be completed within 60 days after achieving the maximum production rate but not later than 180 days after initial start-up.

(2) The performance test must be conducted at the maximum normal operating process load.

(3) You must establish the control parameters including:

(1) the scrubber effluent pH, (2) oxidation reduction potential (ORP), (3) scrubber liquid flowrate, and (4) pressure drop as your operating limits during the



three-run performance test.

(4) You must collect pH, ORP, pressure drop, and liquid flow-rate data every 15 minutes during the entire period of the performance tests.

(5) You must determine the average pH, ORP, pressure drop, and liquid flow-rate for each individual test run in the three-run performance test by computing the average of all the 15-minute readings taken during each test run. The hourly averages shall be used to establish the operating limits.

(6) The method used to measure H<sub>2</sub>S shall include EPA Method 15 from 40CFR60, Appendix A or another reference method approved by the Department.

(7) A performance test protocol shall be submitted to the Department for approval at least 60 days prior to completion of the test. The Department must be notified 10 days prior to the scheduled test date so a Department representative may be present during the test.

(8) The results of the performance test shall be submitted to the Department within 60 days following completion of the performance test.

(9) A permit modification application shall be submitted no later than 90 days upon receiving approval of the performance test report. The application shall contain the proposed compliance certification conditions for the established operating limits for the scrubber effluent pH, ORP, scrubber liquid flowrate and pressure drop.

(10) Subsequent performance test requirements will be at the discretion of the Department based on design, operation and maintenance practices used to minimize the impact of excess emissions on ambient air quality, the environment and human health.

Parameter Monitored: HYDROGEN SULFIDE

Lower Permit Limit: 99 percent degree of air cleaning or greater

Reference Test Method: EPA Method 15 or other approved method

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: MINIMUM - NOT TO FALL BELOW STATED VALUE AT ANY TIME

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 9: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**



**Applicable Federal Requirement:6 NYCRR 212.4 (a)**

**Item 9.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT Emission Point: 00001

Regulated Contaminant(s):  
CAS No: 007783-06-4 HYDROGEN SULFIDE

**Item 9.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: RECORD KEEPING/MAINTENANCE PROCEDURES

Monitoring Description:

DEMONSTRATING CONTINUOUS COMPLIANCE  
HYDROGEN SULFIDE SCRUBBER SYSTEM

- (1) You must install, operate, and maintain a flow, pressure, ORP and pH measurement device for the hydrogen sulfide wet scrubber system.
- (2) The monitoring equipment must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data.
- (3) You must monitor and collect data at all required intervals at all times that the affected source is operating, except for malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments).
- (4) You must determine the 12-hour block average of all recorded readings, except as provided as follows. For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out of control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance. Any period for which the monitoring system is out-of-control and data are not available for a required calculation constitutes a deviation from the monitoring requirements.
- (5) You must maintain the 12-hour average pressure drop, liquid flow-rate, ORP and pH within the operating limits established during the performance test.
- (6) Operation not within the established operating limits



shall indicate a deviation from normal conditions. You must immediately complete an investigation of the source, determine and document the cause of the deviation and complete corrective action, if necessary.

(7) You must monitor and maintain records of the total combined production of ammonium paratungstate (APT) and tungsten oxide on a rolling 12-month total basis. If the combined total production of APT and tungsten oxides exceeds 2,750 tons per year, you shall demonstrate the control equipment is designed to process the additional load. In addition, you shall complete an air screening analysis to demonstrate any increase in hydrogen sulfide emissions do not exceed the impact levels.

(8) You must keep the records of all inspection and monitoring data. Your records must be in a form suitable and readily available for expeditious review. You must keep records of the occurrence and duration of each malfunction of the associated air pollution control and monitoring equipment. You must keep records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning air pollution control, or monitoring equipment to its normal or usual manner of operation. You must keep each record for 5 years following the date of each recorded action.

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 10: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 10.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT

Emission Point: 00002

Regulated Contaminant(s):

CAS No: 007664-41-7

AMMONIA

**Item 10.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: RECORD KEEPING/MAINTENANCE PROCEDURES

Monitoring Description:

DEMONSTRATING CONTINUOUS COMPLIANCE  
AMMONIA SCRUBBER SYSTEM



- (1) You must install, operate, and maintain a flow, pressure and pH measurement device for the ammonia wet scrubber system and the ammonia recovery system.
- (2) The monitoring equipment must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data.
- (3) You must monitor and collect data at all required intervals at all times that the affected source is operating, except for malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments).
- (4) You must determine the 12-hour block average of all recorded readings, except as provided as follows. For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out of control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance. Any period for which the monitoring system is out-of-control and data are not available for a required calculation constitutes a deviation from the monitoring requirements.
- (5) You must maintain the 12-hour average pressure drop, liquid flow-rate and pH within the operating limits established during the performance test.
- (6) Operation not within the established operating limits shall indicate a deviation from normal conditions. You must immediately complete an investigation of the source, determine and document the cause of the deviation and complete corrective action, if necessary.
- (7) You must monitor and maintain records of the total combined production of ammonium paratungstate (APT) and tungsten oxide on a rolling 12-month total basis. If the combined total production of APT and tungsten oxides exceeds 2,750 tons per year, you shall demonstrate the control equipment is designed to process the additional load. In addition, you shall complete an air screening analysis to demonstrate any increase in ammonia emissions do not exceed the impact levels.
- (8) You must maintain the two stage scrubbing system in accordance with manufacturer specifications.



(9) You must keep the records of all inspection and monitoring data. Your records must be in a form suitable and readily available for expeditious review. You must keep records of the occurrence and duration of each malfunction of the associated air pollution control and monitoring equipment. You must keep records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning air pollution control, or monitoring equipment to its normal or usual manner of operation. You must keep each record for 5 years following the date of each recorded action.

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 11: Compliance Demonstration**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 212.4 (a)**

**Item 11.1:**

The Compliance Demonstration activity will be performed for:

Emission Unit: U-00APT                      Emission Point: 00002

Regulated Contaminant(s):  
CAS No: 007664-41-7                      AMMONIA

**Item 11.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

ROUTINE AMMONIA PERFORMANCE TESTING  
AND ESTABLISH OPERATING LIMITS

(1) A performance test to demonstrate compliance with the required 94 percent control efficiency of ammonia emissions across the ammonia gas scrubber system and the ammonia recovery system must be completed within 60 days after achieving the maximum production rate but not later than 180 days after initial start-up.

(2) The performance test must be conducted at the maximum normal operating process load.

(3) You must establish the control parameters including:  
(1) the scrubber effluent pH, (2) scrubber liquid flowrate, and (3) pressure drop as your operating limits during the three-run performance test.



(4) You must collect pH, pressure drop, and liquid flow-rate data every 15 minutes during the entire period of the performance tests.

(5) You must determine the average pH, pressure drop, and liquid flow-rate for each individual test run in the three-run performance test by computing the average of all the 15-minute readings taken during each test run. The hourly averages shall be used to establish the operating limits.

(6) The method used to measure ammonia shall be approved by the Department.

(7) A performance test protocol shall be submitted to the Department for approval at least 60 days prior to completion of the test. The Department must be notified 10 days prior to the scheduled test date so a Department representative may be present during the test.

(8) The results of the performance test shall be submitted to the Department within 60 days following completion of the performance test.

(9) A permit modification application shall be submitted no later than 90 days upon receiving approval of the performance test report. The application shall contain the proposed compliance certification conditions for the established operating limits for the scrubber effluent pH, scrubber liquid flowrate and pressure drop.

(10) Subsequent performance test requirements will be at the discretion of the Department based on design, operation and maintenance practices used to minimize the impact of excess emissions on ambient air quality, the environment and human health.

Parameter Monitored: AMMONIA

Lower Permit Limit: 94 percent degree of air cleaning or greater

Reference Test Method: Department approved method

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: RANGE - NOT TO FALL OUTSIDE OF STATED RANGE AT ANY TIME

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION



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

Where emission source owners and/or operators keep records pursuant to compliance with the operational flexibility requirements of 6 NYCRR Subpart 201-5.4(b)(1), and/or the emission capping requirements of 6 NYCRR Subparts 201-7.2(d), 201-7.3(f), 201-7.3(g), 201-7.3(h)(5), 201-7.3(i) and 201-7.3(j), the Department will make such records available to the public upon request in accordance with 6 NYCRR Part 616 - Public Access to Records. Emission source owners and/or operators must submit the records required to comply with the request within sixty working days of written notification by the Department of receipt of the request.

**Item B: 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 12: Contaminant List**

**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable State Requirement:ECL 19-0301**

**Item 12.1:**

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

CAS No: 007664-41-7  
Name: AMMONIA

CAS No: 007664-93-9  
Name: SULFURIC ACID

CAS No: 007783-06-4  
Name: HYDROGEN SULFIDE

CAS No: 0NY075-00-0  
Name: PARTICULATES

**Condition 13: Unavoidable noncompliance and violations**

**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR 201-1.4**

**Item 13.1:**

At the discretion of the commissioner a violation of any applicable emission standard for necessary scheduled equipment maintenance, start-up/shutdown conditions and malfunctions or upsets may be excused if such violations are unavoidable. The following actions and recordkeeping and reporting requirements must be adhered to in such circumstances.

(a) The facility owner and/or operator shall compile and maintain records of all equipment 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 commissioner's representative when requested to do so in writing or when so required by a condition of a permit issued for the corresponding air contamination source except where conditions elsewhere in this permit which contain more stringent reporting and notification provisions for an applicable requirement, in which case they supercede those stated here. Such reports shall describe why the violation was unavoidable and shall include the time, frequency and duration of the maintenance and/or start-up/shutdown activities and the identification of air contaminants, and the estimated emission rates. If a facility owner and/or operator is subject to continuous stack monitoring and quarterly reporting requirements, he need not submit reports for equipment maintenance or start-up/shutdown for the facility to the commissioner's representative.

(b) In the event that emissions of air contaminants in excess of any emission standard in 6 NYCRR Chapter III Subchapter A occur due to a malfunction, the facility owner and/or operator shall report such malfunction by telephone to the commissioner's representative as soon as possible during normal working hours, but in any event not later than two working days after



becoming aware that the malfunction occurred. Within 30 days thereafter, when requested in writing by the commissioner's representative, the facility owner and/or operator shall submit a written report to the commissioner's representative describing the malfunction, the corrective action taken, identification of air contaminants, and an estimate of the emission rates. These reporting requirements are superseded by conditions elsewhere in this permit which contain reporting and notification provisions for applicable requirements more stringent than those above.

(c) The Department may also require the owner and/or operator to include in reports described under (a) and (b) above an estimate of the maximum ground level concentration of each air contaminant emitted and the effect of such emissions depending on the deviation of the malfunction and the air contaminants emitted.

(d) In the event of maintenance, start-up/shutdown or malfunction conditions which result in emissions exceeding any applicable emission standard, the facility owner and/or operator shall take appropriate action to prevent emissions which will result in contravention of any applicable ambient air quality standard. Reasonably available control technology, as determined by the commissioner, shall be applied during any maintenance, start-up/shutdown or malfunction condition subject to this paragraph.

(e) In order to have a violation of a federal regulation (such as a new source performance standard or national emissions standard for hazardous air pollutants) excused, the specific federal regulation must provide for an affirmative defense during start-up, shutdowns, malfunctions or upsets.

**Condition 14: Emission Unit Definition**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR Subpart 201-5**

**Item 14.1:**

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

Emission Unit: U-00APT

Emission Unit Description:

Emission Unit U-00APT includes the processing of concentrated ore to produce sodium tungstate solution by crushing, ball milling, alkali digestion, dilution and filtration. The sodium tungstate solution generated from the concentrated ore undergoes additional processing which includes purification, filtration, solution pH adjustment, filtration, ion exchange, vaporization/crystallization, filtration and ammonium paratungstate drying.

Building(s): APT

**Condition 15: Visible Emissions Limited**  
**Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR 211.2**

**Item 15.1:**

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.

\*\*\*\* Emission Unit Level \*\*\*\*

Condition 16: Emission Point Definition By Emission Unit
Effective between the dates of 09/10/2012 and Permit Expiration Date

Applicable State Requirement:6 NYCRR Subpart 201-5

Item 16.1:

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

Emission Unit: U-00APT

Emission Point: 00001
Height (ft.): 100 Diameter (in.): 18
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00002
Height (ft.): 80 Diameter (in.): 6
NYTMN (km.): 4757.198 NYTME (km.): 198.494

Emission Point: 00004
Height (ft.): 58 Diameter (in.): 3
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00005
Height (ft.): 58 Diameter (in.): 6
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00006
Height (ft.): 58 Diameter (in.): 6
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00007
Height (ft.): 58 Diameter (in.): 6
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00008
Height (ft.): 58 Length (in.): 18 Width (in.): 12
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 00009
Height (ft.): 58 Length (in.): 18 Width (in.): 12
NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 0003A
Height (ft.): 58 Diameter (in.): 2



NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

Emission Point: 0003B

Height (ft.): 58

Diameter (in.): 2

NYTMN (km.): 4757.198 NYTME (km.): 198.494 Building: APT

**Condition 17: Process Definition By Emission Unit  
Effective between the dates of 09/10/2012 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR Subpart 201-5**

**Item 17.1:**

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

Emission Unit: U-00APT

Process: 002

Process Description:

Process 002 includes a purification process. Sodium tungstate filtrate solution containing soluble impurities is transferred into purification tanks where chemicals including magnesium sulfate, sodium sulfide, 10% sulfuric acid and recycle liquor from the hydrogen sulfide scrubber are added. The pH of the solution remains slightly alkaline as silicone containing compounds are precipitated and then filtered out. Filtrate is collected and transferred to the pH adjustment tanks where dilution water and more 10% sulfuric acid are added. The key purpose of pH adjustment is to precipitate virtually all of the molybdenum present as the pH is lowered to approximately 3.0. At this pH a reaction takes place which results in the release of hydrogen sulfide and some sulfur oxide. These vapors discharge to a hydrogen sulfide scrubber.

The hydrogen sulfide scrubber system is designed to eliminate 99 percent of the hydrogen sulfide from the pH adjustment reaction. Hydrogen sulfide itself is acidic and will react with a base. The incoming hydrogen sulfide gas is scrubbed in a packed tower with a solution containing 20% sodium hydroxide (caustic soda) and 12.5% sodium hypochlorite. The tower is maintained at a pH of 8.0 via a pH probe, transmitter, controller and control valve. Sodium hypochlorite is added to the mix via an Oxidation Reduction Potential (ORP) probe, transmitter, controller and control valve. The probe will maintain a minimum of 600 millivolts of potential or approximately 8 mg/l of free chlorine to react with sodium sulfide. Sodium sulfate and sodium chloride salts are produced and discharged to the Buffalo Sewer Authority.

Emission Source/Control: 00017 - Control

Control Type: GAS SCRUBBER (GENERAL, NOT CLASSIFIED)



Emission Source/Control: 521VC - Control  
Control Type: VENT CONDENSER

Emission Source/Control: 522VC - Control  
Control Type: VENT CONDENSER

Emission Source/Control: 00056 - Process

Emission Source/Control: 00521 - Process

Emission Source/Control: 00522 - Process

Emission Source/Control: 00571 - Process

Emission Source/Control: 00572 - Process

Emission Source/Control: 00573 - Process

Emission Source/Control: 00621 - Process

Emission Source/Control: 00671 - Process

Emission Source/Control: 00672 - Process

Emission Source/Control: 00673 - Process

Emission Source/Control: IONEX - Process

**Item 17.2:**

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

Emission Unit: U-00APT

Process: 003

Process Description:

Process 003 includes the crystallization process. Aqueous ammonia tungstate solution, containing excess unreacted ammonium hydroxide, is fed to a batch operated evaporator-crystallizer system. Here ammonium paratungstate (APT) is precipitated and recovered as wet cake. The APT cake is then dried. All of the units are heated and vaporize the water and ammonia present. Some ammonia is released during the crystallization as ammonium tungstate converts to crystallized APT. Solution containing crystallized APT is filtered through a vacuum filter. Dewatered ammonium paratungstate crystals are then dried at 250 to 300 degrees Celsius in a furnace. Furthermore, at times, the facility plans to make tungsten oxide (WO<sub>3</sub>) instead of APT through additional heating in a calcining furnace. The production of WO<sub>3</sub> drives off the combined ammonia and results in the liberation of additional ammonia. Ammonia from this process is vented



to a dilute ammonia recovery process.

#### Ammonia (NH<sub>3</sub>) Recovery Process Description

Ammonia is used at Niagara Refining to pull tungsten containing molecules off a resin bed, in the production process of tungsten oxide. When the ammonia has done its job, the excess free ammonia is “boiled” off in the crystallizer and recovered. During crystallization, as the free ammonia is boiled off, a chemical reaction occurs to form Ammonium Paratungstate or APT. During this reaction, ammonia is also formed. A subsequent process, in which crystalline APT is calcined to form tungsten oxide also forms ammonia.

These two sources of ammonia together with the free ammonia boiled off from the crystallizer are captured for reuse. The system that does this process is called the Ammonia Recovery System or ARS.

The ARS consists of a purified water spray, a heat recovering heat exchanger, a condenser and a scrubber. The ammonia from the crystallizer goes through a spray bank where purified water helps absorb the ammonia during the early stages of the crystallization. From there, the ammonia/water stream enters a heat recovery heat exchanger that helps cool the ammonia/water stream and heats the plant hot water system. The stream then combines with the calciner ammonia, and then enters a large condenser. All the water condenses and most of the ammonia is absorbed in the water. This stream (now called aqua ammonia) is later strengthened back to its original strength with fresh commercial aqua ammonia.

Any ammonia that does not absorb into the water at the condenser is sent to a scrubber (packed tower) where it is absorbed by purified water. This weak stream of aqua ammonia is also reused in the process and can be strengthened back to usable strength with commercial aqua ammonia.

Emission Source/Control: 00015 - Control  
Control Type: AMMONIA SCRUBBING

Emission Source/Control: 08101 - Control  
Control Type: PARTICULATE TRAP

Emission Source/Control: 08102 - Control  
Control Type: PARTICULATE TRAP

Emission Source/Control: 841ME - Control  
Control Type: MIST ELIMINATOR



Emission Source/Control: 842ME - Control  
Control Type: MIST ELIMINATOR

Emission Source/Control: 00841 - Process

Emission Source/Control: 00842 - Process

Emission Source/Control: 00851 - Process

Emission Source/Control: 00852 - Process

Emission Source/Control: 00891 - Process

Emission Source/Control: 00892 - Process

Emission Source/Control: 00ARS - Process

**Item 17.3:**

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

Emission Unit: U-00APT

Process: 004

Process Description:

Process 004 includes the gaseous ammonia scrubbing system. Niagara Refining's ammonium paratungstate production operation includes a two-stage scrubbing system to remove gaseous ammonia vented from various process tanks containing aqueous solutions. Most of the ammonia emissions occur during transfers of vessel contents.

The primary vent system consists of a common manifolded vent header purged with dilution air. Vents for three of the tanks, which normally contain liquors higher in ammonia content, are separately manifolded and padded with nitrogen to eliminate flammability potential. This manifold is also tied into the primary vent system.

Sulfuric acid is used as the scrubbing media. This is ideal since it reacts very rapidly with ammonia and exhibits no vapor pressure. Product formed is soluble ammonium sulfate. Pumps, one for each system, recirculate acidic liquor over a venturi eductor where the gas and liquid intimately contact.

The scrubber system utilizes venturi eductors not only to achieve vapor-liquid contacting but also to pull the dilution air and ammonia vapors through the common vent system. Gases exiting the first scrubber system are drawn into the second scrubber where further contacting takes



place. The second scrubber will always be richer in acid content than the first. When the first scrubber is spent, valves are switched to reverse the scrubbing order. The No.1 scrubber is pumped out, re-charged with dilute sulfuric acid to become the No.2 scrubber. The previous No.2 scrubber becomes No.1.

Vent pipes from the scrubber tanks, only one open at any given time, combine into a single vent pipe and direct dilution air containing moisture and small amounts of unneutralized ammonia to the atmosphere.

Emission Source/Control: 00018 - Control  
Control Type: AMMONIA SCRUBBING

Emission Source/Control: 00491 - Process

Emission Source/Control: 00492 - Process

Emission Source/Control: 00711 - Process

Emission Source/Control: 00870 - Process

Emission Source/Control: 00925 - Process

Emission Source/Control: 00926 - Process

Emission Source/Control: 00927 - Process

Emission Source/Control: 07101 - Process

Emission Source/Control: 07141 - Process

Emission Source/Control: 09212 - Process

Emission Source/Control: 09214 - Process

**Item 17.4:**

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

Emission Unit: U-00APT

Process: 005

Process Description:

Process 005 includes tank vents not vented to the scrubber control systems. There are several chemical solution tanks that do not vent through the scrubber control systems. These include two NaOCl, NaOH, H<sub>2</sub>SO<sub>4</sub>, MgSO<sub>4</sub>, Na<sub>2</sub>S, NH<sub>3</sub>Cl and two IT feed tanks. Some of these tanks vent directly to the roof and others vent through filter cartridges to remove particulates before being vented inside the building. Particulates are generated from the addition of dry raw material used to create the

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desired tank solution. Other particulate emissions are generated from the transfer of dry material to the Blue/Yellow Tungsten screeners. Particulates from these sources are controlled by a baghouse before being vented inside the building.

Emission Source/Control: 08151 - Control  
Control Type: FABRIC FILTER

Emission Source/Control: 08152 - Control  
Control Type: FABRIC FILTER

Emission Source/Control: 980FC - Control  
Control Type: PARTICULATE TRAP

Emission Source/Control: 990FC - Control  
Control Type: PARTICULATE TRAP

Emission Source/Control: 00674 - Process

Emission Source/Control: 00675 - Process

Emission Source/Control: 00716 - Process

Emission Source/Control: 00717 - Process

Emission Source/Control: 00781 - Process

Emission Source/Control: 00782 - Process

Emission Source/Control: 00783 - Process

Emission Source/Control: 00911 - Process

Emission Source/Control: 00941 - Process

Emission Source/Control: 00942 - Process

Emission Source/Control: 00951 - Process  
Design Capacity: 5,000 gallons

Emission Source/Control: 00953 - Process  
Design Capacity: 5,000 gallons

Emission Source/Control: 00980 - Process

Emission Source/Control: 00990 - Process

Emission Source/Control: 08121 - Process

Emission Source/Control: 08122 - Process

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Emission Source/Control: 09141 - Process

Emission Source/Control: 09142 - Process

**Item 17.5:**

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

Emission Unit: U-00APT

Process: 01A

Process Description:

Process 01A includes the initial processing of ore concentrate. Scheelite or Wolframite is transferred from bulk super sacs and sent to a ball mill. The ore concentrate solution is mixed with sodium hydroxide to leach a sodium tungstate solution which is later purified. Particulate emissions are generated from the transfer of dry material to the Scheelite ore hoppers. Particulates from these sources are controlled by a baghouse before being vented inside the building.

Emission Source/Control: 00027 - Control  
Control Type: FABRIC FILTER

Emission Source/Control: 422VC - Control  
Control Type: VENT CONDENSER

Emission Source/Control: 00211 - Process

Emission Source/Control: 00212 - Process

Emission Source/Control: 00221 - Process

Emission Source/Control: 00222 - Process

Emission Source/Control: 00241 - Process

Emission Source/Control: 00242 - Process

Emission Source/Control: 00413 - Process

Emission Source/Control: 00414 - Process

Emission Source/Control: 00422 - Process

Emission Source/Control: 00442 - Process

