

CLASS II AIR QUALITY PERMIT

DRAFT PERMIT No. 97526

PERMITTEE: Linde Gas & Equipment, Inc.
FACILITY: Linde Gas & Equipment, Inc.
PLACE ID: 2433
DATE ISSUED: Date Pending
EXPIRY DATE: Date Pending

SUMMARY

This Class II air quality synthetic minor permit is issued to Linde Gas & Equipment, Inc., the Permittee, for the continued operation of their chemical synthesis and repackaging facility located in Mohave County at 3426W Griffith Road, Kingman, AZ 86401. This permit renews and supersedes Permit No. 70386.

The facility has the potential to emit hazardous air pollutants (HAPs) in excess of major source thresholds. However, the facility has accepted emission limitations and standards on HAPs. Therefore, the facility qualifies for a Class II synthetic minor permit as allowed under Arizona Administrative Code (A.A.C.) R18-2-306.01.A.

This permit is issued in accordance with Arizona Revised Statutes (ARS) 49-426. It contains requirements from Title 18, Chapter 2 of the A.A.C. and Title 40 of the Code of Federal Regulations (CFR). All definitions, terms, and conditions used in this permit conform to those in the Arizona Administrative Code R18-2-101 et. seq. (A.A.C.) and Title 40 of the Code of Federal Regulations, except as otherwise defined in this permit.

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ATTACHMENT "A": GENERAL PROVISIONS

I. PERMIT EXPIRATION AND RENEWAL

- A.** This permit is valid for a period of five (5) years from the date of issuance.
[ARS § 49-426.F, A.A.C. R18-2-306.A.1]
- B.** The Permittee shall submit an application for renewal of this permit at least six (6) months, but not more than eighteen (18) months, prior to the date of permit expiration.
[A.A.C. R18-2-304.D.2]

II. COMPLIANCE WITH PERMIT CONDITIONS

- A.** The Permittee shall comply with all conditions of this permit including all applicable requirements of the Arizona Revised Statutes (A.R.S.) Title 49, Chapter 3, and the air quality rules under Title 18, Chapter 2 of the Arizona Administrative Code. Any permit noncompliance is grounds for enforcement action; for permit termination, revocation and reissuance, or revision; or for denial of a permit renewal application. In addition, noncompliance with any federally enforceable requirement constitutes a violation of the Clean Air Act.
[A.A.C. R18-2-306.A.8.a]
- B.** It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
[A.A.C. R18-2-306.A.8.b]

III. PERMIT REVISION, REOPENING, REVOCATION AND REISSUANCE, OR TERMINATION FOR CAUSE

- A.** The permit may be revised, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit revision, revocation and reissuance, termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
[A.A.C. R18-2-306.A.8.c]
- B.** The permit shall be reopened and revised under any of the following circumstances:
1. The Director or the Administrator determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit; and
[A.A.C. R18-2-321.A.1.c]
 2. The Director or the Administrator determines that the permit needs to be revised or revoked to assure compliance with the applicable requirements.
[A.A.C. R18-2-321.A.1.d]
- C.** Proceedings to reopen and issue a permit, including appeal of any final action relating to a permit reopening, shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists. Such reopening

shall be made as expeditiously as practicable. Permit reopenings shall not result in a resetting of the five-year permit term.

[A.A.C. R18-2-321.A.2]

IV. POSTING OF PERMIT

- A.** The Permittee shall post this permit or a certificate of permit issuance on location where the equipment is installed in such a manner as to be clearly visible and accessible. All equipment covered by this permit shall be clearly marked with one of the following:

[A.A.C. R18-2-315.A]

1. Current permit number; or
2. Serial number or other equipment ID number that is also listed in the permit to identify that piece of equipment.

- B.** A copy of the complete permit shall be kept on site.

[A.A.C. R18-2-315.B]

V. FEE PAYMENT

The Permittee shall pay fees to the Director pursuant to ARS § 49-426(E) and A.A.C. R18-2-326.

[A.A.C. R18-2-306.A.9 and -326]

VI. EMISSIONS INVENTORY QUESTIONNAIRE AND EMISSIONS STATEMENT

- A.** The Permittee shall complete and submit to the Director an emissions inventory questionnaire no later than June 1 every three years beginning June 1, 2021. At the Director's request, the Permittee may be required to complete and submit emissions inventory questionnaires in addition to the triennial emissions inventory questionnaire. The Director shall notify the Permittee in writing of the decision to require additional emissions inventory questionnaires.

[A.A.C. R18-2-327.A.1.b]

- B.** The emissions inventory questionnaire shall be on an electronic or paper form provided by the Director and shall include the information required by A.A.C. R18-2-327.A.3 for the previous calendar year.

[A.A.C. R18-2-327.A.3]

- C.** The Permittee shall submit to the Director an amendment to an emissions inventory questionnaire, containing the documentation required by A.A.C. R18-2-327.A.3, whenever the Permittee discovers or receives notice, within two years of the original submittal, that incorrect or insufficient information was submitted to the Director by a previous emissions inventory questionnaire. The amendment shall be submitted to the Director within 30 days of discovery or receipt of notice. If the incorrect or insufficient information resulted in an incorrect annual emissions fee, the Director shall require that additional payment be made or shall apply an amount as a credit to a future annual emissions fee. The submittal of an amendment shall not subject the Permittee to an enforcement action or a civil or criminal penalty if the original submittal of incorrect or insufficient information was not due to willful neglect.

[A.A.C. R18-2-327.A.4]

VII. COMPLIANCE CERTIFICATION

- A.** The Permittee shall submit a compliance certification to the Director semiannually which describes the compliance status of the source with respect to each permit condition. The certifications shall be submitted no later than May 15th and November 15th. The May 15th compliance certification shall report the compliance status of the source during the period between October 1st of the previous year and March 31st of the current year. The November 15th compliance certification shall report the compliance status of the source during the period between April 1st and September 30th of the current year.
[A.A.C. R18-2-309.2.a]
- B.** The compliance certifications shall include the following:
1. Identification of each term or condition of the permit that is the basis of the certification;
[A.A.C. R18-2-309.2.c.i]
 2. Identification of the methods or other means used by the Permittee for determining the compliance status with each term and condition during the certification period;
[A.A.C. R18-2-309.2.c.ii]
 3. Status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certifications shall identify each deviation (including any deviations reported pursuant to Condition XII.B of this Attachment) during the period covered by the certification and take it into account for consideration in the compliance certification
[A.A.C. R18-2-309.2.c.iii]
 4. Other facts the Director may require in determining the compliance status of the source.
[A.A.C. R18-2-309.2.c.iv]
- C.** A progress report on all outstanding compliance schedules shall be submitted every six months beginning six months after permit issuance.
[A.A.C. R18-2-309.5.d]

VIII. CERTIFICATION OF TRUTH, ACCURACY AND COMPLETENESS

Any document required to be submitted by this permit, including reports, shall contain a certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

[A.A.C. R18-2-309.3]

IX. INSPECTION AND ENTRY

Upon presentation of proper credentials, the Permittee shall allow the Director or the authorized representative of the Director to:

- A. Enter upon the Permittee's premises where a source is located, emissions-related activity is conducted, or where records are required to be kept under the conditions of the permit;
[A.A.C. R18-2-309.4.a]
- B. Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of the permit;
[A.A.C. R18-2-309.4.b]
- C. Inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
[A.A.C. R18-2-309.4.c]
- D. Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements; and
[A.A.C. R18-2-309.4.d]
- E. Record any inspection by use of written, electronic, magnetic and photographic media.
[A.A.C. R18-2-309.4.e]

X. PERMIT REVISION PURSUANT TO FEDERAL HAZARDOUS AIR POLLUTANT STANDARD

If this source becomes subject to a standard promulgated by the Administrator pursuant to Section 112(d) of the Act, then the Permittee shall, within twelve months of the date on which the standard is promulgated, submit an application for a permit revision demonstrating how the source will comply with the standard.

[A.A.C. R18-2-304.D.3]

XI. ACCIDENTAL RELEASE PROGRAM

If this source becomes subject to the provisions of 40 CFR Part 68, then the Permittee shall comply with these provisions according to the time line specified in 40 CFR Part 68.

[40 CFR Part 68]

XII. EXCESS EMISSIONS, PERMIT DEVIATIONS, AND EMERGENCY REPORTING

A. Excess Emissions Reporting

[A.A.C. R18-2-310.01.A, B, and C]

1. Excess emissions shall be reported as follows:

- a. The Permittee shall report to the Director any emissions in excess of the limits established by this permit. Such report shall be in two parts as specified below:

[A.A.C. R18-2-310.01.A]

- (1) Notification by telephone or facsimile within 24 hours of the time when the Permittee first learned of the occurrence of excess emissions including all available information from Condition XII.A.1.b below.

- (2) Detailed written notification by submission of an excess emissions report within 72 hours of the notification pursuant to Condition XII.A.1.a(1) above.
- b. The report shall contain the following information:
 - (1) Identity of each stack or other emission point where the excess emissions occurred;
[A.A.C. R18-2-310.01.B.1]
 - (2) Magnitude of the excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the magnitude of the excess emissions;
[A.A.C. R18-2-310.01.B.2]
 - (3) Time and duration, or expected duration, of the excess emissions;
[A.A.C. R18-2-310.01.B.3]
 - (4) Identity of the equipment from which the excess emissions emanated;
[A.A.C. R18-2-310.01.B.4]
 - (5) Nature and cause of the emissions;
[A.A.C. R18-2-310.01.B.5]
 - (6) If the excess emissions were the result of a malfunction, steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunctions;
[A.A.C. R18-2-310.01.B.6]
 - (7) Steps that were or are being taken to limit the excess emissions; and
[A.A.C. R18-2-310.01.B.7]
 - (8) If the excess emissions resulted from start-up or malfunction, the report shall contain a list of the steps taken to comply with the permit procedures governing source operation during periods of startup or malfunction.
[A.A.C. R18-2-310.01.B.8]
2. In the case of continuous or recurring excess emissions, the notification requirements shall be satisfied if the source provides the required notification after excess emissions are first detected and includes in such notification an estimate of the time the excess emissions will continue. Excess emissions occurring after the estimated time period, or changes in the nature of the emissions as originally reported, shall require additional notification pursuant to Condition XII.A.1 above.
[A.A.C. R18-2-310.01.C]

B. Permit Deviations Reporting

The Permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. Where the applicable requirement contains a definition of prompt or otherwise specifies a timeframe for reporting deviations, that definition or timeframe shall govern. Where the applicable requirement does not address the timeframe for reporting deviations, the Permittee shall submit reports of deviations according to the following schedule:

1. Notice that complies with Condition XII.A above is prompt for deviations that constitute excess emissions;
[A.A.C. R18-2-306.A.5.b.i]
2. Notice that is submitted within two working days of discovery of the deviation is prompt for deviations of permit conditions identified by Condition I.C.1 of Attachment “B”;
[A.A.C. R18-2-306.A.5.b.ii]
3. Except as provided in Conditions XII.B.1 and 2, prompt notification of all other types of deviations shall be semiannually, concurrent with the semiannual compliance certifications required in Section VII, and can be submitted via myDEQ, the Arizona Department of Environmental Quality’s online portal.
[A.A.C. R18-2-306.A.5.b.ii]

C. Emergency Provision

1. An “emergency” means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, that require immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
[A.A.C. R18-2-306.E.1]
2. An emergency constitutes an affirmative defense to an action brought for noncompliance with technology-based emission limitations if Condition XII.C.3 below is met.
[A.A.C. R18-2-306.E.2]
3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
[A.A.C. R18-2-306.E.3]
 - a. An emergency occurred and that the Permittee can identify the cause(s) of the emergency;
[A.A.C. R18-2-306.E.3.a]
 - b. The permitted facility was being properly operated at the time of the emergency;
[A.A.C. R18-2-306.E.3.b]

- c. During the period of the emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards or other requirements in the permit; and

[A.A.C. R18-2-306.E.3.c]

- d. The Permittee submitted notice of the emergency to the Director by certified mail, facsimile, or hand delivery within two working days of the time when emission limitations were exceeded due to the emergency. This notice shall contain a description of the emergency, any steps taken to mitigate emissions, and corrective action taken.

[A.A.C. R18-2-306.E.3.d]

4. In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

[A.A.C. R18-2-306.E.4]

5. This provision is in addition to any emergency or upset provision contained in any applicable requirement.

[A.A.C. R18-2-306.E.5]

D. Affirmative Defenses for Excess Emissions Due to Malfunctions, Startup, and Shutdown

1. Applicability

A.A.C. R18-2-310 establishes affirmative defenses for certain emissions in excess of an emission standard or limitation and applies to all emission standards or limitations except for standards or limitations:

- a. Promulgated pursuant to Sections 111 or 112 of the Act;

[A.A.C. R18-2-310.A.1]

- b. Promulgated pursuant to Titles IV or VI of the Clean Air Act;

[A.A.C. R18-2-310.A.2]

- c. Contained in any Prevention of Significant Deterioration (PSD) or New Source Review (NSR) permit issued by the U.S. EPA;

[A.A.C. R18-2-310.A.3]

- d. Contained in A.A.C. R18-2-715.F; or

[A.A.C. R18-2-310.A.4]

- e. Included in a permit to meet the requirements of A.A.C. R18-2-406.A.5.

[A.A.C. R18-2-310.A.5]

2. Affirmative Defense for Malfunctions

Emissions in excess of an applicable emission limitation due to malfunction shall constitute a violation. When emissions in excess of an applicable emission limitation are due to a malfunction, the Permittee has an affirmative defense to a civil or administrative enforcement proceeding based on that violation, other than a judicial action seeking injunctive relief, if the Permittee has complied with the

reporting requirements of A.A.C. R18-2-310.01 and has demonstrated all of the following:

[A.A.C. R18-2-310.B]

- a. The excess emissions resulted from a sudden and unavoidable breakdown of process equipment or air pollution control equipment beyond the reasonable control of the Permittee;

[A.A.C. R18-2-310.B.1]

- b. The air pollution control equipment, process equipment, or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;

[A.A.C. R18-2-310.B.2]

- c. If repairs were required, the repairs were made in an expeditious fashion when the applicable emission limitations were being exceeded. Off-shift labor and overtime were utilized where practicable to ensure that the repairs were made as expeditiously as possible. If off-shift labor and overtime were not utilized, the Permittee satisfactorily demonstrated that the measures were impracticable;

[A.A.C. R18-2-310.B.3]

- d. The amount and duration of the excess emissions (including any bypass operation) were minimized to the maximum extent practicable during periods of such emissions;

[A.A.C. R18-2-310.B.4]

- e. All reasonable steps were taken to minimize the impact of the excess emissions on ambient air quality;

[A.A.C. R18-2-310.B.5]

- f. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance;

[A.A.C. R18-2-310.B.6]

- g. During the period of excess emissions there were no exceedances of the relevant ambient air quality standards established in Title 18, Chapter 2, Article 2 of the Arizona Administrative Code that could be attributed to the emitting source;

[A.A.C. R18-2-310.B.7]

- h. The excess emissions did not stem from any activity or event that could have been foreseen and avoided, or planned, and could not have been avoided by better operations and maintenance practices;

[A.A.C. R18-2-310.B.8]

- i. All emissions monitoring systems were kept in operation if at all practicable; and

[A.A.C. R18-2-310.B.9]

- j. The Permittee's actions in response to the excess emissions were documented by contemporaneous records.
[A.A.C. R18-2-310.B.10]

3. Affirmative Defense for Startup and Shutdown

- a. Except as provided in Condition XII.D.3 below, and unless otherwise provided for in the applicable requirement, emissions in excess of an applicable emission limitation due to startup and shutdown shall constitute a violation. When emissions in excess of an applicable emission limitation are due to startup and shutdown, the Permittee has an affirmative defense to a civil or administrative enforcement proceeding based on that violation, other than a judicial action seeking injunctive relief, if the Permittee has complied with the reporting requirements of A.A.C. R18-2-310.01 and has demonstrated all of the following:

[A.A.C. R18-2-310.C.1]

- (1) The excess emissions could not have been prevented through careful and prudent planning and design;
[A.A.C. R18-2-310.C.1.a]
- (2) If the excess emissions were the result of a bypass of control equipment, the bypass was unavoidable to prevent loss of life, personal injury, or severe damage to air pollution control equipment, production equipment, or other property;
[A.A.C. R18-2-310.C.1.b]
- (3) The air pollution control equipment, process equipment, or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;
[A.A.C. R18-2-310.C.1.c]
- (4) The amount and duration of the excess emissions (including any bypass operation) were minimized to the maximum extent practicable during periods of such emissions;
[A.A.C. R18-2-310.C.1.d]
- (5) All reasonable steps were taken to minimize the impact of the excess emissions on ambient air quality;
[A.A.C. R18-2-310.C.1.e]
- (6) During the period of excess emissions there were no exceedances of the relevant ambient air quality standards established in Title 18, Chapter 2, Article 2 of the Arizona Administrative Code that could be attributed to the emitting source;
[A.A.C. R18-2-310.C.1.f]
- (7) All emissions monitoring systems were kept in operation if at all practicable; and
[A.A.C. R18-2-310.C.1.g]

- (8) Contemporaneous records documented the Permittee's actions in response to the excess emissions.

[A.A.C. R18-2-310.C.1.h]

- b. If excess emissions occur due to a malfunction during routine startup and shutdown, then those instances shall be treated as other malfunctions subject to Condition XII.D.2 above.

[A.A.C. R18-2-310.C.2]

4. Affirmative Defense for Malfunctions During Scheduled Maintenance

If excess emissions occur due to a malfunction during scheduled maintenance, then those instances will be treated as other malfunctions subject to Condition XII.D.2 above.

[A.A.C. R18-2-310.D]

5. Demonstration of Reasonable and Practicable Measures

For an affirmative defense under Condition XII.D.2 or XII.D.3, the Permittee shall demonstrate, through submission of the data and information required by this Condition XII.D and Condition XII.A.1 above, that all reasonable and practicable measures within the Permittee's control were implemented to prevent the occurrence of the excess emissions.

[A.A.C. R18-2-310.E]

XIII. RECORDKEEPING REQUIREMENTS

- A. The Permittee shall keep records of all required monitoring information including, but not limited to, the following:

1. The date, place as defined in the permit, and time of sampling or measurements;

[A.A.C. R18-2-306.A.4.a.i]

2. The date(s) any analyses were performed;

[A.A.C. R18-2-306.A.4.a.ii]

3. The name of the company or entity that performed the analyses;

[A.A.C. R18-2-306.A.4.a.iii]

4. A description of the analytical techniques or methods used;

[A.A.C. R18-2-306.A.4.a.iv]

5. The results of analyses; and

[A.A.C. R18-2-306.A.4.a.v]

6. The operating conditions as existing at the time of sampling or measurement.

[A.A.C. R18-2-306.A.4.a.vi]

- B. The Permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance

records and all original strip-chart recordings or other data recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.

[A.A.C. R18-2-306.A.4.b]

XIV. DUTY TO PROVIDE INFORMATION

- A.** The Permittee shall furnish to the Director, within a reasonable time, any information that the Director may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating the permit, or to determine compliance with the permit. Upon request, the Permittee shall also furnish to the Director copies of records required to be kept by the permit. For information claimed to be confidential, the Permittee shall furnish an additional copy of such records directly to the Administrator along with a claim of confidentiality.

[A.A.C. R18-2-304.G and -306.A.8.e]

- B.** If the Permittee has failed to submit any relevant facts or has submitted incorrect information in the permit application, the Permittee shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information.

[A.A.C. R18-2-304.H]

XV. PERMIT AMENDMENT OR REVISION

The Permittee shall apply for a permit amendment or revision for changes to the facility which does not qualify for a facility change without revision under Section XVII below, as follows:

- A.** Facility Changes that Require a Permit Revision;

[A.A.C. R18-2-317.01]

- B.** Administrative Permit Amendment;

[A.A.C. R18-2-318]

- C.** Minor Permit Revision; and

[A.A.C. R18-2-319]

- D.** Significant Permit Revision.

[A.A.C. R18-2-320]

The applicability and requirements for such action are defined in the above referenced regulations.

XVI. FACILITY CHANGE WITHOUT A PERMIT REVISION

- A.** Except for a physical change or change in the method of operation at a Class II source requiring a permit revision under A.A.C. R18-2-317.01, or a change subject to logging or notice requirements in Condition XVI.B, a change at a Class II source shall not be subject to revision, notice, or logging requirements under this Section.

[A.A.C. R18-2-317.02.A]

- B.** The following changes may be made if the source keeps on site records of the changes according to Condition XVI.F below:

[A.A.C. R18-2-317.02.B]

1. Implementing an alternative operating scenario, including raw materials changes;
 2. Changing process equipment, operating procedures, or making any other physical change if the permit requires the change to be logged;
 3. Engaging in any new insignificant activity listed in A.A.C. R18-2-101.68 but not listed in the permit;
 4. Replacing an item of air pollution control equipment listed in the permit with an identical (same model, different serial number) item. The Director may require verification of efficiency of the new equipment by performance tests; and
 5. A change that results in a decrease in actual emissions if the source wants to claim credit for the decrease in determining whether the source has a net emissions increase for any purpose. The logged information shall include a description of the change that will produce the decrease in actual emissions. A decrease that has not been logged is creditable only if the decrease is quantifiable, enforceable, and otherwise qualifies as a creditable decrease.
- C.** The permit shield described in A.A.C. R18-2-325 shall not apply to any change made under this Section, other than implementation of an alternate operating scenario under Condition XVI.B.1.
[A.A.C. R18-2-317.02.F]
- D.** Notwithstanding any other part of this Section, the Director may require a permit to be revised for any change that, when considered together with any other changes submitted by the Permittee under this Section over the term of the permit, constitutes a change under subsection A.A.C. R18-2-317.01.A.
[A.A.C. R18-2-317.02.G]
- E.** A copy of all logs required under Condition XVI.B shall be filed with the Director within 30 days after each anniversary of the permit issuance date. If no changes were made at the source requiring logging, a statement to that effect shall be filed instead.
[A.A.C. R18-2-317.02.I]
- F.** Logging Requirements
[Arizona Administrative Code, Appendix 3]
1. Each log entry required by a change under Condition XVI.B shall include at least the following information:
 - a. A description of the change, including:
 - (1) A description of any process change;
 - (2) A description of any equipment change, including both old and new equipment descriptions, model numbers, and serial numbers, or any other unique equipment ID number; and
 - (3) A description of any process material change.

- b. The date and time that the change occurred.
 - c. The provisions of Condition XVI.B that authorizes the change to be made with logging.
 - d. The date the entry was made and the first and last name of the person making the entry.
2. Logs shall be kept for five (5) years from the date created. Logging shall be performed in indelible ink in a bound log book with sequentially number pages, or in any other form, including electronic format, approved by the Director.

XVII. TESTING REQUIREMENTS

- A.** The Permittee shall conduct performance tests as specified in the permit and at such other times as may be required by the Director.

[A.A.C. R18-2-312.A]

- B.** Operational Conditions during Performance Testing

Performance tests shall be conducted under such conditions as the Director shall specify to the plant operator based on representative performance of the source. The Permittee shall make available to the Director such records as may be necessary to determine the conditions of the performance tests. Operations during periods of start-up, shutdown, and malfunction (as defined in A.A.C. R18-2-101) shall not constitute representative conditions of performance tests unless otherwise specified in the applicable standard.

[A.A.C. R18-2-312.C]

- C.** Performance Tests shall be conducted and data reduced in accordance with the test methods and procedures contained in the Arizona Testing Manual unless modified by the Director pursuant to A.A.C. R18-2-312.B.

[A.A.C. R18-2-312.B]

- D.** Test Plan

At least 14 working days prior to performing a test, the Permittee shall submit a test plan to the Director, which must include the following, in addition to all other applicable requirements, as identified in the Arizona Testing Manual:

[A.A.C. R18-2-312.B]

1. Test duration;
2. Test location(s);
3. Test method(s); and
4. Source operation and other parameters that may affect test results.

- E.** Stack Sampling Facilities

The Permittee shall provide, or cause to be provided, performance testing facilities as follows:

[A.A.C. R18-2-312.E]

1. Sampling ports adequate for test methods applicable to the facility;
2. Safe sampling platform(s);
3. Safe access to sampling platform(s); and
4. Utilities for sampling and testing equipment.

F. Interpretation of Final Results

Each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic mean of the results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs is required to be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the Permittee's control, compliance may, upon the Director's approval, be determined using the arithmetic mean of the results of the other two runs. If the Director or the Director's designee is present, tests may only be stopped with the Director's or such designee's approval. If the Director or the Director's designee is not present, tests may only be stopped for good cause. Good cause includes: forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the Permittee's control. Termination of any test without good cause after the first run is commenced shall constitute a failure of the test. Supporting documentation, which demonstrates good cause, must be submitted.

[A.A.C. R18-2-306.A.3.c and A.A.C. R18-2-312.F]

G. Report of Final Test Results

A written report of the results of performance tests conducted pursuant to 40 CFR 63, shall be submitted to the Director within 60 days after the test is performed. A written report of the results of all other performance tests shall be submitted within 4 weeks after the test is performed, or as otherwise provided in the Arizona Testing Manual. All performance testing reports shall be submitted in accordance with the Arizona Testing Manual and A.A.C. R18-2-312.A.

[A.A.C. R18-2-312.A and B]

H. Extension of Performance Test Deadline

For performance testing required under Condition XVII.A above, the Permittee may request an extension to a performance test deadline due to a force majeure event as follows:

[A.A.C. R18-2-312.J]

1. If a force majeure event is about to occur, occurs, or has occurred for which the Permittee intends to assert a claim of force majeure, the Permittee shall notify the

Director in writing as soon as practicable following the date the Permittee first knew, or through due diligence should have known that the event may cause or caused a delay in testing beyond the regulatory deadline. The notification must occur before the performance test deadline unless the initial force majeure or a subsequent force majeure event delays the notice, and in such cases, the notification shall be given as soon as practicable.

[A.A.C. R18-2-312.J.1]

2. The Permittee shall provide to the Director a written description of the force majeure event and a rationale for attributing the delay in testing beyond the regulatory deadline to the force majeure; describe the measures taken or to be taken to minimize the delay; and identify a date by which the Permittee proposes to conduct the performance test. The performance test shall be conducted as soon as practicable after the force majeure event occurs.

[A.A.C. R18-2-312.J.2]

3. The decision as to whether or not to grant an extension to the performance test deadline is solely within the discretion of the Director. The Director shall notify the Permittee in writing of approval or disapproval of the request for an extension as soon as practicable.

[A.A.C. R18-2-312.J.3]

4. Until an extension of the performance test deadline has been approved by the Director under Conditions XVII.H.1, 2, and 3 above, the Permittee remains subject to the requirements of Section XVII.

[A.A.C. R18-2-312.J.4]

5. For purposes of this Section XVII, a “force majeure event” means an event that will be or has been caused by circumstances beyond the control of the Permittee, its contractors, or any entity controlled by the Permittee that prevents it from complying with the regulatory requirement to conduct performance tests within the specified timeframe despite the Permittee's best efforts to fulfill the obligation. Examples of such events are acts of nature, acts of war or terrorism, or equipment failure or safety hazard beyond the control of the Permittee.

[A.A.C. R18-2-312.J.5]

XVIII. PROPERTY RIGHTS

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

[A.A.C. R18-2-306.A.8.d]

XIX. SEVERABILITY CLAUSE

The provisions of this permit are severable. In the event of a challenge to any portion of this permit, or if any portion of this permit is held invalid, the remaining permit conditions remain valid and in force.

[A.A.C. R18-2-306.A.7]

XX. PERMIT SHIELD

Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements identified in the portions of this permit subtitled "Permit Shield". The permit shield shall not apply to minor revisions pursuant to Condition XV.C of this Attachment and any facility changes without a permit revision pursuant to Section XVI of this Attachment.

[A.A.C. R18-2-317.F, - 320, and -325]

XXI. PROTECTION OF STRATOSPHERIC OZONE

If this source becomes subject to the provisions of 40 CFR Part 82, then the Permittee shall comply with these provisions accordingly.

[40 CFR Part 82]

XXII. APPLICABILITY OF NSPS/NESHAP GENERAL PROVISIONS

For all equipment subject to a New Source Performance Standard or a National Emission Standard for Hazardous Air Pollutants, the Permittee shall comply with all applicable requirements contained in Subpart A of Title 40, Chapter 60 and Chapter 63 of the Code of Federal Regulation.

[40 CFR Part 60 Subpart A and Part 63 Subpart A]

ATTACHMENT "B": SPECIFIC CONDITIONS

I. FACILITY-WIDE REQUIREMENTS

A. Operational Requirement

1. The Permittee shall operate and maintain each piece of equipment in accordance with manufacturer operation and maintenance instructions. If manufacturer operation and maintenance instructions are not available, the Permittee shall prepare an Operation and Maintenance (O&M) Plan. The O&M Plan shall provide adequate information to properly operate and maintain each piece of equipment in good working order.

[A.A.C. R18-2-306.A.2]

2. Recordkeeping Requirements

- a. The Permittee shall maintain on site records of the manufacturer operation and maintenance instructions or O&M Plan for each piece of equipment.

[A.A.C. R18-2-306.A.4]

- b. The Permittee shall maintain records of all maintenance activities carried out on each piece of equipment. These records shall include the type of maintenance activity performed and its duration, including the date, starting time, and ending time of each maintenance activity.

[A.A.C. R18-2-306.A.4]

- c. The Permittee shall retain all recordkeeping on site to demonstrate compliance with Conditions I.A.2.a and I.A.2.b. These records shall be readily available upon request for a period of at least five (5) years in a form that is suitable for expeditious inspection and review.

[A.A.C. R18-2-306.A.4]

B. Opacity

1. Instantaneous Surveys and Six-Minute Observations

- a. Instantaneous Surveys

Any instantaneous survey required by this permit shall be determined by either option listed in Conditions I.B.1.a(1) and (2):

[A.A.C. R18-2-311.b]

- (1) Alternative Method ALT-082 (Digital Camera Operating Technique)

- (a) The Permittee, or Permittee representative, shall be certified in the use of Alternative Method ALT-082.

- (b) The results of all instantaneous surveys and six-minute observations shall be obtained within 30 minutes.

- (2) EPA Reference Method 9 Certified Observer.

[A.A.C. R18-2-306.A.3.c]

b. Six-Minute Observations

Any six-minute observation required by this permit shall be determined by either option listed in Conditions I.B.1.b(1) and (2):

[A.A.C. R18-2-311.b]

- (1) Alternative Method ALT-082 (Digital Camera Operating Technique)

(a) The Permittee, or Permittee representative, shall be certified in the use of Alternative Method ALT-082.

(b) The results of all instantaneous surveys and six-minute observations shall be obtained within 30 minutes.

- (2) EPA Reference Method 9.

- c. The Permittee shall have on site or on call a person certified in EPA Reference Method 9 unless all six-minute Method 9 observations required by this permit are conducted as a six-minute Alternative Method ALT-082 (Digital Camera Operating Technique) and all instantaneous visual surveys required by this permit are conducted as an instantaneous ALT-082 camera survey. Any six-minute Method 9 observation required by this permit can be conducted as a six-minute Alternative Method ALT-082 and any instantaneous visual survey required by this permit can be conducted as an instantaneous ALT-082 camera survey.

[A.A.C. R18-2-306.A.3.c]

2. Monitoring, Recordkeeping, and Reporting Requirements

[A.A.C. R18-2-306.A.3.c]

- a. At the frequency specified in the following sections of this permit, the Permittee shall conduct an instantaneous survey of visible emissions from both process stack sources, when in operation, and fugitive dust sources.
- b. If the visible emissions on an instantaneous basis appears less than or equal to the applicable opacity standard, then the Permittee shall keep a record of the name of the observer, the date on which the instantaneous survey was made, and the results of the instantaneous survey.
- c. If the visible emissions on an instantaneous basis appears greater than the applicable opacity standard, then the Permittee shall immediately conduct a six-minute observation of the visible emissions.
- (1) If the six-minute observation of the visible emissions is less than or equal to the applicable opacity standard, then the Permittee shall record the name of the observer, the date on which the six-

minute observation was made, and the results of the six-minute observation.

- (2) If the six-minute observation of the visible emissions is greater than the applicable opacity standard, then the Permittee shall do the following:
 - (a) Adjust or repair the controls or equipment to reduce opacity to less than or equal to the opacity standard;
 - (b) Record the name of the observer, the date on which the six-minute observation was made, the results of the six-minute observation, and all corrective action taken; and
 - (c) Report the event as an excess emission for opacity in accordance with Condition XII.A of Attachment "A".
 - (d) Conduct another six-minute observation to document the effectiveness of the adjustments or repairs completed.

C. Recordkeeping and Reporting Requirements

1. Deviations from the following Attachment "B" permit conditions shall be promptly reported in accordance with Condition XII.B.2 of Attachment "A":
[A.A.C. R18-2-306.A.5.b]
 - a. Condition II.C.2.a(1) of Attachment "B";
 - b. Condition II.C.2.b(1) of Attachment "B";
 - c. Condition II.C.2.c(1) of Attachment "B";
 - d. Condition II.D.2.a(1) of Attachment "B";
 - e. Condition II.D.2.b(1) of Attachment "B";
 - f. Condition II.D.2.c(1) of Attachment "B";
 - g. Condition II.D.2.e(1) of Attachment "B";
 - h. Condition II.D.2.f(1) of Attachment "B";
 - i. Condition II.D.2.g(1) of Attachment "B";
 - j. Condition II.D.2.h of Attachment "B";
 - k. Condition II.D.2.i(1) of Attachment "B";
 - l. Condition II.D.2.j of Attachment "B"; and

m. Condition II.D.2.k of Attachment "B".

2. The Permittee shall submit reports of all monitoring activities required in Attachment "B" along with the compliance certifications required by Section VII of Attachment "A."

[A.A.C. R18-2-306.A.5]

D. Ambient Monitoring System Requirements

[A.A.C. R18-2-306.A.3.c and -331.A.3.c]

[Material permit conditions are indicated by underlines and italics]

1. *The Permittee shall operate and maintain the Vertex monitoring system in accordance with the Ambient Air Monitoring Plan incorporated herein as Appendix A.*
2. Any one-hour average fenceline concentration of arsine exceeding 7.5 parts per billion (ppb) shall be reported as described in Condition X.
3. Reportable alarms resulting from the fenceline monitors shall be reported as follows:
 - a. The Permittee shall report to the Director any reportable alarms resulting from the monitors. Such report shall be in two parts as specified below:
 - (1) Notification by telephone or facsimile within 24 hours of the time when the Permittee first learned of the reportable alarm event including all available information from Condition I.D.3.b below.
 - (2) Detailed written notification by submission of a report within 72 hours of the notification pursuant to Condition I.D.3.a(1) above.
 - b. The report shall contain the following information:
 - (1) Identity of each monitor involved in the reportable alarm event;
 - (2) Magnitude of the pollutant concentration detected by the monitor(s);
 - (3) Date, time and duration, or expected duration, of the reportable alarm event;
 - (4) Identity of the equipment from which the pollutant(s) emanated;
 - (5) Nature and cause of such emissions;
 - (6) If the reportable alarm event was the result of a malfunction, steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunctions; and

- (7) Steps taken to reduce concentrations below the reportable alarm threshold. If the reportable alarm event resulted from start-up or malfunction, the report shall contain a list of the steps taken to comply with the permit procedures.
4. In the case of continuous or recurring reportable alarm events, the notification requirements of this section shall be satisfied if the source provides the required notification after reportable alarm events occur and includes in such notification an estimate of the time the reportable alarm event will continue. Reportable alarm events occurring after the estimated time period, or changes in the nature of the emissions as originally reported, shall require additional notification pursuant to Condition I.D.3 above.

II. SYNTHESIS AND HANDLING OPERATIONS

A. Applicability

- B.** This Section applies to the synthesis and/or handling of arsine, diborane, diethyltelluride, phosphine, silane, dichlorosilane, ammonia, silicon tetrafluoride, germanium tetrafluoride, silicon tetrachloride, enriched boron 11 trifluoride, boron trifluoride, carbon tetrafluoride, carbon monoxide, methyl fluoride, fluorine, methyl bromide, methyl iodide, dichloromethane, and any mixtures thereof.

C. Particulate Matter and Opacity

1. Emission Limitations and Standards

- a. The opacity of any plume or effluent from any stack shall not be greater than 20%.

[A.A.C. R18-2-702.B.3]

- b. If the presence of uncombined water is the only reason for an exceedance of any visible emissions requirement in Condition II.C.1.a, the exceedance shall not constitute a violation of the applicable opacity limit.

[A.A.C. R18-2-702.C]

- c. In any one hour period, the Permittee shall not cause, allow, or permit the discharge of particulate matter into the atmosphere in excess of the amounts calculated by the following equations:

- (1) For process sources having a process weight rate of 60,000 pounds per hour (30 tons per hour) or less, the maximum allowable emissions shall be determined by the following equation:

$$E = 4.1P^{0.67}$$

E = the maximum allowable particulate emission rate in pounds-mass per hour.

P = the process weight rate in tons-mass per hour.

[A.A.C. R18-2-730.A.1.a]

- (2) For process sources having a process weight rate greater than 60,000 pounds per hour (30 tons per hour), the maximum allowable emissions shall be determined by the following equation:

$$E = 55.0P^{0.11} - 40$$

Where E and P are defined as indicated in Condition II.C.1.c(1) above.

[A.A.C. R18-2-730.A.1.b]

- d. When applying the process weight rate equations, the Permittee shall utilize the total process weight from all similar units employing a similar type process to determine the maximum allowable emissions of particulate matter.

[A.A.C. R18-2-730.B]

2. Air Pollution Control Requirements

a. Arsine Baghouse 1

- (1) The Permittee shall operate and maintain Arsine Baghouse 1 to capture particulate matter emissions from the Arsine Guardian 1 combustion unit in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) The effluent of Arsine Baghouse 1 shall be directed to the Ventilation Emergency Scrubber 1 (VES-1).

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

b. Arsine Baghouse 2

- (1) The Permittee shall operate and maintain Arsine Baghouse 2 to capture particulate matter emissions from the Arsine Guardian 2 combustion unit in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) The effluent of Arsine Baghouse #2 shall be directed to the Ventilation Emergency Scrubber 1 (VES-1).

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

c. Phosphine Dynawave Wet Scrubber

- (1) The Permittee shall operate and maintain Phosphine Dynawave Wet Scrubber to capture particulate matter emissions from the Phosphine Guardian combustion unit in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) The effluent of the Phosphine Dynawave Wet Scrubber shall be directed to the Ventilation Emergency Scrubber 1 (VES-1).

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

d. Silane Baghouses 1 and 2

- (1) The Permittee shall operate and maintain Silane Baghouses 1 and 2 to capture particulate matter emissions from the Silane Guardian combustion unit in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) The effluent of Silane Baghouses 1 and 2 shall be directed to the Ventilation Emergency Scrubber 1 (VES-1).

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

3. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C. R18-2-702.B.3 and C, and -730.A.1 and B.

[A.A.C. R18-2-325]

D. HAPs and Gaseous Emissions

1. Emission Limitations and Standards

- a. The Permittee shall not cause, allow or permit to be discharged into the atmosphere arsine emissions in excess of 10.23 grams in any one-hour period.

[A.A.C. R18-2-306.01 and -331.A.3.a]

[Material permit conditions are indicated by underlines and italics]

- b. The Permittee shall not cause, allow or permit to be discharged into the atmosphere arsine emissions in excess of 618.18 grams in any rolling 24-hour period.

[A.A.C. R18-2-306.01 and -331.A.3.a]

[Material permit conditions are indicated by underlines and italics]

- c. The Permittee shall not cause, allow or permit to be discharged into the atmosphere arsine emissions in excess of 3,343.15 grams in any rolling 365-day period.

[A.A.C. R18-2-306.01 and -331.A.3.a]

[Material permit conditions are indicated by underlines and italics]

- d. The Permittee shall not emit gaseous or odorous materials from equipment, operations or premises under their control in such quantities or concentrations as to cause air pollution.
[A.A.C. R18-2-730.D]
- e. Materials including solvents or other volatile compounds, paints, acids, alkalis, pesticides, fertilizers and manure shall be processed, stored, used and transported in such a manner and by such means that they will not evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Where means are available to reduce effectively the contribution to air pollution from evaporation, leakage or discharge, the installation and use of such control methods, devices or equipment shall be mandatory.
[A.A.C. R18-2-730.F]
- f. Where a stack, vent or other outlet is at such a level that fumes, gas mist, odor, smoke, vapor or any combination thereof constituting air pollution is discharged to adjoining property, the Director may require the installation of abatement equipment or the alteration of such stack, vent, or other outlet by the Permittee to a degree that will adequately dilute, reduce or eliminate the discharge of air pollution to adjoining property.
[A.A.C. R18-2-730.G]

2. Air Pollution Control Requirements

a. Arsine Guardian 1

- (1) *The Permittee shall operate and maintain Arsine Guardian 1 combustion unit to capture and destroy emissions of arsine and its mixtures as well as diethyltelluride and its mixtures in a manner consistent with good air pollution control practices.*

[A.A.C. R18-2-306.01 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) *The effluent of the Arsine Guardian 1 combustion unit shall be directed to the Arsine Baghouse 1 for particulate matter collection.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

b. Arsine Guardian 2

- (1) *The Permittee shall operate and maintain Arsine Guardian 2 combustion unit to capture and destroy emissions of arsine and its mixtures as well as diethyltelluride and its mixtures in a manner consistent with good air pollution control practices.*

[A.A.C. R18-2-306.01 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) *The effluent of the Arsine Guardian 2 combustion unit shall be directed to the Arsine Baghouse 2 for particulate matter collection.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

c. Phosphine Guardian

- (1) *The Permittee shall operate and maintain Phosphine Guardian combustion unit to capture and destroy emissions of phosphine and its mixtures in a manner consistent with good air pollution control practices.*

- (2) *The effluent of the Phosphine Guardian combustion unit shall be directed to the Phosphine Dynawave Wet Scrubber System for particulate matter collection.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

d. Silane Guardian

- (1) *The Permittee shall operate and maintain Silane Guardian combustion unit to capture and destroy emissions silane and its mixtures, diborane and its mixtures, and carbon monoxide in a manner consistent with good air pollution control practices.*

- (2) *The effluent of the Silane Guardian combustion unit shall be directed to the Silane Baghouses 1 and 2 for particulate matter collection.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

e. Wet Scrubbers A, B, C and D

- (1) *The Permittee shall operate and maintain Wet Scrubbers A, B, C and D to capture and destroy emissions of dichlorosilane, trichlorosilane, silicon tetrachloride and methyltrichlorosilane in a manner consistent with good air pollution control practices.*

- (2) *The effluent of Wet Scrubbers A, B, C and D shall be directed to the Ventilation Emergency Scrubber 3 (VES 3).*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

f. Ventilation Emergency Scrubber 1 (VES-1)

- (1) *The Permittee shall operate and maintain Ventilation Emergency Scrubber 1 (VES-1) to capture and destroy emissions of arsine, diborane, silane, diethyltelluride, phosphine, dichloromethane, methyl bromide, methyl iodide, and carbon monoxide in a manner consistent with good air pollution control practices.*

[A.A.C. R18-2-306.01 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) *The Permittee shall operate Ventilation Emergency Scrubber 1 (VES-1) in accordance with Attachment "C" of this permit.*

[A.A.C. R18-2-306.01 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

g. Process Caustic Wet Scrubber (PCWS-1)

- (1) *The Permittee shall operate and maintain Process Caustic Wet Scrubber 1 (PCWS-1) to capture and destroy emissions of silicon tetrafluoride, germanium tetrafluoride, fluorine and enriched boron 11 trifluoride in a manner consistent with good air pollution control practices.*

- (2) *The effluent of the Process Caustic Wet Scrubber 1 (PCWS-1) shall be directed to the Ventilation Emergency Scrubber 2 (VES-2).*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

h. Ventilation Emergency Scrubber 3 (VES-3)

The Permittee shall operate and maintain Ventilation Emergency Scrubber (VES-3) to capture and destroy emissions of dichlorosilane, trichlorosilane, methyltrichlorosilane, silicon tetrachloride, disilane; mixtures of disilane and silane; mixtures of disilane and silicon tetrafluoride; enriched boron-11 trifluoride; boron trifluoride; mixtures of diborane and hydrogen; and mixtures of diborane and nitrogen, mixtures of diborane and boron tetrafluoride, enriched boron-11 trifluoride, and carbon monoxide in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

i. Process Dry Scrubber (PDS-1)

- (1) *The Permittee shall operate and maintain Process Dry Scrubber (PDS-1) to capture emissions of fluorine and inert gases in a manner consistent with good air pollution control practices.*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

- (2) *The effluent of the Process Dry Scrubber (PDS-1) shall be directed to the Ventilation Emergency Scrubber 2 (VES-2).*

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

j. Ventilation Emergency Scrubber 2 (VES-2)

The Permittee shall operate and maintain Ventilation Emergency Scrubber 2 (VES-2) to capture and destroy emissions of silicon tetrafluoride, germanium tetrafluoride, enriched boron 11 trifluoride, boron trifluoride, fluorine, and inert gases in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

k. Fluorine Emergency Stack (FES)

The Permittee shall operate and maintain the Fluorine Emergency Stack (FES) to capture and destroy emissions of fluorine in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underlines and italics]

3. Testing Requirements

- a. The Permittee shall schedule and conduct an annual performance test for arsine emissions from the stack of Ventilation Emergency Scrubber 1 (VES-1). Testing shall be conducted in accordance with Section XVII of Attachment "A" of this permit.

[A.A.C. R18-2-312.A]

- b. In addition to the reporting requirements in Condition XVII.G of Attachment "A" of this permit, the Permittee shall submit the Vertex continuous monitoring data for the time period concurrent with the performance test required in Condition II.D.3.a above.

4. Monitoring, Recordkeeping and Reporting Requirements

The Permittee shall operate, maintain and calibrate the Vertex continuous monitoring system, in accordance with the manufacturer's specifications, for purposes of demonstrating compliance with the emission limits in Conditions II.D.1.a, II.D.1.b, and II.D.1.c above.

[A.A.C. R18-2-306.A.3.c and -331.A.3.c]

[Material permit conditions are indicated by underlines and italics]

5. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C. R18-2-730.D, F and G.

[A.A.C. R18-2-325]

III. AMMONIA OPERATIONS

A. Applicability

This Section applies to the ammonia filling and processing operations.

B. Particulate Matter and Opacity

1. Emission Limitations and Standards

- a. The opacity of any plume or effluent from the stack of the ammonia scrubber shall not be greater than 20%.

[A.A.C. R18-2-702.B.3]

- b. If the presence of uncombined water is the only reason for an exceedance of any visible emissions requirement in Condition III.B.1.a, the exceedance shall not constitute a violation of the applicable opacity limit.

[A.A.C. R18-2-702.C]

- c. In any one hour period, the Permittee shall not cause, allow, or permit the discharge of particulate matter into the atmosphere in excess of the amounts calculated by the following equations:

- (1) For process sources having a process weight rate of 60,000 pounds per hour (30 tons per hour) or less, the maximum allowable emissions shall be determined by the following equation:

$$E = 4.1P^{0.67}$$

Where:

E = the maximum allowable particulate emission rate in pounds-mass per hour

P = the process weight rate in tons-mass per hour

[A.A.C. R18-2-730.A.1.a]

- (2) For process sources having a process weight rate greater than 60,000 pounds per hour (30 tons per hour), the maximum allowable emissions shall be determined by the following equation:

$$E = 55.0P^{0.11} - 40$$

Where E and P are defined as indicated in Condition III.B.1.c(1) above.

[A.A.C. R18-2-730.A.1.b]

- d. When applying the process weight rate equations, the Permittee shall utilize the total process weight from all similar units employing a similar type process to determine the maximum allowable emissions of particulate matter.

[A.A.C. R18-2-730.B]

2. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C. R18-2-702.B.3, A.A.C. R18-2-702.C, A.A.C. R18-2-730.A.1 and A.A.C. R18-2-730.B.

[A.A.C. R18-2-325]

C. Gaseous and Odorous Emissions

1. Emission Limitations

- a. The Permittee shall not emit gaseous or odorous materials from equipment, operations or premises under his control in such quantities or concentrations as to cause air pollution.

[A.A.C. R18-2-730.D]

- b. Materials including solvents or other volatile compounds, paints, acids, alkalis, pesticides, fertilizers and manure shall be processed, stored, used and transported in such a manner and by such means that they will not evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Where means are available to reduce effectively the contribution to air pollution from evaporation, leakage or discharge, the installation and use of such control methods, devices or equipment shall be mandatory.

[A.A.C. R18-2-730.F]

- c. Where a stack, vent or other outlet is at such a level that fumes, gas mist, odor, smoke, vapor or any combination thereof constituting air pollution is discharged to adjoining property, the Director may require the installation of abatement equipment or the alteration of such stack, vent, or other outlet by the Permittee to a degree that will adequately dilute, reduce or eliminate the discharge of air pollution to adjoining property.

[A.A.C. R18-2-730.G]

2. Air Pollution Controls

The Permittee shall install, operate and maintain the Ammonia Recovery System (Wet Scrubber) to capture and destroy ammonia emissions associated with ammonia cylinder processing operations in a manner consistent with good air pollution control practices.

[A.A.C. R18-2-306.A.2 and -331.A.3.d and e]

[Material permit conditions are indicated by underline and italics]

3. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C. R18-2-730.D, F and G.

[A.A.C. R18-2-325]

IV. NON-NSPS EMERGENCY GENERATORS

A. Applicability

1. This Section applies to each internal combustion engine identified in Attachment "C" as subject to A.A.C. R18-2-719 for Existing Stationary Rotating Machinery and NESHAP 40 CFR 63 Subpart ZZZZ.

B. Particulate Matter and Opacity

1. Emission Limitations and Standards

[A.A.C. R18-2-719.B, -719.C.1 and -719.E]

a. Particulate Matter

- (1) The Permittee shall not cause or allow to be discharged into the atmosphere from the generator stack(s) particulate matter in excess of the amount calculated by the following equation:

$$E = 1.02Q^{0.769}$$

where:

E = the maximum allowable particulate emissions rate in pounds-mass per hour.

Q = the heat input in million Btu per hour.

- (2) For the purposes of the calculations required in Condition IV.B.1.a(1) above, the heat input shall be the aggregate heat content of all fuels whose products of combustion pass through a stack or other outlet. The total heat input of all operating fuel-burning units at a plant or premises shall be used for determining the maximum allowable amount of particulate matter which may be emitted.

b. Opacity

[A.A.C. R18-2-719.E]

- (1) The Permittee shall not cause, allow or permit to be emitted into the atmosphere from any stationary rotating machinery, smoke for any period greater than 10 consecutive seconds which exceeds 40% opacity.
- (2) Visible emissions when starting cold equipment shall be exempt from this requirement for the first 10 minutes.

2. Monitoring and Recordkeeping Requirements

[A.A.C. R18-2-306.A.3.c.]

- a. Each quarter, the Permittee shall monitor visible emissions emanating from each generator stack when the generator is in operation sources in accordance with Condition I.B.
- b. The Permittee shall keep records of fuel supplier certifications. The certification shall contain information regarding the name of fuel supplier and lower heating value of the fuel. These records shall be made available to ADEQ upon request

3. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C. R18-2-719.B, -719.C.1 and -719.E.

[A.A.C. R18-2-325]

C. Sulfur Dioxide

1. Emission Limitations and Standards

a. The Permittee shall not emit or cause to emit more than 1.0 pound of sulfur dioxide per million Btu heat input

[A.A.C. R18-2-719.F]

b. The Permittee shall not burn high sulfur diesel fuel (sulfur content greater than 0.9 % by weight) in the generator(s).

[A.A.C. R18-2-719.H]

2. Recordkeeping and Reporting Requirements

a. The Permittee shall keep daily records of the sulfur content and lower heating value of the fuel being fired in the generator(s). The Permittee shall keep records of fuel supplier certifications or other documentation listing the sulfur content to demonstrate compliance with the sulfur content limit specified in Condition IV.C.1 above. These records shall be made available to ADEQ upon request.

[A.A.C. R18-2-306.A.3.c and -719.I]

b. The Permittee shall report to the Director any daily period during which the sulfur content of the fuel being fired in the machine exceeds 0.8%.

[A.A.C. R18-2-719.J]

3. Permit Shield

Compliance with the conditions of this Section shall be deemed compliance with A.A.C. R18-2-719.F, -719.H, -719.I, and -719.J.

[A.A.C. R18-2-325]

D. HAPs

1. Compliance Dates

[40 CFR 63.6595(a)(1)]

The Permittee operating an existing Compression Ignition (CI) Reciprocating Internal Combustion Engine (RICE) shall comply with the following applicable emission limitations and operating limitations.

2. General Requirements

a. The Permittee shall comply with the applicable emission limitations and operating limitations in this Attachment at all times.

- b. The Permittee shall operate and maintain at all times the generator(s) including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.
- c. The Permittee shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes.
[40 CFR 63.6625(h); Table 2c of Subpart ZZZZ]
- d. The Permittee shall operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop a maintenance plan which shall provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

[40 CFR 63.6625(e)]

3. Operating Requirements

[40 CFR 60.6640 (f)]

- a. The Permittee shall operate the emergency stationary RICE according to the requirements in Conditions IV.D.3.a(1) and IV.D.3.a(2) below. If the engine is not operated according to the requirements in Conditions IV.D.3.a(1) and IV.D.3.a(2) below, the engine will not be considered an emergency engine and shall meet all requirements for non-emergency engines.
 - (1) The Permittee may operate the emergency stationary RICE for any combination of the purposes specified in Condition IV.D.3.a(5) of this section for a maximum of 100 hours per calendar year. Any non-emergency situations as allowed by Condition IV.D.3.a(5) count towards the 100 hours per calendar year.
[40 CFR 63.6640 (f)(2)]
 - (2) The Permittee may operate the emergency RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. The Permittee may petition the Administrator and the Director for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that the Federal, State, or local standards require maintenance and testing beyond 100 hours per year. Copies of records shall be made available to ADEQ upon request.
[40 CFR 63.6640 (f)(2)(i)]
 - (3) The Permittee may operate the emergency stationary RICE for emergency demand response for periods in which the Reliability

Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference***), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

[40 CFR 63.6640 (f)(2)(ii)]

- (4) The Permittee may operate the emergency stationary RICE for emergency demand response for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

[40 CFR 63.6640 (f)(2)(iii)]

- (5) The Permittee operating an emergency stationary RICE located at area sources of HAP may be operated for up to 50 hours per calendar year on non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in Condition IV.D.3.a(1). Except as provided in Conditions IV.D.3.a(2) and IV.D.3.a(3), the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

- b. If the emergency CI stationary RICE has a site rating of more than 100 brake HP, a displacement of less than 30 liters, uses diesel fuel, and is contractually obligated to be available for more than 15 hours per calendar year for purposes specified in Conditions IV.D.3.a(3) and IV.D.3.a(4) or Condition IV.D.3.a(5), the Permittee must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for non-road diesel fuel beginning January 1, 2015, except that any existing fuel purchased (or otherwise obtained) prior to January 1, 2015, may be used until depleted.

[40 CFR 63.6604(b)]

- c. *The Permittee shall install a non-resettable hour meter if one is not already installed.*

[40 CFR 63.6625(f) and R18-2-331.A.3.c]

[Material Permit Conditions are indicated by underlines and italics]

- d. The Permittee shall change the oil and filter every 500 hours operation or annually, whichever comes first. If the Permittee prefers to extend the oil change requirement, an oil analysis program described below shall be completed. The oil analysis must be performed at the same frequency specified for changing the oil.

[40 CFR 63.6625 (i) and (j), and Table 2d to 40 CFR 63 Subpart ZZZZ]

- (1) The Permittee shall at a minimum analyze the following three parameters: Total Base Number (for CI engines), Total Acid

Number (for SI engines), viscosity and water content. The condemning limits for these parameters are as follows:

- (a) Total Base Number is less than 30 percent of the Total Base Number of the oil when new;
 - (b) Viscosity: changed more than 20 percent from the viscosity of oil when new; and
 - (c) Water Content: greater than 0.5 percent by volume.
 - (d) If all of the above limits are not exceeded, the Permittee is not required to change the oil. If any of the above limits are exceeded, the Permittee shall change the oil within 2 business days of receiving the results of the analysis or before commencing operation, whichever is later. Records shall be kept of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program shall be part of the maintenance plan for the operation of the engine.
- e. The Permittee shall inspect the air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary.
[40 CFR 63.6603(a); Table 2d of Subpart ZZZZ]
 - f. The Permittee shall inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.
[40 CFR 63.6603(a); Table 2d of Subpart ZZZZ]

4. Recordkeeping Requirements

- a. The Permittee shall keep records of the hours of operation of the RICE that is recorded through the non-resettable hour meter. Records shall include the date, start and stop times, hours spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engine is used for the purposes specified in Condition IV.D.3.a(3), the owner or operator must keep records of the notification of the emergency situation and the date, start time, and end time of the engine operation for these purposes.
[40 CFR 63.6655(f)]
- b. The Permittee shall keep records of the parameters that are analyzed and the results of the oil analysis, if any, and the oil changes for the engine.
[40 CFR 63.6625(i)]
- c. The Permittee shall keep records of the maintenance conducted on the CI RICE that demonstrates operation and maintenance of the CI RICE in accordance with your maintenance plan.
[40 CFR 63.6655(e)]

- d. If the emergency stationary RICE does not meet the standards applicable to non-emergency engine, the Permittee shall keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The Permittee shall document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the Permittee shall keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.

[40 CFR 63.6655]

- e. The Permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that the stationary RICE and after-treatment control device (if any) were operated and maintained in accordance with the Permittee's maintenance plan.

[40 CFR 63.6655]

5. Reporting

- a. For emergency stationary RICE with a site rating of more than 100 brake HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in Conditions IV.D.3.a(2) and IV.D.3.a(3) or that operates for the purpose specified in Condition IV.D.3.a(4), the Permittee must submit to the Administrator and Director annually, a report according to the following requirements:

[40 CFR 63.6650]

- (1) Company name and address where the engine is located.
- (2) Date of the report and beginning and ending dates of the reporting period.
- (3) Engine site rating and model year.
- (4) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.
- (5) Hours operated for the purpose specified in Condition IV.D.3.a(2).
- (6) Number of hours the engine is contractually obligated to be available for the purposes specified in Condition IV.D.3.a(3).
- (7) A statement declaring deviations, if any, from the fuel requirements as specified in 40 CFR 80.510(b) for non-road diesel fuel.
- (8) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual

reports for each calendar year must be submitted no later than March 31 of the following calendar year.

- (9) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.edpa.gov/cdx). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator and Director at their respective addresses below.

(a) EPA Region IX, Director, Air Division
75th Hawthorne Street
San Francisco, CA 94105

(b) Director, Air Quality Division
1110 W. Washington Street
Phoenix, AZ 85007

6. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with 40 CFR Part 63.6603(a), 6605(b), 63.6625(f), 63.6655(e), 63.6655(f), Table 2d of 40 CFR subpart ZZZZ.

[A.A.C. R18-2-325]

V. NSPS – EMERGENCY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES (CI ICE)

A. Applicability

This Section applies to each emergency CI ICE identified in Attachment “C” as subject to NSPS 40 CFR 60 Subpart IIII.

B. Emergency ICE

An emergency ICE shall be limited to emergency situations and required testing and maintenance only such as to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or used to pump water in the case of fire or flood, etc. Stationary CI ICE used to supply power to an electric grid or that supply power as part of a financial arrangement with another entity shall not be considered to be emergency engines.

C. Operating Requirement

1. The Permittee shall install a non-resettable hour meter prior to startup of the engine.

[A.A.C. R18-2-306.A.3 and -331.A.3.c]

[Material Permit Conditions are indicated by underlines and italics]

2. The Permittee shall operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions.
[40 CFR 60.4211(a)(1)]
3. The Permittee shall change only those emission-related settings that are permitted by the manufacturer.
[40 CFR 60.4211(a)(2)]
4. The Permittee shall meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.
[40 CFR 60.4211(a)(3)]
5. The Permittee must operate the emergency stationary ICE according to the requirements in Condition V.C.5.a through V.C.5.c below. In order for the engine to be considered an emergency stationary ICE, any operation other than emergency operation, maintenance response, and operation in non-emergency situations for 50 hours per year, as described in Conditions V.C.5.a through V.C.5.c below is prohibited. If the emergency stationary ICE is not operated in accordance with the requirements in Conditions V.C.5.a through V.C.5.c below, the engine will not be considered an emergency engine and must meet all requirements for non-emergency engines.
[40 CFR 60.4211(f)]
 - a. There is no time limit on the use of emergency stationary ICE in emergency situations.
[40 CFR 60.4211(f)(1)]
 - b. The Permittee may operate the emergency stationary ICE for any combination of the purposes specified in Conditions V.C.5.b(1) through V.C.5.b(3) below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by Condition V.C.5.c below counts as part of the 100 hours per calendar year allowed by this Condition V.C.5.b.
[40 CFR 60.4211(f)(2)]
 - (1) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government, the manufacturer, the vendor, the regional transmission operator, or the insurance company associated with the engine. The Permittee may petition the Administrator or Director for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond the 100 hours per year.
[40 CFR 60.4211(f)(2)(i)]

- (2) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see 40 CFR 60.17), or other authorized entity as determined by the Reliability Coordinator has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.
[40 CFR 60.4211(f)(2)(ii)]
 - (3) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
[40 CFR 60.4211(f)(2)(iii)]
- c. The Permittee may operate the emergency stationary ICE for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in Condition V.C.5.b. Except as provided in Condition V.C.5.c(1), the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.
[40 CFR 60.4211(f)(3)]
 - (1) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:
 - (a) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.
 - (b) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
 - (c) The dispatch follows reliability emergency operation or similar protocols that follow specific NERC regional, state, public utility commission, or local standards or guidelines.
 - (d) The power is provided only to the facility or to support the local transmission and distribution system.
 - (e) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state public utility commission or local standards or guidelines that are being followed for

dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

[40 CFR 60.4211(f)(3)(i)]

6. Operation of the CI ICE other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, is prohibited.

[40 CF 60.4211(f) and A.A.C. R18-2-331.A.3.a]

[Material permit conditions are indicated by underline and italics]

7. For CI ICE with a displacement of less than 30 liters per cylinder that use diesel fuel, the Permittee must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted.

[40 CFR 60.4207(b)]

8. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with 40 CFR 60.4209(a) and §60.4211(f).

[A.A.C. R18-2-325]

D. Emission Limitations and Standards

[40 CFR 60.4205 (a) through (e)]

1. The Permittee operating a new or modified or reconstructed emergency CI ICE shall comply with the emission standards listed in the corresponding applicable regulations for the same model year and cylinder displacement as stated in Conditions V.D.2 through V.D.7.

2. Pre-2007 with Displacement <10 Liters:

The Permittee operating pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in Table 1 of this section.

[40 CFR 60.4205(a)]

3. Pre-2007 with Displacement $10 \leq x < 30$ Liters:

The Permittee operating pre-2007 model year emergency stationary CI ICE with a displacement great than or equal to 10 liters per cylinder and less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards in 40 CFR 94.8(a)(1).

[40 CFR 60.4205(a)]

4. 2007 and Later < 30 Liters

The Permittee operating 2007 and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new non-road CI engines in 40 CFR

60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

[40 CFR 60.4205(b)]

5. Fire Pump Displacement < 30 Liters:

The Permittee operating fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emissions standards in Table 2 of this subsection, for all pollutants.

[40 CFR 60.4205(c)]

6. Displacement \geq to 30 Liters:

[40 CFR 60.4205(d)]

The Permittee operating emergency stationary CI engines with a displacement of greater than or equal to 30 liters per cylinder must meet the requirements below:

a. For engines installed prior to January 1, 2012, limit the emissions of NO_x in the stationary CI internal combustion engine exhaust to the following:

- (1) 17.0 g/KW-hr (12.7 g/HP-hr) when maximum engine speed is 130 rpm;
- (2) $45 * n^{-0.2}$ g/KW-hr ($34 * n^{-0.2}$ g/HP-hr) when maximum engine speed is 130 or more but less than 2,000 rpm where n is maximum engine speed; and
- (3) 9.8 g/KW-hr (7.3 g/HP-hr) when maximum engine speed is 2,000 rpm or more.

b. For engines installed on or after January 1, 2012, limit the emissions of NO_x in the stationary CI internal combustion engine exhaust to the following:

- (1) 14.4 g/KW-hr (10.7 g/HP-hr) when maximum engine speed is less than 130 rpm;
- (2) $44 * n^{-0.23}$ g/KW-hr ($33 * n^{-0.23}$ g/HP-hr) when maximum engine speed is greater than or equal to 130 but less than 2,000 rpm and where n is maximum engine speed; and
- (3) 7.7 g/KW-hr (5.7 g/HP-hr) when maximum engine speed is greater than or equal to 2,000 rpm.

7. Displacement < 30 Liters with Performance Test Requirements:

The Permittee operating emergency stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests in-use must meet the NTE standards as indicated in 40 CFR 60.4212.

[40 CFR 60.4205(e)]

Table B-1: Emission Standards for Stationary Pre-2007 Model Year Engines with a Displacement of <10 Liters per Cylinder and 2007-2010 Model Year Engines > 2237 KW (3000 HP) and With a Displacement of <10 Liters per Cylinder

Engine Power	NMHC + NO _x	HC	NO _x	CO	VOC
	g/KW-hr (g/HP-hr)				
KW<8 (HP<11)	10.5 (7.8)			8.0 (6.0)	1.0 (0.75)
8≤KW<19 (11≤HP<25)	9.5 (7.1)			6.6 (4.9)	0.80 (0.60)
19≤KW<37 (25≤HP<50)	9.5 (7.1)			5.5 (4.1)	0.80 (0.60)
37≤KW<56 (50≤HP<75)			9.2 (6.9)		
56≤KW<75 (75≤HP<100)			9.2 (6.9)		
75≤KW<130 (100≤HP<175)			9.2 (6.9)		
130≤KW<225 (175≤HP<300)		1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40)
225≤KW<450 (300≤HP<600)		1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40)
450≤KW<560 (600≤HP<750)		1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40)
KW>560 (HP>750)		1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40)

Table B-2: Emission Standards for 2008 Model Year and Later Emergency Stationary CI ICE <37 KW (50 HP) With a Displacement of <10 Liters per Cylinder

Engine Power	Model Year(s)	NO _x + NMHC	CO	PM
	g/KW-hr (g/HP-hr)			
KW<8 (HP<11)	2008+	7.5 (5.6)	8.0 (6.0)	0.40 (0.30)
8≤KW<19 (11≤HP<25)	2008+	7.5 (5.6)	6.6 (4.9)	0.40 (0.30)
19≤KW<37 (25≤HP<50)	2008+	7.5 (5.6)	5.5 (4.1)	0.30 (0.22)

8. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with 40 CFR 60.4205(a), §60.4205(b), §60.4205(c), §60.4205 (d), §60.4205(e), and §60.4205(f)

[A.A.C. R18-2-325]

E. Compliance Requirements

1. Pre-2007 Model Year Engines

[40 CFR 60.4211 (b)]

- a. The Permittee operating a pre-2007 model year stationary CI ICE or a CI fire pump manufactured prior to the model years in Table 3 of 40 CFR Part 60 Subpart IIII, shall demonstrate compliance according to one of the following methods:
- b. Purchasing an engine certified according to 40 CFR Part 89 or 40 CFR Part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.
- c. Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.
- d. Keeping records of engine manufacturer data indicating compliance with the standards.
- e. Keeping records of control device vendor data indicating compliance with the standards.
- f. Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in 40 CFR 60.4212, as applicable.

2. 2007 and Later Year Stationary CI ICE

[40 CFR 60.4211(c)]

The Permittee operating a 2007 model year and later stationary CI ICE or a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in Table 3 of 40 CFR Part 60, Subpart IIII, shall comply by purchasing an engine certified to the emission standards in §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications, except as permitted in Condition V.E.4.

3. Modified or Reconstructed Stationary ICE

[40 CFR 60.4205(e) and 4211(e)]

The Permittee operating a modified or reconstructed stationary CI ICE shall demonstrate compliance with the applicable standards using one of the following methods:

- a. Purchasing an engine certified to the emission standards in 60.4205(f).

- b. Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in 60.4212. The test shall be conducted within 60 days after the engine commences operation after the modification or reconstruction. The in-use performance tests shall meet the NTE standards as indicated in 40 CFR 60.4212.
- 4. If the Permittee does not install, configure, operate, and maintain the CI ICE and control device according to the manufacturer's emission-related written instructions, or change the emission-related setting in a way that is not permitted by the manufacturer, the Permittee shall demonstrate compliance as following:
[40 CFR 60.4211(g)]
 - a. CI ICE less than 100 HP

The Permittee shall keep a maintenance plan and records of conducted maintenance to demonstrate compliance and shall, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the Permittee shall conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.
 - b. CI ICE greater than or equal to 100 HP and less than or equal to 500 HP

The Permittee shall keep a maintenance plan and records of conducted maintenance to demonstrate compliance and shall, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the Permittee shall conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after changing any non-permitted emission-related setting.
 - c. CI ICE greater than 500 HP

The Permittee shall keep a maintenance plan and records of conducted maintenance to demonstrate compliance and shall, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the Permittee shall conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after changing any non-permitted emission-related setting on the engine. Subsequent tests shall be conducted every 8760 hours of engine operation or 3 years, whichever comes first.
- 5. Permit Shield

Compliance with the conditions of this Section shall be deemed compliance with 40 CFR 60.4211(b), §60.4211(c), §60.4211(e), §60.4211(g) and §60.4205(e).

[A.A.C. R18-2-325]

F. Notification Requirements

[40 CFR 60.4214(b)]

There is no requirement for submission of initial notification for emergency stationary ICEs.

G. Recordkeeping Requirements

1. If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached.

[40 CFR 60.4214(c)]

2. Starting with model years in Table 5 of 40 CFR Subpart IIII, the Permittee operating an emergency ICE that does not meet the standards applicable to non-emergency engines in the applicable model year, shall keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter.

3. The Permittee shall record the time of operation of the engine and the reason the engine was in operation during that time.

[40 CFR 60.4214(b)]

4. The Permittee operating an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in Condition V.C.2, you must submit an annual report according to the requirements in Conditions V.G.4.a through V.G.4.c of this section.

a. The report must contain the following information.

- (1) Company name and address where the engine is located.
- (2) Date of the report and beginning and ending dates of the reporting period.
- (3) Engine site rating and model year.
- (4) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.
- (5) Hours operated for the purposes specified in Conditions V.C.5.b(1) and V.C.5.b(2) including the date, start time, and end time for engine operation for the purposes specified in Conditions V.C.5.b(1) and V.C.5.b(2).

- (6) Number of hours the engine is contractually obligated to be available for the purposes specified in Condition V.C.5.
- (7) Hours spent operating for the purposes specified in Condition V.C.5.b(3), including the date, start time, and end time for engine operation for the purposes specified in Condition V.C.5.b(3). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.
- b. Annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.
- c. The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in 40 CFR 60.4.

[40 CFR 60.4214(d)]

5. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with 40 CFR 60.4214(b).

VI. FUGITIVE DUST REQUIREMENTS

A. Applicability

This Section applies to any non-point source of fugitive dust in the facility.

B. Particulate Matter and Opacity

Open Areas, Roadways & Streets, Storage Piles, and Material Handling

1. Emission Limitations and Standards

- a. Opacity of emissions from any fugitive dust non-point source shall not be greater than 40%.

[A.A.C. R18-2-614]
- b. The Permittee shall employ the following reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne:
 - (1) Keep dust and other types of air contaminants to a minimum in an open area where construction operations, repair operations, demolition activities, clearing operations, leveling operations, or any earth moving or excavating activities are taking place, by good modern practices such as using an approved dust suppressant

or adhesive soil stabilizer, paving, covering, landscaping, continuous wetting, detouring, barring access, or other acceptable means;

[A.A.C. R18-2-604.A]

- (2) Keep dust to a minimum from driveways, parking areas, and vacant lots where motor vehicular activity occurs by using an approved dust suppressant, or adhesive soil stabilizer, or by paving, or by barring access to the property, or by other acceptable means;

[A.A.C. R18-2-604.B]

- (3) Keep dust and other particulates to a minimum by employing dust suppressants, temporary paving, detouring, wetting down or by other reasonable means when a roadway or alley is used, repaired, constructed, or reconstructed;

[A.A.C. R18-2-605.A]

- (4) Take reasonable precautions, such as wetting, applying dust suppressants, or covering the load when transporting material likely to give rise to airborne dust. Earth or other material that is deposited by trucking or earth moving equipment shall be removed from paved streets by the person responsible for such deposits;

[A.A.C. R18-2-605.B]

- (5) Take reasonable precautions, such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods when crushing, screening, handling, transporting or conveying of materials or other operations likely to result in significant amounts of airborne dust;

[A.A.C. R18-2-606]

- (6) Take reasonable precautions such as chemical stabilization, wetting, or covering when organic or inorganic dust producing material is being stacked, piled, or otherwise stored;

[A.A.C. R18-2-607.A]

- (7) Operate stacking and reclaiming machinery utilized at storage piles at all times with a minimum fall of material, or with the use of spray bars and wetting agents;

[A.A.C. R18-2-607.B]

- (8) Any other method as proposed by the Permittee and approved by the Director.

[A.A.C. R18-2-306.A.3.c]

2. Monitoring and Recordkeeping Requirements

VII. OTHER PERIODIC ACTIVITIES

- a. The Permittee shall maintain records of the dates on which any of the activities listed in Condition VI.B.1.b above were performed and the control measures that were adopted.

[A.A.C. R18-2-306.A.3.c]

- b. Opacity Monitoring Requirements

Each month, the Permittee shall monitor visible emissions from fugitive sources in accordance with Condition I.B.

[A.A.C. R18-2-306.A.3.c]

C. Permit Shield

Compliance with this Section shall be deemed compliance with A.A.C. R18-2-604, -605, -606, 607, and -614.

[A.A.C. R18-2-325]

VII. OTHER PERIODIC ACTIVITIES

A. Abrasive Blasting

1. Particulate Matter and Opacity

- a. Emission Limitations and Standards

The Permittee shall not cause or allow sandblasting or other abrasive blasting without minimizing dust emissions to the atmosphere through the use of good modern practices. Good modern practices include:

[A.A.C. R18-2-726]

- (1) Wet blasting;
- (2) Effective enclosures with necessary dust collecting equipment; or
- (3) Any other method approved by the Director.

- b. Opacity

The Permittee shall not cause, allow or permit visible emissions from sandblasting or other abrasive blasting operations in excess of 20% opacity.

[A.A.C. R18-2-702.B.3]

2. Monitoring and Recordkeeping Requirement

- a. Each time an abrasive blasting project is conducted, the Permittee shall make a record of the following:

[A.A.C. R18-2-306.A.3.c]

- (1) The date the project was conducted;

- (2) The duration of the project; and
 - (3) Type of control measures employed.
 - b. A certified EPA Reference Method 9 observer shall conduct a quarterly survey of visible emissions emanating from sandblasting or other abrasive blasting operations when in operation and in accordance with Condition I.B.

[A.A.C. R18-2-306.A.3.c]
 - c. If there were no sandblasting or other abrasive blasting operations during a calendar quarter, then no quarterly survey of visible emissions is required. However, the Permittee shall record that no sandblasting or other abrasive blasting operations occurred during that calendar quarter.

[A.A.C. R18-2-306.A.3.c]
3. Permit Shield

Compliance with Condition VII.A.1.a shall be deemed compliance with A.A.C. R18-2-702.B.3 and -726.

[A.A.C. R18-2-325]

B. Use of Paints

1. Volatile Organic Compounds and Opacity
 - a. Emission Limitations and Standards

While performing spray painting operations, the Permittee shall comply with the following requirements:

 - (1) The Permittee shall not conduct or cause to be conducted any spray painting operation without minimizing organic solvent emissions. Such operations, other than architectural coating and spot painting, shall be conducted in an enclosed area equipped with controls containing no less than 96% of the overspray.

[A.A.C.R18-2-727.A]
 - (2) The Permittee or their designated contractor shall not either:
 - (a) Employ, apply, evaporate, or dry any architectural coating containing photochemically reactive solvents for industrial or commercial purposes; or
 - (b) Thin or dilute any architectural coating with a photochemically reactive solvent.

[A.A.C.R18-2-727.B]
 - (3) For the purposes of Condition VII.B.1.a(1), a photochemically reactive solvent shall be any solvent with an aggregate of more than 20 percent of its total volume composed of the chemical

compounds classified in Condition VII.B.1.a(2), or which exceeds any of the following percentage composition limitations, referred to the total volume of solvent:

[A.A.C.R18-2-727.C]

- (a) A combination of the following types of compounds having an olefinic or cyclo-olefinic type of unsaturation-hydrocarbons, alcohols, aldehydes, esters, ethers, or ketones: 5 percent.
- (b) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent.
- (c) A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent.
- (4) Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one of the groups of organic compounds described in Condition VII.B.1.a(3), it shall be considered to be a member of the group having the least allowable percent of the total volume of solvents.

[A.A.C.R18-2-727.D]

b. Opacity

The Permittee shall not cause, allow or permit visible emissions from painting operations in excess of 20% opacity.

[A.A.C. R18-2-702.B.3]

2. Monitoring and Recordkeeping Requirements

- a. Each time a spray painting project is conducted, the Permittee shall make a record of the following:
 - (1) The date the project was conducted;
 - (2) The duration of the project;
 - (3) Type of control measures employed;
 - (4) Safety Data Sheets for all paints and solvents used in the project; and
 - (5) The amount of paint consumed during the project.
- b. Architectural coating and spot painting projects shall be exempt from the recordkeeping requirements of Condition VII.B.2.a.

[A.A.C. R18-2-306.A.3.c]

- c. A certified EPA Reference Method 9 observer shall conduct a quarterly survey of visible emissions emanating from spray painting operations when in operation and in accordance with Condition I.B.

[A.A.C. R18-2-306.A.3.c]

- d. If there were no spray painting operations during a calendar quarter, then no quarterly survey of visible emissions is required. However, the Permittee shall record that no spray painting operations occurred during that calendar quarter.

[A.A.C. R18-2-306.A.3.c]

3. Permit Shield

Compliance with the Conditions of this Section shall be deemed compliance with A.A.C.R18-2702.B.2 and -727.

[A.A.C.R18-2-325]

C. Demolition and Renovation - Hazardous Air Pollutants

1. Emission Limitation and Standard

The Permittee shall comply with all of the requirements of 40 CFR 61 Subpart M (National Emission Standards for Hazardous Air Pollutants - Asbestos).

[A.A.C. R18-2-1101.A.12]

2. Monitoring and Recordkeeping Requirement

The Permittee shall keep all required records in a file. The required records shall include the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.

[A.A.C. R18-2-306.A.3.c]

3. Permit Shield

Compliance with the Condition VII.C.1 shall be deemed compliance with A.A.C. R18-2-1101.A.12.

[A.A.C. R18-2-325]

ATTACHMENT “C”: OPERATION AND MAINTENANCE PLAN

I. GENERAL REQUIREMENTS

- A.** Prior to implementing any changes to this Attachment, the Permittee shall obtain the Director’s approval pursuant to the appropriate provisions of Condition XV of Attachment “A”.
- B.** At the time that the Permittee submits an air quality permit application or notification pursuant to Condition XV of Attachment “A” (including changes that do not require a permit revision) for the construction, modification or replacement of an air pollution control device, the Permittee shall develop and submit an Operation and Maintenance Plan that contains the following information:
- [A.A.C. R18-2-306.A.3.c]
1. The process parameters that provide reasonable assurance that the control device is achieving the designed level of control;
 2. The operating parameter set points for each process parameter to be monitored; and
 3. A detailed preventative maintenance plan.
- C.** The Permittee shall monitor the parameters required by this Attachment as required by this permit, except for weekends and holidays when no plant activity is occurring.
- [A.A.C. R18-2-306.A.3.c]
- D.** The Permittee shall inspect and maintain all equipment in accordance with Condition I.A.1 of Attachment “B”.
- [A.A.C. R18-2-306.A.3.c]

II. ARSINE GUARDIANS AND BAGHOUSES

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below:
- [A.A.C. R18-2-306.A.3.c]
1. Reaction Chamber Temperature, in degrees celsius, shall be recorded continuously; and
 2. Baghouse pressure differential in Arsine Baghouses 1 and 2, in inches of H₂O, shall be recorded continuously.
- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.
- [A.A.C. R18-2-306.A.3.c]
- C.** Operating Parameter Set points
- The baghouse pressure differentials for Baghouses 1 and 2 shall be kept between 0.2” H₂O

and 10" H₂O.

[A.A.C. R18-2-306.A.3.c]

D. Excursions

1. An excursion is defined as any Baghouse pressure differential less than 0.2" H₂O or greater than 10" H₂O, on a 15-minute average, while the baghouse is in operation or arsine is being vented to the control system.
2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

- a. Minimizing the period of any startup, shutdown, or malfunction, and
- b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Condition II.C.

3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

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

III. PHOSPHINE GUARDIANS AND DYNAWAVE

- A. The following process parameters shall be monitored and recorded on a process log at the intervals listed below, during days that phosphine is being produced, processed, or phosphine is being vented to the control system:

[A.A.C. R18-2-306.A.3.c]

1. Reaction Chamber Temperature, in degrees celsius, shall be recorded continuously.
 2. Dynawave Spray Nozzle Inlet Pressure, in psig, shall be manually recorded at least once per day.
 3. Dynawave pressure differential, in inches of H₂O, shall be recorded at least once per day.
- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.
- [A.A.C. R18-2-306.A.3.c]
- C.** Operating Parameter Setpoints

Operating parameters listed in Condition III.A above shall be kept within the values listed in Table C-1 below.

[A.A.C. R18-2-306.A.3.c]

Table C-1: Operating Parameters for Phosphine Operations

	Reaction Chamber Temperature (°C)	Dynawave Spray Nozzle Inlet Pressure (psig)	Dynawave ΔP (inches water)
Max	900	30	31
Min	350	5	0.5

- D.** Excursions
1. An excursion is defined as:
 - a. Any Reaction Chamber temperature reading less than 350°C;
 - b. Any Dynawave spray nozzle inlet pressure less than 5 psig or greater than 30 psig; or
 - c. Any Dynawave pressure differential less than 0.5" H₂O or greater than 31" H₂O.
 2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

 - a. Minimizing the period of any startup, shutdown, or malfunction, and

IV. SILANE GUARDIANS AND BAGHOUSES

- b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-1 above.
- 3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

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

IV. SILANE GUARDIANS AND BAGHOUSES

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below, on days when silane is being processed or silane is being vented to the control system:

[A.A.C. R18-2-306.A.3.c]

 - 1. Reaction Chamber Temperature, in degrees celsius, shall be recorded continuously.
 - 2. Baghouse pressure differential, in inches of H₂O, shall be recorded at least once per day for the baghouse that is in operation.
- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]
- C.** Operating Parameter Setpoints

Operating parameters listed in Condition IV.A above shall be kept within the values listed in Table C-2 below.

[A.A.C. R18-2-306.A.3.c]

Table C-2: Operating Parameters for Silane Operations

	Reaction Chamber Temperature (°C)	Baghouse ΔP (inches water)
Max	900	10
Min	100	0.2

D. Excursions

1. An excursion is defined as:
 - a. Any Reaction Chamber temperature reading less than 100°C while the unit is in operation or silane is being vented to the control system; or
 - b. Any Baghouse pressure differential less than 0.2" H₂O or greater than 10" H₂O while the baghouse is in operation or silane is being vented to the control system.
2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:
 - a. Minimizing the period of any startup, shutdown, or malfunction; and
 - b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-2 above.

[A.A.C. R18-2-306.A.3.c]
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

 - a. Summary information on the number, duration and cause (including unknown cause, if applicable) of the excursion, and the corrective actions taken.
 - b. Summary information on the number, duration and cause (including unknown cause, if applicable) for monitoring downtime incidents (other

than downtime associated with zero and span or other calibration checks, if applicable).

V. DICHLOROSILANE WET SCRUBBERS

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below, during days that dichlorosilane is being processed or dichlorosilane is being vented to the control system:

[A.A.C. R18-2-306.A.3.c]

1. Caustic strength (strength of scrubber solution), in mL acid, shall be recorded at least once per day;
2. Tower flow rate (flow rate of scrubber solution in the scrubber tower), in gallons per minute, shall be recorded at least once per day; and
3. Pressure differential across the orifice plate, in inches H₂O, shall be recorded at least once per day.

- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]

VI. AMMONIA SCRUBBER

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below, on days when ammonia is being processed or ammonia is being vented to the control system:

[A.A.C. R18-2-306.A.3.c]

1. NH₄OH Concentration, in percent, shall be recorded at least once per day;
2. Tank Level, in percent of full, shall be recorded at least once per day; and
3. Mini Scrubber Pump Discharge Pressure, in psig, shall be recorded at least once per day.

- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]

- C.** Operating Parameter Setpoints

Operating parameters listed in Condition VI.A above shall be kept within the values listed in Table C-3 below.

Table C-3: Operating Parameters

	NH ₄ OH Concentration (%)	Tank Level (%)	Mini Scrubber Pump Discharge Pressure (psig)
Max	30%	95%	40 psig
Min	N/A	15%	5 psig

[A.A.C. R18-2-306.A.3.c]

D. Excursions

1. An excursion is defined as:
 - a. Any NH₄OH concentration of greater than 30%;
 - b. Any tank level less than 15% full (except when the tank is being emptied or refilled) or greater than 95% full; or
 - c. Any mini scrubber pump discharge pressure greater than 40 psig or less than 5 psig.
2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

- a. Minimizing the period of any startup, shutdown, or malfunction; and
- b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-3 above.
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

- a. Summary information on the number, duration and cause (including unknown cause, if applicable) of the excursion, and the corrective actions taken; and

- b. Summary information on the number, duration and cause (including unknown cause, if applicable) for monitoring downtime incidents (other than downtime associated with zero and span or other calibration checks, if applicable).

VII. VENTILATION EMERGENCY SCRUBBER (VES-1)

- A. The following process parameters shall be monitored and recorded on a process log at the intervals listed below:

[A.A.C. R18-2-306.A.3.c]

 1. Potassium Permanganate (KMnO_4) concentration, in percent KMnO_4 , shall be recorded at least once per day;
 2. KMnO_4 flow rate, in gallons per minute, shall be recorded continuously; and
 3. Air flow rate, in cubic feet per minute, shall be recorded continuously.
- B. The primary KMnO_4 electric pump shall be backed up by a diesel generator. In the event of an electric motor pump failure, loss of flow must be detected via motor amperage or other method as approved by ADEQ, and the diesel generator must start up automatically.

[A.A.C. R18-2-306.A.3.c]
- C. The KMnO_4 solution shall be tested every week to determine the percent dissolved solids and percent suspended solids, except during a week in which a muck-out is scheduled.

[A.A.C. R18-2-306.A.3.c]
- D. The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]
- E. During times when the liquid flow meter is inoperative, the Permittee shall monitor the potassium permanganate liquid flow rate by manually verifying the pump motor amperage and the potassium permanganate level in the VES-1 at least twice per 8-hour shift with at least 3 hours between each measurement. An alternative monitoring approach may be used with prior written approval by the Director. The Permittee shall not operate for more than 7 days with the liquid flow meter inoperative.

[A.A.C. R18-2-306.A.3.c]

VIII. PROCESS CAUSTIC WET SCRUBBER (PCWS-1)

- A. The following process parameters shall be monitored and recorded on a process log at the intervals listed below, during days that GeF_4 , SiF_4 and B^{11}F_3 are being processed or such compounds are being vented to the control system:

[A.A.C. R18-2-306.A.3.c]

 1. Caustic (Sodium Hydroxide – NaOH) concentration, shall be monitored using the surrogate parameter “pH” and recorded at least once per day;

2. Tower Nozzle Pressure shall have a low pressure alarm and the status recorded daily;
 3. Sump Liquid Level shall have a low level alarm switch and the level shall be recorded at least once per day; and
 4. The Pressure Differential across the tower, in inches water column, shall be recorded at least once per day.
- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.
- [A.A.C. R18-2-306.A.3.c]
- C.** Operating Parameter Setpoints

Operating parameters listed in Condition VIII.A above shall be kept within the values listed in Table C-4 below.

Table C-4: Operating Parameters for Caustic Wet Scrubber

	Caustic (NaOH) Strength (pH)	Tower Nozzle Pressure (psig)	Sump Liquid Level (inch)	DP Across Tower (inches water column)
Max	N/A	16	20	0.6
Min	12	10	14	0.1

[A.A.C. R18-2-306.A.3.c]

- D.** Excursions
1. An excursion is defined as:
 - a. Anytime the pH falls below 12;
 - b. Anytime the Tower nozzle pressure falls below 10 psig during any venting operation;
 - c. Any Sump Liquid Level that falls below 14 inches during any venting operation; or
 - d. Anytime the Differential Pressure (DP) Across the Tower climbs above 0.6 inches water column or below 0.1 inches water column.
 2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

- a. Minimizing the period of any startup, shutdown, or malfunction; and
 - b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation,
 - (2) Recording that operations returned to normal without operator action, or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-4 above.
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:
- [A.A.C. R18-2-306.A.3.c]
- a. Summary information on the number, duration and cause (including unknown cause, if applicable) of the excursion, and the corrective actions taken; and
 - b. Summary information on the number, duration and cause (including unknown cause, if applicable) for monitoring downtime incidents (other than downtime associated with zero and span or other calibration checks, if applicable).

IX. VENTILATION EMERGENCY SCRUBBER (VES-3)

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below, during days that Disilane, Silane, Silicon Tetrafluoride, Enriched Boron-11 Trifluoride, Boron Trifluoride, Diborane, or any mixtures thereof, are being processed or vented to the control system:
- [A.A.C. R18-2-306.A.3.c]
1. Tower 1 liquid flow rate shall be recorded at least once per day on a process log;
 2. Tower 2 liquid flow rate shall be recorded at least once per day on a process log; and
 3. Liquid pH shall be recorded at least once per day on a process log.
- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.
- [A.A.C. R18-2-306.A.3.c]
- C.** Operating Parameter Setpoints

Operating parameters listed in Condition IX.A above shall be kept within the values listed in Table C-5 below.

[A.A.C. R18-2-306.A.3.c]

Table C-5: Operating Parameters for Ventilation Emergency Scrubber (VES-3)

	Tower 1 Liquid Flow Rate (gpm)	Tower 2 Liquid Flow Rate (gpm)	Liquid pH
Max	200	200	13.5
Min	100	100	9.5

D. Excursions

1. An excursion is defined as:
 - a. Any Tower 1 liquid flow rate less than 100 gpm or greater than 200 gpm;
 - b. Any Tower 2 liquid flow rate less than 100 gpm or greater than 200 gpm; or
 - c. Any pH less than 9.5 or greater than 13.5.
2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

 - a. Minimizing the period of any startup, shutdown, or malfunction, and
 - b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-5 above.
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

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

X. PROCESS DRY SCRUBBER (PDS-1)

- A.** The End Point Sensor Light status shall be recorded on a daily basis and a log shall be maintained recording when the End Point Sensor Light activates.

[A.A.C. R18-2-306.A.3.c]

- B.** The Permittee shall maintain records of all maintenance activities, including when the alumina bed is replaced, in a log that identifies the date, time and description of these maintenance activities, as well as the reason for the maintenance activity performed.

[A.A.C. R18-2-306.A.3.c]

C. Excursions

1. An excursion is defined as:

Continuing a venting operation without changing out the alumina bed cartridge with a new one after the End Point Sensor Light has shut off signifying that the alumina bed has reached the 95% saturation level.

2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

- a. Shutting down venting to the Process Dry Scrubber until a fresh alumina bed cartridge is installed and the End Point Sensor Lamp is reset to "Lit" status; and
- b. Maintaining a shutdown status until a replacement of the activated alumina bed is completed and any leaks are found and repaired.

3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

- a. Summary information on the number, duration and cause (including unknown cause, if applicable) of the excursion, and the corrective actions taken; and

- b. Summary information on the number, duration and cause (including unknown cause, if applicable) for monitoring downtime incidents (other than downtime associated with zero and span or other calibration checks, if applicable).

XI. VENTILATION EMERGENCY SCRUBBER (VES-2)

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below during days that gases are being produced or vented to the control system:

[A.A.C. R18-2-306.A.3.c]

1. Caustic (Sodium Hydroxide – NaOH) concentration in the Tower Liquid Recycle shall be monitored using the surrogate parameter “pH” and shall be recorded at least once per day;
2. Tower Liquid Recycle Rate, in gallons per minute, shall be recorded continuously and have a “low flow” alarm;
3. Sump Liquid Level shall have a low-level alarm and the level status shall be recorded at least once per day;
4. Air flow rate, in cubic feet per minute, shall be recorded continuously; and
5. The Pressure Differential across the tower, in inches water column, shall be recorded at least once per day.

- B.** In the event of a recirculation pump failure, the loss of flow must be detected and the process must be shut down until flow is restored.

[A.A.C. R18-2-306.A.3.c]

- C.** The NaOH solution shall be tested every week to determine the % dissolved solids and % suspended solids, except during a week in which a muck-out is scheduled.

[A.A.C. R18-2-306.A.3.c]

- D.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]

- E.** During times when the liquid flow meter is inoperative, the Permittee shall monitor the Tower Liquid Recycle Rate manually along with the Liquid Sump Level in the VES-2 Scrubber at least twice per 8-hour shift. An alternative monitoring approach may be used with prior written approval by the Director. The Permittee shall not operate for more than 7 days with the liquid flow meter inoperative.

[A.A.C. R18-2-306.A.3.c]

- F.** Operating Parameter Setpoints

Operating parameters listed in Condition XI.A above shall be kept within the values listed in Table C-6 below.

[A.A.C. R18-2-306.A.3.c]

**Table C-6: Operating Parameters for the Ventilation Emergency Scrubber
VES-2**

	Caustic (NaOH) Strength (pH)	Tower Liquid Recycle Rates (gpm)	Sump Liquid Level (inch)	DP Across Tower (inches water column)
Max	N/A	N/A	20	4.5
Min	8	30	12	1.5

G. Excursions

1. An excursion is defined as:
 - a. Anytime the pH falls below 8;
 - b. Anytime the Tower Liquid Recycle Rate falls below 30 gpm;
 - c. Anytime the Sump Liquid Level falls below 12 inches; or
 - d. Anytime the Differential Pressure (DP) Across the Tower climbs above 4.5 inches water column or below 1.5 inches water column.
2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

 - a. Minimizing the period of any startup, shutdown, or malfunction; and
 - b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without maintenance repair as a result of operator adjustment or action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-6 above.
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A." The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

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

XII. FLOURINE EMERGENCY STACK (FES)

- A.** The following process parameters shall be monitored and recorded on a process log at the intervals listed below:

[A.A.C. R18-2-306.A.3.c]

1. Pressure differential across the adsorber shall be recorded at least once per quarter; and
2. Pressure differential across the pre-filter shall be recorded at least once per quarter.

- B.** The Permittee shall maintain records of all maintenance activities in a log that identifies the date, time, and description of the maintenance activity, as well as a reason for the maintenance activity that was performed.

[A.A.C. R18-2-306.A.3.c]

- C.** Operating Parameter Setpoints

Operating parameters listed in Condition XII.A above shall be kept within the values listed in Table C-7 below.

[A.A.C. R18-2-306.A.3.c]

Table C-7: Operating Parameters for the Fluorine Emergency Stack (FES)

	Differential Pressure (kPa)
Adsorber	<1.0
Pre-Filter	< 0.2

- D.** Excursions

1. An excursion is defined as:
 - a. A differential pressure reading across the adsorber greater than or equal to 1.0 kPa while the scrubber is in operation; or
 - b. A differential pressure reading across the pre-filter greater than or equal to 0.2 kPa while the scrubber is in operation.

2. Upon detection of an excursion, the Permittee shall restore operation of the equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include:

[A.A.C. R18-2-306.A.3.c]

 - a. Minimizing the period of any startup, shutdown, or malfunction; and
 - b. Taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of the excursion. Such actions may include:
 - (1) Initial inspection and evaluation;
 - (2) Recording that operations returned to normal without operator action; or
 - (3) Any necessary follow-up actions to return operations to within the parameters listed in Table C-7 above.
3. The Permittee shall submit reports of all excursions along with the compliance certifications required by Section VII of Attachment "A". The reports shall include, at a minimum, the following:

[A.A.C. R18-2-306.A.3.c]

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

ATTACHMENT “D”: EQUIPMENT LIST

EQUIPMENT TYPE	MAX. CAPACITY	MAKE	MODEL	INSTALLATION / MFG. DATE	EQUIPMENT ID NUMBER	A.A.C. / NSPS / NESHAP
Ventilation Emergency Scrubber	30,000 scfm	Construction International, Inc.	Countercurrent Packed Column Wet Scrubber	N/A	VES-1	A.A.C. R18-2-730
Arsine Guardian 1	2,000 scfm	Hoechst Celanese	Guardian 8	N/A	N/A	A.A.C. R18-2-730
Arsine Guardian 2	2,000 scfm	ATMI	Guardian 8	N/A	N/A	A.A.C. R18-2-730
Arsine Baghouse 1	N/A	Mikropul Environmental Systems	64S8 TRH”C”	N/A	N/A	A.A.C. R18-2-730
Arsine Baghouse 2	N/A	Mikropul Environmental Systems	64S8 TRH	N/A	N/A	A.A.C. R18-2-730
Silane Guardian	2,000 scfm	MG Industries	Guardian 8	N/A	N/A	A.A.C. R18-2-730
Silane Baghouses 1 and 2	1,800 acfm	STACLEAN Diffuser Co.	49-8-ADR	N/A	N/A	A.A.C. R18-2-730
Phosphine Guardian	1,300 scfm	Hoechst Celanese	Guardian 8	N/A	N/A	A.A.C. R18-2-730
Phosphine Dynawave Wet Scrubber	1,300 scfm	Monsanto Enviro-Chem	Reverse Jet Scrubbing System	N/A	N/A	A.A.C. R18-2-730
TCS Wet Scrubber A		Advanced Air Technologies	Apollo Series	N/A	N/A	A.A.C. R18-2-730
DCS Wet Scrubber B	200 scfm	Advanced Air Technologies	Apollo Series	N/A	N/A	A.A.C. R18-2-730
DCS Wet Scrubber C	200 scfm	Advanced Air Technologies	Apollo Series	N/A	N/A	A.A.C. R18-2-730
TCS Wet Scrubber D		Advanced Air Technologies	Apollo Series	N/A	N/A	A.A.C. R18-2-730

EQUIPMENT TYPE	MAX. CAPACITY	MAKE	MODEL	INSTALLATION / MFG. DATE	EQUIPMENT ID NUMBER	A.A.C. / NSPS / NESHAP
Emergency Generator	536 hp	Caterpillar	N/A	TBD	002	NSPS 40 CFR 60 IIII
VES-1 Diesel Generator	230 hp	Caterpillar	C6.6 DIT	March 2017	N/A	NSPS 40 CFR 60 IIII
Diesel Generator VES-2 Scrubber	136 hp	Onsite Energy / John Deere	N/A	2010	N/A	NSPS 40 CFR 60 IIII
Diesel Fire Water Pump	244 hp	Cummins Diesel	N/A	1990	N/A	A.A.C. R18-2-719; NESHAP 40 CFR 63 ZZZZ
Cylinder Shot Blaster & Dust Collector	240 cyl/day	Viking Corp	GC112 (blaster) 9DC (collector)	April 2006	N/A	A.A.C. R18-2-726
Spray Paint Booth	16'×10'×8' (8,000 cfm exhaust fan)	Global Finishing Solutions	DFECG-100816-NSB-4L-BD-SP (U144849-A)	November 2022	007	A.A.C. R18-2-727
Ammonia Recovery System	200 lb/hr	RM Technologies	N/A	July 2006		A.A.C. R18-2-730
Caustic Wet Scrubber	2,825-3,000 scfm 1.5 hp pump 10 hp - fan	Advanced Air Technologies	Orion Series	2010	VES-2	A.A.C. R18-2-730
Process Caustic Wet Scrubber	50 scfm 1.5 hp – pump	Advanced Air Technology	Apollo 50 Series	04/09/2008	PCWS-1	A.A.C. R18-2-730
Process Dry Scrubber	100 slpm	CS Clean Systems	CS200BS	2010	PDS-1	A.A.C. R18-2-730
Gas Detection	N/A	Honeywell	Vertex	2010	N/A	N/A
Ventilation Emergency Scrubber	20 scfm	Advanced Air Technologies	Orion Series Twin Tower	TBD	VES-3	A.A.C. R18-2-730

EQUIPMENT LIST

EQUIPMENT TYPE	MAX. CAPACITY	MAKE	MODEL	INSTALLATION / MFG. DATE	EQUIPMENT ID NUMBER	A.A.C. / NSPS / NESHAP
Emergency Gas Release Absorber	1,060 scfm	CS Clean Systems	CLEAN- PROTECT CP500SF	TBD	FES	A.A.C. R18-2-702 A.A.C. R18-2-730

APPENDIX “A”: AMBIENT AIR MONITORING PLAN

**AMBIENT AIR MONITORING PLAN
PRAXAIR, INC.
KINGMAN, ARIZONA**

Prepared for
Praxair Inc.
Kingman, Arizona

Prepared by
ENVIRON International Corporation
Emeryville, California

September 2007 05-
11161G

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1.0 PROGRAM DESCRIPTION

Praxair, Inc. (“Praxair” or the “Permittee”) maintains an ongoing ambient air monitoring program at the Kingman Facility (the “Facility”). This ambient air monitoring program was originally developed pursuant to an air permit issued by Arizona Department of Environmental Quality (“ADEQ”) in 1990. This program has been operated according to a 1990 Ambient Air Monitoring Program. The purpose of this document is to present an updated methodology for these ongoing monitoring activities as required in a revised air quality control permit anticipated to be issued by ADEQ (Permit No. 31094).

This document addresses the following items of the proposed ambient air monitoring program:

- 1) Purpose of the monitoring and program description.
- 2) Selection of monitoring locations and equipment.
- 3) Sampling methods, calibration, detection limits, equipment, alarms, and sample collection frequency.
- 4) Recordkeeping and reporting

In the remainder of this section, the purpose and objectives of this ambient air monitoring program are presented, followed by a general overview of the program.

1.1 Purpose and Objectives

The purpose of this ambient air monitoring program is to assess potential public exposure to compounds emitted from the Facility by monitoring the ambient air for these compounds. Along with requirements in the air permit for the Facility, the ambient air monitoring plan will ensure that public exposure to air emissions is minimized. This plan will also ensure that any exposures that do occur will not represent a significant health risk, as described by ADEQ regulations.

1.2 Monitoring Program Overview

The monitoring program will consist of ambient air monitoring at two locations on the Facility fenceline for compounds that may be emitted from the Facility. The constituents to be analyzed are Total Hydride Gas and Total Acid Gas.

The monitoring program consists of the following measurements:

- Hydride Gases. Hydride gases will be monitored as a group utilizing the Vertex 72-point continuous monitor with the Hydrides XP Chemcassette. Chemcassettes used to monitor hydrides detect all hydrides and report their total concentration as a single value. As an initial conservative estimate, all hydride gases will be considered Arsine, as Arsine is the most toxic of the hydride compounds.
- Acid Gases. Acid gases will be monitored utilizing the Vertex continuous monitor with the Mineral Acids LP or XP Chemcassette. Chemcassettes used to monitor mineral acids detect all mineral acids (Hydrogen Chloride, Hydrogen Bromide, Hydrogen Fluoride, etc.) and report their total concentration as a single value. Dichlorosilane rapidly hydrolyzes with moisture to form Hydrogen Chloride and a solid, non-toxic siloxane material. The presence of hydrogen chloride will indicate the presence of dichlorosilane.

1.3 Project Organization and Personnel

This monitoring program will be implemented by Praxair. The Monitoring Contact person will be the Kingman Plant Safety & Environmental Services (S&ES) Manager. As of the date of this plan, the contact person is:

Stoney Shumway
S&ES Manager
Phone: (928) 753-2103
Fax: (928) 753-9707

2.0 MONITORING EQUIPMENT DESCRIPTION

This section presents the type of monitoring equipment that will be used for the monitoring plan, and a discussion of the methodology used to sample each type of pollutant required to be monitored. Ambient air monitoring for the gaseous toxics will be conducted on a continuous basis 24 hours a day, seven days per week.

2.1 Vertex System Overview

Ambient monitoring for hydride gases and acid gases is proposed to be performed using the Zellweger Analytics Vertex System. This system continuously monitors up to 72 locations for toxic gases. Samples are taken from each location and sent to an analyzer. There are nine analyzers used at the Kingman plant, eight dedicated to hydride readings and one for acid gases. Each analyzer samples reading from up to eight sampling points.

Various different compounds or classes of compounds can be analyzed by the same monitor via the Chemcassette system. Chemcassettes use a dry reagent medium to collect and analyze air to detect gas leaks. When the Chemcassette is exposed to a target gas, it changes color in direct proportion to the concentration of gas present. The Vertex monitors read color intensity changes and determine the gas concentration by comparison to a known gas response pre-programmed into the instrument.

The Zellweger Vertex Technical Handbook, which has been provided to ADEQ, serves as the manufacturer's operating manual for this equipment.

2.2 Hydride Gases

Hydride gases will be monitored as a group utilizing the Zellweger Analytics Vertex System with a Chemcassette specific for hydrides.

The sample enters the inlet and passes through the Chemcassette tape to the sample outlet. The target gas in the sample flow reacts with the Chemcassette tape and produces a stain density proportional to the gas concentration. An LED in the detector head illuminates the sample stain. The detector optically measures the stain.

The microprocessor in the Chemcassette Analyzer module interprets the stain, then calculates and stores a precise concentration level in the module's memory. Gas

concentrations are reported in parts-per-million (ppm), parts-per-billion (ppb) or milligrams-per-cubic-meter (mg/m^3).

Chemcassette tapes are tagged with a radio frequency identification (RFID) tag to automatically identify: Serial number, Gas family/ tape type, Revision level, Expiration date of the tape, and Chemcassette leader parameters. The module uses a leader on the Chemcassette tape to allow calibration of the optics every time a new tape is installed. The Chemcassette module uses an optical detection system that measures a stain that develops on the Chemcassette tape in the presence of hydrides. The microprocessor in the Analyzer module then interprets the data.

The hydride Chemcassette is not specific for any one compound, but will detect all hydrides and report their total concentration as a single value. As an initial conservative estimate, all hydride gases detected by the Zellweger Analytics Vertex System will be considered Arsine, as Arsine is the most toxic of the hydride compounds. A follow-up investigation will be performed after any reportable alarm detected at the fenceline monitors to attempt to determine which pollutant was actually the cause of the reading.

The Zellweger Analytics Vertex System is capable of monitoring each sample location simultaneously.

2.3 Acid Gases

Acid gases will also be monitored utilizing the Zellweger Analytics Vertex System with a Mineral Acid Chemcassette. Dichlorosilane readily hydrolyzes with moisture in the atmosphere to form hydrogen chloride gas and a solid siloxane material. Due to the rapid reaction, the presence of dichlorosilane is detected by analyzing for hydrogen chloride. The siloxane material has been determined to be non-toxic. This procedure is recommended by Zellweger, the Vertex system manufacturer, for monitoring dichlorosilane. (Zellweger 2004b)

Zellweger acknowledges that un-hydrolyzed dichlorosilane can be detected by the hydride chemcassette, producing a false reading that a hydride gas has been detected. This situation would be assessed during follow-up investigations regarding any reportable alarm detected at the fenceline monitors.

3.0 SELECTION OF MONITORING LOCATIONS

This section provides a discussion of the criteria and the basis for the siting of monitoring stations. The siting of the monitoring stations was performed with consideration of the dominant wind direction, logistical constraints, and current Facility operations. Regulatory requirements and manufacturer's siting criteria were also considered, as discussed below.

The Permittee will monitor hydride gas and acid gas concentrations at the Facility fenceline in two locations:

1. Station 1: Near the Northeast corner of the fenceline.
2. Station 2: Near the Southwest corner of the fenceline

Further identifying information for two stations is provided in Table 1, including Vertex system and Plant Tag numbers, UTM coordinates of these sampling points, and sampling heights. The rationale for the selection of these locations is provided below.

3.1 Arizona Ambient Air Quality Guideline (AAAQG) Compliance

As described above, the use of ambient air monitors is required by a revised air quality control permit anticipated to be issued by ADEQ (Permit No. 31094). Praxair understands that the purpose of the ambient air monitoring requirement is to ensure compliance with the Arizona Ambient Air Quality Guidelines (AAAQGs). The AAAQGs represent ambient air concentrations, so the monitors are proposed to be placed at the facility fenceline to ensure that off-site impacts from plant emissions do not exceed the AAAQGs.

Figure 1 presents the proposed locations of Facility monitoring stations. The data collected from these stations will be used to assess the impacts of Facility emissions on receptor populations outside of the Facility.

Dispersion modeling has been previously performed and submitted to ADEQ as justification for proposed emission limits. The results of this modeling demonstrate that the zone of maximum 1-hour and annual impacts is to the northeast of the Facility. Maps showing isopleths of the predicted 1-hour, 24-hour and annual impacts resulting from modeling are included as Figures 2a through 2c. Surface meteorological data from the Kingman Airport located in Kingman, Arizona from 2000 to 2004 were used in the modeling. The Kingman Airport meteorological data was approved by ADEQ as

representative of meteorological data at the Kingman plant site when dispersion modeling was submitted in support of the permit for this site. These surface data were combined with upper air data for the same time period from Desert Rock Airport located in Mercury, Nevada.

The predominant wind direction is out of the southwest quadrant (Figures 3a through 3e). Station 1 is located on the northeast portion of the fenceline, downwind of the main emission point at the Facility for the predominant wind directions, and in the direction of maximum impact. Therefore, Station 1 will be used provide the best assessment of potential off-site impacts.

Station 2 is located to the southwest of the Facility. The major emission source from the Facility is located in the south of the Facility. Figure 2b shows that during 24-hour averaging periods, there are high potential concentrations immediately to the southwest of the Facility. Furthermore, this station is important in terms of assessing local impacts during periods when the wind is not in the predominant wind direction.

As a result, the two proposed monitoring locations represent the two optimal points where AAAQG compliance can be monitored at the facility fenceline along the pathways most likely to be impacted by facility emissions based on an analysis of dispersion modeling results and local meteorological data.

3.2 Regulatory Siting Criteria

The federal requirements for siting of ambient air monitors of criteria pollutants can be found in 40 C.F.R. Part 58 (USEPA 2006). These requirements are not directly applicable here and are considered secondary to the fundamental requirement to site the monitors to ensure compliance with the AAAQGs, as described above. Nevertheless, these requirements were considered to ensure that the monitors were sited consistent with the best practices required by USEPA for ambient air monitors.

According to USEPA regulations, the monitoring stations siting locations should be secure, located near a power source, and accessible to Facility personnel by truck. Samplers should be sited at least twice the height of any obstacle, such as buildings or trees, away from the obstacle. The monitors must be located greater than 20 meters from the drip line of a building, and 10 meters from the drip line of a tree. The inlet probe

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Kingman, Arizona
Ambient Monitoring Plan

should be surrounded by 270° of unrestricted airflow when sited in an open area, 180° of unrestricted airflow when mounted on the side of a building (USEPA 2006).

There should be no topographic features, such as land surface elevations or valley channels that would interfere with the monitoring locations sited around the perimeter of the Facility. Furthermore, the monitor locations are to be in open areas, distant from buildings, trees, and high vegetation.

The first monitoring point will be located near the northeast corner of the fenced-in operations area (Station 1). The second monitoring point will be located approximately thirty meters from the southwest corner along the southern fence line of the operations area (Station 2). Both monitors will be approximately one meter above ground. These locations ensure compliance with the requirements described above.

For NCore monitors used in regional criteria pollutant sampling, 40 C.F.R Part 58 also requires a 20-second residence time for samples. The regulation specifically states that this residence time is required to avoid reactions between the time a sample is taken and the time it is analyzed. Examples of reactions cited in this regulation include adsorption and desorption of volatile organic compound (VOC) and reactions between ozone and nitrogen oxide (NO). These issues are not a concern for the hydride gases and acid gases monitored at the Kingman plant. These compounds do not exhibit the same type of reactivity as the criteria pollutants described above that are addressed by the EPA rule.

In addition, the manufacturer of the VERTEX monitor clearly envisioned that the residence time of samples taken by this monitor would often exceed 20 seconds. Table B-2 of the Vertex Technical Handbook lists nominal transport times from sampling point to analyzer for various sampling line configurations. In the majority of the cases listed in this table, the residence time of the sample is estimated to be above 20 seconds. In fact, the manufacturer does not cite a maximum residence time at all in its monitor siting recommendations.

40 C.F.R Part 58 also states that a 20-second residence time limit is required to avoid interactions with reactive particulate matter that can deposit on sampling probe walls over time. This would not be an issue for the VERTEX monitors, since the sample lines are filtered (as per manufacturer recommendation and design). For dichlorosilane sample

lines, a 1 μm Teflon membrane is used, while a 0.01 μm membrane is used for hydride sample lines.

3.3 Manufacturer's Siting Recommendations

As described in Section 1.5 of the Vertex Technical Handbook, there are two different types of sampling system flows: Transport flow (high-velocity, large-volume air movement through the lines) and Sample flow (air admitted to the Chemcassette detection system). The high speed of Transport flow allows rapid monitoring and response time when using long lines from monitored locations to the Vertex system. A small portion of the transport flow (sample flow) is analyzed to determine concentration levels of each type of gas.

Zellweger, the Vertex manufacturer, recommends a target sample flowrate of 180 cubic centimeters per minute (cc/min) \pm 5% (i.e., 171 to 189 cc/min). The sample flow rates for both the Station 1 and Station 2 sample points are within the target flow rate recommended by the manufacturer. If the sample flow rate drops below 150 cc/min or increases above 210 cc/min, a Maintenance Fault alarm is generated.

In order to minimize the transport time and to ensure adequate sample flowrate, Zellweger recommends a maximum sample length (from collection point to analyzer) of 400 feet. Although the sample point siting document from the manufacturer acknowledges that "(t)here is minimal research published on the subject of point placement." (Zellweger 1998)

The sample points at Station 1 and Station 2 are located approximately 390 ft. and 400 ft. from the Vertex, respectively. These distances are straight line length, estimated using an electronic site drawing. The length of sample line required to span the distance from the Station 1 sample point to the Vertex is approximately 500 ft. The corresponding distance from the Station 2 sample point to the Vertex is approximately 550 ft. These distances were measured directly using a 100 ft measuring tape and estimating the path of the sample tubing. The exact path of the sample tubing is not known since the tubing is installed in the ceiling in some parts of the plant and underground in others.

These lengths are each greater than the manufacturer's recommended sample line length of 400 ft. However, as noted above, the Maintenance Fault alarm system ensures that the sample flowrate is maintained within the manufacturer's recommended range. Placement

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of the monitors closer to the analyzer could compromise the primary function of the monitors to ensure compliance with the AAAQGs at the facility fenceline.

The manufacturer does not provide specific recommendations on transport times. Section B-4 of the Vertex Technical Handbook shows the nominal Transport times for samples in different lengths of sample lines. Praxair uses one analyzer and 0.190 in. ID tubing. Extrapolating the data presented in Table B-2, a 500 ft sample line (Station 1) would have a nominal transport time of approximately 111 seconds. A 550 ft sample line (Station 2) would have a nominal transport time of approximately 122 seconds.

4.0 MONITOR OPERATING PROCEDURES

All equipment will be operated and maintained in accordance with the manufacturer's directions and Standard Operating Procedures (SOP's) as described in the Vertex Technical Handbook. This subsection describes the routine calibration and sampling procedures for the Vertex system. Table 2 summarizes the frequencies maintenance schedule for the Vertex.

4.1 Detection Limits

The lower detectable level (LDL) of the Vertex System for arsine using a Hydrides XP Chemcassette is 2.5ppb, for phosphine it is 5ppb, for diborane it is 10ppb, and for silane it is 0.3ppm. The LDL for hydrogen chloride using a Mineral Acids LP Chemcassette is 500ppb, which corresponds to a dichlorosilane level of 250ppb. The lowest alarm level for arsine is 3ppb, for phosphine it is 5ppb, for diborane it is 15ppb, and for silane it is 0.5ppm. The lowest alarm level for hydrogen chloride is 500ppb, which corresponds to a dichlorosilane level of 250ppb. According to Zellweger, the Vertex manufacturer, a concentration of dichlorosilane should be determined using half of a reading of hydrogen chloride. This calculation is performed to account for the fact that hydrogen chloride contains one chlorine atom, while dichlorosilane contains two. (Zellweger 2004b)

4.2 Calibration

The Vertex System requires exact flow rates and vacuum levels for accurate gas detection. Factors which affect proper flow setup are sample line length, the type of analyzer installed, the condition of the filters, and the supply vacuum level.

The analyzer is automatically recalibrated when a new Chemcassette is installed. The system flows may be rebalanced for the following reasons: (i) when a line length is changed; (ii) if end-of-line filters are replaced; (iii) when the gas family changes; and (iv) when analyzers are added to a Vertex rack. The sample line flows are always inspected after these activities and are rebalanced if necessary.

4.3 Alarms and Other Critical Control Factors

The Zellweger Analytics Vertex System continuously monitors up to 72 remote locations. It responds to gases that exceed programmed levels by: (i) triggering alarms and opening event windows to warn operators of high or low concentrations; (ii) triggering relays to

external devices; (iii) displaying the location gas type and gas concentration; and (iv) storing the alarm information in a database.

The Vertex System incorporates a range of redundant and protective features for maximum uptime: Intelligent analyzer modules allow one to stop monitoring with no effect on the remaining modules, power supplies are redundant, pumps are redundant, the system powers up in the same state as when powered down, filters, Chemcassettes and major components in one of the analyzers can be replaced while the remaining analyzers continue to function.

Alarms will be sounded if any of the monitors detect a concentration above a predefined threshold. The Facility employs two alarm set points: Level 1 and Level 2 alarms. Following a Level 1 alarm, an investigation into the cause and appropriate corrective action are commenced. Following a Level 2 alarm, a plant evacuation would be ordered. When a plant evacuation occurs, most operations involving toxic gases are automatically shutdown. The automatic shutdown closes all pneumatic valves and traps the gas in the operating systems. Arsine synthesis operations are idled (no more acid is added to the reactor, any additional arsine generated is collected in the cryo) until a decision is made by the incident commander to abort or continue the arsine reactions (depending on the plant evacuation circumstances). The alarm set points used for internal operations are based upon OSHA and/or ACGIH TLV's. Reportable alarm set points for the fenceline monitors are listed in the anticipated ADEQ Permit No. 31094 for the Facility.

The visual output display of monitoring results will be located in an area which is continually manned during operating hours to provide for frequent inspection of the system. The Vertex control system is a redundant system consisting of a central data acquisition computer (DAq), a programmable logic controller (PLC) and one or more analyzer modules.

The data acquisition computer (DAq) is the central processor for the Vertex System. It configures the analyzers, stores data and provides a network interface for data transfer to other computers. System display and operator control is through an on-screen keyboard or an optional external keyboard. The Programmable Logic Controller (PLC) is the control system path between the DAq and the individual analyzers. The PLC polls the analyzers for current information, activates relays which will be connected to external alarms and provides external communications.

If the toxic gas monitors go out of service, all operations involving the handling of the toxic gases will be brought to a conclusion as rapidly as possible. Work will not commence until monitoring systems are fully operational.

Monitoring systems will be checked at the beginning of each work day.

4.4 Sampling Frequency

Ambient air monitoring will be conducted on a continuous basis, 24-hours/day and 7 days/week. The Vertex system draws air simultaneously from all sampling locations. The time for a sample to be analyzed depends on both the distance from the sampling point to the analyzer and the initial analysis period of the Vertex system. The initial analysis period depends on both the pollutant being sampled and the programmed alarm levels. The total time from sampling to registering a Level 1 or Level 2 alarm is typically less than one minute.

4.5 Sample Lines

Sample lines used by the Vertex system are FEP Teflon tubing, measuring ¼" outside diameter (OD) and 0.190" inside diameter (ID). The material type and size of tubing are recommended by the manufacturer. Tubing is purchased directly from the manufacturer, typically in 1,000 ft. rolls. As noted above, the VERTEX sample lines are filtered (as per manufacturer recommendation and design), which would prevent particulate contamination.

The Technical Handbook provided by the manufacturer of the VERTEX system does provide a recommended inspection and maintenance schedule, as well as a recommended frequency for replacement of parts. The Handbook does not specify a sample line replacement frequency. This would indicate that the manufacturer does not consider sample line fouling or deterioration to be an issue. Praxair has also not experienced fouling or deterioration problems, so these factors have not been an issue in practice.

Table 2 summarizes the maintenance schedule for the Vertex. As stated in this table, a daily sample line integrity check will be performed. Sample lines are replaced if any damage is observed or if a daily line integrity test (LIT) is failed and the cause of the failure is determined to be a damaged sample line.

5.0 QUALITY ASSURANCE

The following section describes the quality assurance procedures to be followed for the monitoring data collected according to this plan. This includes a discussion of practices designed to ensure data completeness, a discussion of precision and accuracy determinations, and corrective action procedures for issues that arise.

5.1 Data Completeness

The data quality objective for data completeness is 90% for this monitoring program. The 90% completeness goal is a general goal; it is not a limit on the use of the data or a standard by which additional monitoring can be required. The principal use of the data is to evaluate potential off-site exposures to hydride gases and acid gases. This 90% data completeness goal is conservative compared to the 75% data completeness requirement to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS), as outlined 40 C.F.R Part 50.

5.2 Precision and Accuracy of Monitoring Data

The monitors proposed in this plan are designed to determine concentrations of classes of compounds. As a result, calibration curves are required to calibrate readings for an individual pollutant of concern. According to the manufacturer, the gas calibration curves provided for the Vertex system are designed to read within an accuracy of 10% of the “true” value, on average, over the full detection range, under optimum conditions of temperature and humidity. These calibration curves are also designed to have high precision, having a coefficient of variation (standard deviation divided by average reading) of 5% or better. (Zellweger 2002) These values are proposed as acceptance criteria for accuracy and precision of monitoring data.

The analyzers are automatically recalibrated when a new Chemcassette is installed. This typically occurs once every 30 to 45 days.

5.3 Data Review Procedures

A review of the ambient air monitoring data will be performed on a daily basis to ensure data adequacy and completeness. This review will assess whether the completeness goal of 90% is being met. The review will also allow the system operator to look for trends in monitoring data, including correlations with on site activities.

5.4 Corrective Action Procedures

There are 19 possible Maintenance Faults on the Vertex. A Maintenance Fault indicates that the Vertex System requires attention but is continuing to monitor. There are 34 possible Instrument Faults on the Vertex. An Instrument Fault indicates a loss of monitoring on one or more points. Any Maintenance or Instrument Fault creates a Malfunction Alarm (MALF) on the plant M-1 alarm system. When the MALF is received, the security guard notifies appropriate personnel who then report to the Vertex to get more specific information on the alarm. Troubleshooting/Corrective Actions are performed in accordance with the Troubleshooting procedures in Section 6 of the Vertex Technical Handbook.

Several back-up systems are in place at the facility to ensure that the monitoring system remains operational in the event of a malfunction. At least one extra analyzer is maintained on site in case of analyzer failure. Typically, 20 to 30 extra hydride gas Chemcassettes and 1 or 2 extra acid gas Chemcassettes are maintained on site. These are maintained in a refrigerated or frozen state as recommended by the manufacturer to ensure shelf-life. The system is designed with redundant pumps to ensure continuous sampling flow. Finally, the monitoring system is powered by an uninterruptible power supply backed up by an emergency generator designed to start up automatically in the event of a loss of power at the plant site.

6.0 RECORDKEEPING AND REPORTING

This section describes the recordkeeping and reporting of ambient air quality data that Praxair would collect and report to ADEQ, including requirements consistent with anticipated ADEQ Permit No. 31094.

6.1 Recordkeeping

Data from the Vertex sampling points is continuously recorded by a separate data acquisition computer (SCADA). To save space on the computer, a minimum of one data point is recorded every 30 seconds as long as the data is not changing. When the data is changing, one data point may be stored every second. Therefore each hourly average concentration will be calculated by using between 120 and 3,600 data points. Each maximum concentration in a 24 hour period will be determined from 2,880 to 86,400 data points.

Data from the Vertex sampling points is imported into a Microsoft Excel spreadsheet using the Proficy Historian Add-In feature. Proficy Historian is a Data Acquisition and Analysis tool kit.

The facility will perform preventative maintenance according to the manufacturer's preventative maintenance checklist. This activity is performed by the manufacturer 3 to 4 times/year as part of a maintenance service contract. Additional preventative maintenance is performed by Praxair to ensure proper continuous operation of the monitoring systems. Table 2 summarizes the maintenance schedule for the Vertex. The facility will maintain a written log of all maintenance activities performed on monitoring equipment. This includes scheduled, routine maintenance activities as well as actions taken in response to malfunctions or other problems with monitoring equipment. The log will identify the following information for each maintenance event:

- Affected equipment part or system
- Maintenance performed
- Operator name
- Date

6.2 Reporting

The monitoring data from the two ambient air monitoring points will be reported for each sample point to show the average concentration per hour and the maximum concentration recorded over a 24 hour period including weekends. Data will be collected on daily and monthly report forms and submitted to the ADEQ quarterly, no more than 120 days after the end of the calendar quarter.

To minimize the size of the report, average concentration per hour will only be reported for days where a maximum concentration greater than zero (0) was recorded. If the maximum concentration recorded was zero in a 24-hour period, then all hours in that 24-hour period had an average concentration of zero.

Calibration and maintenance logs for the monitor will be maintained at the Facility for a period of three years plus the current year and will be made available for ADEQ inspection upon request.

7.0 REFERENCES

- Environ International Corporation (ENVIRON). 2006. *Revised Air Quality Impact Analysis in Support of the Air Permit Application for Praxair, Inc.* June.
- United States Environmental Protection Agency (USEPA). 2006. *Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring*. July. 40 CFR Part 58, Appendix E.
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- United States Environmental Protection Agency (USEPA). 1983. *Quality Assurance Handbook for Air Pollution Measurement Systems*. Volume IV. EPA-600/4-82-060.
- Zellweger Analytics MDA Scientific (Zellweger). 2004a. VERTEX 72-Point Continuous Monitor, Technical Handbook Rev. 3.0.
- Zellweger Analytics MDA Scientific (Zellweger). 2004b. Technical Note: Dichlorosilane (DCS) Detection. Document 971243, Rev. 2. September.
- Zellweger Analytics MDA Scientific (Zellweger). 2002. Chemcassette-Based Instrument Accuracy and Precision. July.
- Zellweger Analytics MDA Scientific (Zellweger). 1998. Sampling Point Guidelines: Considerations for selecting the best sample tube location. March.

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Table 1
Proposed Fenceline Monitor Locations
Praxair, Inc.
Kingman, Arizona

Station Number	Vertex Sampling Point ID	Plant Tag No.	Location Description	UTMx	UTMy	Instrument Height
				(m)	(m)	(m)
Station 1	Vertex Point 2-3-2	AE-94-10	Northeast corner of the fenceline	761,340	3,880,030	1
Station 2	Vertex Point 2-3-4	AE-94-12	Southwest corner of the fenceline	761,215	3,879,840	1

Table 2
Maintenance Schedule for Vertex 72-point Continuous Monitor
Praxair, Inc.
Kingman, Arizona

Item	Recommended Schedule	Preventive Maintenance Provider
Sample line filters (end of line)	3-6 months, or as necessary based on daily sample line flow inspections	Praxair
Teflon Filter Membrane (end of line)	1 month, or as necessary based on daily flow inspections	Praxair
Cabinet filter cleaned (located in front of pump module)	3 months or as needed	Praxair
Air filters (located on the analyzer face) ¹	3 months or as needed	OEM
Pump vane replacement	1 year operation per pump	Praxair
Pump stem and filter	6 months	OEM
Valve filter	1 year	OEM
Supply Vacuum Filters	3-6 months	OEM
Particulate Filters	3-6 months	OEM
Acid Scrubber Filter	6 months	OEM
Optics Cleaning	1 year or as needed	OEM

Notes:

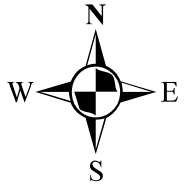
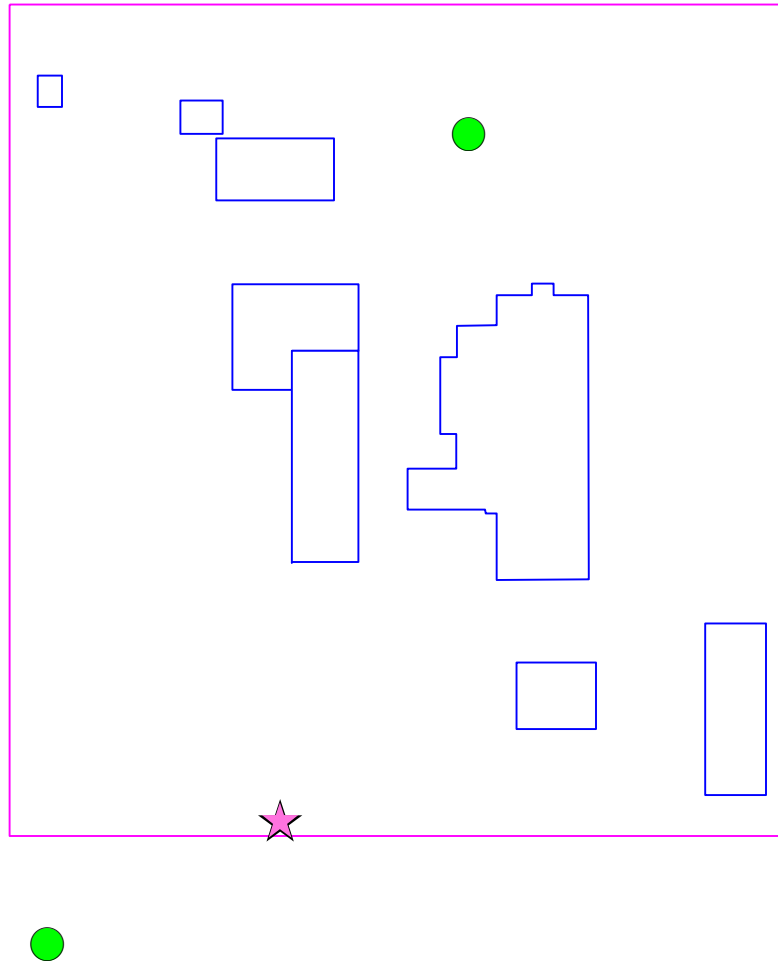
1. Applies only to early Series 1 (1291-1000 and 1291-2000), which represents only one of the nine analyzers in the Vertex system.
2. OEM = Original Equipment Manufacturer. Praxair maintains a service contract that provides for quarterly preventive maintenance.

Reference:





Zellweger Analytics MDA Scientific. 2004. VERTEX 72-Point Continuous Monitor, Technical Handbook Rev. 3.0.

Figure 1

Proposed Fenceline Monitor
Locations Praxair, Inc.
Kingman, Arizona



Legend

-  Fenceline / Property
-  Praxair Buildings
-  Monitoring Stations
-  Emissions Source

ENVIRON

Figure 1

6001 Shellmound St., Suite 700
Emeryville, CA 94608

Figure 2a
Modeled Concentrations (1-Hour Averaging Time)
Praxair, Inc.
Kingman, Arizona

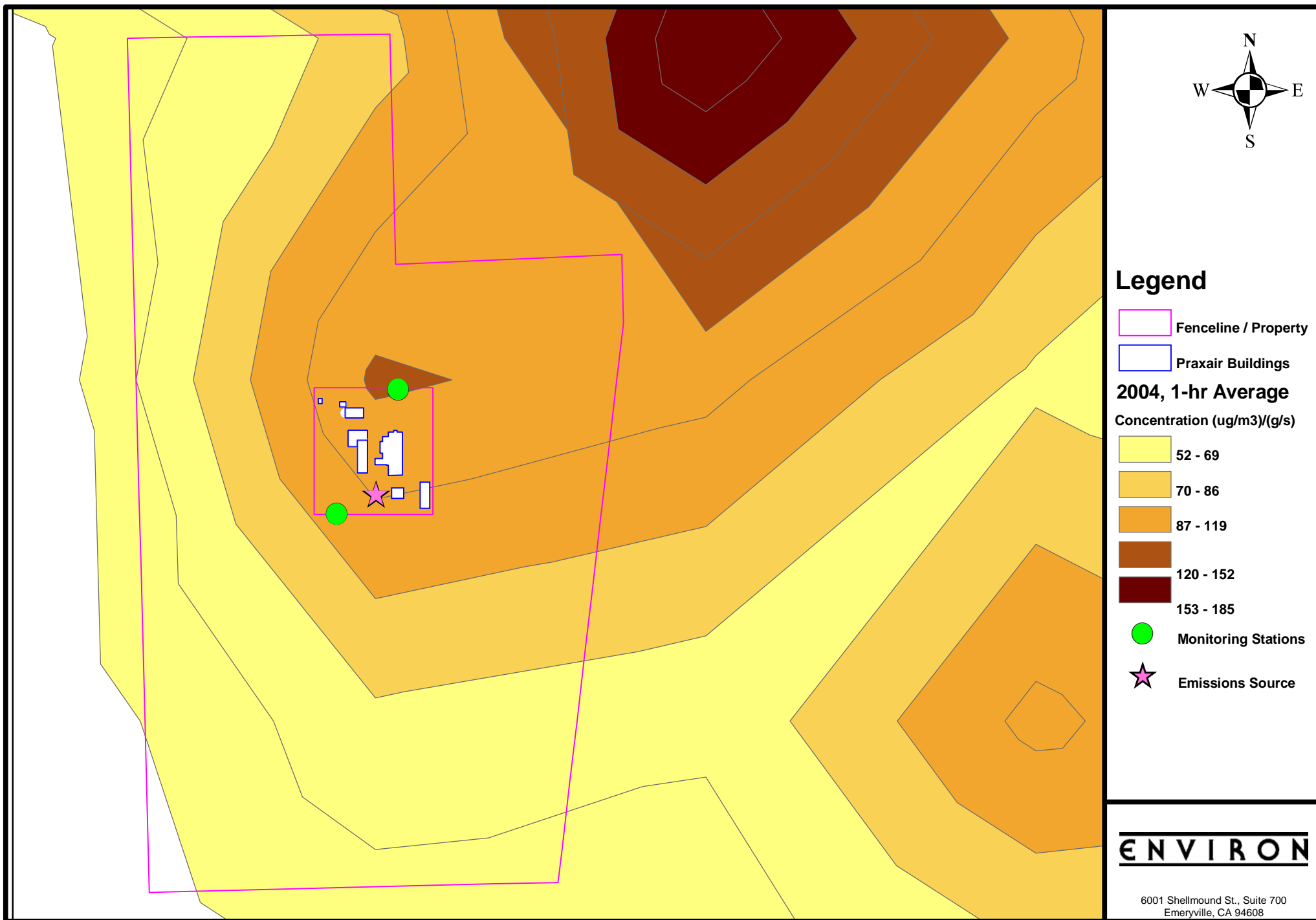


Figure 2b
Modeled Concentrations (24-Hour Averaging Time)
Praxair, Inc.
Kingman, Arizona

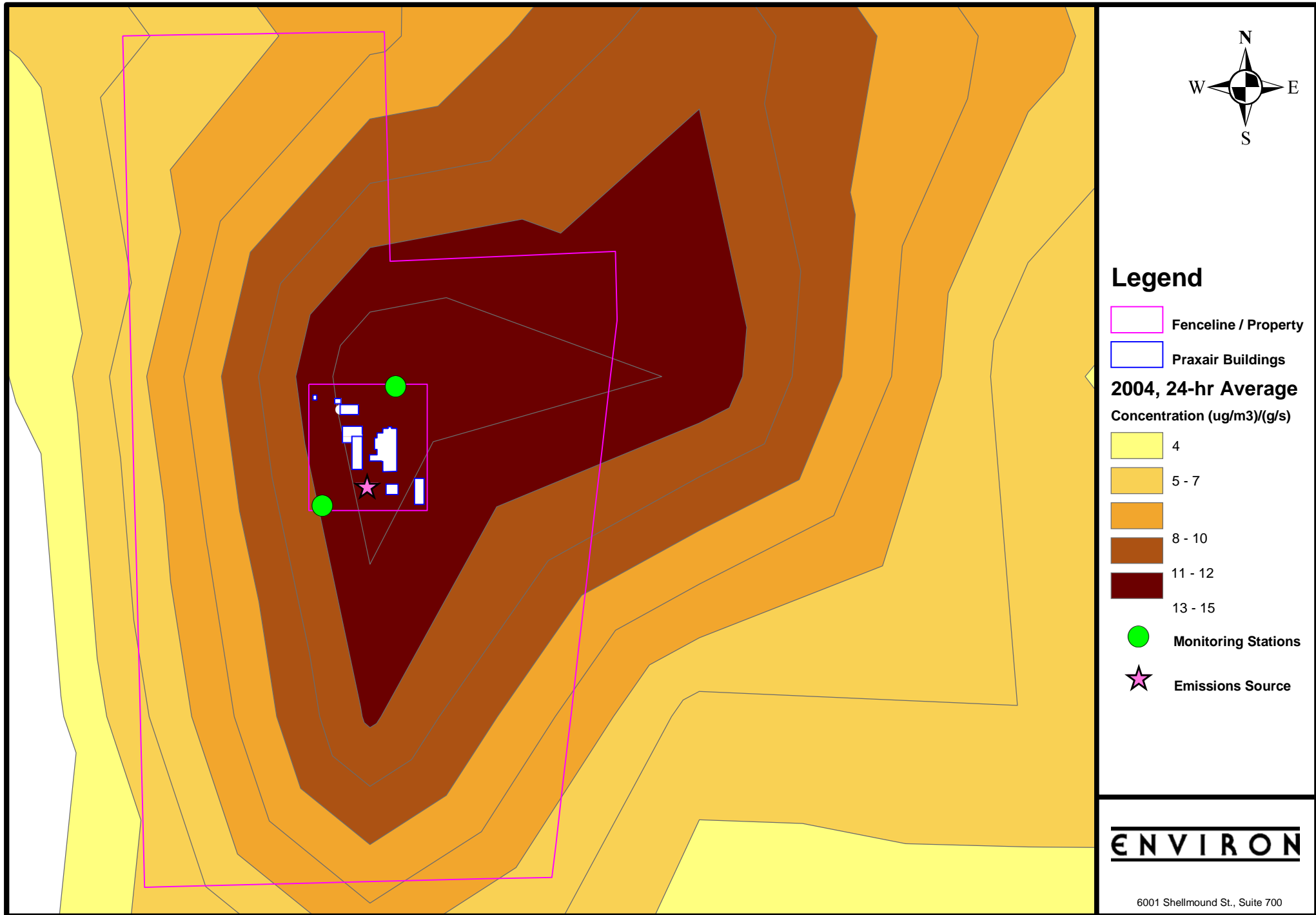
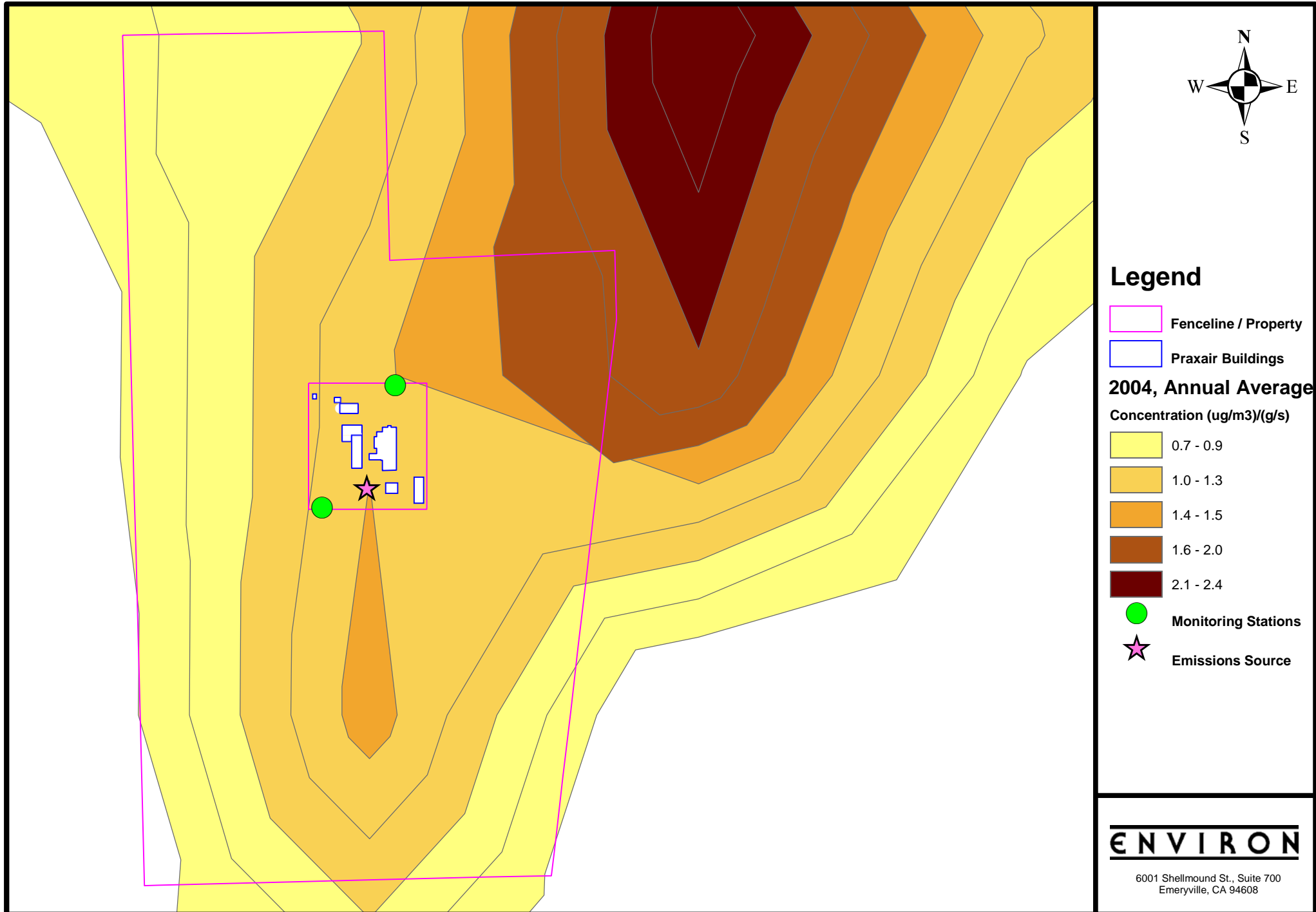


Figure 2c
Modeled Concentrations (Annual Averaging Time)
Praxair, Inc.
Kingman, Arizona

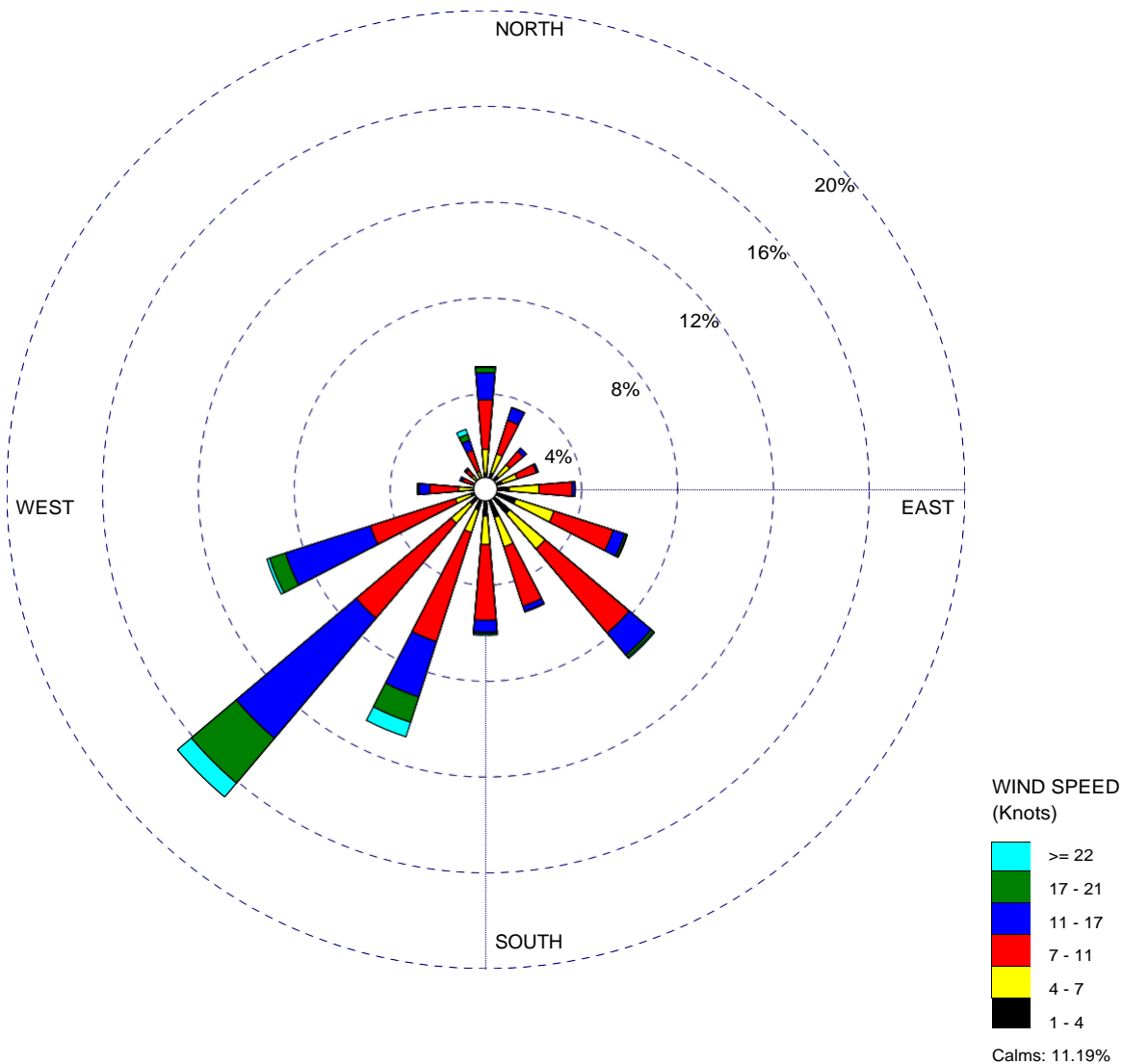


WIND ROSE PLOT:

Figure 3a
Surface Wind Rose, 2000

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

2000
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

11.19%

TOTAL COUNT:

8784 hrs.

AVG. WIND SPEED:

8.48 Knots

DATE:

5/24/2006

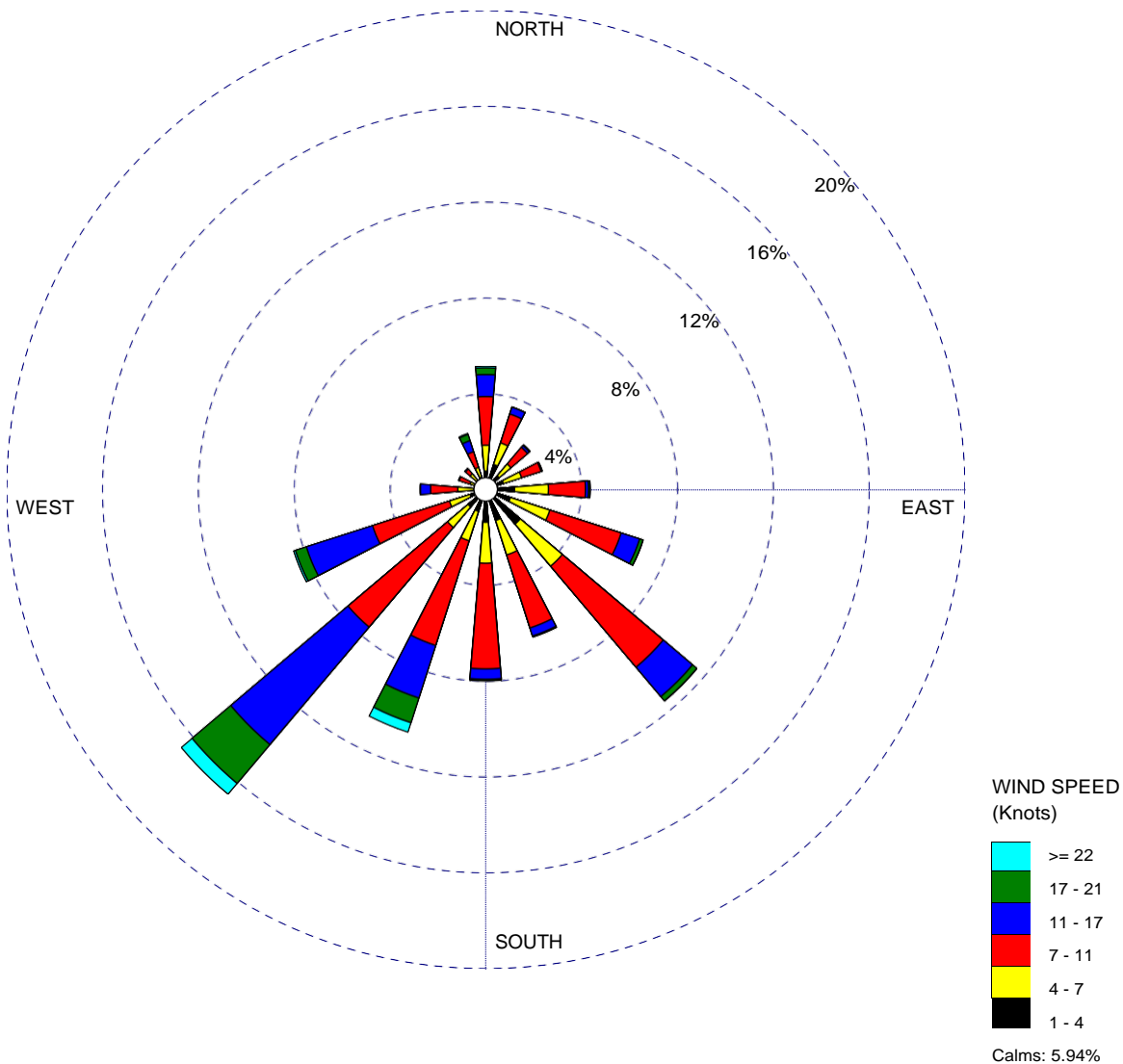
PROJECT NO.:

WIND ROSE PLOT:

Figure 3b
Surface Wind Rose, 2001

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

2001
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

5.94%

TOTAL COUNT:

8760 hrs.

AVG. WIND SPEED:

8.53 Knots

DATE:

5/24/2006

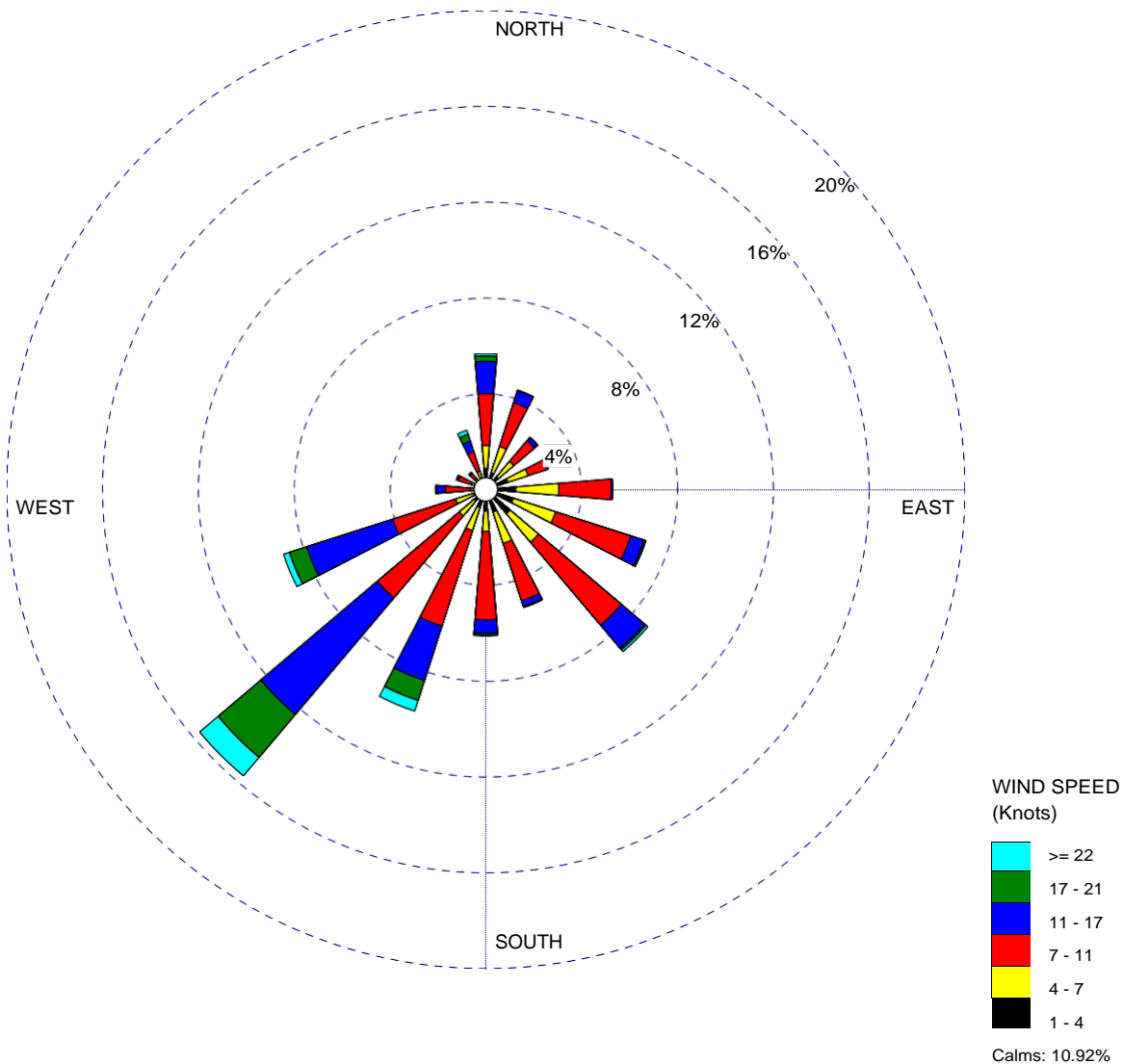
PROJECT NO.:

WIND ROSE PLOT:

Figure 3c
Surface Wind Rose, 2002

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

2002
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

10.92%

TOTAL COUNT:

8760 hrs.

AVG. WIND SPEED:

8.53 Knots

DATE:

5/24/2006

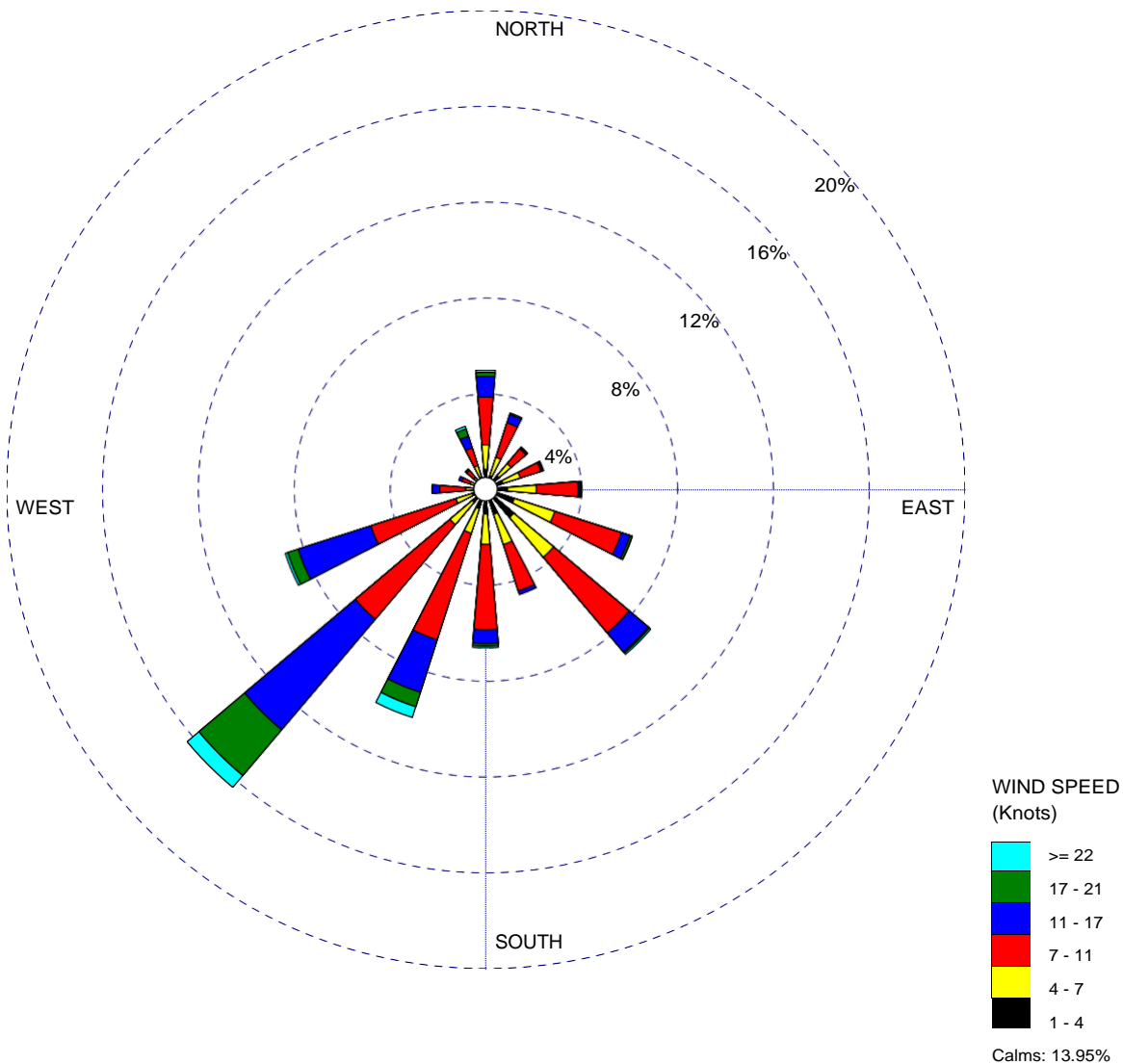
PROJECT NO.:

WIND ROSE PLOT:

Figure 3d
Surface Wind Rose, 2003

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

2003
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

13.95%

TOTAL COUNT:

8760 hrs.

AVG. WIND SPEED:

7.97 Knots

DATE:

5/24/2006

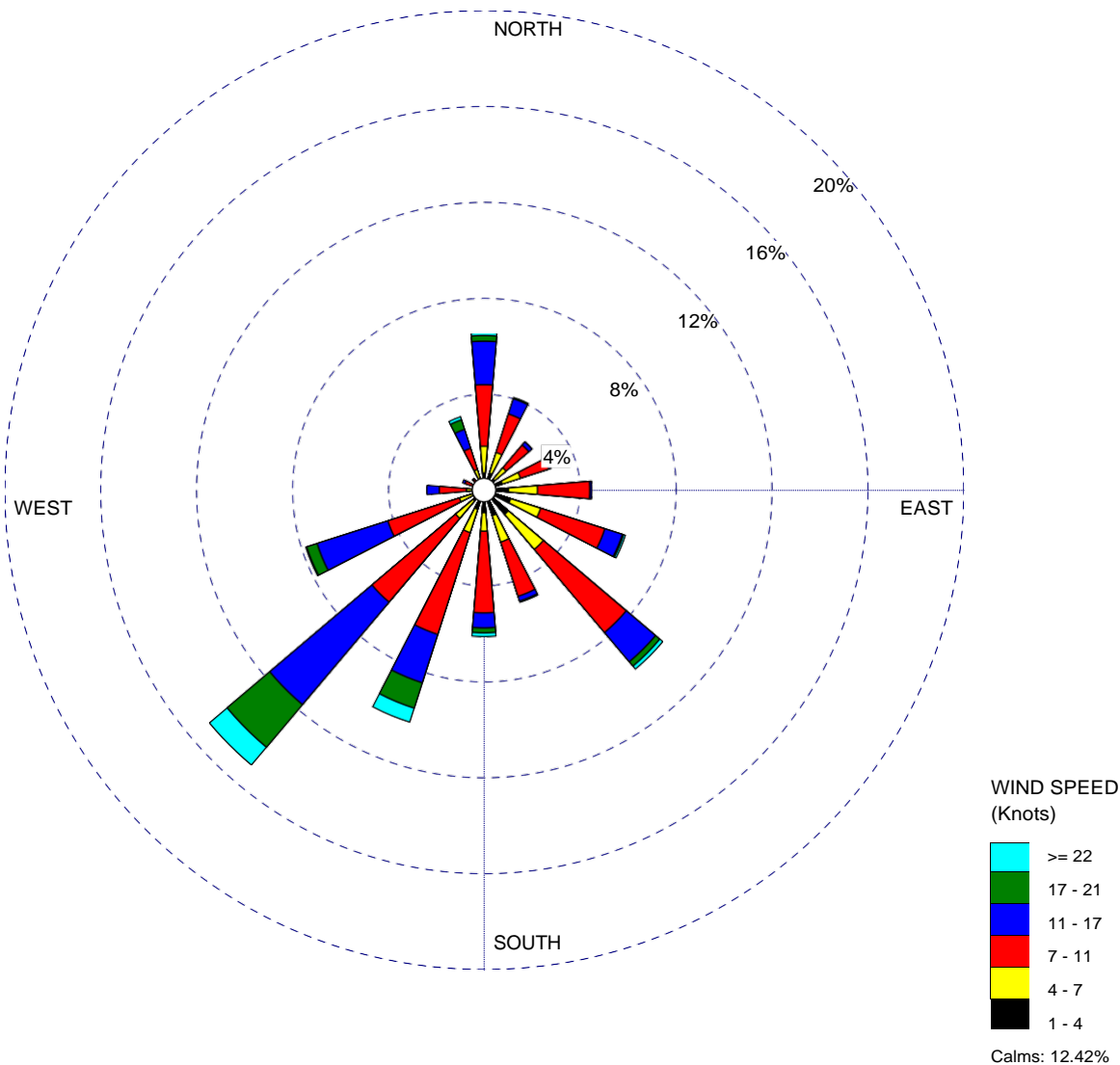
PROJECT NO.:

WIND ROSE PLOT:

Figure 3e
Surface Wind Rose, 2004

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

2004
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:

12.42%

TOTAL COUNT:

8784 hrs.

AVG. WIND SPEED:

8.52 Knots

DATE:

5/24/2006

PROJECT NO.: