#### **ISSUE DATE**

09-XXXE CAB File No. 0562-01

# CERTIFIED MAIL RETURN RECEIPT REQUESTED (XXX)

Mr. Christian Twigg-Smith President CTS Earthmoving, Inc. P.O. Box 470 Holualoa, Hawaii 96725

Dear Mr. Twigg-Smith:

Subject: Temporary Covered Source Permit (CSP) No. 0562-01-CT

Application for Renewal No. 0562-03
Application for Modification No. 0562-04

CTS Earthmoving, Inc.

**Crushing and Screening Plants** 

Located at: Various Temporary Sites, State of Hawaii

**Date of Expiration:** 

In accordance with Hawaii Administrative Rules (HAR), Section 11-60.1, and pursuant to your significant modification and renewal application, the Department of Health hereby amends and renews the subject covered source permit. The modification adds a 560 TPH Cone Crushing Plant with screen and an 814 HP diesel engine generator to the subject permit. The issuance of this amendment and renewal is based on the information that you submitted as part of your application dated March 5, 2009. A receipt for the application filing fee of \$500.00 is enclosed.

This permit supersedes and amends Covered Source Permit No. 0562-01-CT issued on August 16, 2004 and its amendment dated July 27, 2007.

The temporary covered source permit is issued subject to the conditions/requirements set forth in the following Attachments:

Attachment I: Standard Conditions
Attachment II: Special Conditions

Attachment II - INSIG: Special Conditions - Insignificant Activities

Attachment III: Annual Fee Requirements

Attachment IV: Annual Emissions Reporting Requirements

Mr. Christian Twigg-Smith Date Page 2

The forms for submission are as follows:

Form C-2: Compliance Certification

Annual Emissions Report Form: Crushing and Screening Plants

Annual Emissions/Monitoring Report Form: Diesel Engine and Diesel Engine

Generator

Monitoring Report Form: Operating Hours
Monitoring Report Form: Fuel Consumption
Monitoring Report Form: Opacity Exceedances

Change of Location Request for a Temporary Source Form

The following are for use in monitoring visible emission:

Visible Emissions Form Requirements State of Hawaii; Visible Emissions Form State of Hawaii The Ringelmann Chart

This permit: (a) shall not in any manner affect the title of the premises upon which the equipment is to be located; (b) does not release the permittee from any liability for any loss due to personal injury or property damage caused by, resulting from or arising out of the design, installation, maintenance, or operation of the equipment; and (c) in no manner implies or suggests that the Hawaii Department of Health, or its officers, agents, or employees, assumes any liability, directly or indirectly, for any loss due to personal injury or property damage caused by, resulting from or arising out of the design, installation, maintenance, or operation of the equipment.

If you have any questions, please call Mr. Ryan Go of the Clean Air Branch at (808) 586-4200.

Sincerely,

THOMAS E. ARIZUMI, P.E., CHIEF Environmental Management Division

RG:nn Enclosures

c: Wendell Sano, EHS – Hawaii CAB Monitoring Section

# ATTACHMENT I: STANDARD CONDITIONS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

This permit is granted in accordance with the Hawaii Administrative Rules (HAR), Title 11, Chapter 60.1, Air Pollution Control, and is subject to the following standard conditions:

 Unless specifically identified, the terms and conditions contained in this permit are consistent with the applicable requirement, including form, on which each term or condition is based.

(Auth.: HAR §11-60.1-90)

2. This permit, or a copy thereof, shall be maintained at or near the source and shall be made available for inspection upon request. The permit shall not be willfully defaced, altered, forged, counterfeited, or falsified.

(Auth.: HAR §11-60.1-6; SIP §11-60-11)<sup>2</sup>

3. This permit is not transferable whether by operation of law or otherwise, from person to person, from place to place, or from one piece of equipment to another without the approval of the Department of Health, except as provided in HAR, Section 11-60.1-91.

(Auth.: HAR §11-60.1-7; SIP §11-60-9)<sup>2</sup>

4. A request for transfer from person to person shall be made on forms furnished by the Department of Health.

(Auth.: HAR §11-60.1-7)

5. In the event of any changes in control or ownership of the facilities to be constructed or modified, this permit shall be binding on all subsequent owners and operators. The permittee shall <u>notify</u> the succeeding owner and operator of the existence of this permit and its conditions by letter, copies of which will be forwarded to the Department of Health and the U.S. Environmental Protection Agency (EPA), Region 9.

(Auth.: HAR §11-60.1-5, §11-60.1-7, §11-60.1-94)

6. The facility covered by this permit shall be constructed and operated in accordance with the application, and any information submitted as part of the application, for the Covered Source Permit. There shall be no deviation unless additional or revised plans are submitted to and approved by the Department of Health, and the permit is amended to allow such deviation.

(Auth.: HAR §11-60.1-2, §11-60.1-4, §11-60.1-82, §11-60.1-84, §11-60.1-90)

7. This permit (a) does not release the permittee from compliance with other applicable statutes of the State of Hawaii, or with applicable local laws, regulations, or ordinances,

CSP No. 0562-01-CT

Attachment I Page 2 of 6 Issuance Date:

**Expiration Date:** 

and

# **PROPOSED**

CSP No. 0562-01-CT Attachment I

Page 3 of 6 Issuance Date:

Expiration Date:

**PROPOSED** 

(b) shall not constitute, nor be construed to be an approval of the design of the covered source.

(Auth.: HAR §11-60.1-5, §11-60.1-82)

8. The permittee shall comply with all the terms and conditions of this permit. Any permit noncompliance constitutes a violation of HAR, Chapter 11-60.1 and the Clean Air Act and is grounds for enforcement action; for permit termination, suspension, reopening, or amendment; or for denial of a permit renewal application.

(Auth.: HAR §11-60.1-3, §11-60.1-10, §11-60.1-19, §11-60.1-90)

9. If any term or condition of this permit becomes invalid as a result of a challenge to a portion of this permit, the other terms and conditions of this permit shall not be affected and shall remain valid.

(Auth.: HAR §11-60.1-90)

10. The permittee shall not use as a defense in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the terms and conditions of this permit.

(Auth.: HAR §11-60.1-90)

11. This permit may be terminated, suspended, reopened, or amended for cause pursuant to HAR, Sections, 11-60.1-10 and 11-60.1-98, and Hawaii Revised Statutes (HRS), Chapter 342B-27, after affording the permittee an opportunity for a hearing in accordance with HRS, Chapter 91.

(Auth.: HAR §11-60.1-3, §11-60.1-10, §11-60.1-90, §11-60.1-98)

12. The filing of a request by the permittee for the termination, suspension, reopening, or amendment of this permit, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(Auth.: HAR §11-60.1-90)

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

(Auth.: HAR §11-60.1-90)

- 14. The permittee shall <u>notify</u> the Department of Health and U.S. EPA Region 9 in writing of the following dates:
  - a. The anticipated date of initial start-up for each emission unit of a new source or

CSP No. 0562-01-CT
Attachment I
Page 4 of 6
Issuance Date:
Expiration Date:

## **PROPOSED**

- significant modification not more than sixty (60) days or less than thirty (30) days prior to such date:
- b. The **actual date of construction commencement** within fifteen (15) days after such date; and
- c. The actual date of start-up within fifteen (15) days after such date.

(Auth.: HAR §11-60.1-90)

15. The permittee shall furnish, in a timely manner, any information or records requested in writing by the Department of Health to determine whether cause exists for terminating, suspending, reopening, or amending this permit, or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Department of Health copies of records required to be kept by the permittee. For information claimed to be confidential, the Director of Health may require the permittee to furnish such records not only to the Department of Health but also directly to the U.S. EPA Region 9 along with a claim of confidentiality.

(Auth.: HAR §11-60.1-14, §11-60.1-90)

- 16. The permittee shall <u>notify</u> the Department of Health in writing, of the **intent to shut down** air pollution control equipment for necessary scheduled maintenance at least twenty-four (24) hours prior to the planned shutdown. The submittal of this notice shall not be a defense to an enforcement action. The notice shall include the following:
  - a. Identification of the specific equipment to be taken out of service, as well as its location and permit number;
  - b. The expected length of time that the air pollution control equipment will be out of service:
  - c. The nature and quantity of emissions of air pollutants likely to be emitted during the shutdown period:
  - d. Measures such as the use of off-shift labor and equipment that will be taken to minimize the length of the shutdown period; and
  - e. The reasons why it would be impossible or impractical to shut down the source operation during the maintenance period.

(Auth.: HAR §11-60.1-15; SIP §11-60-16)<sup>2</sup>

17. Except for emergencies which result in noncompliance with any technology-based emission limitation in accordance with HAR, Section 11-60.1-16.5, in the event any emission unit, air pollution control equipment, or related equipment malfunctions or breaks down in such a manner as to cause the emission of air pollutants in violation of HAR, Chapter 11-60.1 or this permit, the permittee shall immediately notify the Department of Health of the malfunction or breakdown, unless the protection of personnel or public health or safety demands immediate attention to the malfunction or breakdown and makes such notification infeasible. In the latter case, the notice shall be provided as

CSP No. 0562-01-CT Attachment I Page 5 of 6 Issuance Date: Expiration Date:

soon as practicable. Within five (5) working days of this initial notification, the permittee shall also submit, in writing, the following information:

- a. Identification of each affected emission point and each emission limit exceeded;
- b. Magnitude of each excess emission;
- c. Time and duration of each excess emission;
- d. Identity of the process or control equipment causing the excess emission:
- e. Cause and nature of each excess emission;
- f. Description of the steps taken to remedy the situation, prevent a recurrence, limit the excessive emissions, and assure that the malfunction or breakdown does not interfere with the attainment and maintenance of the National Ambient Air Quality Standards and state ambient air quality standards;
- g. Documentation that the equipment or process was at all times maintained and operated in a manner consistent with good practice for minimizing emissions; and
- h. A statement that the excess emissions are not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

The submittal of these notices shall not be a defense to an enforcement action.

(Auth.: HAR §11-60.1-16; SIP §11-60-16)<sup>2</sup>

18. The permittee may request confidential treatment of any records in accordance with HAR section 11-60.1-14.

(Auth.: HAR §11-60.1-14, §11-60.1-90)

- 19. This permit shall become invalid with respect to the authorized construction is not commenced as follows:
  - a. Within eighteen (18) months after the permit takes effect, is discontinued for a period of eighteen (18) months or more, or is not completed within a reasonable time.
  - b. For phased construction projects, each phase shall commence construction within eighteen (18) months of the projected and approved commencement dates in the permit. This provision shall be applicable only if the projected and approved commencement dates of each construction phase are defined in Attachment II, Special Conditions, of this permit.

(Auth.: HAR §11-60.1-9, §11-60.1-90)

20. The Department of Health may extend the time periods specified in Standard Condition No. 19 upon a satisfactory showing that an extension is justified. Requests for an extension shall be submitted in writing to the Department of Health.

(Auth.: HAR §11-60.1-9, §11-60.1-90)

CSP No. 0562-01-CT Attachment I Page 6 of 6 Issuance Date: Expiration Date:

21. The permittee shall submit fees in accordance with HAR, Chapter 11-60.1, Subchapter 6.

(Auth.: HAR §11-60.1-90)

22. All certifications shall be in accordance with HAR, section 11-60.1-4.

(Auth.: HAR §11-60.1-4, HAR §11-60.1-90)

- 23. The permittee shall allow the Director of Health, the Regional Administrator for the U.S. EPA and/or an authorized representative, upon presentation of credentials or other documents required by law:
  - a. To enter the premises where a source is located or emission-related activity is conducted, or where records must be kept under the conditions of this permit and inspect at reasonable times all facilities, equipment, including monitoring and air pollution control equipment, practices, operations, or records covered under the terms and conditions of this permit and request copies of records or copy records required by this permit; and
  - b. To sample or monitor at reasonable times substances or parameters to ensure compliance with this permit or applicable requirements of HAR, Chapter 11-60.1.

(Auth.: HAR §11-60.1-11, §11-60.1-90)

24. Within thirty (30) days of permanent discontinuance of the construction, modification, relocation, or operation of the facility covered by this permit, the discontinuance shall be <u>reported</u> in writing to the Department of Health by a responsible official of the source.

(Auth.: HAR §11-60.1-8; SIP §11-60-10)<sup>2</sup>

25. Each permit renewal application shall be submitted to the Department of Health and the U.S. EPA Region 9 no less than twelve months and no more than eighteen months prior to the permit expiration date. The director may allow a permit renewal application to be submitted no less than six months prior to the permit expiration date, if the director determines that there is reasonable justification.

(Auth.: HAR §11-60.1-101, 40 CFR §70.5(a)(1)(iii))<sup>1</sup>

26. The terms and conditions included in this permit, including any provision designed to limit a source's potential to emit, are federally enforceable unless such terms, conditions, or requirements are specifically designated as not federally enforceable.

(Auth.: HAR §11-60.1-93)

27. The compliance plan and compliance certification submittal requirements shall be in

CSP No. 0562-01-CT
Attachment I
Page 7 of 6
Issuance Date:
Expiration Date:

accordance with HAR, sections 11-60.1-85 and 11-60.1-86. As specified in HAR, section 11-60.1-86, the compliance certification shall be submitted to the Department of Health and the U.S. EPA Region 9 once per year, or more frequently as set by any applicable requirement.

(Auth.: HAR §11-60.1-90)

28. Any document (including reports) required to be submitted by this permit shall be certified as being true, accurate, and complete by a responsible official in accordance with HAR, sections 11-60.1-1 and 11-60.1-4, and shall be mailed to the following address:

Clean Air Branch Environmental Management Division Hawaii Department of Health 919 Ala Moana Boulevard, Room 203 Honolulu, HI 96814

Upon request and as required by this permit, all correspondence to the State of Hawaii Department of Health associated with this Covered Source Permit shall have duplicate copies forwarded to:

Chief
Permits Office, (Attention: Air-3)
Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

(Auth.: HAR §11-60.1-4, §11-60.1-90)

29. To determine compliance with submittal deadlines for time-sensitive documents, the postmark date of the document shall be used. If the document was hand-delivered, the date received ("stamped") at the Clean Air Branch shall be used to determine the submittal date.

(Auth.: HAR §11-60.1-5, §11-60.1-90)

<sup>&</sup>lt;sup>1</sup> The citations to the Code of Federal Regulations (CFR) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the CFR. Due to the integration of the preconstruction and operating permit requirements, permit conditions may incorporate more stringent requirements than those set forth in the CFR.

CSP No. 0562-01-CT Attachment I Page 8 of 6 Issuance Date:

**Expiration Date:** 

**PROPOSED** 

<sup>&</sup>lt;sup>2</sup> The citations to the State Implementation Plan (SIP) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the SIP.

# ATTACHMENT II: SPECIAL CONDITIONS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In addition to the standard conditions of the covered source permit, the following special conditions shall apply to the permitted facility:

## Section A. Equipment Description

- 1. This permit encompasses the following equipment and associated appurtenances for the crushing and screening plants:
  - a. 1,500 TPH Aggregate Machinery, Inc. Thunderbird II jaw crushing plant, serial no. 2217-03, with 215 1,500 TPH Cedarapids jaw crusher, model no. 3054, serial no. 52169 (30" x 54" jaw size);
  - b. 1,500 TPH Aggregate Machinery, Inc. Thunderbird II jaw crushing plant, serial no. 2495-06, with 215 - 1,500 TPH Cedarapids jaw crusher, model no. 3054, serial no. 54169 (30" x 54" jaw size);
  - c. 560 TPH Cedarapids cone crushing plant, model no. MVP 380, serial no. 10172 with Thunderbird II three-deck screen, model no. 6163.7-SH-O, serial no. 50393 (6' x 16');
  - d. Various conveyors;
  - e. Water spray systems;
  - f. 300 hp Caterpillar diesel engine, model no. C-9, serial no. CLJ04382 driving the 1,500 TPH jaw crushing plant, serial no. 2217-03;
  - g. 425 hp Caterpillar diesel engine, model no. C-12, serial no. BDL 01886 driving the 1,500 TPH jaw crushing plant, serial no. 2495-06; and
  - h. 890 hp Caterpillar diesel engine generator, model no. 3412, serial no. 81Z23751 providing power to various crushing and screening operations.
  - i. 560 TPH Cedarapids cone crushing plant, model no. MVP 380, serial no. 29598-08, with screen serial no. 50393 (6' x 20'):
  - j 814 hp Caterpillar diesel engine generator, model no. 3412, serial no. BPG02516 providing power to various crushing and screening operations.

(Auth.: HAR §11-60.1-3)

2. An identification tag or name plate shall be displayed on the crushing plants, screening plant, diesel engines, and diesel engine generator listed above to show model no., serial no., and manufacturer. The identification tag or name plate shall be permanently attached to the equipment at a conspicuous location.

(Auth.: HAR §11-60.1-5, §11-60.1-90)

## Section B. Applicable Federal Regulations

1. The crushing and screening plants listed above are subject to the provisions of the following federal regulations:

CSP No. 0562-01-CT
Attachment II
Page 2 of 15
Issuance Date:
Expiration Date:

## **PROPOSED**

- a. 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart A, General Provisions; and
- b. 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants.

(Auth.: HAR §11-60.1-3, §11-60.1-90, §11-60.1-161; 40 CFR § 60.1, §60.670)<sup>1</sup>

2. The permittee shall comply with all of the applicable provisions of these standards, including all emission limits, notification, testing, monitoring and reporting requirements. The major

requirements of these standards are detailed in the special conditions of this permit.

(Auth.: HAR §11-60.1-3, §11-60.1-90, §11-60.1-161; 40 CFR Part 60)<sup>1</sup>

# Section C. Operational and Emission Limitations

#### 1. Plant Hour Limits

- a. The total operating hours of the 1,500 TPH crushing plant with 300 hp diesel engine shall not exceed 1,850 hours in any rolling twelve-month (12-month) period.
- b. The total operating hours of the 1,500 TPH crushing plant with 425 hp diesel engine shall not exceed 1,850 hours in any rolling twelve-month (12-month) period.
- c. The total operating hours for each 890 hp or 814hp diesel engine generators servicing the crushing and screening plants shall not exceed 1,850 hours in any rolling twelvemonth (12-month) period.
- d. The permittee shall not operate more than one (1) jaw crusher, one (1) cone crusher with screen, and one (1) diesel engine generator concurrently at the same location.
- 2. Diesel Engines and Diesel Engine Generator
  - a. The minimum stack height of the 890 hp diesel engine generator servicing the crushing and screening plants shall be 21.3 feet above ground level.
  - b. The minimum stack height of the 425 hp diesel engine servicing the 1,500 TPH crushing plant shall be 14 feet above ground level.
  - c. The minimum stack height of the 300 hp diesel engine servicing the 1,500 TPH crushing plant shall be 19.7 feet above ground level.
  - d. For any six (6) minute averaging period, each diesel engine and diesel engine

CSP No. 0562-01-CT
Attachment II
Page 3 of 15
Issuance Date:
Expiration Date:

generator shall not exhibit visible emissions of twenty (20) percent or greater, except as follows: during start-up, shutdown, or equipment breakdown, each diesel engine and diesel engine generator may exhibit visible emissions greater than twenty (20) but not exceeding sixty (60) percent opacity for a period aggregating not more than six (6) minutes in any sixty (60) minutes.

- e. Each diesel engine and diesel engine generator shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.
- f. Each diesel engine and diesel engine generator shall be maintained in good operating condition at all times with scheduled inspections and maintenance as recommended by the manufacturer and as needed.
- g. The minimum stack height of the 814 hp diesel engine generator servicing the crushing and screening plants shall be 19.5 feet above ground level.

(Auth.: HAR §11-60.1-3, §11-60.1-32, §11-60.1-38, §11-60.1-90; SIP §60.1-24)<sup>2</sup>

# Fugitive Emission Limits

- a. The permittee shall not cause to be discharged into the atmosphere from each crusher, fugitive emissions which exhibit greater than fifteen (15) percent opacity.
- b. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the belt conveyors or from any other affected facility, fugitive emissions which exhibit greater than ten (10) percent opacity.
- c. The permittee shall not cause or permit fugitive dust to become airborne without taking reasonable precautions and shall not cause or permit the discharge of visible emissions of fugitive dust beyond the lot line of the property boundary on which the emissions originate.

(Auth.: HAR §11-60.1-3, §11-60.1-33, §11-60.1-90, §11-60.1-161; 40 CFR §60.672)<sup>1</sup>

# 4. Fugitive Emissions Control

- a. Measures shall be taken by the permittee to control fugitive dust (e.g., wet suppression, enclosures, dust screens, etc.) at the crushing plants, screening plant, material transfer points, stockpiles, and throughout the facility. The Department of Health may at any time require the permittee to further abate fugitive dust emissions if an inspection indicates poor or insufficient control.
- b. Water spray systems shall be installed, maintained, and utilized as necessary during operation of the crushing and screening plants to minimize fugitive dust. Water spray bars shall be located at:

CSP No. 0562-01-CT
Attachment II
Page 4 of 15
Issuance Date:
Expiration Date:

- i. Each feeder for the primary crushers;
- ii. Each primary jaw crusher;
- iii. Conveyor transfer below cone crusher; and
- iv. All screen to conveyor transfer sites.
- c. The Department of Health at any time may require continuous operation of the water sprays and/or additional water sprays or manual water spraying at pertinent locations if an inspection indicates that more fugitive dust control is needed.
- d. The crushing and screening plants shall not be operated if observation, or the routine inspection required in Attachment II, Special Condition D.2.b., indicates a significant drop in water flow rate, plugged nozzle(s), leak in the piping system, or other problems which affect the efficiency of the water spray system. The permittee shall investigate and correct the problem before resuming operations. The normal operating flow rate (gal/min) for the water spray system shall be established in the performance test conducted pursuant to this Attachment, Section F, and may be incorporated into the permit.
- A water truck shall be maintained and utilized during the facility's operating hours and at other times as necessary to minimize fugitive dust from haul roads and storage piles.
- f. The water spray system for each crushing and screening operation shall be maintained in good operating condition at all times with scheduled inspections and maintenance as recommended by the manufacturer and as needed.

(Auth.: HAR §11-60.1-3, §11-60.1-33, §11-60.1-90)

### 5. Location Change

- a. The operation of the equipment covered by this temporary covered source permit shall involve at least one (1) location change during the term of this permit.
- b. Subsequent location changes of the equipment shall be in accordance with Section G of Attachment II. For each change in location, the Department of Health reserves the right to impose additional operational controls and restrictions if a site evaluation indicates the controls and/or restrictions are necessary.

(Auth.: HAR §11-60.1-81 and HAR §11-60.1-91)

#### Alternate Operating Scenario

The permittee may replace each primary diesel engine with a temporary replacement unit if

CSP No. 0562-01-CT
Attachment II
Page 5 of 15
Issuance Date:
Expiration Date:

# **PROPOSED**

repair work reasonably warrants removal (i.e., equipment failure, engine overhaul, or any other major problems requiring maintenance of the engine for efficient operation) of the primary diesel engine, provided the following provisions are adhered to:

a. A written notification is submitted in accordance with Attachment II, Special Condition

CSP No. 0562-01-CT PROPOSED
Attachment II

Attachment II
Page 6 of 15
Issuance Date:
Expiration Date:

No. E.7.a., and approval obtained by the Department of Health prior to exchanging the primary diesel engine with another unit.

- b. The temporary replacement engine is the same size or smaller than the primary diesel engine with equal or lower emissions.
- c. The temporary replacement engine complies with all applicable conditions required for the primary equipment, including all operating restrictions and emissions limits.
- d. Written notification for returning the primary engine to service is submitted to the Department of Health in accordance with Attachment II, Special Condition No. E.7.b.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-81, §11-60.1-91)

# Section D. Monitoring and Recordkeeping Requirements

#### 1. Records

All records, including support information, shall be maintained for at least five (5) years from the date of the monitoring sample, measurement, test, report, or application. Support information includes all maintenance, inspection, and repair records, and copies of all reports required by this permit. These records shall true, accurate, and maintained in a permanent form suitable for inspection and made available to the Department of Health or its representative(s) upon request.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-81, §11-60.1-90)

# 2. Water Spray System

- A water flow meter shall be installed, operated, and maintained to measure the total gallons of water use for each water spray system servicing the crushing and screening plants.
- b. Each water spray system, to include the water pump, piping system, spray nozzles, and any gauges (i.e., water pressure, water flow meter, etc.) shall be checked routinely or at least once per month to ensure proper operation of the water spray system.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

#### 3. Hour Limits

A non-resetting hour meter shall be operated and maintained for each crushing plant with diesel engine and the 890 and 814 hp diesel engine generators servicing crushing and screening equipment to determine the total hours operated for purposes of the hour limits

CSP No. 0562-01-CT Attachment II Page 7 of 15 Issuance Date: Expiration Date:

specified in Attachment II, Special Condition Nos. C.1a, C.1b, and C.1c. The non-resetting meter shall not allow the manual resetting of the meter readings and be designed to accommodate a minimum of ten years of equipment operation before the meter returns to a zero reading

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

#### 4. Production

The permittee shall maintain records on the total tons of material processed by each crushing plant and the screening plant for purposes of annual emissions reporting.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

# 5. Fuel Consumption

Fuel purchase receipts, showing the fuel type, sulfur content (percent by weight), date of delivery, and amount (gallons) of fuel delivered for each diesel engine and the diesel engine generator shall be maintained for purposes of the sulfur content limit specified in Attachment II, Special Condition No. C.2.e., and annual emissions reporting. Fuel sulfur content may be demonstrated by providing the supplier's fuel specification sheet for the type of fuel purchased and received.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

## 6. Inspection, Maintenance, and Repair Log

An inspection, maintenance, and repair log shall be maintained for the equipment covered under this permit. Inspection and replacement of parts and repairs to the crushers, screener, conveyors, water spray system, diesel engines, and diesel engine generator shall be well documented. At a minimum, the following records shall be maintained:

- a. The date of the inspection/maintenance/repair work;
- b. A description of the part(s) inspected or repaired;
- c. A description of the findings and any maintenance or repair work performed; and
- d. The name and title of the personnel performing inspection/work.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

## 7. Performance Test

Initial and annual source performance tests shall be conducted on the crushing and screening plants pursuant to Attachment II, Section F. Test summaries and results shall be maintained in accordance with the requirements of this section.

CSP No. 0562-01-CT
Attachment II
Page 8 of 15
Issuance Date:
Expiration Date:

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

# 8. Visible Emissions (V.E.)

- a. Except in those months when V.E. observations are conducted by a certified reader for the annual observation of each diesel engine and the diesel engine generator, the permittee shall conduct monthly (calendar month), V.E. observations of each unit in accordance with Method 9 or by use of a Ringelmann Chart as provided. For each month, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals. Records shall be completed and maintained in accordance with the Visible Emission Observation Form requirements. For the V.E. observations of the diesel engines and diesel engine generator, the observer shall comply with the following additional requirements:
  - i. The distance between the observer and the emission source shall be at least three (3) stack heights but not more than 402 meters (0.25 miles); and
  - ii. The observer shall, when possible, select a position that minimizes interference from other sources of visible emissions. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed.
- b. Except in those months when performance tests are conducted for fugitive emissions pursuant to Attachment II, Special Conditions, Section F, the permittee shall conduct monthly (calendar month), V.E. observations for the crushing and screening plants in accordance with Method 9 or by use of a Ringelmann Chart as provided. For each month, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each emissions point subject to opacity limits as specified in Attachment II, Special Condition Nos. C.3.a and C.3.b. For the V.E. observations of the fugitive emissions, the observer shall comply with the following additional requirements:
  - i. The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet) but not greater than 402 meters (0.25 miles);
  - ii. The observer shall, when possible, select a position that minimizes interference from other visible emission sources. The required observer position relative to the sun (Method 9; Section 2.1) shall be followed:
  - iii. The observer shall record the operating capacity (ton/hr) of the crushing and screening plants at the time the observations were made; and
  - iv. The observer shall record the flow rate (gallon/minute) for the water spray system servicing the crushing and screening plants.
- c. The permittee shall conduct annually (calendar year), V.E. observations for each diesel engine and the diesel engine generator by a certified reader in accordance with 40 CFR, Part 60, Appendix A, Method 9. For the annual observation, two (2) consecutive six (6)

CSP No. 0562-01-CT PROPOSED

Attachment II
Page 9 of 15
Issuance Date:
Expiration Date:

minute observations shall be taken at fifteen (15) second intervals. Records shall be completed and maintained in accordance with the Visible Emissions Observation Form requirements.

- d. The Department of Health may allow observation of a portion of the total fugitive emission points subject to opacity limits, if it can be demonstrated that operations have been in compliance with the permit. At a minimum, at least three fugitive emission points shall be observed each month. The selection of points shall include a primary crusher and screen, or those points as specified by the Department of Health. Allowance to observe a portion of the total required fugitive emission points shall be obtained in writing from the Department of Health.
- e. Upon written request and justification by the permittee, the Department of Health may waive the requirement for the annual V.E. observation of each diesel engine and the diesel engine generator. The waiver request is to be submitted prior to the required annual V.E. observation and must include documentation justifying such action. Documentation should include, but is not limited to, the results of the prior V.E. observation indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous annual V.E. observation.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

### Section E. Notification and Reporting Requirements

- 1. Notification and reporting pertaining to the following events shall be done in accordance with Attachment I, Standard Condition Nos. 14, 16, 17 and 24, respectively:
  - a. Anticipated date of initial start-up of the 560 TPH cone crushing plant with 814 hp diesel engine and actual date of start-up of the plant;
  - b. Intent to shut down air pollution control equipment for necessary scheduled maintenance;
  - c. Emissions of air pollutants in violation of HAR, Chapter 11-60.1 or this permit (excluding technology-based emission exceedences due to emergencies); and
  - d. Permanent discontinuance of construction, modification, relocation, or operation of the facility covered by this permit.

(Auth.: HAR §11-60.1-8, §11-60.1-15, §11-60.1-16, §11-60.1-90; SIP §11-60-10, §11-60-16)<sup>2</sup>

# 2. Deviations

The permittee shall report in writing **within five (5) working days** any deviations from the permit requirements, including those attributed to upset conditions, the probable cause of such deviations, and any corrective actions or preventative measures taken. Corrective

CSP No. 0562-01-CT
Attachment II
Page 10 of 15
Issuance Date:
Expiration Date:

actions may include a requirement for additional source testing, more frequent monitoring, or the implementation of a corrective action plan.

(Auth.: HAR §11-60.1-3, §11-60.1-15, §11-60.1-16, §11-60.1-90)

- 3. Performance Testing
  - a. At least **thirty (30) days prior** to conducting a source performance test pursuant to Special Conditions, Section F, the permittee shall submit a written performance test plan to the Department of Health in accordance with Attachment II, Special Condition No. F.4.
  - Written reports of the results of the source performance tests conducted to demonstrate compliance shall be submitted to the Department of Health within sixty (60) days after the completion of the performance test, and shall be in conformance with Attachment II, Special Condition No. F.6.

(Auth.: HAR §11-60.1-3, §11-60.1-90, §11-60.1-161; 40 CFR § 60.676)<sup>1</sup>

#### 4. Annual Emissions

As required by Attachment IV and in conjunction with the requirements of Attachment III, Annual Fee Requirements, the permittee shall report **annually** the total tons per year emitted of each regulated air pollutant, including hazardous air pollutants. The reporting of annual emissions is due **within sixty (60) days following** the end of each calendar year. Upon the written request of the permittee, the deadline for reporting of annual emissions may be extended, if the Department of Health determines that reasonable justification exists for the extension. The enclosed **Annual Emissions Report Form – Crushing and Screening Plants** and **Annual Emissions Report Form – Diesel Engines and Diesel Engine Generator** shall be used.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

#### Monitoring Reports

The permittee shall submit **semi-annually** the following reports to the Department of Health. The reports shall be submitted **within sixty (60) days** after the end of each semi-annual calendar period (January 1 - June 30 and July 1 - December 31), signed and dated by a responsible official, and shall include the following:

- Identify the type of fuel fired by the diesel engines and diesel engine generator during the respective reporting period. Include the maximum sulfur content (% by weight) of the fuel.
- b. Provide the total operating hours of the jaw crushing plants with diesel engines and the 890 hp diesel engine generator on a monthly and twelve (12) month rolling basis.

CSP No. 0562-01-CT Attachment II Page 11 of 15 Issuance Date: Expiration Date:

c. Identify any opacity exceedances as determined by the required V.E. monitoring of the crushing and screening plants, diesel engines, and diesel engine generator. Each exceedence reported shall include the date, six (6) minute average opacity reading, possible reason for exceedence, duration of exceedence, and corrective actions taken. If there were no exceedences, the permittee shall submit in writing a statement indicating that for each equipment there were no exceedances for that semi-annual period for the diesel engines, diesel engine generator, crushing plants, and screening plant.

The enclosed Monitoring Report Form – Operating Hours, Monitoring Report Form – Fuel Consumption, and Monitoring Report Form – Opacity Exceedances shall be used.

(Auth.: HAR §11-60.1-3, §11-60.1-33, §11-60.1-90)

### 6. Compliance Certification

During the permit term, the permittee shall submit at least **annually** to the Department of Health and U.S. EPA Region 9, the Compliance Certification Form pursuant to HAR, Subsection 11-60.1-86. The permittee shall indicate whether or not compliance is being met with each term or condition of this permit. The compliance certification shall include, at a minimum, the following information:

- a. The identification of each term or condition of the permit that is the basis of the certification:
- b. The compliance status;
- c. Whether compliance was continuous or intermittent;
- The methods used for determining the compliance status of the source currently and over the reporting period;
- e. Any additional information indicating the source's compliance status with any applicable enhanced monitoring and compliance certification including the requirements of Section 114(a) (3) of the Clean Air Act or any applicable monitoring and analysis provisions of Section 504(b) of the Clean air Act; and
- f. Any additional information as required by the Department of Health including information to determine compliance.

The compliance certification shall be submitted within ninety (90) days after the end of each calendar year, and shall be signed and dated by a responsible official or authorized representative.

Upon written request of the permittee, the deadline for submitting the compliance certification may be extended, if the Department of Health determines that reasonable justification exists for the extension.

CSP No. 0562-01-CT Attachment II Page 12 of 15 Issuance Date: Expiration Date:

(Auth.: HAR §11-60.1-4, §11-60.1-86, §11-60.1-90)

# 7. Alternate Operating Scenario

For interchanging each primary diesel engine with a replacement unit, the permittee shall submit:

- a. A written notification prior to exchanging the primary diesel engine with a replacement engine. The notification shall identify the reason(s) for the replacement, replacement and primary engine serial numbers, replacement engine specifications and model number, the estimated emissions (tons per year, pounds per hour, and grams per second) for the temporary replacement engine, and an ambient air quality impact assessment, if requested, for the temporary engine at the location of replacement.
- b. Written notification **within fifteen (15) days** after removing the replacement engine and returning the primary engine to service. The notification shall identify the beginning and ending dates of operation for the primary diesel engine and temporary replacement unit.

(Auth.: HAR §11-60.1-5 and §11-60.1-90)

# Section F. Testing Requirements

- Initial and Annual Performance Testing
  - a. Within sixty (60) days after achieving the maximum production rate of the 1,500 TPH jaw crushing plant with 425 hp diesel engine, but not later than one hundred eighty (180) days after initial start-up of the plant, and annually thereafter, the permittee shall conduct or cause to be conducted performance tests on the plant to determine compliance with the opacity limits specified in Attachment II, Special Condition Nos. C.3.a and C.3.b.
  - b. The permittee shall conduct or cause to be conducted an annual source performance test on all crushing and screening plant equipment subject to the opacity limits specified in Attachment II, Special Condition Nos. C.3.a and C.3.b.
  - The Department of Health may require testing at other points in the facility if an inspection indicates poor or insufficient controls.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90; §11-60.1-161, 40 CFR §60.675, SIP §11-60.15)<sup>1,2</sup>

#### 2. Performance Test Methods

a. The performance tests for the crushing and screening plants shall be conducted by a

CSP No. 0562-01-CT Attachment II Page 13 of 15 Issuance Date:

**Expiration Date:** 

**PROPOSED** 

certified reader using Method 9 of 40 CFR Part 60, Appendix A, and the procedures in 40 CFR §60.11 with the following additions:

- i. The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet);
- ii. The observer shall, when possible, select a position that minimizes interference from other fugitive emission sources. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed;
- iii. The observer shall record the operating capacity (tons/hr) of the crushing and screening plants at the time observations were made; and
- iv. The observer shall record the flow rate for the water spray system in gallons per minute servicing the plants.
- b. When determining compliance with the fugitive dust emissions standard specified in Attachment II, Special Condition No. C.3.a., for the crushers, the duration of Method 9 may be reduced from three (3) hours (thirty 6-minute averages) to one (1) hour (ten six (6)-minute averages) only if the following conditions apply:
  - i. There are no individual readings greater than fifteen (15) percent opacity; and
  - ii. There are no more than three (3) readings of fifteen (15) percent for the one-hour period.
- c. When determining compliance with the fugitive emissions standard specified in Attachment II, Special Condition No. C.3.b., for transfer points on the belt conveyor(s) or for any other affected facility, the duration of Method 9 may be reduced from three (3) hours [thirty six (6)-minute averages] to one (1) hour [ten six (6)-minute averages] only if the following conditions apply:
  - i. There are no individual readings greater than ten (10) percent opacity; and
  - ii. There are no more than three (3) readings of ten (10) percent for the one-hour period.
- d. When determining compliance with the fugitive emissions standards of Attachment II, Special Condition Nos. C.3.a and C.3.b., if emissions from two or more facilities continuously interfere so that the opacity of fugitive emissions from an individual affected facility cannot be read, either of the following procedures may be used:
  - Use for the combined emission stream, the highest fugitive opacity standard applicable to any of the individual affected facilities contributing to the emissions stream.
  - ii. Separate the emissions so that the opacity of emissions from each affected facility can be read.
- e. If, after thirty (30) days notice for an initially scheduled performance test, there is a

CSP No. 0562-01-CT
Attachment II
Page 14 of 15
Issuance Date:
Expiration Date:

delay (due to operational problems, etc.) in conducting any rescheduled performance test required by Section F, the permittee shall submit a notice to the Department of Health at least **seven (7) days** prior to any rescheduled performance test.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §11-60.1-161; 40 CFR §60.675)<sup>1</sup>

# 3. Performance Test Expense and Monitoring

The performance tests shall be made at the expense of the permittee and shall be conducted at the maximum expected operating capacity of each crushing and screening plant. All performance tests may be monitored by the Department of Health.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90; §11-60.1-161, 40 CFR §60.675)<sup>1</sup>

#### 4. Performance Test Plan

At least thirty (30) days prior to conducting the performance test, the permittee shall submit a written performance test plan to the Department of Health and U.S. EPA Region 9 that includes date(s) of the test, test duration, test locations, test methods, source operation, locations of visible emissions readings, and other parameters that may affect the test results. Such a plan shall conform to U.S. EPA guidelines including quality assurance procedures. A test plan or quality assurance plan that does not have the approval of the Department of Health may be grounds to invalidate any test and require a retest.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90; 40 CFR 60.8, SIP §11-60.1-15)<sup>1,2</sup>

#### Deviations

Any deviations from these conditions, test methods, or procedures may be cause for rejection of the test results unless such deviations are approved by the Department of Health before the tests.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

### 6. Performance Test Report

Within **sixty (60)** days after completion of the performance test for each crushing and screening plant, the permittee shall submit to the Department of Health and U.S. EPA Region 9 the test report which shall include the operating conditions of the facility at the time of the test (e.g., operating rate in tons/hr, water meter flow rate during the test in gal/min, etc.), locations where the visible emissions were read, visible emission readings, location of water sprays, summarized test results, comparative results with the permit emission limits, other pertinent support calculations, and field/laboratory data. The results

CSP No. 0562-01-CT Attachment II Page 15 of 15 Issuance Date:

**Expiration Date:** 

## **PROPOSED**

shall be recorded and reported in accordance with 40 CFR Part 60 Appendix A and §60.8. The normal operating flow rate (gal/min) of the water spray system shall be determined by the flow rate used during the performance test that demonstrates compliance with the opacity limits of this permit.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §11-60.1-161; 40 CFR §60.675; SIP §11-60-15)<sup>1,2</sup>

#### 7. Performance Test Waiver

Upon written request and justification, the Department of Health may waive the requirement for, or a portion of, a specific source performance test. The waiver request is to be submitted prior to the required test and must include documentation justifying such action. Documentation should include, but is not limited to, the results of the prior performance test indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous source test.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

# Section G. Change of Location Requirements

- The permittee shall submit information regarding all location changes to the Department of Health for approval at least thirty (30) days, or such lesser time as designated and approved by the Department of Health, prior to the change in location. The information submitted shall include the following:
  - Name, address, phone number of the facility and the plant site manager or other contact:
  - b. Temporary covered source permit number and expiration date;
  - c. Identification of current location;
  - d. Location map of the proposed new temporary location containing the following information:
    - i. Identification of the property boundary, any fence lines; and general terrain features (i.e., flat, hilly, steep);
    - ii. Location of all structures within 100 meters of the equipment. Provide the building dimensions (height, length, and width) of all structures that have heights greater than 40% of the stack height of the equipment; and
    - iii. Identification of any other air pollution sources at the new location.
  - e. Area map showing the proposed new location of the applicable crushing plant and screening plant;
  - f. Projected dates of operation at the new location;

CSP No. 0562-01-CT Attachment II Page 16 of 15 Issuance Date:

**Expiration Date:** 

**PROPOSED** 

g. Identification of any other air pollution sources at the new location;

- h. Certification that no modification will be made to the equipment, and operational methods will remain similar as permitted under this temporary covered source permit at the new location; and
- i. Any additional information as requested by the Department of Health, including an ambient air quality impact assessment of the facility at the new location.

(Auth.: HAR §11-60.1-3, §11-60.1-91)

2. The applicable filing fee shall be submitted to the Department of Health with each change in location request and made payable to the **Clean Air Special Fund-COV**.

(Auth.: HAR §11-60.1-3, §11-60.1-91)

3. Prior to any relocation, the Department of Health shall approve, conditionally approve, or deny in writing each location change. If the Department of Health denies a location change, the applicant may appeal the decision pursuant to HRS, Chapter 91.

(Auth.: HAR §11-60.1-3, §11-60.1-91)

4. At each of the authorized locations, the permittee shall operate in accordance with this temporary covered source permit and all applicable requirements.

(Auth.: HAR §11-60.1-3, §11-60.1-91)

5. All the information required in this section shall be submitted to the Department of Health using the attached form, "Change of Location Request for a Temporary Source," including the area map showing the new proposed location.

(Auth.: HAR §11-60.1-3, §11-60.1-91)

# Section H. Agency Notification

1. Any document (including reports) required to be submitted by this covered source permit shall be done in accordance with Attachment I, Standard Condition No. 28.

(Auth.: HAR §11-60.1-4, §11-60.1-90)

\_\_\_\_\_\_

<sup>&</sup>lt;sup>1</sup>The citations to the Code of Federal Regulations (CFR) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the CFR. Due to the integration of the preconstruction and operating permit requirements, permit conditions may incorporate more stringent requirements than those set forth in the CFR.

<sup>&</sup>lt;sup>2</sup>The citations to the State Implementation Plan (SIP) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the SIP.

# ATTACHMENT II - INSIG: SPECIAL CONDITIONS INSIGNIFICANT ACTIVITIES TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In addition to the standard conditions of the covered source permit, the following special conditions shall apply to the permitted facility:

# Section A. Equipment Description

- 1. Attachment II INSIG encompasses the following insignificant activities:
  - a. 235 gallon fuel storage tank servicing the 300 hp diesel engine;
  - b. 235 gallon fuel storage tank servicing the 425 hp diesel engine; and
  - c. 500 gallon fuel storage tank servicing the 890 hp diesel engine.

(Auth.: HAR §11-60.1-3)

# Section B. Operational Limitations

1. The permittee shall take measures to operate applicable insignificant activities in accordance with the provisions of HAR, Subchapter 2.

(Auth.: HAR §11-60.1-3, §11-60.1-82, §11-60.1-90)

2. The Department of Health may at any time require the permittee to further abate emissions if an inspection indicates poor or insufficient controls.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-82, §11-60.1-90)

# Section C. Monitoring and Recordkeeping Requirements

 The Department of Health reserves the right to require monitoring, recordkeeping, or testing of any insignificant activity to determine compliance with the applicable requirements.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

2. All records shall be maintained for at least five (5) years from the date of any required monitoring, recordkeeping, testing, or reporting. These records shall be in a permanent form suitable for inspection and made available to the Department of Health or its authorized representative upon request.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

CSP No. 0562-01-CT
Attachment II - INSIG
Page 2 of 2
Issuance Date:
Expiration Date:

# Section D. Notification and Reporting

1. Compliance Certification.

During the permit term, the permittee shall submit at least **annually** to the Department of Health and U.S. EPA Region 9, the Compliance Certification Form pursuant to HAR, Subsection 11-60.1-86. The permittee shall indicate whether or not compliance is being met with each term or condition of this permit. The compliance certification shall include, at a minimum, the following information:

- a. The identification of each term or condition of the permit that is the basis of the certification:
- b. The compliance status;
- c. Whether compliance was continuous or intermittent;
- d. The methods used for determining the compliance status of the source currently and over the reporting period;
- e. Any additional information indicating the source's compliance status with any applicable enhanced monitoring and compliance certification including the requirements of Section 114(a)(3) of the Clean Air Act or any applicable monitoring and analysis provisions of Section 504(b) of the Clean Air Act; and
- f. Any additional information as required by the Department of Health including information to determine compliance.

The compliance certification shall be submitted **within ninety (90) days after** the end of each calendar year, and shall be signed and dated by a responsible official or authorized representative.

Upon written request of the permittee, the deadline for submitting the compliance certification may be extended, if the Department of Health determines that reasonable justification exists for the extension.

In lieu of addressing each emission unit as specified in **Compliance Certification Form**, the permittee may address insignificant activities as a single unit provided compliance is met with all applicable requirements. If compliance is not totally attained, the permittee shall identify the specific insignificant activity and provide the details associated with the noncompliance.

(Auth.: HAR §11-60.1-4, §11-60.1-86, §11-60.1-90

# Section E. Agency Notification

1. Any document (including reports) required to be submitted by this Covered Source Permit shall be done in accordance with Attachment I, Standard Condition No. 28.

CSP No. 0562-01-CT Attachment II - INSIG Page 3 of 2 Issuance Date:

**Expiration Date:** 

**PROPOSED** 

(Auth.: HAR §11-60.1-4, §11-60.1-90)

# ATTACHMENT III: ANNUAL FEE REQUIREMENTS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

The following requirements for the submittal of annual fees are established pursuant to HAR, Title 11, Chapter 60.1, Air Pollution Control. Should HAR, Chapter 60.1 be revised such that the following requirements are in conflict with the provisions of HAR, Chapter 60.1, the permittee shall comply with the provisions of HAR, Chapter 60.1:

- 1. Annual fees shall be paid in full:
  - a. Within sixty (60) days after the end of each calendar year; and
  - b. Within thirty (30) days after the permanent discontinuance of the covered source.
- 2. The annual fees shall be determined and submitted in accordance with Hawaii Administrative Rules, Chapter 11-60.1, Subchapter 6.
- The annual emissions data for which the annual fees are based shall accompany the submittal of any annual fees and be submitted on forms furnished by the Department of Health.
- 4. The annual fees and the emission data shall be mailed to:

Clean Air Branch
Environmental Management Division
Hawaii Department of Health
919 Ala Moana Boulevard, Room 203
Honolulu, HI 96814

# ATTACHMENT IV: ANNUAL EMISSIONS REPORTING REQUIREMENTS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the nature and amounts of emissions.

- 1. Complete the attached forms:
  - a. Annual Emissions Report Form: Crushing and Screening Plants
  - b. Annual Emissions Report Form: Diesel Engines and Diesel Engine Generator
- 2. The reporting period shall be from January 1 to December 31 of each year. All reports shall be submitted to the Department of Health within **sixty (60) days** after the end of each calendar year and shall be mailed to the following address:

Clean Air Branch
Environmental Management Division
Hawaii Department of Health
919 Ala Moana Boulevard, Room 203
Honolulu, HI 96814

- 3. The permittee shall retain the information submitted, including all emission calculations. These records shall be in a permanent form suitable for inspection, retained for a minimum of five (5) years, and made available to the Department of Health upon request.
- 4. Any information submitted to the Department of Health without a request for confidentiality shall be considered public record.
- 5. In accordance with HAR, Section 11-60.1-14, the permittee may request confidential treatment of specific information, including information concerning secret processes or methods of manufacture, by submitting a written request to the Department of Health and clearly identifying the specific information that is to be accorded confidential treatment.

# COMPLIANCE CERTIFICATION FORM TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT PAGE 1 OF \_\_\_\_

Issuance Date: Expiration Date:

In accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following certification at least annually, or more frequently as requested by the Department.

(Make Copies of the Compliance Certification Form for Future Use)

For Period:	Date:
Company/Facility Name:	
Responsible Official (Print):	
Title:	
Responsible Official (Signature):	
I certify that I have knowledge of the facts herein set forth, that the same best of my knowledge and belief, and that all information not identified treated by Department of Health as public record. I further state that I construction, modification, or operation of the source in accordance will 11, Chapter 60.1, Air Pollution Control, and any permit issued thereof.	by me as confidential in nature shall be will assume responsibility for the

# COMPLIANCE CERTIFICATION FORM TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (CONTINUED, PAGE 2 OF \_\_\_\_)

Issuance Date:	Expiration Date:

The purpose of this form is to evaluate whether or not the facility was in compliance with the permit terms and conditions during the covered period. If there were any deviations to the permit terms and conditions during the covered period, the deviation(s) shall be certified as *intermittent compliance* for the particular permit term(s) or condition(s). Deviations include failure to monitor, record, report, or collect the minimum data required by the permit to show compliance. In the absence of any deviation, the particular permit term(s) or condition(s) may be certified as *continuous compliance*.

#### Instructions:

Please certify Sections A, B, and C below for continuous or intermittent compliance. Sections A and B are to be certified as a group of permit conditions. Section C shall be certified individually for each operational and emissions limit condition as listed in the Special Conditions section of the permit (list all applicable equipment for each condition). Any deviations shall also be listed individually and described in Section D. The facility may substitute its own generated form in verbatim for Sections C and D.

A. Attachment I, Standard Conditions

Permit term/condition All standard conditions	Equipment(s) All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent
---	--	--

B. Special Conditions - Monitoring, Recordkeeping, Reporting, Testing, and INSIG

b. Special Conditions Monitoring, Recording, Reporting, recting, and more		
Permit term/condition All monitoring conditions	Equipment(s)  All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent
Permit term/condition All recordkeeping conditions	Equipment(s)  All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent
Permit term/condition All reporting conditions	Equipment(s)  All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent
Permit term/condition  All testing conditions	Equipment(s)  All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent
Permit term/condition All INSIG conditions	Equipment(s)  All Equipment(s) listed in the permit	Compliance ☐ Continuous ☐ Intermittent

## COMPLIANCE CERTIFICATION FORM TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (CONTINUED, PAGE 3 OF \_\_\_\_)

Issuance Date:	Expiration Date:

#### C. Special Conditions - Operational and Emissions Limitations

Each permit term/condition shall be identified in chronological order using attachment and section numbers (e.g., Attachment II, B.1, Attachment IIA, Special Condition No. B.1.f, etc.). Each equipment shall be identified using the description stated in Section A of the Special Conditions (e.g., unit no., model no., serial no., etc.). Check all methods (as required by permit) to show compliance for the respective permit term/condition.

Permit term/condition	Equipment(s)	<u>Method</u>	Compliance
		<ul> <li>□ monitoring</li> <li>□ recordkeeping</li> <li>□ reporting</li> <li>□ testing</li> <li>□ none of the above</li> </ul>	□ Continuous □ Intermittent
		<ul> <li>□ monitoring</li> <li>□ recordkeeping</li> <li>□ reporting</li> <li>□ testing</li> <li>□ none of the above</li> </ul>	☐ Continuous ☐ Intermittent
		<ul> <li>□ monitoring</li> <li>□ recordkeeping</li> <li>□ reporting</li> <li>□ testing</li> <li>□ none of the above</li> </ul>	☐ Continuous ☐ Intermittent
		□ monitoring     □ recordkeeping     □ reporting     □ testing     □ none of the above	☐ Continuous☐ Intermittent
		<ul> <li>□ monitoring</li> <li>□ recordkeeping</li> <li>□ reporting</li> <li>□ testing</li> <li>□ none of the above</li> </ul>	☐ Continuous ☐ Intermittent
		<ul> <li>□ monitoring</li> <li>□ recordkeeping</li> <li>□ reporting</li> <li>□ testing</li> <li>□ none of the above</li> </ul>	☐ Continuous ☐ Intermittent
		□ monitoring     □ recordkeeping     □ reporting     □ testing     □ none of the above	☐ Continuous☐ Intermittent

(Make Additional Copies if Needed)

## COMPLIANCE CERTIFICATION FORM TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (CONTINUED, PAGE \_\_\_ OF \_\_\_)

Issuance Date:	Expiration Date:

#### D. Deviations

Permit Term/ Condition	Equipment(s) / Brief Summary of Deviation	<u>Deviation Period</u> time (am/pm) & date (mo/day/yr)	Date of Written Deviation Report to DOH (mo/day/yr)
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	
		Beginning:	
		Ending:	

(Make Additional Copies if Needed)

#### CHANGE OF LOCATION REQUEST FOR A TEMPORARY SOURCE TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (PAGE 1 OF 2)

Issuance Date: May 13, 2009 Expiration Date: May 14, 2014

In accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall provide the following information to the Department of Health:

(Make Copies for Additional Use)

- 1. The permittee shall complete this change of location request form regarding all succeeding location changes and shall submit this form to the Department of Health for approval at least thirty (30) days, or such lesser time as designated and approved by the Department of Health, prior to the change in location.
- 2. The permittee shall submit a location map of the new temporary location containing the following information:
  - a. Identification of the property boundary, any fence lines, and general terrain features (i.e. flat, hilly, steep).
  - b. Location of all structures within 100 meters of the equipment. Provide the building dimensions (height, length, and width) of all structures that have heights greater than 40% of the stack height of the equipment.
  - c. Identification of any other air pollution sources at the new location.
- 3. The permittee shall submit a filing fee with each change in location request. The filing fee shall be made payable to the Clean Air Special Fund-COV and is as follows:

Noncovered Sources	Covered Sources
\$ 50.00 for Non-Air Toxic	X \$100.00 for Non-Air Toxic
\$100.00 for Air Toxic	\$300.00 for Air Toxic

- 4. The permittee shall submit any additional information as requested by the Department of Health.
- 5. This notification form shall be mailed to the following address:

CLEAN AIR BRANCH ENVIRONMENTAL MANAGEMENT DIVISION HAWAII DEPARTMENT OF HEALTH 919 Ala Moana Boulevard, Room 203 Honolulu, HI 96814

(808) 586-4200

<sup>1.</sup> Prior to any relocation, the Department of Health shall approve, conditionally approve, or deny in writing each location change. If the Department of Health denies a location change, the applicant may appeal the decision pursuant to HRS, Chapter 91.

<sup>2.</sup> At each new authorized location, the permittee shall operate in accordance with the current Temporary Covered Source Permit and all applicable requirements.

#### CHANGE OF LOCATION REQUEST FOR A TEMPORARY SOURCE TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (CONTINUED, PAGE 2 OF 2)

Issuance Date: Expiration Date:

1.	Compan	y Name: <u>CTS Earthmoving, Inc</u>	<u>, .</u>	
2.	. Facility Name (if different from the company):			
3. Mailing Address:				
				Zip Code:
		one Number:		
4.	Name of	Owner/Owner's Agent:		
	Title	e:		Phone:
5.		ent Description:		
6.	Current E	Equipment Location:		
7.	New Equ	uipment Location:		
	a. Pla	ant site manager or other contac	ct, if different than C	Current contact:
	b. Pho	one Number:		
	c. Pro	pposed start date at new location	on:	
	d. Est	timated project duration:		
8.	performe	each equipment to be relocated ed. Also identify other air pollut location, if any:		description of the work to be and operated by the permittee at
	and comby me record opera Chapt modif	ify that I have knowledge of the fact complete to the best of my knowledge as confidential in nature shall be t d. I further state that I will assume attion of the source in accordance witter 60.1, Air Pollution Control, and a fications will be made to the equipm itted under the current Temporary C	ge and belief, and that reated by the Departm responsibility for the cith the Hawaii Adminis any permit issued therent and operational m	all information not identified ent of Health as public construction, modification, or trative Rules, Title 11, eof. I further state that no nethods will remain similar as
Re	sponsible	Official (Print Name):		Date:
	Title	e of Responsible Official:		
Re	sponsible	Official (Signature):		

## ANNUAL EMISSIONS REPORT FORM CRUSHING AND SCREENING PLANTS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the nature and amounts of emissions.

(Make Copies for Additional Use)

For Period: Date:		
Company Name: CTS	Earthmoving Inc.	
Facility Name:		
Equipment Location: _		
accurate, and co not identified by Health as public		d that all information e Department of
Responsible Official (P	rint):	
TITLE:		
Responsible Official (S	ignature):	
Equipment Description	Crushing and Screening Plants	
Report the air pollution	control measures used for the plants as follo	ws:
Type of Operation	Air Pollution Control Measures in Use	Control Efficiency (% Reduction)
Truck Unloading		
Jaw Crushing		
Cone Crushing		
Screening		
Conveyors		
Stockpiles		
Truck Loading		

Report amount of material processed by plants as follows:

Plant	TPY of Material Processed
1,500 TPH Jaw Crushing Plant	
1,500 TPH Impact Crushing Plant	
560 TPH Cone Crushing Plant With Screen	
560 TPH Cone Crushing Plant With 6' x 20'	
Screen	

### ANNUAL EMISSIONS REPORT FORM DIESEL ENGINES AND DIESEL ENGINE GENERATOR TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In accordance with the HAR, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the nature and amount of emissions.

(Make Copies for Additional Use)

For Period:	Date:
Company Name: CTS Earthmoving, Inc.	
Equipment Location:	
I certify that I have knowledge of the facts herein accurate, and complete to the best of my knowled not identified by me as confidential in nature sha Health as public record.	dge and belief, and that all information
Responsible Official (Print):	
TITLE:	
Responsible Official (Signature):	
Equipment Description: Diesel Engines	

Model	Capacity	Maximum % Sulfur	Total Fuel Oil No. 2
		Content by Weight	Consumption (gal/yr)
3412	890 hp		
C-12	425 hp		
C-9	300 hp		
3412	814 hp		

# MONITORING REPORT FORM OPERATING HOURS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (PAGE 1 OF 2)

Issuance Date: Expiration Date:

In accordance with the HAR, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following information semi-annually:

(Make Copies for Additional Use)

For Period:	Date:
Company Name: CTS Earthmoving, Inc.	
Equipment Location:	
I certify that I have knowledge of the facts accurate, and complete to the best of my k not identified by me as confidential in natu Health as public record.	mowledge and belief, and that all information
Responsible Official (Print):	
TITLE:	
Responsible Official (Signature):	
Equipment Description: Crushing and Screen	ing Plants
Report the total operating for the 1,500 TPH ja	w crushing plant with 425 hp diesel engine as

Month	1,500 TPH Jaw Crushing Plant with 425 hp Diesel Engine		
	Total Operating Hours	Total Operating Hours	
	Monthly Basis	12-Month Rolling Basis	
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

# MONITORING REPORT FORM OPERATING HOURS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT (CONTINUED, PAGE 2 OF 2)

Issuance Date: Expiration Date:

In accordance with the HAR, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following information semi-annually:

Report the total operating hours for the 1,500 TPH jaw crushing plant with 300 hp diesel engine as follows:

Month	1,500 TPH Jaw Crushing Plant with 300 hp Diesel Engine					
	Total Operating Hours	Total Operating Hours				
	Monthly Basis	12-Month Rolling Basis				
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Report the total operating hours for the 890 hp diesel engine generator as follows:

Month	890 hp Diesel Engine Generator					
	Total Operating Hours	Total Operating Hours				
	Monthly Basis	12-Month Rolling Basis				
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

### MONITORING REPORT FORM FUEL CONSUMPTION TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

In accordance with the HAR, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following information semi-annually:

Report the total operating hours for the 814 hp diesel engine generator as follows:

Month	814 hp Diesel Engine Generator					
	Total Operating Hours	Total Operating Hours				
	Monthly Basis	12-Month Rolling Basis				
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

#### MONITORING REPORT FORM **FUEL CONSUMPTION** TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

**Issuance Date: Expiration Date:** 

In accordance with the HAR, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following information semi-annually:

(Make Copies for Additional Use)					
For Period:	Date:				
Company Name: CTS	Earthmoving, Inc.				
Equipment Location: _					
accurate, and co	omplete to the best of my kr y me as confidential in natur	erein set forth, that the same are true, nowledge and belief, and that all information e shall be treated by the Department of			
Responsible Official (P	rint):				
TITLE:	•				
Responsible Official (S	ignature):				
Equipment Description	: <u>Diesel Engines</u>				
Report the fuel sulfur of	ontent as follows:				
Capacity/Model	Types of Fuel Fired	Maximum % Sulfur Content by Weight			
890 hp/3412					
425 hp/C-12					
300hp/C-9					
814 hp/3412CDITA					

### MONITORING REPORT FORM OPACITY EXCEEDANCES TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

(Make Copies for Additional Use)

In accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, the permittee shall report to the Department of Health the following information semi-annually:

For Period:	 Date:
Company Name: CTS Earthmoving, Inc.	
I certify that I have knowledge of the facts herein set forth accurate, and complete to the best of my knowledge and I not identified by me as confidential in nature shall be tread Health as public record.	belief, and that all information
Responsible Official (Print):	
Title:	
Responsible Official (Signature):	

#### **Visible Emissions:**

Report the following on the lines provided below: all date(s) and six (6) minute average opacity reading(s) which the opacity limit was exceeded during the monthly observations; or if there were no exceedances during the monthly observations, then write "no exceedances" in the comment column.

EQUIPMENT or EMISSION POINT DESCRIPTION	SERIAL/ID NO.	DATE	6 MIN. AVER. (%)	COMMENTS

#### VISIBLE EMISSIONS FORM REQUIREMENTS STATE OF HAWAII TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

**Visible Emissions (V.E.) Form** shall be completed **monthly** (each calendar month) for each equipment subject to opacity limits in accordance with 40 CFR Part 60, Appendix A, Method 9 or use of a Ringelmann Chart as provided. At least **annually** (calendar year), V.E. observation shall be conducted for each equipment subject to opacity limits by a certified reader in accordance with Method 9. The V.E. Form shall be completed as follows:

- 1. V.E. observations shall take place during the day only and shall be compared to the Ringelmann Chart provided. The opacity shall be noted in five (5) percent increments (e.g., 25%).
- 2. Orient the sun within a 140 degree sector to your back. Provide a source layout sketch on the V.E. Form using the symbols as shown.
- 3. For the diesel engines and diesel engine generator, stand at least three (3) stack heights, but not more than a quarter mile from the stack.
- 4. For V.E. observation of fugitive dust emissions from the crushing and screening plants, stand at least 4.57 meters (15 feet) from the visible emissions source, but not more than a quarter mile from the source.
- 5. Two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each stack or emission point.
- 6. The six (6) minute average opacity reading shall be calculated for each observation.
- 7. If possible, the observations shall be performed as follows:
  - a. Read from where the line of sight is at right angles to the wind direction.
  - b. The line of sight shall not include more than one (1) plume at a time.
  - c. Read at the point in the plume with the greatest opacity (e.g., for stacks, at location without condensed water vapor), ideally while the plume is no wider than the stack diameter.
  - d. Read the plume at fifteen (15) second intervals only. Do not read continuously.
  - e. The equipment shall be operating at the maximum permitted capacity.
- 8. If the equipment was shut-down for that period, briefly explain the reason for shut-down in the comment column.

The permittee shall retain the completed V.E. Forms for recordkeeping. These records shall be in a permanent form suitable for inspection, retained for a minimum of five years, and made available to the Department of Health, or its representative upon request.

Any required initial and annual performance test performed in accordance with Method 9 by a certified reader shall satisfy the respective equipment's V.E. monitoring requirements for the month the performance test is performed.

## VISIBLE EMISSIONS FORM DIESEL ENGINES AND DIESEL ENGINE GENERATOR TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

(Make Copies for Future Use for Each Stack)

Permit No				<u> </u>					
		S Earthmov			tack <b>Y</b>	Draw North Arrow			
Equipment and Fuel:				un /					
Site Conditions:			/ind	X Emission Point					
-		ground (ft):_							
		observer (ft							
		c or white):_							
		oud cover):_							
=				<del></del>					
					Observers Position				
Observer	Name:		_			140			
Certified?	(Yes/No):_		_	_ ~					
						Sun Location Line			
Observati	on Date an	d Start Time	e:						
SECONDS		15	20	45		COMMENTO			
MINUTES	0	15	30	45		COMMENTS			
1									
2									
3									
4									
5									
6									
Six (6) Mir	ute Average	Opacity Readi	ng (%):						
Observati	on Date an	d Start Time	e:						
SECONDS	0	15	30	45		COMMENTS			
MINUTES	U	15	30	45		COMMENTS			
1									
2									
3									
4									

5 6

Six (6) Minute Average Opacity Reading (%):

## VISIBLE EMISSIONS FORM CRUSHING AND SCREENING PLANTS TEMPORARY COVERED SOURCE PERMIT NO. 0562-01-CT

Issuance Date: Expiration Date:

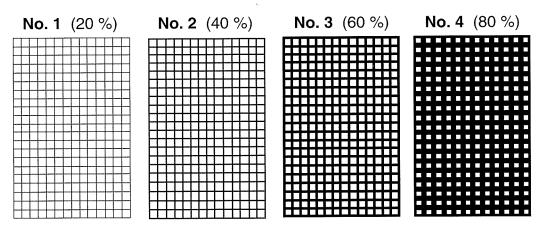
(Make Copies for Future Use for Each Emissions Point)

Permit No.	:			-		
Company Name: CTS Earthmoving, Inc.				Stack X	Draw North Arrow	
		nt descriptio			Sun // Wind	X Emission Point
(Durin Site Cond Emission p Emission p Emission o Sky conditi Wind spee Temperatu	ig observati itions: point height point distand color (black ions (% cloud d (mph): ure (°F):	s/hr): ion) above grou ce from obs or white):_ ud cover):_	ınd (ft): erver (ft):_	- - - -		Observers Position  140  Sun Location Line
Observation	on Date and	I Start Time	:			
SECONDS MINUTES	0	15	30	45		COMMENTS
1						
2						
3						
4						
5						
6						
Six (6) Minu	ute Average C	pacity Readin	g (%):			
Observation	on Date and	I Start Time	:			
SECONDS MINUTES	0	15	30	45		COMMENTS
1						
2						
3						
4						
5						
6						
Six (6) Minu	ute Average C	pacity Readin	ıq (%):			

#### The Ringelmann Chart

In the late 1800's in Paris, France, Professor Maximilian Ringelmann developed the **Ringelmann Chart** to measure the combustion efficiency of coal-fired boilers. The shade of the smoke plume shows how well a boiler is operating - the poorer its combustion efficiency, the more unburned carbon particles in the smoke and the darker the plume.

Professor Ringelmann's chart established four measured shades of gray between white, valued at zero, and black, at five. These specific shades of gray, Ringelmann No. 1 to Ringelmann No. 4, can be accurately reproduced by placing a grid of black lines of a given width and spacing on a white background. Viewed from a distance, the grid lines and background merge into the shades of gray, to be compared to the shade of the smoke plume.



Ringelmann Chart (not to scale)

#### **Regulating Visible Emissions**

The Ringelmann Chart became one of the first tools used to measure visible emissions. Introduced into the United States in 1897, it was soon accepted as the standard measure of smoke density and was used by engineers for power plant testing and smokeless combustion studies. In 1910, the Chart was officially adopted as part of the Smoke Ordinance for Boston, Mass.

Many city, state, and federal regulations now set smoke density limits based on the Ringelmann Smoke Chart. Although not originally designed as a regulatory tool to control air pollution, it gives good practical results when used by well-trained observers.