

**PROPOSED**

DATE

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**  
(XXXX XXXX XXXX XXXX XXXX)

08-E CAB  
File No. 0700-01

Mr. Thomas Hoeffken  
Owner  
Tom's Backhoe & Excavation Co., Inc.  
651 Papipi Road  
Kula, Hawaii 96790

Dear Mr. Hoeffken:

**Subject: Covered Source Permit (CSP) No. 0700-01-C**  
**Initial Application No. 0700-01**  
**Tom's Backhoe & Excavation Co., Inc.**  
**195 TPH Mobile Jaw Crusher with 160 HP Diesel Engine**  
**Located at: Hana Highway, Hana, Maui, TMK: (2) 1-3-004: 001**  
**Date of Expiration:**

The subject Covered Source Permit is issued in accordance with Hawaii Administrative Rules (HAR), Title 11, Chapter 60.1. The issuance of this permit is based on the plans, specifications, and additional information that you submitted as part of your renewal application dated August 19, 2008.

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

Attachment I: Standard Conditions  
Attachment II: Special Conditions  
Attachment III: Annual Fee Requirements  
Attachment IV: Annual Emissions Reporting Requirements

The following forms are enclosed for your use and submittal as required:

Compliance Certification Form  
Annual Fee Form  
Annual Emissions Report Form: Stone Processing  
Annual Emissions/Monitoring Report Form: Operating Hours and Fuel Certification  
Monitoring Report Form: Visible Emissions

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Mr. Thomas Hoeffken  
DATE  
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The following are for use in monitoring and maintaining records on visible emissions:

Visible Emissions Observation Requirements  
Visible Emissions Form  
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 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.

Sincerely,

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

PR:nn

Enclosures

c: Blake Shiigi, EHS - Maui  
CAB Monitoring Section

**ATTACHMENT I: STANDARD CONDITIONS  
TEMPORARY COVERED SOURCE PERMIT NO. 0700-01-C**

**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:

1. 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 notify 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 Regional Administrator for the U.S. Environmental Protection Agency (EPA).  
  
(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, and

(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 notify the Department of Health in writing of the following dates:

- a. The **anticipated date of initial start-up** for each emission unit of a new source or 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 Administrator along with a claim of confidentiality.

(Auth.: HAR §11-60.1-14, §11-60.1-90)

16. The permittee shall notify 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 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. A copy of applicable correspondence or records submitted to the Department of Health shall be provided to the U.S. EPA Administrator.

(Auth.: HAR §11-60.1-90)

19. 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)

20. This permit shall become invalid with respect to the authorized construction if 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; and
- 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)

21. The Department of Health may extend the time periods specified in Standard Condition No. 20 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)

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

(Auth.: HAR §11-60.1-90)

23. All certifications shall be in accordance with HAR, Section 11-60.1-4.

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

24. 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)

25. 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 reported 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>

26. Each permit renewal application shall be submitted to the Department of Health 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>

27. 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)

28. The compliance plan and compliance certification submittal requirements shall be in 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 Regional Administrator once per year, or more frequently as set by any applicable requirement.

(Auth.: HAR §11-60.1-90)

29. **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  
State of Hawaii Department of Health  
P.O. Box 3378  
Honolulu, HI 96801-3378**

**Upon request, 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)

30. 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)

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<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>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  
COVERED SOURCE PERMIT NO. 0700-01-C**

**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 one (1) 195 TPH Mobile Jaw Crusher, model no. Metrotrak, serial no. QM10381, powered by a 160 HP Caterpillar Diesel Engine, model no. 3116TA, serial no. 2MR01700, and (1) Read 480 TPH Power Screen, model no. 1997 Nordberg CV90D, serial no. CV90D1503.

(Auth.: HAR §11-60.1-3)

2. An identification tag or nameplate shall be displayed on the equipment and appurtenances listed above to show model no., serial no., and manufacturer. The identification tag or nameplate shall be permanently attached to the equipment in a conspicuous location.

(Auth.: HAR §11-60.1-5)

**Section B. Applicable Federal Regulations**

1. The 195 TPH stone crushing and screening plant is subject to the provisions of the following federal regulations:
  - 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. 195 TPH Mobile Jaw Crusher

The total operating hours of the 195 TPH mobile jaw crusher shall not exceed two thousand eighty (2,080) hours in any rolling twelve (12) month period.

(Auth.: HAR §11-60.1-3, §11-60.1-38, §11-60.1-90)

2. 160 HP Diesel Engine

The total operating hours of the diesel engine shall not exceed two-thousand eighty (2,080) hours in any rolling twelve (12) month period and shall be fired only on diesel fuel no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

(Auth.: HAR §11-60.1-3, §11-60.1-38, §11-60.1-90)

3. 480 TPH Power Screen

The total operating hours of the power screen shall not exceed two-thousand eighty (2,080) hours in any rolling twelve (12) month period.

(Auth.: HAR §11-60.1-3, §11-60.1-38, §11-60.1-90)

4. Air Pollution Controls

- a. The permittee shall take measures to control fugitive dust (e.g., wet suppression, enclosures, etc.) at the crusher, screens, 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 sprays shall be installed, maintained, and utilized continuously during operation of the 195 TPH stone crushing and screening plant to minimize fugitive dust at the following material drop off points:
  - i. The feeder to the crusher; and
  - ii. Transfer to stockpiles.

The stone crushing and screening plant shall not be operated if observation, or the routine inspection required in Special Condition D.6., 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 Special Condition, Section F. After review of the source test results, the Department of Health may set a requirement for minimum operating flow rate.

- c. Manual water spraying or water trucks shall be utilized to minimize fugitive dust on haul roads and storage piles.
- d. The diesel engine shall be properly maintained and kept in good operating condition at all times with scheduled inspections and maintenance as recommended by the manufacturer or as needed.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-33, §11-60.1-90)

5. Fugitive Emission Limitations

- a. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the conveyors or from any other affected facility any fugitive emissions which exhibit greater than ten (10) percent opacity.
- b. The permittee shall not cause to be discharged into the atmosphere from the 195 TPH crusher any fugitive emissions which exhibit greater than fifteen (15) 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 on which the emissions originate.
- d. The permittee shall take measures to control fugitive dust (e.g., wet suppression, enclosures, dust screens, etc.) at the stone crushing and screening plant and throughout the property. 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.

(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>

6. Diesel Engine Visible Emissions Limitation

For any six (6) minute averaging period, the 325 hp diesel engine shall not exhibit visible emissions of twenty (20) percent or greater, except as follows: during startup, shutdown, or equipment breakdown, the 160 hp diesel engine 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.

(Auth.: HAR §11-60.1-3, §11-60.1-32, §11-60.1-90; SIP §11-60-24)<sup>2</sup>

7. Alternate Operating Scenario

- a. The permittee may replace the diesel engine with a temporary replacement unit if any repair reasonably warrants the removal of the diesel engine from its site,

(i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation) and the following provisions are adhered to:

- i. Notification and approval in accordance with Special Condition No. E.7.a.;
  - ii. The temporary replacement unit is smaller in size with equal or lesser emissions;
  - iii. The temporary replacement unit complies with all applicable conditions including all air pollution control equipment requirements, operating restrictions, and emission limits;
  - iv. The diesel engine shall be repaired and returned to service at the same location in a timely manner; and
  - v. Removal and return information is submitted as required by this Attachment, Special Condition No. E.7.b.
- b. The Department of Health may require an ambient air quality assessment of the temporary unit, and/or provide a conditional approval to impose additional monitoring, testing, recordkeeping, and reporting requirements to ensure the temporary unit is in compliance with the applicable requirements of the permitted unit being temporarily replaced.
  - c. Records shall be maintained in accordance with Special Condition No. D.5.
  - d. The terms and conditions under each operating scenario shall meet all applicable requirements, including special conditions of this permit.

**Section D. Monitoring and Recordkeeping Requirements**

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 applications. Support information includes all maintenance, inspection, and repair records, and copies of all reports required by this permit. These records shall be true, accurate, and in a permanent form suitable for inspection and made available to the Department of Health or their representative upon request.

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

1. Fuel Records

Fuel purchase receipts, showing the fuel type, date of delivery, and amount (gallons) of fuel delivered for the diesel engine shall be maintained on an annual basis. A certificate of analysis of the fuel's sulfur content by weight shall be obtained from the supplier.

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

2. Inspection, Maintenance and Repair Log

An inspection, maintenance and repair log shall be maintained for the equipment covered under this permit. Replacement of parts and repairs to the crushing and screening plant,

diesel engine, and water spray system shall be documented. At a minimum, the following records shall be maintained:

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

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

### 3. Performance Test

Initial and annual source performance tests shall be conducted pursuant to Special Condition, Section F. Test summaries and results shall be maintained in accordance with the requirements of this section.

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

### 4. Visible Emissions (V.E.)

- a. Except in those months where V.E. observations are conducted pursuant to Special Condition No. D.4.c. of this Attachment, the permittee shall conduct **monthly** (calendar month) V.E. observations for the diesel engine in accordance with 40 CFR Part 60, Appendix A, Method 9 or by use of a Ringelmann Chart as provided. For each monthly observation, the permittee shall record two (2) consecutive observations, each six (6) minutes in duration with readings taken at fifteen (15) second intervals. Records shall be completed and maintained in accordance with the *Visible Emissions Observation Requirements*.
- b. Except in those months where a performance test is conducted pursuant to Special Condition No. F. of this Attachment, the permittee shall conduct **monthly** (*calendar month*) V.E. observations for the crushing and screening plant. Observations shall be made at emission points subject to an opacity limit, and shall be performed in accordance with 40 CFR Part 60, Appendix A, Method 9, or by use of a Ringelmann Chart as provided. For each monthly observation, the permittee shall record two (2) consecutive observations, each six (6) minutes in duration with readings taken at fifteen (15) second intervals. For the visible emission observations of fugitive emissions from the crushing and screening plant, 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);
  - 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; and

- iii. The observer shall record the operating capacity (ton/hr) of the plant at the time the observations were made.

The Department of Health may allow observation of a portion of the total emission points at the crushing and screening plant, if it can be demonstrated that operations have been in compliance with the permit. At a minimum, at least two emission points from the crushing and screening plant shall be observed each month. The selected points shall include the crusher and a transfer point, or those points as specified by the Department of Health. Allowance to observe a portion of the total required emission points shall be obtained in writing from the Department of Health.

Records shall be completed and maintained in accordance with the *Visible Emissions Observation Requirements*.

- c. The permittee shall conduct **annually** (calendar year), V.E. observations for the diesel engine by a certified reader in accordance with 40 CFR Part 60, Appendix A, Method 9. For the annual observation, the permittee shall record two (2) consecutive observations, each six (6) minutes in duration with readings taken at fifteen (15) second intervals. Records shall be completed and maintained in accordance with the *Visible Emissions Observation Requirements*.
- d. Upon written request and justification by the permittee, the Department of Health may waive the requirement for the annual V.E. observation of the diesel engine. 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. observations 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, §11-60.1-11, §11-60.1-90)

#### 5. Alternate Operating Scenario

The permittee shall contemporaneously with making a change from one operating scenario to another, record in a log at the permitted facility, the scenario under which it is operating.

#### 6. Water Spray System

- a. A non-resetting water flow meter shall be installed, operated and maintained for the water spray system of the 295 TPH portable crushing plant to determine the cumulative gallons of water used for fugitive dust control and gallon per minute flow rate of the water spray system for the plant.

- b. The 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 week to insure proper operation of the water spray system.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §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. 17 and 25, respectively:
  - a. *Emissions of air pollutants in violation of HAR, Chapter 11-60.1 or this permit (excluding technology-based emission exceedances due to emergencies); and*
  - b. *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. The permittee shall report **within five (5) working days** any deviations from the permit requirements, including those attributable to upset conditions, the probable cause of such deviations and any corrective actions or preventative measures taken. Corrective 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 Test
  - a. At least **thirty (30) days prior** to conducting a source performance test pursuant to Section F of this Attachment, the permittee shall submit a written performance test plan to the Department of Health that includes date(s) of the test, test duration, test locations, test methods, source operation, and other parameters that may affect 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.
  - b. 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.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90; 40 CFR §60.8, SIP §11-60-15)<sup>1, 2</sup>

#### 4. Monitoring Report Forms

The permittee shall submit the following reports to the Department of Health for each temporary location. The reports shall be submitted **within thirty (30) days after the conclusion of operations at each temporary location**. For operations longer than six (6) months in duration, the reports shall be submitted every six (6) months until the conclusion of the operations. The reports shall be signed and dated by a responsible official or authorized representative and shall include the following:

- a. The total operating hours of the diesel engine on a monthly and 12-month rolling basis;
- b. Identify the type of fuel fired in the diesel engine during the respective reporting period. Include the maximum sulfur content (percent by weight) of the fuel; and
- c. Any opacity exceedances as determined by the required V.E. monitoring. Each exceedance reported shall include the date, six (6) minute average opacity reading, possible reason for exceedance, duration of exceedance, and corrective actions taken. If there were no exceedances, the permittee shall submit in writing a statement indicating that for each equipment there were no exceedances for that semi-annual period.

The enclosed *Monitoring Report Forms: Operating Hours and Fuel Certification and Visible Emissions*, shall be used for each temporary location.

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

#### 5. 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 attached *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.

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

#### 6. 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/year emitted of each regulated air pollutant, including any hazardous air pollutants. The reporting of annual emissions is due **within sixty (60) days following the end of each calendar year**. The enclosed **Annual Emissions Report Form: Stone Processing**, shall be used.

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.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

#### 7. Alternate Operating Scenario

- a. The permittee shall submit a written request and receive prior written approval from the Department of Health before the exchange. The written request shall identify at a minimum the reasons for the replacement of the diesel engine from the site of operation and the estimated time period/dates for the temporary replacement, type and size of the temporary unit, emissions data, and stack parameters; and
- b. Prior to the removal and return of the diesel engine, the permittee shall submit to the Department of Health written documentation on the removal and return dates and on the make, size, model and serial numbers for both the temporary replacement unit and the installed unit.

### **Section F. Testing Requirements**

1. The permittee shall conduct or cause to be conducted performance tests on the 195 TPH stone crushing and screening plant. Tests shall be conducted for visible emissions at each point subject to an opacity limit.

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

2. Performance Test Methods

- a. The performance tests shall be conducted by a certified reader using Method 9 of 40 CFR Part 60, Appendix A and the procedures of 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, of Method 9, Section 2.1, shall be followed; and
  - iii. The observer shall record the operating capacity (tons/hr) of the primary crusher at the time observations were made.
- b. When determining compliance with the fugitive emissions standard specified in Attachment II, Special Condition C.5.b., for crushing and screening plant, the duration of Method 9 may be reduced from three (3) hours (thirty 6-minute averages) to one (1) hour (ten 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 (1) hour period.
- c. When determining compliance with the fugitive emissions standard specified in Special Condition C.5.a. of this attachment for any transfer point on the belt conveyor(s) or for any other affected facility, the duration of Method 9 may be reduced from three (3) hours (thirty 6-minute averages) to one (1) hour (ten 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 (1) hour period.
- d. When determining compliance with the fugitive emissions standards of Attachment II, Special Conditions C.5.a. and C.5.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:
  - i. Use for the combined emission stream, the highest fugitive opacity standard applicable to any of the individual affected facilities contributing to the emissions stream; and
  - 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 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. 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)

4. The tests shall be made at the expense of the permittee and shall be conducted at the maximum production rate at which the 195 TPH stone crushing and screening plant will be operated. The Department of Health may monitor the tests.

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

5. **Within sixty (60) days after completion of the performance test**, the permittee shall submit to the Department of Health the test report which shall include the operating conditions (e.g., operating rate in tons/hour, water meter flow rate in gal/min) of the 195 TPH stone crushing and screening plant and locations of where the visible emissions were read, location of water sprays, the summarized test results, comparative results with the permit emission limits, and other pertinent field and laboratory data. The results shall be recorded and reported in accordance with 40 CFR Part 60 Appendix A and §60.8.

The performance test report for the 195 TPH stone crushing and screening plant shall include the crusher operating rates, (tons/hr), locations of where the visible emissions were read, visible emissions readings, location of water sprays, and operating water pressure (psi) and /or water flow rate (gal/min) of the water spray system during the test. The normal operating water pressure of the water spray system shall be determined by the pressure and/or 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>

6. Upon written request and justification, the Department of Health may waive the requirement for, or a portion of, a specific annual source 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 tests 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. Agency Notification**

Any document (including reports) required to be submitted by the Covered Source Permit shall be done in accordance with Attachment I, Standard Condition 29.

(Auth.: HAR §11-60.1-4, §11-60.1-90)

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<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>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 III: ANNUAL FEE REQUIREMENTS  
COVERED SOURCE PERMIT NO. 0700-01-C**

**Issuance Date:**

**Expiration Date:**

The following requirements for the submittal of annual fees are established pursuant to Hawaii Administrative Rules (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 days after the end of each calendar year; and
  - b. Within thirty 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.
3. The annual emissions data for which the annual fees are based shall accompany the submittal of any annual fees and 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  
P.O. Box 3378  
Honolulu, HI 96801-3378**

**ATTACHMENT IV: ANNUAL EMISSIONS REPORTING REQUIREMENTS  
COVERED SOURCE PERMIT NO. 0700-01-C**

**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: **Annual Emissions Report Form - *Stone Processing***, and **Annual Emissions/Monitoring Report Form - *Operating Hours and Fuel Certification***.
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  
State Department of Health  
P.O. Box 3378  
Honolulu, HI 96801-3378**

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 method of manufacturing, by submitting a written request to the Director and clearly identifying the specific information that is to be accorded confidential treatment.

**ATTACHMENT V: COMPLIANCE CERTIFICATION FORM  
COVERED SOURCE PERMIT NO. 0700-01-C  
PAGE 1 OF 4**

**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 are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by Department of Health as public record. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with the Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, and any permit issued thereof.

**ATTACHMENT V: COMPLIANCE CERTIFICATION FORM  
COVERED SOURCE PERMIT NO. 0700-01-C  
(CONTINUED, PAGE 2 OF 4)**

**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**

<u>Permit term/condition</u> All standard conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent
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**B. Special Conditions - Monitoring, Recordkeeping, Reporting, Testing, and INSIG**

<u>Permit term/condition</u> All monitoring conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent
<u>Permit term/condition</u> All recordkeeping conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent
<u>Permit term/condition</u> All reporting conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent
<u>Permit term/condition</u> All testing conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent
<u>Permit term/condition</u> All INSIG conditions	<u>Equipment(s)</u> All Equipment(s) listed in the permit	<u>Compliance</u> Continuous Intermittent



**ATTACHMENT V: COMPLIANCE CERTIFICATION FORM  
COVERED SOURCE PERMIT NO. 0700-01-CT  
(CONTINUED, PAGE 4 OF 4)**

**Issuance Date:**

**Expiration Date**

**D. Deviations**

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

**(Make Additional Copies if Needed)**



ANNUAL EMISSIONS REPORT FORM  
STONE PROCESSING  
COVERED SOURCE PERMIT NO. 0700-01-C

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.

For Period: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name: Tom's Backhoe & Excavation Co., Inc.

Equipment Location: \_\_\_\_\_

Equipment Description: 195 TPH Mobile Jaw Crusher with 160 HP Diesel Engine

Serial/ID No: QM10381

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.

Responsible Official (Print): \_\_\_\_\_

Title: \_\_\_\_\_

Responsible Official (Signature): \_\_\_\_\_

<u>Type of Operation</u>	<u>Tons of Material (tons/year)</u>	<u>Air Pollution Control Measures in Use</u>	<u>Control Efficiency (% Reduction)</u>
Raw material entering primary crusher.	_____	_____	_____

**Additional Information:**

1. Number of Stockpiles \_\_\_\_\_ Control Measure \_\_\_\_\_ % Reduction \_\_\_\_\_

2. Tons/hour of material entering primary crusher \_\_\_\_\_ tons/hr.

*\*Use the following Control Efficiencies, unless documentation is available to show otherwise:*

1. Water sprays, Damp Material, or Shroud: 70%
2. Wet Slurry: 100%

*Efficiency factors may be reduced by the Department of Health, if there are any indications that a source's air pollution control device is not operating at the specified efficiency.*

**ANNUAL EMISSIONS/MONITORING REPORT FORM  
OPERATING HOURS AND FUEL CERTIFICATION  
COVERED SOURCE PERMIT NO. 0700-01-C**

**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 information semi-annually:

For Period: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name: Tom's Backhoe & Excavation Co., Inc.

Equipment Location: \_\_\_\_\_

Equipment Description: Caterpillar Model 3116TA, 160 HP Diesel Engine

Serial/ID No: \_\_\_\_\_

**I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.**

Responsible Official (Print): \_\_\_\_\_

Title: \_\_\_\_\_

Responsible Official (Signature): \_\_\_\_\_

The operating hours of the **160 HP Diesel Engine** shall represent the total operating hours of the **195 TPH Stone Crushing and Screening Plant** at each location.

MONTH	Monthly Operating Hours (per location) 160 hp DEG	Cumulative Operating Hours (per location) Rolling 12-month Period
January		
February		
March		
April		
May		
June		

MONTH	Monthly Operating Hours (per location) 160 hp DEG	Cumulative Operating Hours (per location) Rolling 12-month Period
July		
August		
September		
October		
November		
December		

Equipment Description	Fuel Usage Gallons/Location	Type of Fuel Fired	% Sulfur Content by Weight
160 HP Diesel Engine			

- If not already on file at the Department of Health, provide the suppliers fuel specification sheet for the type of fuel indicated in the above table. The fuel specification sheet shall indicate the % sulfur content by weight.



**VISIBLE EMISSIONS FORM REQUIREMENTS  
STATE OF HAWAII  
COVERED SOURCE PERMIT NO. 0700-01-C**

**Issuance Date:**

**Expiration Date:**

The ***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. Visible emissions 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 V.E. observations of stacks, stand at least three (3) stack heights but not more than a quarter mile from the stack.
4. For V.E. observations of fugitive emissions from 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 visible emission 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 (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 their 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  
COVERED SOURCE PERMIT NO. 0700-01-C**

**Issuance Date:** \_\_\_\_\_

**Expiration Date:** \_\_\_\_\_

(Make Copies for Future Use for Each Stack or Emission Point)

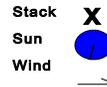
Company Name: \_\_\_\_\_

For stacks, describe equipment and fuel: \_\_\_\_\_

For fugitive emissions from crushers and screens, describe:

Fugitive emission point: \_\_\_\_\_

Plant Production (tons/hr): \_\_\_\_\_



Draw North Arrow



X Emission Point

Observers Position

140

Sun Location Line

**Site Conditions:**

Emission point or stack height above ground (ft): \_\_\_\_\_

Emission point or stack distance from observer (ft): \_\_\_\_\_

Emission color (black or white): \_\_\_\_\_

Sky conditions (% cloud cover): \_\_\_\_\_

Wind speed (mph): \_\_\_\_\_

Temperature ( F): \_\_\_\_\_

Observer Name: \_\_\_\_\_

Certified? (Yes/No): \_\_\_\_\_

Observation Date and Start Time: \_\_\_\_\_

Method of observation (Ringelmann Chart or Method 9): \_\_\_\_\_

MINUTES	Seconds				COMMENTS
	0	15	30	45	
1					
2					
3					
4					
5					
6					
Six (6) Minute Average Opacity Reading (%):					

Observation Date and Start Time: \_\_\_\_\_

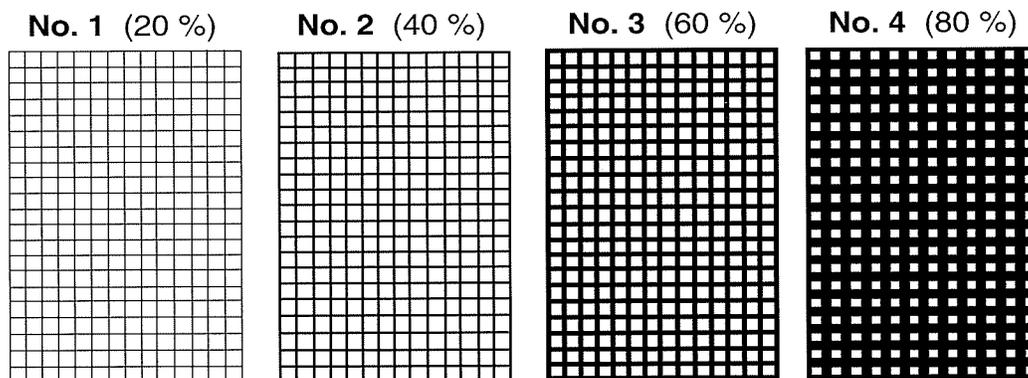
Method of observation (Ringelmann Chart or Method 9): \_\_\_\_\_

MINUTES	Seconds				COMMENTS
	0	15	30	45	
1					
2					
3					
4					
5					
6					
Six (6) Minute Average Opacity Reading (%):					

## 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.