

PROPOSED

Date Issued

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(XXX XXXX XXXX XXXX XXXX)

09-XXE CAB
File No. 0041-03

Mr. Joaquin Silva
President/Owner
West Oahu Aggregate Company, Inc.
855 Umi Street
Honolulu, Hawaii 96819

Dear Mr. Silva:

**Subject: Temporary Covered Source Permit (CSP) No. 0041-01-CT
Application for Renewal No. 0041-03
West Oahu Aggregate Company, Inc.
450 TPH Portable Stone Processing Plant with One (1) Diesel Engine,
and 500 TPH Portable Screening Plant
Located at: Various Temporary Sites, State of Hawaii
Initially Located at: 1650 Paakea Street, Lualualei, Oahu
Date of Expiration: 5 years from issue date**

The subject Temporary Covered Source Permit is issued in accordance with Hawaii Administrative Rules, Title 11, Chapter 60.1. The issuance of this permit is based on the plans, specifications, and information that you submitted as part of your application received on February 19, 2009. This permit supersedes Covered Source Permit No.0041-01-CT issued on April 8, 2005.

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

The forms for submission are as follows:

Compliance Certification Form
Annual Emissions Report Form: Stone Processing Plant
Annual Emissions Report Form: Portable Screening Plant

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Monitoring/Annual Emissions Report Form: Operating Hours and Fuel Certification -
Diesel Engines
Change of Location Request for a Temporary Source
Monitoring Report Form: Opacity Exceedances

Also enclosed are Visible Emissions Observation Form Requirements with the following enclosures:

Visible Emissions Observation Form – 680 HP Diesel Engine
Visible Emissions Observation Form – Stone Processing Plant
Visible Emissions Observation Form – Portable Screening Plant
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.

Sincerely,

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

RG:lt

Enclosures

c: CAB Monitoring Section

**ATTACHMENT I: STANDARD CONDITIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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:

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)²
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)²
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 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, 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 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 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 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)²

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)²

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 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.
- 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)

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 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)²

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))¹

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 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)

¹ 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.

² 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. 0041-01-CT**

Issuance Date:

Expiration Date:

In addition to the standard conditions of the Temporary Covered Source Permit, the following special conditions shall apply to the permitted facility:

Section A. Equipment Description

1. The Stone Processing Plant encompasses the following equipment and associated appurtenances:
 - a. 200 TPH Simplicity pan and grizzly feeder, model 0A120C, SN 5716-0F120C;
 - b. 450 TPH Eagle impact mill crusher, model 33D4200 Jumbo 1400, SN 10930;
 - c. 200 TPH Simplicity triple deck vibrating screen, model 0A140D, SN 3620-HS140D;
 - d. Various conveyors;
 - e. Water spray system; and
 - f. 680 HP Cummins diesel engine generator, model KTA19-G4, SN 37187800.

(Auth.: HAR §11-60.1-3)

2. The Portable Screening Plant encompasses the following equipment and associated appurtenances:
 - a. 500 TPH Powerscreen, model Turbo Chieftain 1400, SN 6608038; and
 - b. Water spray system.

(Auth.: HAR §11-60.1-3)

3. An identification tag or name plate shall be displayed on the pan and grizzly feeder, crusher, screens, and diesel engines listed above to show model no., serial no., and manufacturer. The identification tag or name plate shall be permanently attached to the equipment in a conspicuous location.

(Auth.: HAR §11-60.1-5)

Section B. Applicable Federal Regulations

1. The Stone Processing Plant and the Portable Screening Plant (if used together, and in conjunction with, the stone processing plant) are 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 Part 60, §60.670)¹

2. The permittee shall comply with all applicable provisions of these standards, including all emission limits and all notifications, 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)¹

Section C. Operational Limitations

1. Hourly, Fuel, and Process Limits

- a. The total operating hours of the stone processing plant shall not exceed 2,080 hours in any rolling twelve (12) month period. The hourly limit applies to the following:

- 450 TPH Eagle impact mill crusher; and
- 680 HP Cummins diesel engine.

- b. The total operating hours of the portable screening plant shall not exceed 2,080 hours in any rolling twelve (12) month period. The hourly limit applies to the 500 TPH Powerscreen Turbo Chieftain 1400 screen.

- c. The diesel engines shall only be fired on fuel oil 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)

2. Air Pollution Controls

a. Water Sprays

- i. Water sprays with a water flow meter (to measure the operating flow rate [gal/min]) shall be installed, maintained, and utilized as necessary during operation of the stone processing plant to minimize fugitive dust. Water sprays shall be located at the following material drop off points:

- (1) The feeder to the crushers;
- (2) Screen to conveyor;
- (3) Conveyor to conveyor; and
- (4) Transfer to stockpile.

- ii. For the portable screening plant, water sprays shall be installed, maintained, and utilized as necessary at the following material drop off points:
 - (1) At the feed of the screen; and
 - (2) At the exit of the hopper.
- iii. The Department of Health at any time may require additional watersprays or manual water spraying at pertinent locations if an inspection indicates that more fugitive dust control is needed.
- b. The stone processing plant shall not be operated if observation or routine inspection of the water spray system required in Special Condition No. D.1. of this attachment shows a significant change in water flow rate, plugged nozzle(s), leak in the piping system, or other problem which affects its efficiency. 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.
- c. A water truck shall be maintained and utilized during the facility's operation to minimize fugitive dust on haul roads, facility grounds, and storage piles.
- d. The permittee shall take measures to control fugitive dust (e.g., wet suppression, enclosures, dust screens, etc.) at the stone processing plant, portable screening plant, and throughout the work yard. 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, §11-60.1-5, §11-60.1-33, §11-60.1-90)

3. Visible Emissions Limitations

- a. The permittee shall not cause to be discharged into the atmosphere from the primary or secondary crushers, fugitive emissions which exhibit greater than fifteen percent (15%) opacity.
- b. The permittee shall not cause to be discharged into the atmosphere from any transfer point on belt conveyors or from any screening operations subject to an opacity limit, any fugitive dust emissions which exhibit greater than ten percent (10%) opacity. The portable screening plant and its conveyors shall only be subject to this requirement when utilized in conjunction with the stone processing plant.
- 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.

- d. For any six (6) minute averaging period, the 503 HP Caterpillar and the 680 HP Cummins diesel engines shall not exhibit visible emissions of twenty (20%) percent or greater, except as follows: during startup, shutdown, or equipment breakdown, the 503 HP and 680 HP diesel engines may exhibit visible emissions greater than twenty (20%) percent 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, §11-60.1-33, §11-60.1-90, §11-60.1-161; 40 CFR §60.672; SIP §11-60-24)^{1,2}

4. Location Change Requirements

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. *Subsequent location changes of the stone processing plant or portable screening plant shall be in accordance with Section G of these special conditions. 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)

5. Alternate Operating Scenario

The permittee may replace either of the permitted diesel engines (the 503 HP Caterpillar D.E. or the 680 HP Cummins D.E.) with a temporary replacement unit if 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 No. E.7.a, and approval is obtained by the Department of Health prior to exchanging the primary diesel engine with another unit. The notification shall include removal and return dates, and details on the make, size, model and serial numbers for both the temporary replacement unit and the primary unit.
- b. The temporary replacement engine is the same size as, 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. The primary diesel engine will be repaired and returned to service in a timely manner.

- e. Written notification for returning the primary diesel engine to service is submitted to the Department of Health in accordance with Attachment II, Special Condition No. E.7.b.

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

Section D. Monitoring and Recordkeeping

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

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

1. Water Spray System

The water spray system, to include the piping system, spray nozzle(s), and water flow meter, shall be checked routinely at least once per month to ensure proper operation.

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

2. Hour Limitation

- a. A non-resetting hour meter shall be installed, operated, and maintained on the 503 HP Caterpillar and the 680 HP Cummins diesel engines for the permanent recording of the total amount of hours each diesel engine has operated. 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.
- The hours of operation of the 503 HP Caterpillar diesel engine shall also represent the total operating hours of the 730 TPH Pioneer primary jaw crusher for the purpose of the hourly limitation specified in Special Condition No. C.1.a. of this attachment, and
 - The hours of operation of the 680 HP Cummins diesel engine shall also represent the total operating hours of the 450 TPH Eagle secondary impact crusher for the purpose of the hourly limitation specified in Special Condition No. C.1.a. of this attachment.
- b. A non-resetting hour meter shall be installed, operated, and maintained on the Deutz 109 HP diesel engine. The operating hours of the Deutz diesel engine shall represent the total hours the portable screening plant has operated for the purpose of the hourly limitation specified in Special Condition No. C.1.b. of this attachment. 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, §11-60.1-11, §11-60.1-90)

3. Visible Emissions (V.E.) Monitoring

- a. Except in those months where annual V.E. observations are conducted pursuant to Special Condition No. D.3.c., the permittee shall conduct **monthly** (calendar month) V.E. observations for the 503 HP and 680 HP diesel engines in accordance with 40 CFR Part 60, Appendix A, Method 9 or by use of a Ringelmann Chart as provided. For the monthly observation, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each emission point. Records shall be completed and maintained in accordance with the *Visible Emissions Observation Form Requirements*.
- b. Except in those months where a performance test is conducted pursuant to Special Condition No. D.4. below, **monthly** (calendar month) V.E. observations shall be performed on the stone processing plant and the portable screening plant (if it was used in conjunction with the stone processing plant at any time during the month). Observations shall be conducted for at least three (3) 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. At a minimum, the three selected points from the plant shall include one crusher, one screen, and one transfer point. The observation points shall be rotated every month so that each crusher, screen and transfer point is eventually observed. The Department may require additional emission points to be observed. For the monthly observation, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each emission point. For the stone processing plant, portable screening plant, and the transfer point, 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;
 - iii. The observer shall record the operating capacity (tons/hr) of the primary crusher at the time the observations were made; and
 - iv. The observer shall note proper water spray flow, as required in C.2.a.

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

(Auth.: HAR §11-60.1-3, §11-60.1-32, §11-60.1-90)

- c. The permittee shall conduct **annually** (calendar year), V.E. observations for the 680 HP Cummins diesel engines by a certified reader in accordance with 40 CFR Part 60, Appendix A, Method 9. For the annual observation, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each emission point. Records shall be completed and maintained in accordance with the *Visible Emissions Observation Form Requirements*.

(Auth.: HAR §11-60.1-3, §11-60.1-32, §11-60.1-90)

- 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 engines. 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, §11-60.1-32, §11-60.1-90)

4. Source Performance Test

Annual source performance tests shall be conducted on the stone processing plant and the portable screening plant (if it was used in conjunction with the stone processing plant) pursuant to this Attachment, 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)

5. Records

The permittee shall maintain records on the following:

- a. Total tons of material processed on a yearly basis by the stone processing plant and portable screening plant for purposes of annual emissions reporting.
- b. The number of hours operated by the 680 HP Cummins diesel engine, and the 109 HP Deutz diesel engine on a monthly and 12-month rolling basis for purposes of the limitation specified in Special Condition No. C.1.a and C.1.b. Monthly records for each diesel engine shall include:
 - i. Identification of the diesel engine (i.e., manufacturer & model no.);
 - ii. Date of meter reading;
 - iii. Ending meter readings for each month;
 - iv. Total hours operated each month;
 - v. Total hours operated based on a 12-month rolling basis; and
 - vi. Recorder's name and initials.

- c. Fuel purchase receipts, showing the fuel type, sulfur content (percent by weight), date of delivery, and amount (gallons) of fuel delivered to the site for the diesel engines shall be maintained. Fuel sulfur content may be demonstrated by providing the suppliers' fuel specification sheet for the type of fuel purchased and received. Records on the total amount (gallons) of fuel fired in the diesel engines shall be maintained on an annual basis.
- d. Monthly and annual V.E. records with observation monitoring results of the stone processing plant, portable screening plant (if used in conjunction with the stone processing plant during the month) and the stack exhaust of the 680 HP diesel engine in accordance with the "**Visible Emissions Observation Form Requirements.**"
- e. Source performance test plans, summaries, and results for the stone processing plant and the portable screening plant (if used in conjunction with the stone processing plant).
- f. Equipment inspection, maintenance, and repair work. An inspection, maintenance, and repair log shall be maintained for the equipment covered under this permit. Inspection of, and replacement of parts and repairs to the water spray system, crushers, screens, conveyors, and diesel engines shall be well documented. At a minimum, the log shall include:
 - i. Date of the inspection/maintenance/repair work;
 - ii. A description of the part(s) inspected or repaired;
 - iii. Description of the findings and any maintenance/repair work performed; and
 - iv. The name and title of the personnel performing the inspection/work.

(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 1, Standard Conditions Nos. 16, 17 and 25, respectively:
 - a. *Intent to shut down air pollution control equipment for necessary scheduled maintenance;*
 - b. *Emissions of air pollutants in violation of HAR, Chapter 11-60.1 or this permit (excluding technology-based emission exceedances due to emergencies); and*
 - c. *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)²

2. Deviations

The permittee shall report (in writing) **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 preventive measures taken. Corrective actions may include a requirement for additional performance 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 performance test** for the stone processing plant and the portable screening plant (if used in conjunction with the stone processing plant) pursuant to Special Conditions, Section F, the permittee shall submit a written performance test plan in accordance with Special Condition No. F.4. of this attachment.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §; 40 CFR 60.8, SIP §11-60-15)^{1,2}

b. Written reports of the results of all 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 Special Condition No. F.7. of this attachment.

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

4. Monitoring Report Forms

The permittee shall submit **semi-annually** the following written 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 to June 30 and July 1 to December 31)**, and shall include the following:

- a. Total operating hours of the diesel engines on a monthly and 12-month rolling basis;
- b. Identification of the type of fuel fired in the diesel engines during the respective reporting period. Included the maximum sulfur content (% by weight) of the fuel; and
- c. Identification of any opacity exceedences as determined by the visible emissions monitoring of the stone processing plant, portable screening plant and diesel engines. 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 exceedances, the permittee shall submit in writing a statement indicating that there were no exceedances for the semi-annual period for the stone processing plant, portable screening plant, and diesel engines.

The enclosed **Monitoring Report Forms: "Operating Hours and Fuel Certification - Diesel Engines,"** and **"Opacity Exceedances,"** shall be used.

(Auth.: HAR §11-60.1-3, §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, a compliance certification 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 the 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 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.

For the stone processing operations, the enclosed **Annual Emissions Report Form: Stone Processing Plant**, shall be used. For screening operations, the enclosed **Annual Emissions Report Form: Portable Screening Plant**, shall be used. For the diesel engines, completion and submittal of the **Monitoring/Annual Emissions Report Form: Operating Hours and Fuel Certification – Diesel Engines** shall satisfy the requirement of annual emissions reporting.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

7. Alternate Operating Scenario

For interchanging either of the primary diesel engines with a replacement unit, the permittee shall submit:

- a. A written notification prior to exchanging the primary equipment with a temporary 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(s) 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

1. Performance Testing

The permittee shall conduct or cause to be conducted performance tests on the stone processing plant and the portable screening plant (if used in conjunction with the stone processing plant during the year) on an **annual** basis or at such times as may be specified by the Department of Health, to determine the opacity of emissions. Test shall be conducted for each point subject to an opacity limit.

The Department of Health may require testing at other points in the facility or more frequent testing 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)¹

2. Performance Test Methods

a. The performance tests for the stone processing plant and portable screening plant 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 additions identified in 40 CFR Part 60, Subpart OOO, §60.675 -(c); or U.S. EPA-approved equivalent methods with written consent from the Department of Health. In addition, the observer shall comply with the following 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;
- iii. The observer shall record the operating capacity (tons/hr) of the plant at the time observations were made; and
- iv. The observer shall note proper functioning of the water spray, as required in C.2.b..

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

b. When determining compliance with the fugitive dust emissions standard specified in Special Condition No. C.3.a for the stone processing 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 1-hour period.

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

c. When determining compliance with the fugitive emissions standard specified in Special Condition No. C.3.b for the portable screening plant (if used in conjunction with the stone processing plant during the year) and 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 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 1-hour period.

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

- d. When determining compliance with the fugitive emissions standards of Special Conditions 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:

- 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.
- ii. Separate the emissions so that the opacity of emissions from each affected facility can be read.

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

- 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)¹

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 the stone processing plant and portable 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)¹

4. Performance Test Plan

At least thirty (30) days prior to conducting the performance test for the stone processing plant, and the portable screening plant, if necessary, 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, 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 §11-60-15)^{1,2}

5. Deviation

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 the stone processing plant and portable screening plant, the permittee shall submit to the Department of Health 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 shall be recorded and reported in accordance with 40 CFR Part 60 Appendix A and §60.8 for the stone processing plant and portable screening plant. 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)^{1,2}

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 test.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-32, §11-60.1-90)

Section G. Change of Location Requirements

1. 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:

- a. 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 325 meters of the equipment. Provide the building dimensions (height, length, width and distance to the equipment stack) of all structures that have heights greater than 40% of the stack height of the equipment; and
- e. Area map showing the proposed new location of the portable screening plant;
- f. Projected dates of operation at the new location;
- 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

Any document (including reports) required to be submitted by this covered source permit shall be done in accordance with Attachment 1, Standard Condition No. 29.

(Auth.: HAR §11-60.1-4, §11-60.1-90)

¹ 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.

² 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. 0041-01-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

This attachment encompasses insignificant activities listed in HAR, §11-60.1-82(f) and (g) for which provisions of this permit and HAR, Subchapter 2, General Prohibitions, apply.

(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 for visible emissions, fugitive dust, incineration, process industries, sulfur oxides from fuel combustion, storage of volatile organic compounds, volatile organic compound water separation, pump and compressor requirements, and waste gas disposal.

(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

1. 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 true, accurate, and maintained 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)

Section D. Notification and Reporting

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:

1. The identification of each term or condition of the permit that is the basis of the certification;
2. The compliance status;
3. Whether compliance was continuous or intermittent;
4. The methods used for determining the compliance status of the source currently and over the reporting period;
5. 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
6. 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.

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)

CSP No. 0041-01-CT
Attachment II - INSIG
Page 3 of 2
Issuance Date:
Expiration Date:

PROPOSED

Section E. Agency Notification

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)

**ATTACHMENT III: ANNUAL FEE REQUIREMENTS
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

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 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. 0041-01-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:

Annual Emissions Report Form: Stone Processing Plant
Annual Emissions Report Form: Portable Screening Plant
Monitoring/Annual Emissions Report Form: Operating Hours and Fuel Certification - Diesel Engines

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 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. 0041-01-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 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.

**COMPLIANCE CERTIFICATION FORM
 TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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.

2. 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

**COMPLIANCE CERTIFICATION FORM
 TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT
 (CONTINUED, PAGE ____ 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) used to determine the compliance status of the respective permit term/condition.

<u>Permit term/condition</u>	<u>Equipment(s)</u>	<u>Method</u>	<u>Compliance</u>
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent
		monitoring recordkeeping reporting testing none of the above	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. 0041-01-CT
 (CONTINUED, PAGE ___ OF ___)**

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) & date (mo/day/yr)</u>	<u>Date of Written Deviation Report to DOH (mo/day/yr)</u>
		Beginning: Ending:	

(Make Additional Copies if Needed)

PROPOSED

**ANNUAL EMISSIONS REPORT FORM
STONE PROCESSING PLANT
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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: _____

Facility Name: _____

Equipment Location: _____

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. 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.

Responsible Official (PRINT): _____

TITLE: _____

Responsible Official (Signature): _____

Equipment Simplicity Model OA120C Grizzly Feeder Serial No.: 5716-OF120C

Equipment: Eagle 450 TPH Model 33D4200 Secondary Crusher Serial No. 10930

Equipment: Simplicity Model OA140D Triple-deck Screen Serial No. 3620-HS140D

Type of Operation	Material Processed (Tons/yr)	Air Pollution Control Measures in Use	Control Efficiency (% Reduction)
Truck Unloading			
Primary Crushing			
Secondary Crushing			
Screening			
Truck Loading			
Conveyors			
Stockpiles			

NOTE: Control measures include water sprays, partial enclosures, screens, housing and duct work to baghouses.

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

1. Baghouses: 99%
2. Water sprays, Damp Material, or Shroud: 70%
3. 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.

Additional Information:

Maximum Tons/hour of material entering primary crusher: _____ tons/hr.

PROPOSED

**ANNUAL EMISSIONS REPORT FORM
PORTABLE SCREENING PLANT
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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: _____

Facility Name: _____

Equipment Location: _____

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. 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.

Responsible Official (PRINT): _____

TITLE: _____

Responsible Official (Signature): _____

Equipment: Powerscreen 500 TPH Turbo Chieftain 1400 Screen Serial No. 6608038

Type of Operation	Materials Processed (tons/yr)	Air Pollution Control Measures in Use	Control Efficiency (% Reduction)
Truck Unloading			
Screening			
Truck Loading			
Conveyors			
Stockpiles			

Note: Control measures include water sprays, housing and duct work to baghouses.

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

Baghouses: 99%

Water sprays, damp material or Shroud: 70%

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.

Additional Information:

Maximum Tons/hour of material entering portable screening plant: _____ tons/hr.

**MONITORING/ANNUAL EMISSIONS REPORT FORM
OPERATING HOURS AND FUEL CERTIFICATION - DIESEL ENGINES
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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: _____

Facility Name: _____

Equipment Location: _____

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. 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.

Responsible Official (PRINT): _____

TITLE: _____

Responsible Official (Signature): _____

1. Operating Hours of **Stone Processing Plant** for the reporting period.

Equipment Description, Model, SN	680 HP Cummins Diesel Engine		
	Model KTA 19-G4; SN 37187800		
Month	Monthly Operating Hours	Total Operating Hrs (12-Month Rolling Basis)	End-of-month Meter Reading
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

**MONITORING/ANNUAL EMISSIONS REPORT FORM
OPERATING HOURS AND FUEL CERTIFICATION - DIESEL ENGINES
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT
(CONTINUED, PAGE 2 OF 2)**

Issuance Date:

Expiration Date:

(Make Copies for Additional Use)

3. Operating Hours of Portable **Screening Plant** for the reporting period.

Equipment Description	109 HP Deutz Diesel Engine *		
	Model BF4M1012; SN 00756448		
Month	Monthly Operating Hours	Total Operating Hrs (12-Month Rolling Basis)	End-of-month Meter Reading
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

* Insignificant Activity used to monitor operating hours of the Turbo Chieftain screening plant.

3. **Fuel Certification** for the Reporting Period.

Equipment Description	Type of Fuel Fired	% Sulfur Content by Weight
503 HP Caterpillar Diesel Engine		
680 HP Cummins Diesel Engine		

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

- Types of Fuel:
- Residual Oil: Specify Grade, No. 6, 5, or 4;
 - Distillate Oil (No. 2);
 - Liquefied Petroleum Gas, Butane or Propane;
 - If Other, specify.

**MONITORING REPORT FORM
OPACITY EXCEEDENCES
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-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 following information semi-annually:

(Make Copies for Future Use)

For Period: _____ Date: _____

Company Name: _____

Facility Name: _____

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. 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.

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	SERIAL/ID NO.	DATE	6 MINUTE AVERAGE (%)	COMMENTS

**VISIBLE EMISSIONS FORM REQUIREMENTS
STATE OF HAWAII
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

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
503 HP CATERPILLAR DIESEL ENGINE
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

Issuance Date _____

Expiration Date _____

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

Company Name: West Oahu Aggregate Co., Inc

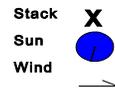
For stacks, describe equipment and fuel: _____

For fugitive emissions from crushers and screens, describe: _____

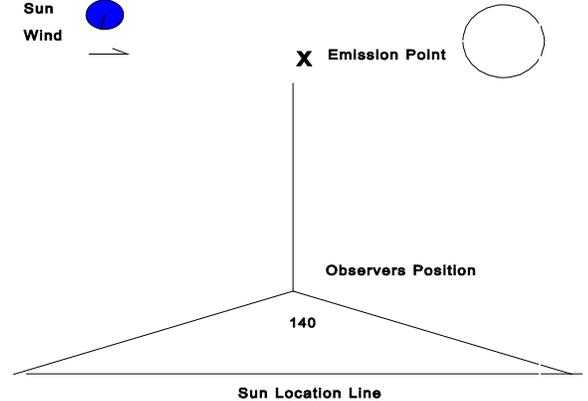
Fugitive emission point: _____

Plant Production (tons/hr): _____

(During observation): _____



Draw North Arrow



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 (%):					

**VISIBLE EMISSIONS FORM
680 HP CUMMINS DIESEL ENGINE
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

Issuance Date

Expiration Date

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

Company Name: West Oahu Aggregate Co., Inc.

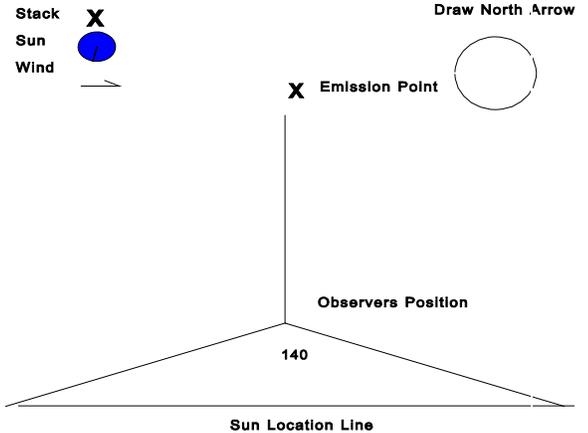
For stacks, describe equipment and fuel: _____

For fugitive emissions from crushers and screens, describe:

Fugitive emission point: _____

Plant Production (tons/hr): _____

(During observation): _____



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 (%):					

**VISIBLE EMISSIONS FORM
STONE PROCESSING PLANT
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

Issuance Date

Expiration Date

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

Company Name: West Oahu Aggregate Co., Inc.

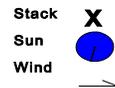
For stacks, describe equipment and fuel: _____

For fugitive emissions from crushers and screens, describe: _____

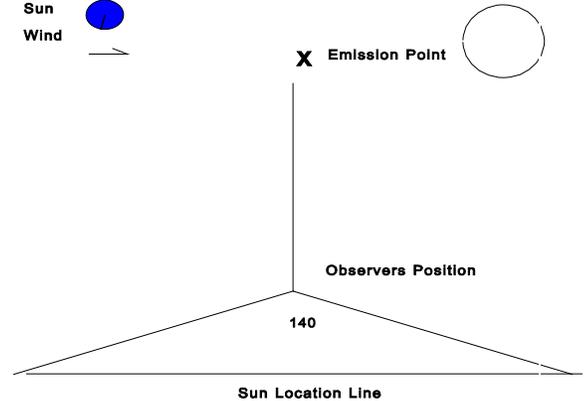
Fugitive emission point: _____

Plant Production (tons/hr): _____

(During observation): _____



Draw North Arrow



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 (%):					

**VISIBLE EMISSIONS FORM
PORTABLE SCREENING PLANT***
(*If used in conjunction with the Stone Processing Plant)
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT

Issuance Date

Expiration Date

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

Company Name: West Oahu Aggregate Co., Inc.

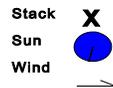
For stacks, describe equipment and fuel: _____

For fugitive emissions from crushers and screens, describe: _____

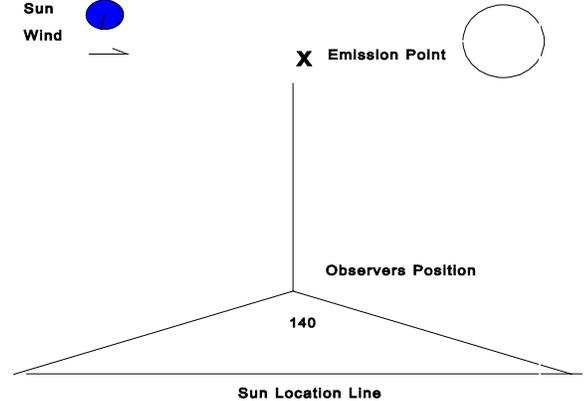
Fugitive emission point: _____

Plant Production (tons/hr): _____

(During observation)



Draw North Arrow



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 (%):					

**CHANGE OF LOCATION REQUEST
FOR A TEMPORARY SOURCE
TEMPORARY COVERED SOURCE PERMIT NO. 0041-01-CT**

Issuance Date

Expiration Date

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 Future Use)

1. The permittee shall submit a change of location request for all succeeding location changes. The change of location request shall include the attached Change of Location Request for a Temporary Source Form and the items identified in nos. 2, 3, and 4 below. The change of location request shall be submitted 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, fence lines, and general terrain features (i.e. flat, hilly, steep);
 - b. Location of all structures within 100 meters (330 feet) of the equipment;
 - c. Location of the equipment moving to the new temporary location; and
 - d. Location of other air pollution sources owned and operated by the permittee at the new location, if any.
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:

Covered Sources

_____ \$100.00 for Non-Air Toxic

_____ \$300.00 for Air Toxic

4. If requested by the Department of Health, the permittee shall submit any additional information including an ambient air quality impact analysis of the equipment at the new location.
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**

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1. 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.
 2. 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. 0041-01-CT
(CONTINUED, PAGE 2 OF 2)**

Issuance Date: _____

Expiration Date: _____

1. Company Name: _____
2. Facility Name (if different from the company): _____
3. Mailing Address: _____
City: _____ State: _____ Zip Code: _____
Phone Number: _____
4. Name of Owner/Owner's Agent: _____
Title: _____ Phone: _____
5. Equipment Description: _____
6. Current Equipment Location: _____
7. **New Equipment Location:** _____
 - a. Plant site manager or other contact, if different than Current contact:

 - b. Phone Number: _____
 - c. Proposed start date at *New Location*: _____
 - d. Estimated project duration: _____
8. Brief description of the work to be performed. Also identify other air pollution sources owned and operated by the permittee at the new location, if any:

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. 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. I further state that no modifications will be made to the equipment and operational methods will remain similar as permitted under the current Temporary Covered Source Permit at this new location.

Responsible Official (Print name): _____ Date: _____

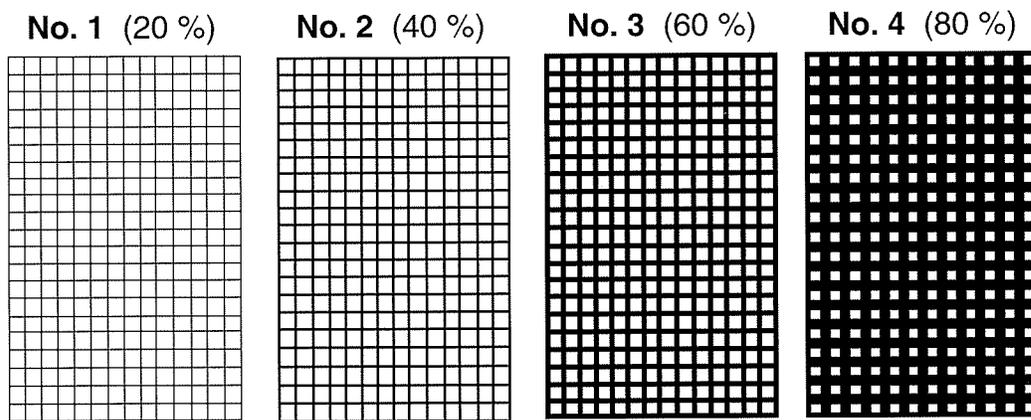
Title of Responsible Official: _____

Responsible Official (Signature): _____

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.