

PROPOSED

ISSUE DATE

CERTIFIED MAIL
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(xxx)

09-E CAB
File No. 0355-02

Mr. George Purdy
Aggregate Division Manager
West Hawaii Concrete
P.O. Box 1390
Kailua-Kona, Hawaii 96745

Dear Mr. Izuno:

**Subject: Temporary Covered Source Permit (CSP) No. 0355-02-CT
Renewal Application No. 0355-05
West Hawaii Concrete
Crushing and Screening Plants
Located at: Various Temporary Sites, State of Hawaii
Date of Expiration: FIVE YEARS FROM ISSUE**

The subject temporary 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 information submitted as part of your application received on April 14, 2008 and the additional information received on July 28, August 15, and September 4, 2008 and January 11 and 29, 2009. This permit supersedes CSP No. 0355-02-CT, issued on February 12, 2007 under application No. 0355-04, in its entirety.

The temporary 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 II - INSIG: Special Conditions - Insignificant Activities
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

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Change of Location Request for a Temporary Source
Annual Emissions Report Form: Crushing and Screening Plants
Annual Emissions Report Form: Diesel Engine Generators

Monitoring Report Form: Crushing and Screening Plants – Each Location
Monitoring Report Form: Fuel Sulfur Content
Monitoring Report Form: Diesel Engine Generators – Each Location
Monitoring Report Form: Diesel Engine Generators – All Locations
Monitoring Report Form: Opacity Exceedances

Enclosed are the following for your use in monitoring visible emissions:

- a. Visible Emissions Form Requirements State of Hawaii
- b. Visible Emissions Form - Diesel Engine Generators
- c. Visible Emissions Form – Crushing and Screening Plants
- d. 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

MM:nn
Enclosures

c: Wendell Sano, EHS-Kona
CAB Monitoring Section

**ATTACHMENT I: STANDARD CONDITIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-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,

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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)

¹The 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

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and operating permit requirements, permit conditions may incorporate more stringent requirements than those set forth in the CFR.

²The 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. 0355-02-CT**

Issuance Date:

Expiration Date:

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

Section A. Equipment Description

1. This permit encompasses the following equipment and associated appurtenances:
 - a. 800 TPH processing plant (615 plant) with:
 - a. Grizzly feeder;
 - b. 800 TPH Cedarapids jaw crusher, model no. 3042, serial no. 43383;
 - c. 460 TPH JCI cone crusher, model no. K300, serial no. J-16897 (54");
 - d. 5' x 16' El-Jay screen, serial no. 34C2292;
 - e. Various conveyors;
 - f. Water spray system; and
 - g. 635 kW/976 hp Caterpillar diesel engine generator, model no. C-27, serial no. MJE00634.
 - b. 1,130 TPH processing plant (618 and 620 plants) with:
 - a. Grizzly feeder;
 - b. 1,130 TPH Cedarapids jaw crusher, model no. 4248, serial no. 52073;
 - c. 400 TPH Canica vertical shaft impactor, model no. 100, serial no. 100368-03;
 - d. 645 Cedarapids cone crusher, model no. MVP 450, serial no. 52074;
 - e. 8' x 20' Cedarapids triple-deck screen, serial no. 52075;
 - f. 8' x 20' Cedarapids triple-deck screen, serial no. 52076;
 - g. Various conveyors;
 - h. Water spray system; and
 - i. 1,000 kW/1,350 hp Cummins diesel engine generator, model no. QST30-G5, serial no. 2177-03.
 - c. Additional pieces of equipment (613 and 618 plants) are listed as follows:
 - a. 400 TPH Canica vertical shaft impactor, model no. 100, serial no. 10012590;
 - b. 6' x 18' Vari-Vibe triple-deck screen, serial no. 961224;
 - c. 8' x 20' Diester triple-deck screen, serial no. 1030566;
 - d. 545 kW/810 hp Caterpillar diesel engine generator, model no. 3412, serial no. 81Z09675; and
 - e. 160 kW/245 hp Caterpillar diesel engine generator, model no. 3306, serial no. 66D17769.

(Auth.: HAR §11-60.1-3)

2. An identification tag or name plate shall be displayed on the crushers, screeners, and

diesel engine generators listed above to show model no., serial no., and manufacturer. The identification tag or name plate shall be permanently attached to the equipment at a conspicuous location.

(Auth.: HAR §11-60.1-5, §11-60.1-90)

Section B. Applicable Federal Regulations

1. The crushers, screeners, and conveyors listed above 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 § 60.1, §60.670)¹

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)¹

Section C. Operational and Emission Limitations

1. Production Limit

The total production shall not exceed 2,000,000 tons in any rolling twelve-month (12-month) period at any one location.

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

2. Diesel Engine Generators

- a. The maximum number of diesel engine generators operating at any one location shall be limited to three (3). At no time shall more than three (3) diesel engine generators operate simultaneously at any one site.
- b. The total fuel consumption of the 1,000 kW/1,350 hp diesel engine generator shall not exceed 189,900 gallons at any one location in any rolling twelve-month (12-month) period.

- c. The total combined fuel consumption of the 1,000 kW/1,350 hp diesel engine generator shall not exceed 305,000 gallons at all locations in any rolling twelve-month (12- month) period.
- d. The total combined fuel consumption of the 635 kW/976 hp diesel engine generator shall not exceed 138,000 gallons at all locations in any rolling twelve-month (12- month) period.
- e. The total fuel consumption of the 545 kW/810 hp diesel engine generator shall not exceed 118,800 gallons at any one location in any rolling twelve-month (12-month) period.
- f. The total combined fuel consumption of the 545 kW/810 hp diesel engine generator shall not exceed 225,000 gallons at all locations in any rolling twelve-month (12- month) period.
- g. The total combined fuel consumption of the 160 kW/245 hp diesel engine generator shall not exceed 37,800 gallons at all locations in any rolling twelve-month (12-month) period.
- h. The diesel engine generators shall be fired only on fuel oil No. 2 with a maximum sulfur content not to exceed 0.5% by weight.
- i. For any six (6) minute averaging period, the diesel engine generators shall not exhibit visible emissions of twenty (20) percent or greater, except as follows: during start-up, shutdown, or equipment breakdown, the diesel engine generators 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.
- j. The minimum stack height of the 1,000 kW/1,350 hp diesel engine generator shall be 23 feet above base elevation.
- k. The minimum stack height of the 635 kW/976 hp and 545 kW/810 hp diesel engine generators shall be 17 feet above base elevation.
- l. The minimum stack height of the 160 kW/245 hp diesel engine generator shall be 13 feet above base elevation.
- m. The diesel engine generators shall be maintained in good operating condition at all times with scheduled inspections and maintenance as recommended by the manufacturer and as needed.

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

3. Fugitive Emission Limits

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

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

4. Fugitive Dust Control

- a. Measures shall be taken by the permittee to control fugitive dust (e.g., wetting dry material prior to screening, minimize drop height to stockpile, etc.) for all material transfer points, stockpiles, and throughout the facility. The Department of Health may at any time require the permittee to further abate fugitive dust emissions if an inspection indicates poor or insufficient control.
- b. Water spray systems shall be maintained and utilized, as necessary, during operation of the crushing and screening plants to ensure compliance with the fugitive dust limits specified in Attachment II, Special Condition No. C.3.
- c. The Department of Health at any time may require continuous operation of the water sprays and/or additional water sprays or manual water spraying at pertinent locations if an inspection indicates that more fugitive dust control is needed.
- d. The crushing and screening plants shall not be operated if observation, or the routine inspection required in Attachment II, Special Condition No. D.2.b., indicates a significant drop in water flow rate, plugged nozzle(s), leak in the piping system, or other problems which affect the efficiency of the water spray system. The permittee shall investigate and correct the problem before resuming operations.
- e. A water truck shall be maintained and utilized during the facility's operating hours and at other times as necessary to minimize fugitive dust from operations to process aggregate.

- f. The water spray systems for the crushing and screening plants shall be maintained in good operating condition at all times with scheduled inspections and maintenance as

needed to ensure compliance with the fugitive dust limits specified in Attachment II, Special Condition No. C.3.

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

5. Pre-approved Location Changes

- a. The permittee may relocate equipment to the following pre-approved locations without submitting a location change request required by Section G of the permit, provided the Department of Health is notified in writing prior to moving equipment to the pre-approved location in accordance with Attachment II, Special Condition No. E.7.a:

Location No.	Location Description
1	Kona Quarry
2	Waikoloa Quarry
3	Waimea Quarry (Kamuela Quarry)
4	West Hawaii Sanitary Landfill in Puuanahulu

- b. The permittee may request pre-approval by the Department of Health for operating equipment at other locations pursuant to Attachment II, Special Condition No.E.7.b.
- c. Location change requests that are not pre-approved shall be in accordance with Section G of Attachment II.
- d. For operating at Kona, Waikoloa, and Waimea quarry locations, each diesel engine generator shall be located on the property at the UTM coordinate specified in the air modeling assessment pursuant to Attachment II, Special Condition Nos. E.7.b and E.7.c.
- e. The total operation of each diesel engine generator shall not exceed 12 hours per day at the Kona, Waikoloa, and Waimea quarry locations.

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

6. Location Changes (general)

- a. The operation of the crushing and screening plants covered by this temporary covered source permit shall involve at least one (1) location change during the term of this permit.

- b. Location changes of the equipment shall be in accordance with, Special Condition No. C.5 and Section G of Attachment II as applicable. For each change in location, the Department of Health reserves the right to impose additional operational controls and restrictions if a site evaluation indicates the controls and/or restrictions are necessary.

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

7. Alternate Operating Scenario

- a. The permittee may replace each diesel engine generator with a temporary replacement unit. For the temporary replacement unit, the following conditions shall apply:
 - i. A request for the replacement unit shall be submitted in accordance with Attachment II, Special Condition No. E.8.a;
 - ii. The temporary replacement engine must be similar in size to the diesel engine generator being replaced with equal or lesser emissions;
 - iii. The temporary replacement unit shall comply with all applicable conditions required for the primary unit, including all air pollution control equipment requirements, operating restrictions, and emission limits; and
 - iv. Removal and return information shall be submitted in accordance with Attachment II, Special Condition No. E.8.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 Attachment II, Special Condition No. D.9.
- d. The terms and conditions under each operating scenario shall meet all applicable requirements, including special conditions of this permit.

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

Section D. Monitoring and Recordkeeping Requirements

1. Records

All records, including support information, shall be maintained for at least five (5) years

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

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

2. Water Spray Systems

- a. Records on the total gallons of water used for the water spray systems and water truck(s) shall be maintained for the facility.
- b. The water spray systems for the crushing and screening plants shall be checked routinely and at least once per month to ensure proper operation of the water spray systems.

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

3. Fuel Limits

- a. A non-resetting fuel flow meter shall be operated and maintained for each diesel engine generator to determine the total gallons of fuel fired at each location.
- b. Monthly records of the beginning fuel flow meter readings shall be maintained. The total gallons of fuel fired shall be determined and recorded on a monthly and 12-month rolling basis at each location.

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

4. Production

The permittee shall maintain records on the total tons of material processed by the crushing and screening plants for each location for purposes of annual emissions reporting and the limit specified in Attachment II, Special Condition No. C.1.

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

5. Fuel Sulfur Content

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

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

6. Inspection, Maintenance, and Repair Log

An inspection, maintenance, and repair log shall be maintained for the equipment covered under this permit. Inspection and replacement of parts and repairs to the crushing and screening plants, water spray systems, and diesel engine generators shall be well documented. At a minimum, the following records shall be maintained:

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

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

7. Performance Test

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

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

8. Visible Emissions (V.E.)

- a. Except in those months when V.E. observations are conducted by a certified reader for the annual observation of the diesel engine generators, the permittee shall conduct monthly (calendar month), V.E. observations of each diesel engine generator in accordance with Method 9 or by use of a Ringelmann Chart as provided. For each month, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals. Records shall be completed and maintained in accordance with the Visible Emission Observation Form requirements. For the V.E. observations of the diesel engine generators, the observer shall comply with the following additional requirements:
 - i. The distance between the observer and the emission source shall be at least three (3) stack heights but not more than 402 meters (0.25 miles);
 - ii. The observer shall, when possible, select a position that minimizes interference from other sources of visible emissions. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed.
- b. Except in those months when performance tests are conducted for fugitive emissions pursuant to Attachment II, Special Conditions, Section F, the permittee shall conduct

monthly (calendar month), V.E. observations for the crushing and screening plants in accordance with Method 9 or by use of a Ringelmann Chart as provided. For each month, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for each emissions point subject to opacity limits as specified in Attachment II, Special Condition Nos. C.3.a and C.3.b. For the V.E. observations of the fugitive emissions, the observer shall comply with the following additional requirements:

- i. The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet) but not greater than 402 meters (0.25 miles).
 - ii. The observer shall, when possible, select a position that minimizes interference from other visible emission sources. The required observer position relative to the sun (Method 9; Section 2.1) shall be followed.
 - iii. The observer shall record the operating capacity (ton/hr) of the processing plants for the time the observations were made.
- c. The permittee shall conduct annually (calendar year), V.E. observations for the diesel engine generators 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. Records shall be completed and maintained in accordance with the Visible Emissions Form 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 generators. The waiver request is to be submitted prior to the required annual V.E. observation and must include documentation justifying such action. Documentation should include, but is not limited to, the results of the prior V.E. observation indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous annual V.E. observation.

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

9. 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.

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

Section E. Notification and Reporting Requirements

1. Notification and reporting pertaining to the following events shall be done in accordance with Attachment I, Standard Condition Nos. 14, 16, 17, and 24, respectively:

- a. Anticipated date of initial startup, actual date of construction commencement, and actual date of startup of the 635 kW/976 hp diesel engine generator;
- b. Intent to shut down air pollution control equipment for necessary scheduled maintenance;
- c. Emissions of air pollutants in violation of HAR, Chapter 11-60.1 or this permit (excluding technology-based emission exceedences due to emergencies); and

- d. Permanent discontinuance of construction, modification, relocation, or operation of the facility covered by this permit.

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

2. Deviations

The permittee shall report in writing **within five (5) working days** any deviations from the permit requirements, including those attributed to upset conditions, the probable cause of such deviations, and any corrective actions or preventative measures taken. Corrective actions may include a requirement for additional source testing, more frequent monitoring, or the implementation of a corrective action plan.

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

3. Performance Testing

- a. At least **thirty (30) days prior** to conducting a source performance test pursuant to Special Conditions, Section F, the permittee shall submit a written performance test plan to the Department of Health in accordance with Attachment II, Special Condition No. F.4.

- b. Written reports of the results of the performance tests conducted to demonstrate compliance shall be submitted to the Department of Health **within sixty (60) days** after the completion of the performance test, and shall be in conformance with Attachment II, Special Condition No. F.6.

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

4. Annual Emissions

As required by Attachment IV and in conjunction with the requirements of Attachment III, Annual Fee Requirements, the permittee shall report **annually** the total tons per year

emitted of each regulated air pollutant, including hazardous air pollutants. The reporting of annual emissions is due **within sixty (60) days following** the end of each calendar year. Upon the written request of the permittee, the deadline for reporting of annual emissions may be extended, if the Department of Health determines that reasonable justification exists for the extension. The enclosed **Annual Emissions Report Form – Crushing and Screening Plants** and **Annual Emissions Report Form – Diesel Engine Generators** shall be used.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

5. Monitoring Reports

The permittee shall submit **semi-annually** the following reports to the Department of Health. The reports shall be submitted **within sixty (60) days** after the end of each semi-annual calendar period (January 1 - June 30 and July 1 - December 31), signed and dated by a responsible official. The enclosed **Monitoring Report Form: Crushing and Screening Plants – Each Location, Monitoring Report Form: Fuel Sulfur Content, Monitoring Report Form: Diesel Engine Generators – Each Location, Monitoring Report Form: Diesel Engine Generators – All Locations** and **Monitoring Report Form – Opacity Exceedances** shall be used.

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

6. Compliance Certification

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

- a. The identification of each term or condition of the permit that is the basis of the certification;
- b. The compliance status;
- c. Whether compliance was continuous or intermittent;
- 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)

7. Pre-approved Location Changes

- a. For operating equipment at pre-approved locations, the permittee shall notify the Department of health in writing prior to moving equipment to the new location. Each notification shall include, at a minimum, the following information:
 - i. The current equipment location and pre-approved location for equipment relocation;
 - ii. The type (e.g., impactor, jaw crusher, diesel engine generator, etc.) of equipment for relocation to the pre-approved site;
 - iii. Information for each piece of equipment being moved to the pre-approved location that includes the applicable model no., serial no., equipment manufacturer, and capacity (e.g., tons per hour, horsepower, etc.); and
 - iv. The estimated duration of operation for equipment being moved to the pre-approved location.
- b. The permittee may request locations be pre-approved for relocating equipment that continually moves to and from the same site. For each request, the permittee shall provide the Department of Health with:
 - i. Written notification identifying the proposed location with a location map that includes information requested in Attachment II, Special Condition No. G.1.d;
 - ii. The Universal Transverse Mercator (UTM) coordinates for each diesel engine generator at the pre-approved site; and
 - ii. An air modeling assessment for diesel engine generators operating at the proposed location.
- c. For changing the location of operation of each diesel engine generator at all pre-approved quarry locations, the permittee shall provide the Department of Health with An air modeling assessment that includes the emission impacts and UTM coordinates of each diesel engine generator operating at the pre-approved site.

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

8. Alternate Operating Scenario

- a. The permittee shall submit a written request and receive prior written approval from the Department of Health before exchanging each diesel engine generator with a temporary replacement unit. The written request shall identify, at a minimum, the reasons for the replacement of the diesel engine generator 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.
- b. Prior to the removal and return of each diesel engine generator, the permittee shall submit to the Department of Health written documentation on the removal and return dates and the make, size, model, and serial numbers for both the temporary replacement unit and the installed unit.

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

Section F. Testing Requirements

1. Annual Performance Testing

- a. The permittee shall conduct or cause to be conducted an annual source performance test on all crushing and screening plant equipment subject to the opacity limits specified in Attachment II, Special Condition Nos. C.3.a and C.3.b.
- b. The Department of Health may require testing at other points in the facility if an inspection indicates poor or insufficient controls.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90; §11-60.1-161, 40 CFR §60.675, SIP §11-60.15)^{1,2}

2. Performance Test Methods

- a. The performance tests for the crushing and screening plants shall be conducted by a certified reader using Method 9 of 40 CFR Part 60, Appendix A, and the procedures in 40 CFR §60.11 with the following additions:
 - i. The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet).
 - ii. The observer shall, when possible, select a position that minimizes interference from other fugitive emission sources. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed.

- iii. The observer shall record the operating capacity (tons/hr) of the crushing and screening plants at the time observations were made.
- b. When determining compliance with the fugitive emissions standard of Attachment II, Special Condition No. C.3.a., for the crushers, the duration of Method 9 may be reduced from three (3) hours (thirty 6-minute averages) to one (1) hour (ten six (6)-minute averages) only if the following conditions apply:
 - i. There are no individual readings greater than fifteen (15) percent opacity; and
 - ii. There are no more than three (3) readings of fifteen (15) percent for the one-hour period.
- c. When determining compliance with the fugitive emissions standard of Attachment II, Special Condition No. C.3.b., for transfer points on the belt conveyor(s) or for any other affected facility, the duration of Method 9 may be reduced from three (3) hours [thirty six (6)-minute averages] to one (1) hour [ten six (6)-minute averages] only if the following conditions apply:
 - i. There are no individual readings greater than ten (10) percent opacity; and
 - ii. There are no more than three (3) readings of ten (10) percent for the one-hour period.
- d. When determining compliance with the fugitive emissions standards of Attachment II, Special Condition Nos. C.3.a and C.3.b., if emissions from two or more facilities continuously interfere so that the opacity of fugitive emissions from an individual affected facility cannot be read, either of the following procedures may be used:
 - 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.
- 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 crushing and screening

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

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

5. Deviations

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

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

6. Performance Test Report

Within **sixty (60) days** after completion of the performance test for the crushing and screening plants, the permittee shall submit to the Department of Health and U.S. EPA Region 9 the test report which shall include the operating conditions of the facility at the time of the test (e.g., operating rate in tons/hr, 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.

(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 source test.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

Section G. Change of Location Requirements

1. Except when location changes are performed in accordance with Attachment II, Special Condition No. C.5, the permittee shall submit information regarding 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, facility phone number, and the plant site manager or other contact;
 - b. Temporary covered source permit number and expiration date;
 - c. Identification of current location;
 - d. Location map of the proposed new temporary location containing the following information:
 - i. Identification of the property boundary, any fence lines; and general terrain features (i.e., flat, hilly, steep);
 - ii. Location of all structures within 100 meters of the equipment. Provide the building dimensions (height, length, and width) of all structures that have heights greater than 40% of the stack height of the diesel engine generators; and
 - iii. Identification of any other air pollution sources at the new location.
 - e. Area map showing the proposed new location of the equipment;
 - 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

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

(Auth.: HAR §11-60.1-4, §11-60.1-90)

¹The 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.

²The 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. 0355-02-CT**

Issuance Date:

Expiration Date:

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

Section A. Equipment Description

1. Attachment II - INSIG encompasses fuel tanks for the diesel engine generators that power plant equipment.

(Auth.: HAR §11-60.1-3)

Section B. Operational Limitations

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

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

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

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

Section C. Monitoring and Recordkeeping Requirements

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 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

1. Compliance Certification.

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

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

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

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

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

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

Section E. Agency Notification

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

(Auth.: HAR §11-60.1-4, §11-60.1-90)

**ATTACHMENT III: ANNUAL FEE REQUIREMENTS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date:

Expiration Date:

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

1. Annual fees shall be paid in full:
 - a. Within **sixty (60) days** after the end of each calendar year; and
 - b. Within **thirty (30) days** after the permanent discontinuance of the covered source.
2. The annual fees shall be determined and submitted in accordance with Hawaii Administrative Rules, Chapter 11-60.1, Subchapter 6.
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. 0355-02-CT**

Issuance Date:

Expiration Date:

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

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

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

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

**COMPLIANCE CERTIFICATION FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-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: West Hawaii Concrete

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. 0355-02-CT
 (CONTINUED, PAGE 2 OF ___)**

Issuance Date:

Expiration Date:

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

Instructions:

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

A. Attachment I, Standard Conditions

<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. 0355-02-CT
 (CONTINUED, PAGE 3 OF ___)**

Issuance Date:

Expiration Date:

C. Special Conditions - Operational and Emissions Limitations

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

<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
		monitoring recordkeeping reporting testing none of the above	Continuous Intermittent

(Make Additional Copies if Needed)

**COMPLIANCE CERTIFICATION FORM
 TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-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)

**CHANGE OF LOCATION REQUEST
FOR A TEMPORARY SOURCE
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(PAGE 1 OF 2)**

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 additional use)

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

Noncovered Sources	Covered Sources
_____ \$ 50.00 for Non-Air Toxic	<u> X </u> \$100.00 for Non-Air Toxic
_____ \$100.00 for Air Toxic	_____ \$300.00 for Air Toxic
4. The permittee shall submit any additional information as requested by the Department of Health.
5. This notification form shall be mailed to the following address:

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

(808) 586-4200**

-
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. 0355-02-CT
(CONTINUED, PAGE 2 OF 2)

Issuance Date:

Expiration Date:

1. Company Name: West Hawaii Concrete
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. Identify each equipment to be relocated and provide a 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): _____

**ANNUAL EMISSIONS REPORT FORM
CRUSHING AND SCREENING PLANTS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-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: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Report the air pollution control measures used for the facility as follows:

Type of Operation	Air Pollution Control Measures in Use	Control Efficiency (% Reduction)
Truck Unloading		
Crushing		
Screening		
Conveyors		
Stockpiles		
Truck Loading		

2. Report the tons per year (TPY) of material processed by the crushing and screening plants at all locations as follows:

Plant	TPY of Material Processed
Crushing and Screening Plants	

**ANNUAL EMISSIONS REPORT FORM
DIESEL ENGINE GENERATORS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date: _____

Expiration Date: _____

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

(Make copies for additional use)

For Period: _____ Date: _____

Company Name: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Report the diesel engine generator fuel consumption for operation at all locations as follows:

Model	Capacity	Maximum % Sulfur Content by Weight	Total Fuel Oil No. 2 Consumption (gal/yr)
QST30-G5	1,000 kW/1,350 hp		
C-27	635 kW/976 hp		
3412	545 kW/810 hp		
3306	160 kW/245 hp		

**MONITORING REPORT FORM
CRUSHING AND SCREENING PLANTS – EACH LOCATION
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date: _____

Expiration Date: _____

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

(Make copies for additional use for each location)

For Period: _____ Date: _____

Company Name: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Identify each plant location for the reporting period: _____

2. Report the total production for the crushing and screening plants in tons as follows for each location:

Month	Crushing and Screening Plant Production	
	Total Production (tons)	Total Production (tons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

PROPOSED

**MONITORING REPORT FORM
FUEL SULFUR CONTENT
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date: _____

Expiration Date: _____

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

(Make copies for additional use)

For Period: _____

Date: _____

Company Name: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Report the fuel sulfur content for the diesel engine generators as follows:

Model	Capacity	Types of Fuel Fired	Maximum % Sulfur Content by Weight
QST30-G5	1,000 kW/1,350 hp		
C-27	635 kW/976 hp		
3412	545 kW/810 hp		
3306	160 kW/245 hp		

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS - EACH LOCATION
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(PAGE 1 OF 3)**

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 for each location:

(Make copies for additional use for each location)

For Period: _____ Date: _____

Company Name: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Identify each location of the 1,000 kW/1,350 hp diesel engine generator for the reporting period: _____
2. Report the total fuel consumption for each location for the 1,000 kW/1,350 hp diesel engine generator as follows:

Month	1,000 kW/1,350 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

PROPOSED

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS – EACH LOCATION
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(CONTINUED, PAGE 2 OF 3)**

Issuance Date:

Expiration Date:

- Identify each location of the 545 kW/810 hp diesel engine generator for the reporting period: _____
- Report the total fuel consumption for each location for the 545 kW/810 hp diesel engine generator as follows:

Month	545 kW/810 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

- Report all incidences when more than three diesel engine generators operated at any one location.

Date	Duration of Operation

- Report all incidences when a diesel engine generator was operated at a site other than that specified by Attachment II, Special No. C.5.c.

Date	Equipment Serial No.	Duration of Operation	UTM Coordinate

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS – EACH LOCATION
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(CONTINUED, PAGE 3 OF 3)**

Issuance Date:

Expiration Date:

7. Report all incidences when a diesel engine generator was operated more than 12 hours per day at the Kona Quarry.

Date	Equipment Serial No.	Duration of Operation (hours)

8. Report all incidences when a diesel engine generator was operated more than 12 hours per day at the Waikoloa Quarry.

Date	Equipment Serial No.	Duration of Operation (hours)

9. Report all incidences when a diesel engine generator was operated more than 12 hours per day at the Waimea Quarry.

Date	Equipment Serial No.	Duration of Operation (hours)

PROPOSED

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS – ALL LOCATIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(PAGE 1 OF 3)**

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 for all locations:

(make copies for additional use)

For Period: _____ Date: _____

Company Name: West Hawaii Concrete

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.

Responsible Official (Print): _____

TITLE: _____

Responsible Official (Signature): _____

1. Report the total combined fuel consumption for all locations for the 1,000 kW/1,350 hp diesel engine generator as follows:

Month	1,000 kW/1,350 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

PROPOSED

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS - ALL LOCATIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(CONTINUED, PAGE 2 OF 3)**

Issuance Date:

Expiration Date:

2. Report the total combined fuel consumption for all locations for the 635 kW/976 hp diesel engine generator as follows:

Month	635 kW/976 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

3. Report the total combined fuel consumption for all locations for the 545 kW/810 hp diesel engine generator as follows:

Month	545 kW/810 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

PROPOSED

**MONITORING REPORT FORM
DIESEL ENGINE GENERATORS – ALL LOCATIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT
(CONTINUED, PAGE 3 OF 3)**

Issuance Date:

Expiration Date:

4. Report the total combined fuel consumption for all locations for the 160 kW/245 hp diesel engine generator as follows:

Month	160 kW/245 hp Diesel Engine Generator	
	Total Fuel consumption (gallons)	Total Production (gallons)
	Monthly Basis	12-Month Rolling Basis
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

**VISIBLE EMISSIONS FORM REQUIREMENTS
STATE OF HAWAII
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date:

Expiration Date:

Visible Emissions (V.E.) Form shall be completed **monthly** (each calendar month) for each

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

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

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

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

**VISIBLE EMISSIONS FORM
DIESEL ENGINE GENERATORS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date: _____ **Expiration Date:** _____

(Make copies for future use for each stack)

Permit No.: _____

Company Name: West Hawaii Concrete

Equipment and Fuel: _____

Site Conditions:

Stack height above ground (ft): _____

Stack distance from observer (ft): _____

Emission color (black or white): _____

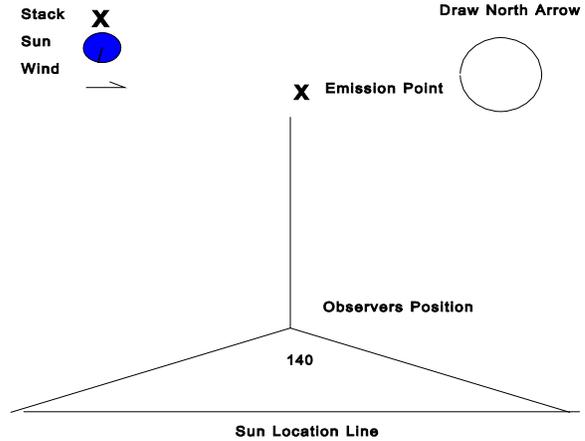
Sky conditions (% cloud cover): _____

Wind speed (mph): _____

Temperature (°F): _____

Observer Name: _____

Certified? (Yes/No): _____



Observation Date and Start Time: _____

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

Observation Date and Start Time: _____

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

**VISIBLE EMISSIONS FORM
CRUSHING AND SCREENING PLANTS
TEMPORARY COVERED SOURCE PERMIT NO. 0355-02-CT**

Issuance Date: _____

Expiration Date: _____

(Make copies for future use for each emission point)

Permit No.: _____

Company Name: West Hawaii Concrete

Fugitive emission point description: _____

Plant Production (tons/hr): _____
(During observation)

Site Conditions:

Emission point height above ground (ft): _____

Emission point distance from observer (ft): _____

Emission color (black or white): _____

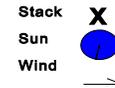
Sky conditions (% cloud cover): _____

Wind speed (mph): _____

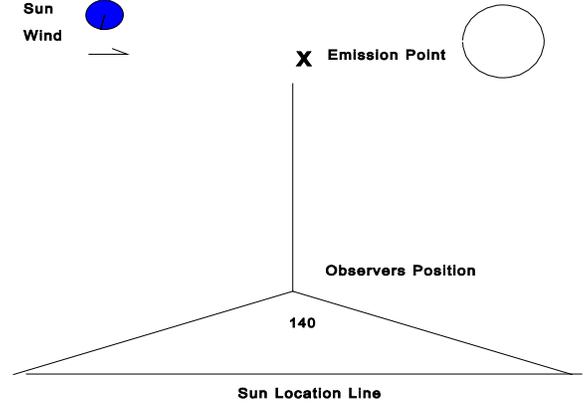
Temperature (°F): _____

Observer Name: _____

Certified? (Yes/No): _____



Draw North Arrow



Observation Date and Start Time: _____

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

Observation Date and Start Time: _____

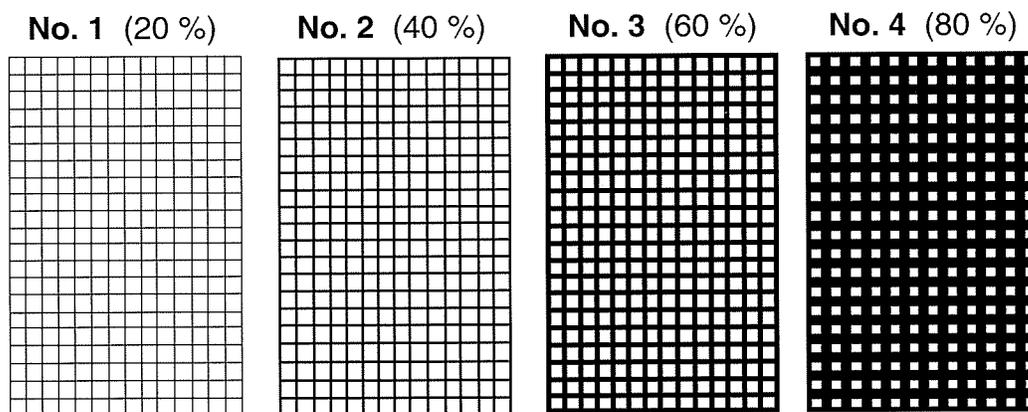
SECONDS	0	15	30	45	COMMENTS
MINUTES					
1					
2					
3					
4					
5					
6					
Six (6) Minute Average Opacity Reading (%):					

PROPOSED

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.