PROPOSED

Issue Date

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

09-XXXE CAB
File No. 0569

Mr. Hugh M. Willocks
Vice President, Construction
Willocks Construction Corporation
16-209 Melekahiwa Place
Keaau, Hawaii 96749

Dear Mr. Willocks:

Subject: Temporary Covered Source Permit (CSP) No. 0569-01-CT
Renewal Application No. 0569-03
Willocks Construction Corporation
Mobile Crushing Plant
Located at: Various Temporary Sites, State of Hawaii
Date of Expiration: 5 Years From Issue Date

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 that you submitted as part of your application received on December 23, 2008. A receipt for the application filing fee of $500.00 is enclosed. This permit supersedes in its entirety temporary CSP No. 0569-01-CT, issued on September 19, 2008.

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

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

Compliance Certification
Annual Emissions Report Form: Crushing and Screening Plants
Annual Emissions Report Form: Diesel Engines and Diesel Engine Generator
Monitoring Report Form: Fuel Certification
Monitoring Report Form: Operating Hours
Monitoring Report Form: Screening Plant Front-End Loader Exceedances
Monitoring Report Form: Opacity Exceedances
Change of Location Request for a Temporary Source

The following are for use in monitoring visible emissions:

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

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

Sincerely,

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

MS:lt

Enclosures

c: Ed Yamamoto, EHS – Hilo
Wendell Sano, EHS – Kona
CAB Monitoring Section

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ATTACHMENT I: STANDARD CONDITIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 <u>notify</u> the succeeding owner and operator of the existence of this permit and its conditions by letter, copies of which will be forwarded to the Department of Health and the U.S. Environmental Protection Agency (EPA), Region 9.

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

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

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

7. This permit (a) does not release the permittee from compliance with other applicable statutes of the State of Hawaii, or with applicable local laws, regulations, or ordinances, 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 <u>notify</u> the Department of Health and U.S. EPA Region 9 in writing of the following dates:

a. The **anticipated date of initial start-up** for each emission unit of a new source or 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 <u>reported</u> in writing to the Department of Health by a responsible official of the source.

    (Auth.: HAR §11-60.1-8; SIP §11-60-10)[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)

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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**.**

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ATTACHMENT II: SPECIAL CONDITIONS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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. This Mobile Crushing Plant encompasses the following equipment and associated appurtenances:

   a. 340 TPH Extec mobile crusher, model no. C12, serial no. 6908, with 310 hp Caterpillar diesel engine, model no. 3306BDITA, serial no. 64Z31751, water spray system, and various conveyors;
   b. 380 TPH Kue Ken primary jaw crusher, model no. 4236 (42" x 36"), serial no. 120M5017, with stepped vibrating grizzly feeder approximately 42" x 16";
   c. 210 TPH Telsmith cone crusher, model no. 48 S TEL, serial no. 202M7274, with an El-Jay two-deck screen, model no. 34D0689, identification no. FSG514324;
   d. 275 hp Caterpillar diesel engine, model no. 3306T, serial no. 7JB05489;
   e. 360 kW Detroit Diesel diesel engine generator, model no. 8083-7400, serial no. 8VF112536;
   f. 179 TPH Powerscreen Powergrid, 10 ft x 14 ft, model no. Mk II, serial no. 7204123, with:
      i. Discharge belt conveyor;
      ii. Discharge hopper;
      iii. A rubber shroud; and
   g. Various conveyors and water spray systems.

   (Auth.: HAR §11-60.1-3)

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

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

Section B. Applicable Federal Regulations

1. The 340 TPH crusher, 380 TPH crusher, 179 TPH screener, and associated conveyors 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]

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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, §60.8, §60.670)[1]

Section C. Operational and Emission Limitations

1. Hour Limits

   a. The total operating hours of the 380 TPH crushing plant shall not exceed 2,500 hours in any rolling twelve-month (12-month) period.

   b. The total operating hours of the 210 TPH crushing plant shall not exceed 2,500 hours in any rolling twelve-month (12-month) period.

   c. The total operating hours of the 275 hp diesel engine shall not exceed:

      i. 2,500 hours in any rolling twelve-month (12-month) period; and
      ii. Twenty two (22) hours per day.

   d. The total operating hours of the 360 kW diesel engine generator shall not exceed:

      i. 2,500 hours in any rolling twelve-month (12-month) period; and
      ii. Twenty two (22) hours per day.

   e. The total operating hours of the 179 TPH screening plant, as represented by the total hours of the (exempt) 58 hp diesel engine, shall not exceed 3,120 hours in any rolling twelve-month (12-month) period.

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

2. Diesel Engines and Diesel Engine Generator

   a. Power for the 340 TPH crushing plant shall be provided by the 310 hp diesel engine.

   b. Stack Height Requirement

      i. The minimum stack height for the 310 hp diesel engine shall be 13 feet above base elevation.

      ii. The minimum stack height for the 275 hp diesel engine shall be 19 feet-8 inches above base elevation.

iii. The minimum stack height for the 360 kW diesel engine generator shall be 19 feet-8 inches above base elevation.

c. The diesel engines and diesel engine generator shall only be fired on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

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

e. The diesel engines and diesel engine generator shall be maintained in good operating condition to promote good combustion and minimize emissions.

(Auth.: HAR §11-60.1-3,§11-60.1-32, §11-60.1-38, §11-60.1-90; SIP §11-60-24)[2]

3. 179 TPH Screening Plant

a. The permittee shall operate the front-end loaders at the site in accordance with the following conditions:

i. The maximum heaped bucket capacity of the front-end loader used to load the screening plant shall not exceed 5.25 cubic yards (cy);
ii. The permittee shall operate only one (1) front-end loader for loading of the screening plant to limit screening operations to 179 TPH. At no time shall more than one (1) front-end loader be utilized for loading of the screening plant; and
iii. The screening plant shall be limited to 105 cubic yard per hour;

b. The permittee shall not operate the screening plant in a configuration that would result in an increase in the number of emission points, such as the addition of more transfer or stacking conveyors.

c. The permittee shall adequately dampen the material prior and subsequent to screening operations to minimize fugitive dust.

d. A discharge hopper and rubber shroud mounted under the screen shall be installed, operated, and maintained to direct screened material onto the discharge conveyor and contain fugitive dust when the screened material is transferred to the conveyor. The discharged hopper and rubber shroud shall be utilized at all times during operation of the screening plant.

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

4. Fugitive Emission Limits

   a. The permittee shall not cause to be discharged into the atmosphere from any crusher and screener, 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 take reasonable precautions to prevent fugitive dust from becoming airborne 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]

5. Fugitive Dust Controls

   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. The water spray system(s) shall be maintained and utilized, as necessary, during operation of the crushing and screening plants. 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. The water spray nozzles shall be located at the loading points of the crushers, screen and drop discharge end of the conveyors, including the following locations:

      i. The transfer location into the crushers;
      ii. Conveyor transfer to the cone crusher;
      iii. Conveyor transfer below each crusher;
      iv. Conveyor transfer to the screen;
      v. Conveyor transfer from the screen;
      vi. Other material transfer points; and
      vii. Conveyor transfer to each stockpile.

   c. The crushing and screening plants shall not be operated if observation or the routine inspection required in Attachment II, Special Condition No. D.5.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(s). The permittee shall investigate and correct the problem before resuming operations. The normal operating water pressure (psi) and/or flow rate (gal/min) for the water spray systems of the crushing plant shall be established during the performance test conducted pursuant to Attachment II, Section F, and may be incorporated into the permit.

d. A water truck shall be maintained and utilized during the facility's operating hours and at other times as necessary to minimize fugitive dust from haul roads, stockpiles, material transfer points, and other applicable site locations.

e. The water spray systems 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.

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

6. Plant Maintenance

The Mobile Crushing Plant, which includes the crushers, screener, diesel engines, diesel engine generator, conveyors and water spray systems, shall be maintained in good operating condition with scheduled inspection and maintenance as recommended by the manufacturer, or as needed.

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

7. Alternate Operating Scenario

a. The permittee may replace the diesel engines and the diesel engine generator with a temporary replacement unit if any repair reasonably warrants the removal of the diesel engine or the diesel engine generator from its site (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation) and the following provisions are adhered to:

   i. Notification and approval in accordance with Special Condition No. E.7.a.;
   ii. The temporary replacement unit is similar in size with equal or lesser emissions;
   iii. The temporary replacement unit complies with all applicable conditions including all air pollution control equipment requirements, operating restrictions, and emission limits;
   iv. The diesel engine or diesel engine generator shall be repaired and returned to service at the same location in a timely manner; and
   v. Removal and return information is submitted as required by this Attachment, Special Condition No. E.7.b.

b. The Department of Health may require an ambient air quality assessment of the temporary unit, and/or provide a conditional approval to impose additional monitoring, testing, recordkeeping, and reporting requirements to ensure the temporary unit is in compliance with the applicable requirements of the permitted unit being temporarily replaced.

c. Records shall be maintained in accordance with Special Condition No. D.10.; and

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, §11-60.1-90)

8. Location Change

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

b. Subsequent location changes of the equipment shall be in accordance with Section G of Attachment II. For each change in location, the Department of Health reserves the right to impose additional operational controls and restrictions if a site evaluation indicates the controls and/or restrictions are necessary.

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

Section D. Monitoring and Recordkeeping Requirements

1. Records

All records, or copies thereof, including support information, shall be maintained for at least five (5) years from the date of the monitoring sample, measurement, test, report, or applications. Support information includes all maintenance, inspection, and repair records, and copies of all reports required by this permit. These records shall be true, accurate, and 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. Production

The permittee shall maintain records on the total tons of material processed by the Mobile Crushing Plant for purposes of annual emissions reporting.

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

3. Fuel Specification

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

type of fuel purchased and received.

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

4. Hour Limits

a. The permittee shall operate and maintain a non-resetting hour meter on the 275 hp diesel engine, 360 kW diesel engine generator, and (exempt) 58 hp diesel engine for the permanent recording of the total hours 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 meter shall permanently record the total hours of operation for the purpose of the hour limitations specified in Attachment II, Special Condition No. C.1. The following information shall be recorded for the diesel engines and diesel engine generator:

i. The horsepower (hp) or kilowatt (kW), manufacturer's name, model number, and serial number of the diesel engine or diesel engine generator;
ii. The crushing and screening plants the diesel engines and diesel engine generator are providing power to;
iii. The date of meter reading;
iv. Beginning readings for each month;
v. Total hours of operation for each day for the 275 hp diesel engine and 360 kW diesel engine generator;
vi. Total hours of operation for each month;
vii. Total hours of operation on a rolling twelve (12) month basis; and
viii. Recorder's name and title.

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

5. Water Spray System

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

b. The water spray system, including the water pump, piping system, spray bars, spray nozzles, and water flow meter shall be checked routinely or at least once per week to ensure proper operation of the water spray system.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §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 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. 179 TPH Screening Plant

The permittee shall record the dates and duration where more than one front-end loader is used to load the portable screen, or where the heaped bucket capacity of the front-end loader used to load the screen is greater than 5.25 cubic-yards (cy). The permittee shall include the description of the incidence, for example, the number of loaders, the size of the bucket(s) the type and amount (tons) of material processed during the incident, and why it occurred.

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

8. Performance Test

Performance tests shall be conducted on the crushing plant 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)

9. Visible Emissions (V.E.)

a. Diesel Engines and Diesel Engine Generator

i. Except in those months when V.E. observations are conducted by a certified reader for the annual observation of the diesel engines and diesel engine generator, the permittee shall conduct **monthly** (calendar month), V.E. observations of the diesel engines and 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 engines and diesel engine generator, the observer shall comply with the following additional requirements:

(1) The distance between the observer and the emission source shall be at least three (3) stack heights but not more than 402 meters (0.25 miles); and
(2) 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.

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

iii. 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 and diesel engine generator. The waiver request is to be submitted prior to the required annual V.E. observation and must include documentation justifying such action. Documentation should include, but is not limited to, the results of the prior V.E. observation indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous annual V.E. observation.

b. Fugitive Emissions

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 Mobile Crushing Plant 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.4.a. and C.4.b. Records shall be completed and maintained in accordance with the Visible Emission Observation Form requirements. 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 crushers and screener at the time the observations were made;
iv. The observer shall note proper water spray flow for the crushing plant; and
v. The Department of Health may allow observation of a portion of the total fugitive emission points subject to opacity limits if it can be demonstrated that operations have been in compliance with the permit. At a minimum, at least three (3) fugitive emission points shall be observed each month. The selection of points shall include the primary crushers or those points as specified by the Department of Health. Allowance to observe a portion of the total required fugitive emission points shall be obtained in writing from the Department of Health.

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

10. 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)

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Section E. Notification and Reporting Requirements

1. Standard Condition Reporting

   Notification and reporting pertaining to the following events shall be done in accordance with Attachment I, Standard Conditions Nos. 16, 17 and 24, 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. Reporting 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 preventative measures taken. Corrective actions may include a requirement for additional source testing, more frequent monitoring, or 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 Attachment II, 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.5., which includes position and locations of the V.E. reading.

   b. Written reports of the results of the source performance test 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 §60.8, 40 CFR § 60.676, SIP §11-60-15)[1, 2]

4. Monitoring Reports

   The permittee shall complete and submit **semi-annually** monitoring reports to the Department of Health. The reports shall be submitted **within sixty (60) days** after the end of each semi-annual calendar period (January 1 - June 30 and July 1 - December 31),

signed and dated by a responsible official, and shall include the following:

a. Identify the type of fuel fired by the diesel engines and diesel engine generator during the respective reporting period. Include the maximum sulfur content (% by weight) of the fuel;
b. The total operating hours of the 275 hp Caterpillar diesel engine on a daily, monthly, and twelve (12) month rolling basis;
c. The total operating hours of the 360 kW Detroit Diesel diesel engine on a daily, monthly, and twelve (12) month rolling basis;
d. The total operating hours of the (exempt) 58 hp Duetz diesel engine on a monthly and twelve (12) month rolling basis;
e. The total operating hours of the 380 TPH crushing plant on a monthly and twelve (12) month rolling basis;
f. The total operating hours of the 210 TPH crushing plant on a monthly and twelve (12) month rolling basis;
g. Each incident the equipment of the Mobile Crushing Plant operational limitations as specified in Attachment II, Special Condition Nos. C.1.c.ii., C.1.d.ii., and C.3.a. are exceeded; and
h. Identify any opacity exceedances as determined by the required V.E. monitoring of the Mobile Crushing Plant. Each exceedance reported shall include the date, six (6) minute average opacity reading, possible reason for exceedance, duration of exceedance, and corrective actions taken. If there were no exceedances, the permittee shall submit in writing a statement indicating that for each equipment there were no exceedances for that semi-annual period.

The following enclosed forms shall be used:

a. **Monitoring Report Form: Fuel Certification**;
b. **Monitoring Report Form: Operating Hours**;
c. **Monitoring Report Form: Screening Plant Front-End Loader Exceedances**; and
d. **Monitoring Report Form: Opacity Exceedances**.

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

5. Annual Emissions Reporting

a. 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 pollutant, including hazardous air pollutants. The report is due **within sixty (60) days** following the end of each calendar year. The following forms shall be used:

i. **Annual Emissions Report Form: Crushing and Screening Plants**; and
ii. **Annual Emissions Report Form: Diesel Engines and Diesel Engine Generator**.

b. Upon the permittee's written request, the deadline for the annual emissions report may be extended, if the Department of Health determines that reasonable justification exists for the extension.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

6. Compliance Certification

a. 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:

i. The identification of each term or condition of the permit that is the basis of the certification;
ii. The compliance status;
iii. Whether compliance was continuous or intermittent;
iv. The methods used for determining the compliance status of the source currently and over the reporting period;
v. 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
vi. Any additional information as required by the Department of Health including information to determine compliance.

b. 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.

c. 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. Alternate Operating Scenario

a. The permittee shall submit a written request and receive prior written approval from the Department of Health before the exchange. The written request shall identify at a minimum the reasons for the replacement of the diesel engine from the site of operation and the estimated time period/dates for the temporary replacement, type and size of the temporary unit, emissions data, and stack parameters.

b. Prior to the removal and return of the diesel engine, the permittee shall submit to the Department of Health written documentation on the removal and return dates and on

the make, size, model and serial numbers for both the temporary replacement unit and the installed unit.

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

Section F. Testing Requirements

1. Performance Testing

   a. The permittee shall conduct or cause to be conducted an annual source performance test on the Mobile Crushing Plant equipment subject to the opacity limits specified in Attachment II, Special Condition Nos. C.4.a. and C.4.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, §11-60.1-5, §11-60.1-11, §11-60.1-90; 40 CFR §60.675)[1]

2. Performance Test Methods

   a. Performance tests for the determination of opacity 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 for the fugitive emissions observations:

      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 fugitive emission sources. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed; and
      iii. The observer shall record the operating capacity (tons/hr) of the crushers and screener at the time observations were made.

   b. When determining compliance with the fugitive emissions standard specified in Attachment II, Special Condition Nos. C.4.a. and C.4.b., the duration of Method 9 observations must be thirty (30) minutes (five (5) 6-minutes averages). Compliance with the applicable fugitive emission limits specified in Attachment II, Special Condition Nos. C.4.a. and C.4.b. must be based on the average of the five (5) 6-minute averages.

   c. When determining compliance with the fugitive emissions standards of Attachment II, Special Condition Nos. C.4.a. and C.4.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; or

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

d. A single visible emission observer may conduct visible emission observations for up to three (3) fugitive, stack, or vent emission points within a 15-second internal if the following conditions are met:

i. No more than three emission points may be read concurrently;
ii. All three emission points must be within a 70 degree viewing sector or angle in front of the observer such that the proper sun position can be maintained for all three points; and
iii. If an opacity reading for any one of the three emission points equals or exceeds the applicable standard, then the observer must stop taking readings for the other two points and continue reading just that single point.

e. If, after **thirty (30) days** notice for an initially scheduled performance test, there is a delay, for example, due to operational problems, 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. Testing Expense and Monitoring

Performance tests shall be made at the expense of the permittee and shall be conducted at the maximum expected production rate at which the plant will be operated. All tests may be monitored by the Department of Health.
(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90)

4. 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, §11-60.1-5, §11-60.1-11, §11-60.1-90)

5. Performance Test Plan

At least **thirty (30) days prior** to conducting a source 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, and other parameters that may affect test results. Such a plan shall conform to

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U.S. EPA

guidelines, including quality assurance procedures. A test plan or quality assurance plan that does not meet EPA guidelines may be grounds to invalidate any test and require a retest.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90; 40 CFR §60.8, SIP §11-60-15)[1, 2]

6. Performance Test Report

Within sixty (60) days after completion of each performance test, 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 (e.g., operating rate in tons/hr, water meter flow rate during the test in gal/min, etc.), the summarized test results, 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. The performance test report shall include the primary crusher operating rate (tons/hr) at the closed side setting, locations of where the visible emissions were read, visible emission readings, location of water sprays, and normal operating gallon per minute flow rate of the water spray system during the test. The normal operating water flow rate of the water spray system shall be determined by the water flow rate used during the source performance test that demonstrates compliance with the opacity limits.

(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 annual 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 test(s) indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous performance test.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

Section G. Change of Location Requirements

1. The permittee shall complete and 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, and 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 and any fence lines;
   ii. Location of all structures within 100 meters of the equipment. Provide the building dimensions (height, length, and width) of all structures that have heights greater than 40% of the stack height of the equipment; and
   iii. Identification of any other air pollution sources at the new location.

e. List of the equipment to be used at the site and description of the plant configuration;
f. Area map showing the equipment and the new proposed location;
g. Projected dates of operation at the new location;
h. Identification of any other air pollution sources at the new location;
i. 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
j. 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, §11-60.1-5, §11-60.1-90, §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," along with the area maps showing the equipment and the new proposed location.

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

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Section H. 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)

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[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.

PROPOSED

ATTACHMENT II – INSIG
SPECIAL CONDITIONS – INSIGNIFICANT ACTIVITIES
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 their authorized representative upon request.

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

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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, §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 be submitted **within ninety (90) days** *after the end of each calendar year*, and shall be signed and dated by a responsible official. 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.

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 the **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

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)

PROPOSED

ATTACHMENT III: ANNUAL FEE REQUIREMENTS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 (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

PROPOSED

ATTACHMENT IV: ANNUAL EMISSIONS REPORTING REQUIREMENTS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 form(s):

   Annual Emissions Report Form: Crushing and Screening Plants
   Annual Emissions Report Form: Diesel Engines and Diesel Engine Generator

2. The reporting period shall be from January 1 to December 31 of each year. All reports shall be submitted to the Department of Health within **sixty (60) days** after the end of each calendar year and shall be mailed to the following address:

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

3. The permittee shall retain the information submitted, including all emission calculations. These records shall be in a permanent form suitable for inspection, retained for a minimum of five (5) years, and made available to the Department of Health upon request.

4. Any information submitted to the Department of Health without a request for confidentiality shall be considered public record.

5. In accordance with HAR, Section 11-60.1-14, the permittee may request confidential treatment of specific information, including information concerning secret processes or methods of manufacture, by submitting a written request to the Director and clearly identifying the specific information that is to be accorded confidential treatment.

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COMPLIANCE CERTIFICATION FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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.

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COMPLIANCE CERTIFICATION FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(CONTINUED, PAGE 2 OF _____)

Issuance Date: **Expiration Date:**

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

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

A. Attachment I, Standard Conditions

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

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

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

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COMPLIANCE CERTIFICATION FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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.

Permit term/condition	Equipment(s)	Method	Compliance
		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)

PROPOSED

COMPLIANCE CERTIFICATION FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(CONTINUED, PAGE _____ OF _____)

Issuance Date: **Expiration Date:**

D. Deviations

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

(Make Additional Copies if Needed)

PROPOSED

ANNUAL EMISSIONS REPORT FORM
CRUSHING AND SCREENING PLANTS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 Future Use)

For Period:_____ Date:_____

Company:_____

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 total tons per year (TPY) of materials processed and air pollution control measures in use:

Type of Operation	Materials Processed (TPY)	Air Pollution Control Measures in Use	Control Efficiency (% Reduction)
Truck Unloading			
340 TPH Extec Jaw Crushing			
380 TPH Kue Ken Jaw Crushing			
210 TPH Telsmith Cone Crushing			
179 TPH Powerscreen Screener			
Conveyors			
Stockpiles			
Truck Loading			

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, or Shroud: 70%
*Subsequent transfer points of water sprayed material: 70-(5*n)%*
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.

PROPOSED

ANNUAL EMISSIONS REPORT FORM
DIESEL ENGINES AND DIESEL ENGINE GENERATOR
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 Future Use)

For Period:_____ Date:_____

Company:_____

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):_____

Fuel Consumption

Report the total fuel usage (gallons) for the calendar year.

Equipment Description	Total Fuel Oil No. 2 Consumption (gal/yr)	Maximum % Sulfur Content by Weight
310 hp Caterpillar diesel engine		
275 hp Caterpillar diesel engine		
360 kW Detroit Diesel diesel engine generator		

PROPOSED

MONITORING REPORT FORM
FUEL CERTIFICATION
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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:_____

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 maximum fuel sulfur content (% by weight) of fuel oil no. 2 for the reporting period:

Fuel Certification			
Equipment Description	Types of Fuel Fired during the Reporting Period	Supplier	Maximum Sulfur Content (% by Weight)
310 hp Caterpillar diesel engine	Fuel Oil No. 2		
275 hp Caterpillar diesel engine	Fuel Oil No. 2		
360 kW Detroit Diesel diesel engine generator	Fuel Oil No. 2		
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 percent sulfur content by weight.			

PROPOSED

MONITORING REPORT FORM
OPERATING HOURS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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 report to the Department of Health the following information **semi-annually**:

(Make Copies for Future Use)

For Period:_____ Date:_____

Company:_____

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 total operating hours of the 275 hp diesel engine, 360 kW diesel engine generator, and 58 hp diesel engine:

HOURS OF OPERATION						
Month	275 HP DE		360 kW DEG		58 HP DE	
	Hours	12-Month Rolling Basis	Hours	12-Month Rolling Basis	Hours	12-Month Rolling Basis
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

PROPOSED

MONITORING REPORT FORM
OPERATING HOURS
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(CONTINUED, PAGE 2 OF 2)

Issuance Date: **Expiration Date:**

(Make Copies for Future Use)

2. Report all incidents when the operating hours of the 275 hp diesel engine or 360 kW diesel engine generator exceeded 22 hours per day. If no such incidents occurred, state "none".

Equipment Description	Date of Exceedance	Total Hours Operated	Reason for Exceedance

3. Report the total operating hours of the 380 TPH crushing plant and 210 TPH crushing plant:

HOURS OF OPERATION				
Month	380 TPH Crushing Plant		210 TPH Crushing Plant	
	Hours	12-Month Rolling Basis	Hours	12-Month Rolling Basis
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

PROPOSED

MONITORING REPORT FORM
SCREENING PLANT FRONT-END LOADER EXCEEDANCES
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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:

(Make Copies for Future Use)

For Period:_____ Date:_____

Company:_____

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):_____

Equipment utilization

In accordance with Attachment II, Special Condition No. C.3.a., the permittee shall operate the front-end loaders at the site with the following conditions:

i. The maximum heaped bucket capacity of the front-end loader used to load the screening plant shall not exceed 5.25 cubic-yards (cy); and
ii. The permittee shall operate only one (1) front-end loader for limiting the screening operations to 179 TPH. At no time shall more than one (1) front-end loader be utilized for loading of the screening plant.

Indicate in the table below, each incident Attachment II, Special Condition No. C.3.a. was exceeded. If there were no exceedances, state “none”.

FRONT-END LOADER EXCEEDANCES					
Dates of Exceedance		Total Hours Operated During Exceedance	Type and Total Tons of Material Processed During Exceedance	Specify the Number of Front-End Loaders and Max Bucket Capacity Exceedance	Reason For Exceeding the Limitation
From	To				

PROPOSED

MONITORING REPORT FORM
OPACITY EXCEEDANCES
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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/Facility 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.

Responsible Official (Print):_____

Title:_____

Responsible Official (Signature):_____

Visible Emissions:

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

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

PROPOSED

CHANGE OF LOCATION REQUEST FOR A TEMPORARY SOURCE
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(PAGE 1 OF 3)

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 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 site containing the following information:

   a. Identification of the property boundary and any fence lines;
   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; and
   c. Identification of any other air pollution sources at the new location.

3. The permittee shall submit a **$100 filing fee** with each change of location request for a non-toxic, covered source. The fee shall be made payable to the **Clean Air Special Fund- COV .**

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

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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.

PROPOSED

CHANGE OF LOCATION REQUEST FOR A TEMPORARY SOURCE
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(CONTINUED, PAGE 2 OF 3)

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. 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:
   Indicate the equipment proposed for usage at the new site, by circling the equipment description and circling the permit equipment number, and filling in the number of conveyors and water spray bars, as specified in Attachment II, Special Condition No. A.1.

Equipment Description	Permit Equipment number	Equipment Description	Permit Equipment Number
340 TPH Exec mobile crusher with 310 hp Caterpillar diesel engine	1.a.	275 hp Caterpillar diesel engine	1.d.
380 TPH Kue Ken primary jaw crusher	1.b.	360 kW Detroit Diesel diesel engine generator	1.e.
210 TPH Telsmith cone crusher	1.c.	_____ number of conveyers	1.g.
179 TPH mobile Powerscreen Powergrid with 58 hp Duetz diesel engine	1.f.	_____ number of water spray bars	1.g.

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:_____

PROPOSED

CHANGE OF LOCATION REQUEST FOR A TEMPORARY SOURCE
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT
(CONTINUED, PAGE 3 OF 3)

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)

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):_____ Date:_____

Title:_____

Responsible Official (Signature):_____

PROPOSED

VISIBLE EMISSIONS FORM REQUIREMENTS
STATE OF HAWAII
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-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.

PROPOSED

VISIBLE EMISSIONS FORM
TEMPORARY COVERED SOURCE PERMIT NO. 0569-01-CT

Issuance Date: **Expiration Date:**

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

Company Name:_____

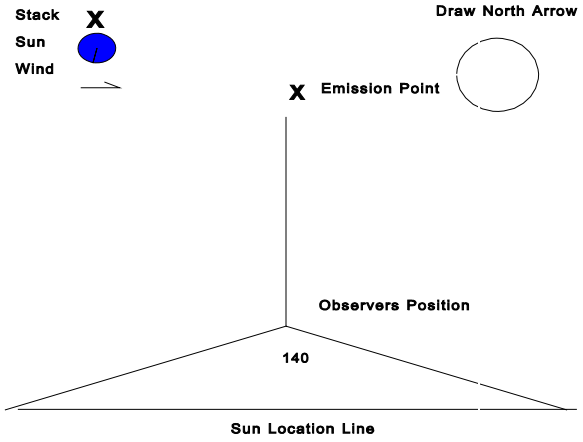
For stacks, describe equipment and fuel:_____

For fugitive emissions from crushers and screens, describe:

Fugitive emission point:_____

Plant Production (tons/hr):_____

(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):_____

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

Observation Date and Start Time:_____

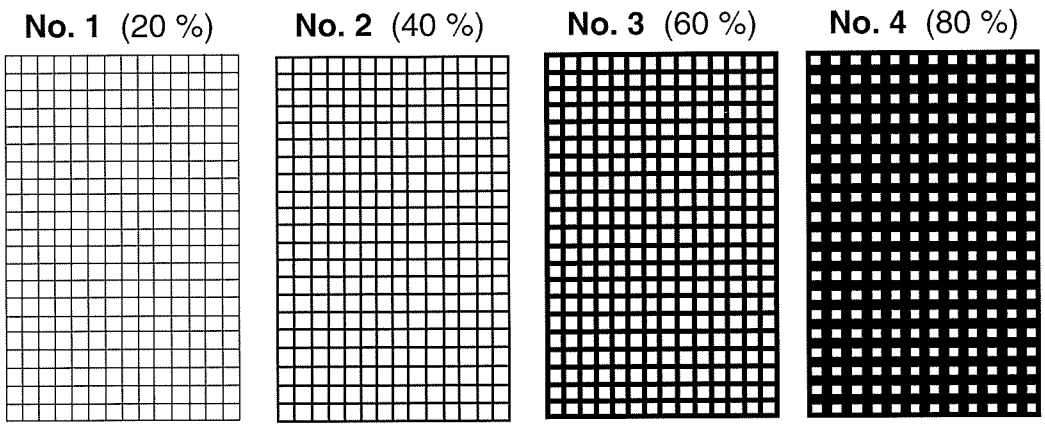
Method of observation (Ringelmann Chart or Method 9):_____

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

The Ringelmann Chart

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

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



Ringelmann Chart (not to scale)

Regulating Visible Emissions

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

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