

TEMPORARY COVERED SOURCE PERMIT REVIEW - NO. 0242-01-CT
Minor Modification - Adding 386 TPH Mobile Cone Crusher, 400 TPH Screen,
661 TPH Mobile Screen, and Portable Conveyor
Application No. 0242-08

Applicant: Goodfellow Brothers, Inc.

Facility: 780 TPH Stone Processing Plant with 1,000 kW Diesel Engine Generator and 700
TPH Mobile Stone Processing Plant with Integral Diesel Engines

Equipment Location: Various locations throughout the state

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Background:

Goodfellow Brothers, Inc. (GBI) owns and operates a variety of crushers, screens, and conveyors for stone processing activities. The equipment is used to crush basalt and other materials for construction purposes. Materials are batch-dropped into a primary crusher, forwarded via conveyors to either a stockpile or to a secondary and possibly a tertiary crusher. The stockpiles either remain throughout the duration of the project or are moved by a front-end loader.

The equipment is deployed to various locations and may be erected in several different configurations depending on the project requirements. The current permit covers most of GBI's equipment inventory of crushers, screen trailers, and diesel engine generators. The permitted inventory of equipment also includes crushers with integrated diesel engines. To allow operational flexibility, the permit allows the following plant configurations:

Non-Mobile Crushers

- i. One (1) primary crusher;
- ii. One (1) secondary crusher;
- iii. One (1) tertiary crusher;
- iv. One (1) 1,000 kW diesel engine generator (LP-84, LP-121, LP-130);

- v. Three (3) screens - limited to one (1) mobile screen (K-145, K-147, or K-155);
- vi. Four (4) storage piles; and
- vii. Various conveyors.

Mobile Crushers

- i. One (1) Nordberg Mobile Jaw Crusher (K-148, K-149, K-150, K-151, or K-164);
- ii. One (1) Nordberg Mobile Cone Crusher (K-152);
- iii. One (1) mobile screen (K-145, K-147, or K-155);
- iv. Two (2) storage piles; and
- v. Various conveyors.

Due to the size and manufacture date of the crushers, the crushers are subject to 40 CFR Part 60, Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants.

Proposed Project:

GBI is proposing to add one 386 TPH mobile cone crusher, one 661 TPH mobile screen, one 400 TPH screen, and one portable conveyor. The addition of these equipment to GBI's inventory is considered a minor modification because the emissions from each temporary location will not increase.

The 386 TPH mobile cone crusher is a Terex-Pegson Maxtrack 52" cone crusher. The mobile crusher is track-mounted and uses a 425 hp integral diesel engine to power the drive train and the jaw crusher. The 425 hp diesel engine is a Caterpillar C-12 DITA and is tier II certified. GBI equipment no. K- 166.

The 661 TPH mobile screen is a Powerscreen Chieftain 2100 2-deck screen. The mobile screen is also track-mounted and uses a Deutz 100 hp diesel engine to power the drive train and the screen. The 100 hp diesel engine is an insignificant activity. GBI equipment no. K- 167. In order to remain a minor modification, operational limitations need to be imposed on the screen because the screen is larger than any of the screens in the current inventory and emissions at each temporary location cannot increase. As such, the screen will only be allowed to operate with the 400 TPH mobile jaw crushers and the 386 TPH cone crusher above.

The 400TPH screen is a JCI Dual 6203-32LP screening plant. The screening plant is a 6'x 20' 3-

deck screening trailer. Power to operate the screen will come from one of GBI's currently permitted diesel engine generators. GBI equipment no. K-165.

The portable conveyor is a Powerscreen MGL M95 hydraulic conveyor. The portable conveyor uses a 78 hp diesel engine to power the conveyor system. The 78 hp diesel engine is an insignificant activity.

Once this modification is complete, each temporary location is allowed to have any or all of the following equipment (changes in bold):

a. Non-Mobile Stone Processing Plant

- i. One (1) primary crusher
- ii. One (1) secondary crusher;
- iii. One (1) tertiary crusher;
- iv. One (1) 1,000 kW diesel engine generator (LP-84, LP-121, LP-130);
- v. Three (3) screens - limited to one (1) mobile screen (K-145, K-147, or K-155);
- vi. Four (4) storage piles; and
- vii. Various conveyors

b. Mobile Stone Processing Plant

- i. One (1) Nordberg Mobile Jaw Crusher (K-148, K-149, K-150, K-151, or K-164);
- ii. One (1) Mobile Cone Crusher (K-152 or **K-166**);
- iii. One (1) mobile screen (K-145, K-147, or K-155);
- iii. Two (2) storage piles; and
- iv. Various conveyors.

c. **661 TPH Mobile Screen K-167**

The 661 TPH mobile screen shall operate only with the following equipment at temporary stone processing plant location:

- i. One (1) 400 TPH Nordberg Mobile Jaw Crusher (K-148, K-149, K-150, or K-164);**
- ii. One (1) 396 TPH Terex-Pegson Mobile Cone Crusher (K-166);**
- iii. Two (2) storage piles; and**
- iv. Various conveyors**

Equipment Description:

The following is a list of the equipment covered under this temporary covered source permit. The equipment listed in bold are being added under this modification.

- a. 780 TPH Jaw Crusher, Nordberg model C140B, serial no. C1403124: equipment no. K-129;
- b. 780 TPH Jaw Crusher, Nordberg model C140B, serial no. 34395: equipment no. K-76;
- c. 700 TPH Cone Crusher, Nordberg model no. HP400, serial no. 123450: equipment no. K-153;
- d. 500 TPH Cone Crusher, Omnicone model 1560, serial no. 1560-253: equipment no. K-26;
- e. 500 TPH Cone Crusher, Omnicone model 1560, serial no. 304-300034: equipment no. K-130;
- f. 440 TPH Screen Trailer, JCI model FSG5162-26, serial no. 97H01F32: equipment no. K-27;
- g. 440 TPH Screen Trailer, JCI model 620332, serial no. 96H01F32: equipment no. K-143;
- h. 400 TPH Screen Trailer, JCI model 6203-32LP, serial no. P060378: equipment no. K-165**
- i. 264 TPH Screen, Cedar Rapids, 4'x12'x2, serial no. 1426: equipment no. K-23;
- j. 1 MW Diesel Engine Generator, Gen Set model 3512, serial no. 24Z8717, with a minimum stack height of 17 feet: equipment no. LP-130;
- k. 1 MW Diesel Engine Generator, Gen Set model 3512, serial no. 24Z01234, with a minimum stack height of 17 feet: equipment no. LP-84;
- l. 1 MW Diesel Engine Generator, Gen Set model 3512, serial no. 24Z08458, with a minimum stack height of 17 feet: equipment no. LP-121;
- m. 700 TPH Mobile Jaw Crusher, Nordberg model no. LT110, serial no. 72940, with Caterpillar Diesel Engine model no. C-12 DITA, serial no. BDL04410, with a minimum stack height of 15.9 feet: equipment no. K-151;
- n. 400 TPH Mobile Jaw Crusher, Nordberg model no. LT105, serial no. 72742, with Caterpillar Diesel Engine model no. C-9 DITA, serial no. CLS07165, with a minimum stack height of 11.9 feet: equipment no. K-148;
- o. 400 TPH Mobile Jaw Crusher, Nordberg model no. LT105, serial no. 72816, with Caterpillar Diesel Engine model no. C-9 DITA, serial no. CLJ07851, with a minimum stack height of

9.9 feet: equipment no. K-149;

- p. 400 TPH Mobile Jaw Crusher, Nordberg model no. LT105, serial no. 72839, with Caterpillar Diesel Engine model no. C-9 DITA, serial no. CLJ07329, with a minimum stack height of 10.9 feet: equipment no. K-150;
- q. 400 TPH Mobile Jaw Crusher, Nordberg model no. LT105, serial no. 73316, with Caterpillar Diesel Engine model no. C-9 DITA, serial no. CLJ07329, with a minimum stack height of 10.9 feet: equipment no. K-164;
- r. 450 TPH Mobile Cone Crusher, Nordberg model no. LT300HP, serial no. 72814, with Caterpillar Diesel Engine model no. C-15 DITA, serial no. BEM04965, with a minimum stack height of 16.8 feet: equipment no. K-152;
- s. **386 TPH Mobile Cone Crusher, Terex-Pegson model no. 1300 Maxtrak, serial no. 130126CF, with Caterpillar Diesel Engine model no. C-12 DITA, serial no. BDL03217, with a minimum stack height of 15.9 feet: equipment no. K-166;**
- t. **661 TPH Mobile Screen, Powerscreen model no. Chieftain 2100, serial no. 12401468, with 100 hp Deutz Diesel Engine model no. BF4M2012, serial no. 10167853: equipment no. K-167;**
- u. 420 TPH Mobile Screen, Finlay Hydrascreens model no. 683 Super Trak, serial no. FTP510277 with 96 hp Deutz diesel engine: equipment no. K-145;
- v. 420 TPH Mobile Screen, Finlay Hydrascreens model no. 683 Super Trak, serial no. FTP541638 with 96 hp Deutz diesel engine: equipment no. K-147;
- w. 420 TPH Mobile Screen, Finlay Hydrascreens model no. 683 Super Trak, serial no. FTP551003 with 96 hp Deutz diesel engine: equipment no. K-155;
- x. Various conveyors; and
- y. Various water sprays.

Air Pollution Controls:

Water sprays are located at the crushers, screens, conveyors, and stockpiles to control fugitive dust from the crushing operations. Manual watering, including the use of water trucks, will control fugitive dust from the stockpiles and unpaved roads.

Applicable Requirements:

Hawaii Administrative Rules (HAR):

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1 Air Pollution Control

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

11-60.1-31 Applicability

11-60.1-32 Visible Emissions

11-60.1-33 Fugitive Dust

11-60.1-37 Process Industries

11-60.1-38 Sulfur Oxides from Fuel Combustion

Subchapter 5, Covered Sources

Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111 Definitions

11-60.1-112 General Fee Provisions for Covered Sources

11-60.1-113 Application Fees for Covered Sources

11-60.1-114 Annual Fees for Covered Sources

11-60.1-115 Basis of Annual Fees for Covered Sources

Subchapter 8, Standards of Performance for Stationary Sources

11-60.1-161 New Source Performance Standards

Subchapter 10, Field Citations

NSPS:

40 CFR, Part 60, Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants - states that fixed stone processing plants with capacities greater than 25 TPH and portable stone processing plants with capacities greater than 150 TPH, that commence construction, reconstruction, or modification after August 31, 1983 are subject to the requirements of the subpart. As such, all of the crushers are subject to Subpart OOO.

Synthetic minor:

A synthetic minor is a facility that without limiting conditions, physical or operational, emits above the major triggering levels as defined by HAR 11-60.1-1 for either criteria pollutant(s) or hazardous air pollutant(s). Without operational limits, the diesel engines would be a major

source for NO_x. Thus, GBI is a synthetic minor.

Non-Applicable Requirements:

BACT:

A Best Available Control Technology (BACT) analysis is required for each new or modified emissions unit located within a stationary source that has a net emissions increase equal to or greater than the significant levels defined in HAR §11-60.1-1. By definition, an emissions unit is part of a stationary source. A stationary source is a structure, facility, or installation located on one or more contiguous or adjacent properties that are under common ownership or control. Since a stationary source must have a location, each temporary location is a stationary source.

The addition of these units will not cause an increase in emissions at each temporary location. The 396 TPH cone crusher is smaller than the currently permitted 450 TPH cone crusher, K-152. The 400 TPH screen is also smaller than the currently permitted screens. The 661 TPH screen is larger than any of the currently permitted screens. This screen however, will be restricted to operating only with crushers less than 420 TPH. This would limit the amount of material the screen can process and the emissions at each temporary location will not increase.

CAM:

The purpose of Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM. Since the facility is not a major source, CAM does not apply.

CERR (Consolidated Emission Reporting Rule):

40 CFR part 51, Subpart A – Emission Inventory Reporting Requirements, determines the annual emissions reporting frequency based on the actual emissions of each pollutant from any individual emission point within the facility that emits at or above the triggering levels. Since the trigger levels are at or above the major source levels and by definition, a temporary source

cannot be a major source, the facility is not subject to annual emission reporting under CERR.

The Department does however, require facilities to report their annual emissions if the facility-wide emissions exceed the Department's trigger levels. The Department uses the data for in-house recordkeeping purposes. The temporary stone processing plants exceed the Department's trigger levels and are required to submit annual emissions. The proposed modification does not affect this applicability. Table 1 below summarizes the Department's trigger levels and illustrates the facility's applicability.

Table 1 Comparison of Emissions to CAB Trigger Levels

| Pollutant | 780 TPH plant 2,000 hrs (TPY) | CAB trigger (TPY) |
|------------------|-------------------------------------|-------------------------|
| PM ₁₀ | 17 | 25 |
| SO _x | 5.8 | 25 |
| NO _x | 36.6 | 25 |
| VOC ¹ | 1.0 | 25 |
| CO | 9.7 | 250 |

1 - total organic compounds (TOC) as volatile organic compounds (VOC)

NESHAP/MACT:

Stone processing is not a NESHAP source.

40 CFR 63, Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines is not applicable to the diesel engines because the facility is not a major source of HAPs.

PSD:

PSD does not apply since this facility is not a major source.

Insignificant Activities/Exemptions:

The small diesel engines used on portable conveyor and the 661 TPH screen are insignificant activities because with a fuel feed rate of 3.0 and 4.9 gallons per hour respectively, the heat input

is less than 1 MMBtu/hr. HAR§11-60.1-82(f)(2)

Alternate Operating Scenarios:

No new alternate operating scenarios were proposed. Currently, GBI is allowed to use a temporary replacement for their diesel engine generators should one of them unexpectedly go out-of-service.

Project Emissions:

Emissions at the temporary locations will not increase because the equipment permitted at each location is not changing. As such, no emissions calculations were made. The table below lists the maximum emissions from mobile crushing plant.

Table 2
Facility-wide Emissions for the Mobile Plant with the Maximum Allowed Equipment

| Pollutant | 700 TPH Primary Crusher, K-151 (TPY) | 450 TPH Cone Crusher, K-152 (TPY) | 420 TPH Screen, K-145, 147, or 155 (TPY) | Unpaved Roads 15,000 VMT (TPY) | Facility- wide 2,000 hrs (TPY) |
|------------------|---|--|---|--------------------------------------|---|
| SO ₂ | 0.8 | 1.0 | -- | -- | 1.8 |
| NO _x | 5.0 | 7.2 | -- | -- | 12.2 |
| CO | 1.2 | 0.7 | -- | -- | 1.9 |
| VOC ¹ | 0.1 | 0.1 | -- | -- | 0.2 |
| PM ₁₀ | 8.1 | 5.1 | 0.5 | 7.5 | 21.2 |

1 - total organic compounds (TOC) as volatile organic compounds (VOC)

Air Quality Assessment:

An ambient air quality assessment is required for this modification because the two diesel engines, two Caterpillar C-12s, were not previously modeled together. Although a larger diesel engine, the C-15, was previously modeled with the C-12, a comparison of the screening models for the C-12 and C-15 predicted higher impacts from the C-12 diesel engine. The 100 hp diesel engine on the mobile screen and the 78 hp diesel engine of the hydraulic conveyor system are

considered insignificant activities and thus, do not need to be included in the modeling of an ambient air quality analysis.

The applicant performed an Ambient Air Quality Impact Analysis (AAQIA) using the U.S. USEPA recommended air quality model ISCST3 with screening meteorological data. Receptor arrays with 30 meter spacing were generated from USGS DEM data for each site. The following assumptions were used in the analysis;

1. Simple and complex terrain;
2. Rural dispersion;
3. SCREEN3 default met data;
4. Scaling factors of 0.9, 0.7, 0.4, and 0.2 for the 3-hour, 8-hour, 24-hour, and annual concentrations, respectively.

Table 3 below lists the emission rates and stack parameters used in the analysis.

Table 3
Emission Rates and Stack Parameters

| Unit | Emission Rates (g/s) | | | | Stack Parameters | | | |
|-------|----------------------|-----------------|-------|-------|------------------|--------------|--------------|------------------|
| | NOx | SO ₂ | PM10 | CO | Height (m) | Diameter (m) | Velocity (m) | Temperature (°K) |
| K-151 | 0.631 | 0.181 | 0.014 | 0.152 | 4.88 | 0.127 | 94.4 | 763 |
| K-166 | 0.631 | 0.181 | 0.014 | 0.152 | 4.88 | 0.127 | 94.4 | 763 |

The model was run assuming that both crushers were operating next to each other. Table 4 below shows the results of the modeling runs.

Table 4
ISCST3 Model Results

| Pollutant | Averaging Period | Concentration ($\mu\text{g}/\text{m}^3$) |
|------------------|------------------|--|
| NO _x | Annual | 59 |
| SO _x | 3-hour | 445 |
| | 24-hour | 198 |
| | Annual | 23 |
| PM ₁₀ | 24-hour | 15 |
| | Annual | 2 |
| CO | 1-hour | 415 |
| | 8-hour | 291 |

1 - NO_x concentrations include adjustments for annual throughput limits and EPA tier 1 factor of 0.75

Since GBI is requesting to operate the crushers on any island, the highest background concentrations throughout the state were used in the analysis. Background air quality data used in the analysis was obtained from the Department's 2004 Annual Summary of the Hawaii Air Quality Data. Table 5 below lists the monitoring stations and background concentrations used.

Table 5
Background Values

| Pollutant | Averaging Period | Background ($\mu\text{g}/\text{m}^3$) | Monitoring Station |
|------------------|------------------|---|--------------------|
| NO _x | Annual | 9 | Kapolei |
| SO ₂ | 3-hour | 427 | Hilo |
| | 24-hour | 107 | Hilo |
| | Annual | 8 | Kona |
| PM ₁₀ | 24-hour | 65 | Kihei |
| | Annual | 19 | Kihei |
| CO | 1-hour | 3,762 | University |
| | 8-hour | 2,323 | University |

The tables below summarize the potential impacts when background concentrations are included.

As shown, it is predicted that the operation of the crushers will not exceed the state or national ambient air quality standards (SAAQS/NAAQS).

Table 6
Predicted Impacts from K-151 and K-166

| Pollutant | Averaging Period | Concentration ($\mu\text{g}/\text{m}^3$) | | | |
|-----------------|------------------|--|------------|-------|------------|
| | | ISCST3 Model | Background | Total | % of SAAQS |
| NO _x | Annual | 59 | 9 | 68 | 97 |
| SO ₂ | 3-hour | 445 | 427 | 872 | 67 |
| | 24-hour | 198 | 107 | 305 | 84 |
| | Annual | 23 | 8 | 31 | 39 |
| PM10 | 24-hour | 15 | 65 | 80 | 53 |
| | Annual | 2 | 19 | 21 | 42 |
| CO | 1-hour | 415 | 3,762 | 4,177 | 42 |
| | 8-hour | 291 | 2,323 | 2,614 | 52 |

1 - NO_x concentrations include adjustments for annual throughput limits and EPA tier 1 factor of 0.75

Conclusion and Recommendation:

GBI is proposing to increase their inventory of equipment covered under this permit by adding a non-mobile screen, a mobile cone crusher, and a mobile screen. With the addition of these equipment, the emission estimates and modeling predict that the facility will remain a non-major source and will operate within the limits of the ambient air quality standards. To ensure compliance, the operating hours will be monitored by the use of a non-resetting hour meter on the diesel engines. Air pollution controls at the facility consist of water sprays at various locations.

Issuance of a Temporary Covered Source Permit is recommended based on the information provided by the applicant and the conservative nature of the calculations.