PROPOSED

Temporary Covered Source Permit No. 0547-01-CT Review

Facility: Northwest Demolition & Dismantling
200 TPH Stone Processing Plant with 300 HP Diesel Engine
and Triple-Deck Screener
Located at Hickam Air Force Base, Oahu
UTM 2,358,450 meters North, 607,880 meters East

Applicant: Northwest Demolition & Dismantling

Equipment: 200 TPH Eagle Stone Processing Plant, Model No. 1000-15CV, Serial No. 30008
(Note: Impactor crusher of plant has Serial No. 30007)
300 HP John Deere Diesel Engine, Model No. 6081HF001,
Serial No. RG6081H023213
5' x 12' CEC Triple-Deck Screener
Conveyors (7)
Water sprays

Responsible Official: Mr. Brian H. Smith
President
(503) 638-6900

Contact Person: Mr. Richard Wayper
Project Manager
(503) 638-6900

Mailing Address: Northwest Demolition & Dismantling
P.O. Box 230819
Tigard, OR 97281

Proposed Project:

The applicant submitted their initial noncovered source permit on October 10, 2003, for the operation of the equipment listed above. The noncovered source permit application was based on a 90 TPH production rate. After initial review of the application, the 90 TPH rate was not the maximum capacity of the crusher. A covered source permit application was then submitted May 18, 2004, with the crusher being rated at 200 TPH. A 3,500 hr/yr operating limit was proposed, as was already indicated in the first application submittal.

An air permit would allow the facility to crush and process rock at various locations as approved by the Department. A front-end loader feeds raw material to the grizzly feeder of the jaw crusher. The crushed rock is conveyed to a 3-deck screen where oversized material returns to the jaw crusher and two different sized material is separated and then transported by conveyor belts to stock piles.

The Standard Industrial Classification Code (SICC) for this plant is 1442 (Construction Sand and Gravel). Air emissions impact is evaluated at the initial location, Hickam Air Force Base, Oahu.

Air Pollution Controls:

Water truck will be used at the unpaved roadways and stockpiles to control fugitive dust. 70% efficiency factor is used when water is directly applied at the feed opening of the impact crusher, stockpiles, and unpaved roads. A 35% efficiency factor is used when the crushed rock is damp due to carryover from direct water application.

Applicable Requirements:

Hawaii Administrative Rules (HAR) Title 11 Chapter 59.
Hawaii Administrative Rules (HAR) Title 11 Chapter 60.1:
- 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
  - 11-60.1-38 Sulfur Oxides From Fuel Combustion
- Subchapter 5 - Covered Sources
- Subchapter 6 - Fees for Covered Sources, Sections 111 -115
  - 11-60.1-111 Definition
  - 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(27) Standards of Performance for Nonmetallic Mineral Processing Plants
- Subchapter 10 - Field Citations

Compliance Data System (CDS)

The stone processing plant is a covered source (federal requirements applicable or emissions equal to or greater than 100 TPY criteria air pollutant). As such, the facility will be included in an inventory system for annual inspection.

New Source Performance Standards (NSPS)

NSPS 40 CFR Part 60 Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants applies for portable crushers with a maximum design capacity greater than 150 TPH and construction (fabrication, erection, or installation of an affected facility) date after August 31, 1983. The stone crusher has a capacity of 200 TPH and built after August 1983.

Non-Applicable Requirements:

Best Available Control Technology (BACT)

To determine BACT applicability, fugitive emission are included. Vehicle traffic emissions are added if the definition of “major” requires the consideration of fugitives in calculating potential emissions for major source determination (11-60.1-131 - Definitions). Vehicle fugitive emissions are considered for determining if the NSPS source (source category regulated by Section 111) is major. As shown in Table 1, no pollutant emissions from the facility exceed the respective significant level (11-60.1-1).

Table 1 - Significant Level Trigger Levels

Pollutant	Facility Emissions, TPY	Significant Level, TPY
NO_x	6.17	40
SO_2	1.77	40
CO	0.36	100
PM_{10}	7.73	15
TSP	18.37	25
VOC	0.19	40
Pb	---	0.6

Consolidated Emissions Reporting Rule (CERR)

40 CFR Part 51, Subpart A - Emissions Inventory Reporting Requirements, determines CER based on facility-wide emissions of each air pollutant at the CER triggering level(s). Fugitive emissions are considered if the stationary source belongs in a listed source category (see definition for "major source", HAR 11-60.1-1). Total emissions of each pollutant listed in Table 2 are less than the respective CER triggering levels and therefore, emissions data will not be required to be inputted into the National Emissions Inventory (NEI) database.

However, annual emissions report still will be required because the stone processing plant is a covered source due to federal requirements (e.g., NSPS). Report forms for the stone processing plant and diesel engine will be included in the permit to be submitted with the annual fees, which are based on emissions from the facility.

Table 2 - CERR Triggering Levels

Pollutant	[a]Facility-Wide Emissions, TPY	CER Triggering Levels, TPY
NO_x (as NO_2)	6.17	100
SO_2	1.77	100
CO	0.36	1,000
PM_{10}	7.73	100
VOC	0.19	100
Pb	---	5
HAPs	---	---

[a]Emissions include diesel engine, stone processing plant, stockpile(s) and vehicle traffic

National Emission Standards for Hazardous Emission Pollutants (NESHAP), 40 CFR Part 61
There are no proposed equipment that is a listed source under NESHAP.

Maximum Achievable Control Technology (MACT), 40 CFR Part 63
The facility is not a major source of hazardous air pollutants (HAPs), > 10 TPY single HAP or > 25 TPY for total combined HAPs; and not a listed source category subject to MACT.

Compliance Assurance Monitoring (CAM)

The purpose of 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 CFR, 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. The proposed equipment does not meet the aforementioned requirements listed (1) to (5), and thus CAM is not applicable.

Prevention of Significant Deterioration (PSD)
Not a major source (criteria air pollutant > 100 TPY for listed sources or 250 TPY for all other sources).

Synthetic Minor
Potential emissions equal to or greater than 100 TPY and reduced by physical or operating restrictions (i.e., hour limitation) to below 100 TPY would trigger synthetic minor status. Fugitive sources including vehicle traffic emissions are included in determining applicability since the stone processing plant is subject to NSPS. The pollutant with the highest emissions is TSP with 37.21 TPY from the stone processing plant and diesel engine operating continuously for 8,760 hr/yr, storage piles, and vehicle traffic emissions. The total potential emissions are already less than 100 TPY, and thus synthetic minor status is not applicable.

Insignificant Activities/Exemptions:
HAR 11-60.1-82(f)(2) - fuel burning equipment with a heat input capacity less than 1 MMBtu/hr. The 75 kW diesel engine is part of the screener and is exempt since the heat input rate is 0.685 MMBtu/hr.

Alternative Operating Scenarios:
The applicant is not proposing any alternate operating scenarios.

Project Emissions:
The sources of emissions for the facility are a 200 TPH stone processing plant, 300 hp diesel engine powering the stone processing plant, crushed rock storage pile(s), and unpaved road traversing by trucks. Emissions from continuous 8,760 hr/yr operation for the stone processing plant and diesel engine are in parenthesis. The emissions are shown in the following tables:

PROPOSED

Table 3 - Stone Processing Plant

Activity	[a]PM_{10} Emission Factor, lb/ton	[b]Control Efficiency	PM_{10} Annual Emissions, TPY	[c]TSP Emission Factor, lb/ton	TSP Annual Emissions, TPY
Truck unloading to Feeder	1.6E-05	35%	[d]3.64 E-03 (9.11 E-03)	3.36 E-05	7.64 E-03 (1.91 E-02)
Primary Crushing	0.0024	70%	0.251 (0.628)	0.005	0.529 (1.32)
Conveyor Transfer Point (7)	0.0014	35%	2.229 (5.580)	0.0029	4.682 (11.72)
Screening	0.015	35%	3.413 (8.541)	0.032	7.167 (17.94)
Truck Loading	1.0 E-04	35%	0.022 (0.055)	2.1 E-04	0.049 (0.123)
		Total	5.920 (14.81)	Total	12.431 (31.12)

[a]AP-42, Table 11.19.2-2 (1/95)
[b]70% water spray control efficiency, 35% dampened material control efficiency (½ control efficiency of 70% for moisture carryover from water spray or stockpile fugitive emissions abatement from water truck)
[c]TSP = 2.1 x PM_{10}
[d](200 ton/hr) x (3,500 hr/yr) x (1.6 E-05 lb/ton) x (1 - 0.35) x (ton/2,000 lb) = 3.64 E-03 TPY

Table 4 - Diesel Engine (Criteria Pollutants)

Pollutant	[a]Emission Factor, g/hr	[b]Annual Emissions, TPY
NO_x	1,600	[c]6.17 (15.45)
CO	93	0.36 (0.90)
SO_x	[d]0.29 –> [e]0.5 lb/MMBtu	[f]1.77 (4.43)
TSP/PM_{10}	26	0.10 (0.25)
VOC	48	0.19 (0.46)

[a]Manufacturer's specifications
[b]3,500 hr/yr
[c](1,600 g/hr) x (3,500 hr/yr) x (2.205 E-03 lb/g) x (ton/2,000 lb) = 6.17 TPY
[d]AP-42, Table 3.3-1 (10/96)
[e]0.29 lb/MMBtu translates to 0.29% sulfur by weight, so EF for 0.5% sulfur is 0.5 lb/MMBtu:
(7.05 lb/gal) x (14.44 gal/hr) x **0.29%** by weight = 0.2952 lb S/hr
$S + O_2$ –> SO_2 (implies 1:1 molar ratio for $S:SO_2$)
(MW SO_2 / MW S) x sulfur emission rate = (64.06 / 32.06) x 0.2952 = 0.5899 lb SO_2 /hr
(0.5899 lb SO_2/hr) x (hr/ 14.44 gal) x (1 gal/0.14 MMBtu) = **0.29** lb SO_2 / MMBtu
[f](14.44 gal/hr) x (3,500 hr/yr) x (0.14 MMBtu/gal) x (0.50 lb/MMBtu) x (ton/2,000 lb) = 1.77 TPY

PROPOSED

Table 5 - Diesel Engine (HAPs)

Hazardous Air Pollutant (HAP)	[a]Emission Factor, lb/MMBtu	[b]Annual Emissions, TPY
Benzene	9.33 E-04	[c]3.30 E-03
Toluene	4.09 E-04	1.45 E-03
Xylene	2.85 E-04	1.01 E-03
Propylene	2.58 E-03	9.13 E-03
1,3 - Butadiene	< 3.91 E-05	< 1.38 E-04
Formaldehyde	1.18 E-03	4.17 E-03
Acetaldehyde	7.67 E-04	2.71 E-03
Acrolein	< 9.25 E-05	< 3.27 E-04
Total PAH	1.68 E-04	5.94 E-04
	Tota HAPs	2.28 E-02

[a]AP-42, Table 3.3-2 (10/96)
[b]3,500 hr/yr
[c](14.44 gal/hr) x (3,500 hr/yr) x (0.14 MMBtu/gal) x (9.33 E-04 lb/MMBtu) x (ton/2,000 lb) = 3.30 E-03 TPY

Storage Piles

AP-42, Section 13.2.4.3, Equation (1) (revision 1/95)
Table 11.12-2 (10/01), footnote b for aggregate moisture content

E, lb/ton = k(0.0032) x [$(U/5)^{1.3}$ / $(M/2)^{1.4}$] emission factor
U = 15 mph windspeed
M = 1.77% moisture content

aggregate storage pile(s): (200 ton/hr) x (3,500 hr/yr) = 700,000 TPY

PM_{10}: E = 0.35 (0.0032) x [$(15/5)^{1.3}$ / $(1.77/2)^{1.4}$] = 5.54 E-03 lb/ton
(5.54 E-03 lb/ton) x (700,000 ton/yr) x (ton/2,000 lb) x (1-70%) = 0.58 TPY
Water truck 70% Control Eff.

TSP: k = 0.74, E = 1.17 E-02 lb/ton
(1.17 E-02 lb/ton) x (700,000 ton/yr) x (ton/2,000 lb) x (1-70%) = 1.22 TPY

Vehicle Emissions (Unpaved Roads)
AP-42, Section 13.2.2, Equation 1a and 2, Table 13.2.2-2 (revision 12/03)

E, lb/VMT = $k\ (s/12)^a\ (W/3)^b\ [\ (365 - P) / P\ ]$
k = 1.5 for PM_{10}, k = 4.9 for TSP
a = 0.9 for PM_{10}, a = 0.7 for TSP
b = 0.45
s = 3.9% silt content
W = 26.5 tons mean vehicle weight
P = no. of "wet" days with at least 0.01 inches of precipitation for a year = 81 (www.wrcc.dri.edu)

Trucks VMT/yr: 0.2 mi. round trip
amount of crushed rock = 700,000 ton/yr
truck load capacity = 21 tons
no. of truck loads = no. of trips on road = 700,000 / 21 = 33,333 trips
trucks VMT/yr = 0.2 x 33,333 = 6,667 mi/yr

PM_{10}: $E = 1.5\ (3.9/12)^{0.9}(26.5/3)^{0.45}[\ (365 - 81) / 365] = 1.13$ lb/VMT
(1.13 lb/VMT) x (6,667 mi/yr) x (1 - 70%) x (ton/2,000 lb) = 1.13 TPY
70% control efficiency for water truck

TSP: $E = 4.9\ (3.9/12)^{0.7}(26.5/\ 3)^{0.45}[\ (365 - 81) / 365] = 4.63$ lb/VMT
(4.63 lb/VMT) x (6,667 mi/yr) x (1 -70%) x (ton/2,000 lb) = 4.62 TPY

Ambient Air Quality Assessment:

SCREEN3 air quality modeling was used to predict emissions concentrations from the 300 hp diesel engine. Per Fred Peyer of EMET, there are no buildings near the site of the project location. The only downwash structure would be the portable stone processing plant (see attached modeling results for structure dimensions). The initial project location is in relatively flat terrain. All regulatory defaults were used in the modeling. Emission rates, stack parameters, and modeling results are shown in the following tables.

The maximum 1-hour concentration at 1 g/s was 1,750 ug/m^3. One-hour conversion factors to appropriate averaging periods were 0.2, 0.4, 0.7, and 0.9 for annual, 24-hr, 8-hr, and 3-hr, respectively. The equation to determine SAAQS compliance:

(emission rate, g/s) x (max concentration from modeling @ 1 g/s) x conversion factor < SAAQS

Table 6 - Emission Rates (g/s)

Unit	NO_x (as NO_2)	PM_{10}	SO_2	CO
Diesel Engine	0.4444	0.0072	0.1273	0.0258

PROPOSED

Table 7 - Stack Parameters

Unit	stack height (m)	stack dia. (m)	stack velocity (m/s)	stack temp., (K)
Diesel Engine	4.27	0.127	62.104	670

Table 8 - Modeling Results

Pollutant	Averaging Period	Concentration (ug/m^3)	[a]Background (ug/m^3)	Total (ug/m^3)	SAAQS (ug/m^3)	Percent of SAAQS (%)
SO_2	3-hr	[b]200.50	30	230.50	1,300	17.7
	24-hr	89.11	9	98.11	365	26.9
	Annual	17.80	2	19.80	80	24.8
NO_2	Annual	[c]42.63	9	51.63	70	73.8
PM_{10}	24-hr	5.04	90	95.04	150	63.4
	Annual	1.01	15	16.01	50	32.0
CO	1-hr	45.15	3,990	4,035.15	10,000	40.4
	8-hr	31.61	1,582	1,613.61	5,000	32.3

[a]2002 Annual Summary Hawaii Air Quality Data: Honolulu monitoring station for SO_2, PM_{10}, and CO
Kapolei monitoring station for NO_x

[b]Sample calculation: (0.1273 g/s) x [(1,750 ug/m^3) / (1 g/s)] x 0.9 = 200.50 ug/m^3

[c]Ozone Limiting Method used:

(0.4444 g/s) x [(1,750 ug/m^3) / (1 g/s)] x 0.2 x (3,500 hr / 8,760 hr) = 62.14 ug/m^3
62.14 + 9 = 71.14, which is greater than 70 ug/m^3 limit for SAAQS, thus OLM 2nd tier screening can be applied

ambient background O_3 (annual) = 38 ug/m^3 , 2002 Hawaii Air Quality Data

For thermal conversion of NO_x to NO_2, the following equation is used:

$NO_2 = 0.10 [NO_x] + [MW\ NO_2 / MW\ O_3] [O_3]$
$MW\ NO_2 = 14 + (16 \times 2) = 46$
$MW\ O_3 = 16 \times 3 = 48$

Thus, $NO_2 = (0.10)(62.14) + (46/48)(38) = 42.63\ ug/m^3$

Other Issues:
None.

PROPOSED

Significant Permit Conditions:

1. Special Condition No. C.2.c. - A 3,500 hr/yr limitation was proposed by the applicant. Since the diesel engine is physically part of the stone processing plant and not a peripheral power source, the plant will also be limited to the same restriction. The limit would have the diesel engine in compliance with NO_2 Annual SAAQS.
2. Special Condition No. C.3.a. - To limit the screener operation to 3,500 hours without installing a second hour-meter, the screener shall only operate with the 200 TPH stone processing plant.
3. Special Condition Nos. 4.a. and 4.b - 10% opacity for conveyor transfer points and other affected facilities, and 15% opacity for the crusher. The limits are from the NSPS requirements.

Conclusion and Recommendation:

Measures will be taken to control fugitive dust from unpaved roads and storage piles with the use of a water truck. Water spray at the feed opening of the impact crusher will be used also for fugitive dust control. Applicant has proposed an operating time limit and air quality modeling indicates compliance with SAAQS. As such, issuance of the initial covered source permit is recommended following public comments and EPA review.

Reviewer: Carl Ibaan
Date: July 13, 2004