

Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109
(415) 771-6000

**Engineering Evaluation
and
Statement of Basis
for
MAJOR FACILITY REVIEW PERMIT
ADMINISTRATIVE AMENDMENT**

**for
Waste Management of Alameda County
Facility #A2066**

Facility Address:

10840 Altamont Pass Road
Livermore, CA 94550

Mailing Address:

10840 Altamont Pass Road
Livermore, CA 94550

Application Engineer: Carol Allen
Site Engineer: Carol Allen

May 2014

Application: 24727

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ENGINEERING EVALUATION and STATEMENT of BASIS

Waste Management of Alameda, Inc.; Site # A2066

APPLICATION # 24727

I. STATEMENT OF BASIS FOR APPLICATION # 24727

Pursuant to New Source Review Application # 24726, the District issued an Authority to Construct for two portable CNG-fired engines (S-221 and S-222) equipped with Ceramic Catalysts (A-221 and A-222) to reduce NO_x, CO, and HC emissions. These portable CNG-fired engines will provide power to the hydraulic lifts on two portable waste tipper platforms and will replace two diesel-fired engines (S-206 and S-208) that are currently powering these lifts.

These portable engines are also considered to be nonroad engines and are exempt from Major Facility Review pursuant to BAAQMD Regulation 2, Rule 6, Section 114, which states:

2-6-114 Exemption, Non-Road Engines: Engines as defined by 40 CFR Part 89 are exempt from this regulation. (Adopted 10/20/99)

Although these portable non-road engines are exempt from Major Facility Review (MFR), the District has identified such engines in Table II-D of the MFR Permit for Site # A-2066. The District is planning to update Table II-D by identifying these new engines. This revision will add detail to the permit but will not alter any applicable requirements. Since this revision will not include any substantive changes to the permit, it may be handled as an administrative amendment.

The MFR Permit will be modified as described below.

A. SECTIONS I, III-IX, AND XI:

No changes are proposed to these sections.

B. SECTION II:

The two new portable CNG-fired engines and associated catalysts will be added to Table II-D as shown below:

D. Exempt Equipment List

Each of the following devices is exempt from major facility review permitting pursuant to the requirements of BAAQMD Regulation 2, Rule 6: Permits, Major Facility Review. The applicable exemption for each device is identified in the table below. Registered portable engines and non-road engines are exempt from BAAQMD Regulation 2, Rule 6 pursuant to BAAQMD Regulation 2-6-113 and 2-6-114, respectively, even though these engines may be required to have a BAAQMD permit to operate pursuant to BAAQMD Regulation 2, Rule 1, Permit, General Requirements.

**Table II – D
 Exempt Equipment**

S-#	Description	Type or Make and Model	Capacity	Comments
<u>S-221</u>	<u>Portable CNG-Fired Engine for Tipper # 83; abated by A-221 CleanAir Assure TWC Catalytic Controls for NOx, CO, and HC</u>	<u>Model Year 2012, Caterpillar G3306</u>	<u>145 bhp, 638 in³ displacement, 1.08 MM BTU/hour of CNG</u>	<u>Exempt per 2-6-114</u>
<u>S-222</u>	<u>Portable CNG-Fired Engine for Tipper # 70; abated by A-222 CleanAir Assure TWC Catalytic Controls for NOx, CO, and HC</u>	<u>Model Year 2012, Caterpillar G3306</u>	<u>145 bhp, 638 in³ displacement, 1.08 MM BTU/hour of CNG</u>	<u>Exempt per 2-6-114</u>

C. SECTION X:

These above revisions are summarized in the revision history section as shown below.

X. Revision History

...

Administrative Amendment (Application # 23962):

May 28, 2013

- Correct typographical errors in TAC concentration limits listed in Condition # 19235, Part 12 and in Table VII-A.
- Increase ethylene dichloride limit in Condition # 19235, Part 12 and in Table VII-A.

Administrative Amendment (Application # 24727):

May 12, 2014

- Add two portable CNG-fired engines (S-221 and S-222) to Table II-D.
- Add Application #24727 changes to Section X Revision History.

D. SUMMARY:

This action is constitutes an administrative amendment as defined in Regulation 2-6-201 because it involves only non-substantive amendments to the permit and does not alter any applicable requirements.

In accordance with Regulation 2-6-413, this action does not require public notification or an EPA review period. Therefore, staff recommends that the APCO take final action on the administrative amendments proposed above and notify EPA as required by Regulation 2-6-413.4.

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APPENDIX A

Engineering Evaluation for Application # 24726

ENGINEERING EVALUATION

for

Waste Tipper Engine Replacements

Waste Management of Alameda County; PLANT # 2066

APPLICATION # 24726

A. BACKGROUND

Waste Management of Alameda County operates the Altamont Landfill and Resource Recovery Facility in Livermore, CA (Site # A2066). This site includes an active MSW landfill, landfill gas collection and control equipment, landfill gas energy recovery equipment, green waste processing operations, waste water treatment operations, and numerous diesel engines that provide primary power to portable equipment and emergency power to other operations.

On October 21, 2010, the District issued Waste Management Permits to Operate for four portable diesel-fired engines (S-206, S-208, S-217, and S-218) and their associated diesel PM filters that power the hydraulic lifts on four waste tippers (see Application # 21312). The District imposed an annual operating time restriction of 29,200 hours/year for the four engines combined to ensure that these engines and related operations would comply with Regulation 2, Rule 5 Project Risk Limits.

Waste Management is now requesting to replace the two older diesel-fired tipper engines (S-206 and S-208) with two new compressed natural gas (CNG) fired tipper engines (S-221 and S-222). Waste Management has requested to split the existing operating time limit (29,200 hours/year for four engines) between each type of engine (14,600 hours/year for the two diesel-fired tipper engines and 14,600 hours/year for the two CNG-fired tipper engines). The new engines will be rich-burn 4-stroke gas-fired engines (145 bhp/108 kW each). The new engines will be permitted to use either standard compressed natural gas or liquefied natural gas (derived from Altamont's landfill gas) produced at S-210. The S-210 gas will typically have a lower heat content and higher sulfur content than standard compressed natural gas but should meet PG&E's pipeline quality standards (minimum heat content of 950 BTU/scf and maximum sulfur content of 1.0 grains/100 scf of gas). The new engines are designed to meet federal Tier 2 emission standards and are equipped with catalytic controls achieving at least 95% reduction in NOx emissions and at least 50% reduction in CO and NMOC emissions.

As discussed in the HRSA report, this application is considered to be a related project to Application # 23687. Therefore, the District must include the landfill and landfill gas combustion devices in the HRSA for Application # 24726.

B. EMISSIONS

Criteria Pollutants:

Criteria pollutant emissions from the proposed S-221 and S-222 CNG-fired portable waste tipper engines are derived from manufacturer emission rates and control factors, federal Tier 2 emission standards for non-road engines, AP-42 data for 4-stroke rich burn gas fired IC engines (AP-42 Chapter 3.2), and PG&E sulfur content limits.

Table 1. Descriptions and Rated Capacities of the New Waste Tipper Engines

Source Number	Source Description	Rated Capacity Bhp	Electrical Output kW	Maximum Fuel Use scf / hour	Maximum Fire Rate MM BTU / hour
S-221	Portable CNG-fired Rich-Burn IC Engine for Tipper # 83; equipped with CleanAir Assure TWC Catalytic Controls	145.0	108	1140	1.083
S-222	Portable CNG-fired Rich-Burn IC Engine for Tipper # 70; equipped with CleanAir Assure TWC Catalytic Controls	145.0	108	1140	1.083

Table 2. Databank Emission Factors (grams/bhp-hour)

Source Number	NO _x ^(a)	CO ^(a)	POC ^(b)	PM10 ^(c)	SO ₂ ^(d)
S-221	1.206	0.700	0.101	0.066	0.010
S-222	1.206	0.700	0.101	0.066	0.010

(a) Manufacturer's maximum expected emission rate after abatement by catalytic controls.

(b) Tier 2 Standard: 2.7 g/kW-hr of HC+NO_x (5% HC).

(c) From AP-42 Table 3.2-3 (filterable + condensable = 9.5E-3 + 9.91E-3 = 1.941E-2 lbs PM10/MM BTU)

(d) From AP-42 Table 3.2-3, SO₂ = 5.88E-4 lbs/MM BTU at 2000 grains of S/MM scf n.gas. This AP-42 factor will be scaled to the PG&E limit of 1.0 gr/100 scf = 5.88E-4 * 1.0 / 0.2 = 2.94E-3 lbs/MM BTU

Table 3. Maximum Hourly Emissions (Pounds/Hour)

Source Number	NO _x	CO	POC	PM10	SO ₂
S-221	0.3854	0.2238	0.0322	0.0210	0.0032
S-222	0.3854	0.2238	0.0322	0.0210	0.0032

Proposed maximum daily emissions for each engine are based on the Table 3 hourly emission rates and the maximum possible operating time of 24 hours/day. Proposed maximum daily emissions are presented in Table 4.

Table 4. Proposed Maximum Daily Emissions (Pounds/Day)

Source Number	Hours/Day	NOx	CO	POC	PM10	SO2
S-221	24	9.25	5.37	0.77	0.50	0.08
S-222	24	9.25	5.37	0.77	0.50	0.08

At the proposed maximum operating rate of 24 hours/day, the emissions are less than 10 pounds/day for each pollutant and BACT is not triggered for the proposed engines.

Maximum annual emissions are based on Waste Management’s requested operating time of 7300 hours/year per engine and the Table 3 hourly emission rates. Annual emissions are presented in Table 5.

Table 5. Proposed Maximum Annual Emissions (Tons/Year)

Source Number	Hours/Year	NOx	CO	POC	PM10	SO2
S-221	7300	1.407	0.817	0.117	0.077	0.012
S-222	7300	1.407	0.817	0.117	0.077	0.012
Total	14,600	2.813	1.634	0.235	0.153	0.023

Actual Emission Reductions:

This project involves the permanent shut down and removal of two existing portable engines (S-206 and S-208). NOx and POC emission increases from S-206 and S-208 were fully offset by Waste Management pursuant to Applications # 17305 and # 21312. Therefore, Waste Management is eligible to receive the full permitted NOx and POC emission rates from these engines as emission reduction credits. Emission reductions for other pollutants must be calculated based on actual usage levels. Waste Management reported that S-206 and S-208 were operated for an average of 1972 hours/year per engine during August 2009 through January 2012. Actual emission reductions are determined based on this operating rate and the certified emission factors for these engines. Emission reductions are presented below.

Table 6. Emission Reductions for S-206 and S-208

Source Number		NOx	CO	POC	PM10	SO2
	bhp	g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr	g/bhp-hr
S-206	127	2.621	0.969	0.138	0.019	0.0054
S-208	127	2.621	0.969	0.138	0.019	0.0054
	hrs/yr	tons/year		tons/year		
S-206	7300	2.679		0.141		
S-208	7300	2.679		0.141		
	hrs/yr		tons/year		tons/year	tons/year
S-206	1972		0.268	0.038	0.005	0.001
S-208	1972		0.268	0.038	0.005	0.001
		tons/year	tons/year	tons/year	tons/year	tons/year
Total		5.357	0.535	0.282	0.010	0.003

Cumulative Emission Increases:

For this site, offsets are required for NOx and POC emission increases. As shown below, the amount of NOx and POC offsets previously supplied for S-206 and S-208 will exceed the offsets required for NOx and POC increases from S-221 and S-222. The remaining balance of NOx and POC emissions should be returned to Waste Management.

Table 7. Cumulative Emission Increase Inventory for Application # 24726 (Tons/Year)

	NOx	CO	POC	PM10	SO2
Current Balance	0.000	195.823	0.000	17.530	66.596
Emission Increases	2.813	1.634	0.235	0.153	0.023
Offset Ratio	1.15		1.15		
Initial ERCs Required	3.235		0.270		
Actual Reductions	- 5.357	- 0.535	- 0.282	- 0.010	- 0.003
Balance	- 2.122	196.922	- 0.047	17.673	66.616

Toxic Air Contaminants:

Uncontrolled TAC emissions for S-221 and S-222 were estimated using the emission factors in AP-42 Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines for natural gas fired IC engines. Since the catalytic controls on these engines are expected to achieve at least 50% control of NMOC, the District estimated that these catalytic controls would achieve 50% control for each individual organic TAC. TAC emissions from S-221 and S-222 are presented in the attached spreadsheet.

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

The CNG-fired IC engines in this application were evaluated in accordance with the objective measurements and standard procedures described in District Permit Handbook Chapter 2.3.2 Stationary Natural Gas Engines. These engines do not trigger BACT. This application does not involve any discretionary decisions. Therefore, the issuance of an Authority to Construct and Permit to Operate for these engines is considered ministerial pursuant to Regulation 2-1-311. No further CEQA review is required.

The project is over 1000 feet from the nearest school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

Regulation 2, Rule 2:

As shown in Table 4, the emissions from each proposed engine is expected to be less than 10 pounds per day for each pollutant. Therefore, BACT is not required for S-221 or S-222.

This facility is subject to the Regulation 2-2-302 offset requirements for NO_x and POC emission increases, because NO_x and POC emissions from this site each exceed 10 tons/year. Since NO_x and POC emissions also exceed 35 tons/year each, this facility is responsible for providing the required emission reduction credits to offset NO_x and POC emission increases. As shown in Table 5, total emission increases for this application are: 2.813 tons/year of NO_x and 0.235 tons/year of POC. All NO_x and POC emission increases must be offset at a ratio of 1.15:1.0. The total emission reduction credits required for this application are: 3.235 tons/year of NO_x and 0.270 tons/year of POC. As part of this project, Waste Management will be permanently shutting down S-206 and S-208. NO_x and POC emissions from these diesel-fired waste tipper engines (S-206 and S-208) were fully offset by Waste Management pursuant to Applications # 17305 and #21312. Therefore, Waste Management will receive full credit for these emission reductions (5.357 tons/year of NO_x reductions and 0.282 tons/year of POC reductions). Since the NO_x and POC emission reductions are greater than the proposed emission increases, the balance (2.122 tons/year of NO_x and 0.047 tons/year of POC) should be returned to Waste Management when the shutdowns are complete and the permits for S-206 and S-208 are cancelled.

Regulation 2-2-303 offset requirements for PM₁₀ and SO₂ emission increases only apply if the site is determined to be a major facility of either PM₁₀ or SO₂. From Regulation 2-1-204.1, fugitive emissions are only included for the source categories specified in 40 CFR 70.2. Since landfills are not one of these specified categories, the fugitive landfill emissions are excluded from the major facility determination. Total site-wide non-fugitive emissions are: 38.65 tons/year of PM₁₀ and 92.07 tons/year of SO₂ (see attached January 2013 summary of permitted emission levels for Site # A2066). Since these non-fugitive site-wide permitted emission rates do not exceed 100 tons/year, this site is not a major facility of PM₁₀ or SO₂, and offsets are not required for these pollutants.

This site is not a PSD facility, because the total site-wide potential to emit for each pollutant is less than 250 tons/year of non-fugitive emissions. A summary of site-wide permitted emission levels is attached. Pursuant to Application #18819, the District has approved a site-wide CO cap to ensure that the total CO PTE cannot exceed 250 tons/year. Since this site is not a PSD facility, PSD requirements do not apply.

New Source Review for Toxic Air Contaminants:

In addition to the TAC emissions from S-221 and S-222, this project includes Application #23687, which was approved in October 2012. The HRSA that was prepared for Application # 23687 included the four diesel fired waste tipper engines in addition to all landfill gas combustion equipment and Fill Areas 1 and 2

of the landfill. This HRSA was updated by removing two diesel fired portable engines (S-206 and S-208) and adding two CNG-fired portable engines (S-221 and S-222). The District is continuing to use the LLL Site 300 met-data in the air dispersion modeling program until site-specific met data is available. The health impacts for the new CNG engines and for this entire project are summarized below.

Table 8. Health Impacts for Proposed New CNG-Fired Engines and for Total Project

	Cancer Risk per Million			Chronic Hazard Index	Acute Hazard Index
	MEI	Resident	Worker	MEI	
S-2 Altamont Landfill (FA1 & FA2)	7.59	4.563	0.881	0.113	0.025
A-15 and A-16 LFG Flares	0.04	0.013	0.005	0.008	< 0.001
S-6 and S-7 LFG Turbines	0.01	0.002	0.002	0.001	< 0.001
S-23 and S-24 LFG Engines	0.99	0.118	0.115	0.020	0.002
Diesel Engines (S-217 & S-218)	0.43	0.297	0.060	0.0002	NA
CNG Engines (S-221 & S-222)	0.09	0.043	0.013	0.002	0.001
Total Project	7.65	4.629	0.889	0.114	0.025

The two CNG-fired IC engines will result in a cancer risk of 0.09 in a million and a chronic HI of 0.002. Since the source risk for each of these new sources will be less than 1 in a million cancer risk and less than 0.2 chronic HI, TBACT is not requirement for these CNG-fire engines.

The source risk for the S-2 Altamont Landfill is greater than the TBACT threshold of 1 in a million cancer risk. The engineering evaluation for Application #14814 contains a detailed discussion of the TBACT requirements for this landfill.

As shown in Table 8, maximum project risks are: 7.7 in a million cancer risk, 0.1 chronic HI, and 0.03 acute HI. Since these project risks are less than the Regulation 2-5-302 limits (<10 in a million cancer risk and <1.0 chronic HI and <1.0 acute HI), this project complies with the District's toxic NSR requirements.

Regulation 2, Rule 6:

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act (40 CFR, Part 70) and BAAQMD Regulation 2, Rule 6, Major Facility Review (MFR), because it is a major facility for NO_x and CO emissions and also because it is a designated facility (since it is subject to the control requirements of the Emission Guidelines for MSW Landfills). Therefore, this facility is required to have an MFR permit pursuant to Regulations 2-6-301 and 2-6-304.

The MFR Permit for this facility was initially last renewed on December 19, 2013. This application to add 2 new sources and remove 2 existing sources will require a minor revision of the Title V permit. This Title V permit revision will be handled pursuant to Application # 24757.

Regulation 6, Rule 1:

The two new CNG-fired tipper engines are subject to Regulation 6, Rule 1. Regulation 6-1-301 limits the visible emissions from each of these sources to Ringelmann 1.0. No visible particulate emissions are expected from properly operating diesel engines equipped with particulate filters.

Regulation 6-1-310 limits the exhaust point emission rate to 0.15 grains/dscf. Based on AP-42 emission factor data, natural gas fired rich burn engines are expected to have a PM10 emission rate of 1.941E-2 lbs/MM BTU. This emission factor is converted to grain loading using the EPA f factor of 8710 dscf of flue gas (0% O₂)/MM BTU. The grain loading rate for the proposed engines is: 0.016 grains/dscf at 0% O₂. The proposed CNG engine will comply with the Regulation 6-1-310 limit by a margin of at least 9:1. Since there is a high margin of compliance with this grain loading limit and emissions are very low (0.077 tons/year of PM10 per engine), additional compliance demonstration monitoring for this limit would not be justifiable.

Regulation 9, Rule 1:

The portable CNG-fired engines are subject to Regulation 9, Rule 1. Regulation 9-1-302 limits the sulfur dioxide concentration in an exhaust point to 300 ppmv. At the PG&E sulfur content limit (1.0 grains of S/100 scf of gas) and minimum heat content (950 BTU/scf), the sulfur dioxide emission rate will be: 0.003 lbs/MM BTU. Using the EPA F-factor of 8710 dscf flue gas/MM BTU, this emission rate is equivalent to 2 ppmv of SO₂ in the exhaust at 0% O₂. Since this maximum possible concentration is far less than the 300 ppmv SO₂ concentration limit, compliance demonstration monitoring is not necessary.

Regulation 9, Rule 8:

Regulation 9, Rule 8 applies to stationary internal combustion engines.

If the S-221 and S-222 portable CNG-fired rich-burn engines are deemed to be stationary engines, the applicable emission limits would be: Regulations 9-8-301.1 (25 ppmv of NO_x at 15% O₂) and 9-8-301.3 (2000 ppmv of CO at 15% O₂) while the engines are firing standard natural gas and Regulations 9-8-302.2 (70 ppmv of NO_x at 15% O₂) and 9-8-302.3 (2000 ppmv of CO at 15% O₂) while the engines are firing waste-derived gas. At the expected post catalytic controlled emission rates for these CNG-fired engines (1.206 g NO_x/bhp-hr and 0.700 g CO/bhp-hr), the equivalent outlet concentrations are: 97 ppmv of NO_x at 15% O₂ and 92 ppmv of CO at 15% O₂. Thus, the proposed engines will comply with the Regulation 9-8-301.3 and 302.3 CO standards, but the proposed engines will not meet either the Regulation 9-8-301.1 or 302.2 NO_x standards.

Although the proposed portable CNG-fired engines meet the Regulation 9-8-204 definition of a stationary internal combustion engine because these engine will remain at a specific facility for more than 1 year, these engines also meet the federal definition of a nonroad engine. Federal regulations prohibit Districts from adopting more stringent emission standards for nonroad engines. Since S-221 and S-222 are portable nonroad engines, District staff now expects that the Regulation 9, Rule 8 emission standards should not apply to portable engines, even if these portable engines remain at a single facility for more than 12 months.

It appears that the monitoring and record keeping requirements in 9-8-501-503 will not apply to S-221 and S-222 if the District is indeed preempted from imposing the Regulation 9-8-301 or 302 emission standards on these on-site portable engines. Regulation 9-8-503 states, "Any person who must comply with Section 9-8-301, 302, ... shall use a portable analyzer ... to verify compliance ..." Thus, it appears that 9-8-503 will not apply to S-221 and S-222, if the District finds Sections 301 and 302 do not apply. Likewise, Sections 9-8-501 and 9-8-502 appear to be applicable to engines only if an engine is subject to a 9-8-300 emission limit.

Federal Requirements:

The engines in this application are not considered to be "stationary" engines by federal definitions, because they meet the requirements of nonroad engines, as defined in 40 CFR 1068.30:

Nonroad engine means:

- (1) Except as discussed in paragraph (2) of this definition, a nonroad engine is an internal combustion engine that meets any of the following criteria:
 - (i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).
 - (ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).
 - (iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
- (2) An internal combustion engine is not a nonroad engine if it meets any of the following criteria:
 - (i) The engine is used to propel a motor vehicle, an aircraft, or equipment used solely for competition.
 - (ii) The engine is regulated under 40 CFR part 60, (or otherwise regulated by a federal New Source Performance Standard promulgated under section 111 of the Clean Air Act (42 U.S.C. 7411)).
 - (iii) The engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. See §1068.31 for provisions that apply if the engine is removed from the location.

Although these engines reside at this facility for more than 12 months, they do not reside at a single on-site location (as defined above) for more than 12 consecutive months.

Since the portable diesel engines in this application are nonroad engines and not stationary engines, the NSPS requirements for stationary compression ignition engines (40 CFR, Part 60, Subpart IIII) and the NESHAP requirements for stationary reciprocating internal combustion engines (40 CFR, Part 63, Subpart ZZZZ) do not apply to these engines.

The CNG-fired engines are subject to 40 CFR Part 1048 Control of Emissions from New, Large Nonroad Spark Ignition Engines pursuant to Section 1048.1(a): applies to engines above 19kW and to Section 1048.1(b) applies to engines manufactured on or after January 1, 2004. In accordance with Section 1048.101(a)(2), subject engines must be certified to the Tier 2 standards: 2.7 g/kW-hr for HC+NOx and 4.4 g/kW-hr for CO. These standards also apply during steady state testing. During field testing, the standards specified in Section 1048.101(c)(2) are: 3.8 g/kW-hr for HC+NOx and 6.5 g/kW-hr for CO. These standards and equivalent limits are summarized below

Table 9. Federal Nonroad Engine Standards (Tier 2) in Equivalent Units

Certification & Steady State Testing	HC+NOx	CO
g/kW-hr	2.7	4.4
g/bhp-hr	2.013	3.281
lbs/MM BTU	0.594	0.968
ppmv @ 15% O2	HC = 23 NOx = 153	432
Field Testing	HC+NOx	CO
g/kW-hr	3.8	6.5
g/bhp-hr	2.834	4.847
lbs/MM BTU	0.836	1.430
ppmv @ 15% O2	HC = 32 NOx = 215	638

The engine manufacturer stated that the proposed CNG engines, when equipped with the proposed catalytic controls, would meet the federal Tier 2 standards above. The engine manufacturer's emissions data and control factors are presented below. The expected exhaust rates from the proposed CNG engines (1.72 g/kW-hr of HC+NOx and 0.94 g/kw-hr of CO) are less than the Tier 2 federal standards in Table 9.

Table 10. Emission Rates from Proposed CNG Engines

	Uncontrolled Emissions			Catalytic Controls			Exhaust Rates	
	HC	NOx	CO	HC	NOx	CO	HC+NOx	CO
g/kW-hr				50%	95%	50%	1.72	0.94
g/bhp-hr	0.16	24.11	1.40	50%	95%	50%	1.286	0.700
lbs/MM BTU	0.047	7.115	0.413	50%	95%	50%	0.380	0.207
ppmv @ 15% O2	37	1932	184	50%	95%	50%	18 / 97	92

D. PERMIT CONDITIONS

The four existing diesel fired tipper engines are subject to Condition # 24578. The District is proposing to revise these conditions to reflect that S-206 and S-208 will be shut down. The District is proposing a new set of conditions for the CNG fired portable tipper engines. Permit condition changes are shown below.

Condition # 24578

FOR: S-206 PORTABLE DIESEL ENGINE FOR WASTE TIPPER # 83, EQUIPPED WITH A-206 DIESEL PARTICULATE FILTER; S-208 PORTABLE DIESEL ENGINE FOR WASTE TIPPER # 70, EQUIPPED WITH A-208 DIESEL PARTICULATE FILTER; S-217 PORTABLE DIESEL ENGINE FOR WASTE TIPPER # 71, EQUIPPED WITH A-207 DIESEL PARTICULATE FILTER; AND S-218 PORTABLE DIESEL ENGINE FOR WASTE TIPPER # 93, EQUIPPED WITH A-209 DIESEL PARTICULATE FILTER.

1. The owner/operator of the portable diesel-fueled waste tipper engines (S-206, S-208, S-217, and S-218) has been issued permits for portable sources (also known as nonroad engines by federal definitions) that are subject to Regulation 2-1-220 and the CARB ATCM for diesel PM from portable engines. Based on these portable source and nonroad engine determinations, these engines are not subject to the CARB ATCM for stationary compression ignition engines, the federal NSPS requirements for stationary compression ignition engines (40 CFR Part 60, Subpart III), or the federal NESHAP requirements for stationary reciprocating internal combustion

- engines (40 CFR, Part 63, Subpart ZZZZ). To retain these portable source and nonroad engine determinations, the owner/operator shall not operate any of these engines in one on-site location for more than 12 consecutive months. Any backup or standby engine that replaces one of these engines at the same on-site location and is intended to perform the same function will be counted toward this time limitation. The owner/operator shall not move equipment and then return it to the same location in an attempt to circumvent the portable equipment time requirement. (Basis: Regulations 2-1-220.1-3, 2-1-220.10, CCR §93116.2(a)(28), and 40 CFR 1068.30)
2. The owner/operator shall use CARB diesel fuel exclusively to fire these engines. (Basis: Cumulative Increase, Offsets, BACT, TBACT, Regulation 2-5-302, and CCR §93116.3(a))
 3. While S-206 and S-208 are operating, the total combined operating time for S-206, S-208, S-217, and S-218 shall not exceed 29,200 hours during any consecutive 12-month period. Upon shutdown of S-206 and S-208, the total combined operating time for S-217 and S-218 shall not exceed 14,600 hours during any consecutive 12-month period. (Basis: Regulation 2-5-302, Cumulative Increase, and Offsets)
 4. The owner/operator shall equip each engine (S-206, S-208, S-217, and S-218) with a non-resettable totalizing meter that measures hours of operation for each engine. For S-206 and S-208, this meter shall be installed by no later than April 1, 2010. For S-217 and S-218, this meter shall be installed prior to initial operation of these engines. (Basis: Cumulative Increase and Offsets)
 5. Each engine shall be equipped with a diesel particulate filter, and this filter shall be operated during any time that an engine is operating. The owner/operator shall clean, regenerate, and maintain the diesel particulate filter in accordance with the manufacturer's recommended procedures. (Basis: Regulations 2-5-301 and 2-5-302)
 6. To demonstrate compliance with Parts 1-5, the owner/operator shall maintain the following records in a District approved log and shall make these records available to District staff upon request. All records shall be retained for at least five years from the date of entry. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District or state regulations. (Basis: Cumulative Increase, Offsets, Regulations 2-1-220 and 2-5-302, CCR §93116.2(a)(28), and 40 CFR 1068.30)
 - a. The owner/operator shall maintain annual records of engine operating locations, waste placement locations, operating procedures, or other documentation that demonstrates to the APCO's satisfaction that the waste tipper engines have satisfied the portability criteria in Part 1.
 - b. For S-206, S-208, S-217, and S-218, the owner/operator shall record the hours of operation per calendar month for each engine.
 - c. The owner/operator shall record the total operating time for all four waste tipper engines for each consecutive rolling 12-month period.
 - d. For each diesel particulate filter, the owner/operator shall keep records of all major maintenance events that involve sending the unit offsite for cleaning and/or repair.

- ~~7. The waste tipper engines are subject to Regulation 9, Rule 8 as of January 1, 2012. The owner/operator shall take all steps necessary to ensure that these waste tipper engines either meet the NOx and CO emission limits in Regulation 9 8 304.1 by the January 1, 2012 effective date or satisfy the delayed compliance criteria in Regulation 9 8 305. (Basis: Regulations 9 8 110.1 and 9 8 110.3)~~
7. The owner/operator shall ensure that the S-206 and S-208 engines are permanently shut-down within 90 days of initial operation of S-221 or S-222. The owner/operator shall maintain records of the shutdown dates for S-206 and S-208 and shall notify the District of the shutdown date within 14 days of shutdown. (Basis: Regulation 2-2-302: Offsets for S-221 and S-222)

Condition # 25448

**FOR: S-221 PORTABLE CNG-FIRED ENGINE FOR WASTE TIPPER # 83, AND
S-222 PORTABLE CNG-FIRED ENGINE FOR WASTE TIPPER # 70**

1. The owner/operator of the portable CNG-fired waste tipper engines (S-221 and S-222) has been issued permits for portable sources (also known as nonroad engines by federal definitions) that are subject to Regulation 2-1-220. Based on these portable source and nonroad engine determinations, these engines are not subject to the federal NSPS requirements for stationary spark-ignition engines (40 CFR Part 60, Subpart JJJJ), or the federal NESHAP requirements for stationary reciprocating internal combustion engines (40 CFR, Part 63, Subpart ZZZZ). To retain these portable source and nonroad engine determinations, the owner/operator shall not operate any of these engines in one on-site location for more than 12 consecutive months. Any backup or standby engine that replaces one of these engines at the same on-site location and is intended to perform the same function will be counted toward this time limitation. The owner/operator shall not move equipment and then return it to the same location in an attempt to circumvent the portable equipment time requirement. (Basis: Regulations 2-1-220.1-3, 2-1-220.10, and 40 CFR Part 1068.30)
2. The owner/operator shall use either compressed natural gas meeting standard requirements or liquefied natural gas supplied from S-210 to fire these engines. (Basis: Cumulative Increase and Offsets)
3. The total combined operating time for S-221 and S-222 shall not exceed 14,600 hours during any consecutive 12-month period. (Basis: Cumulative Increase and Offsets)
4. The owner/operator shall equip each engine (S-221 and S-222) with a non-resettable totalizing meter that measures hours of operation for each engine. This meter shall be installed prior to initial operation of these engines. (Basis: Cumulative Increase and Offsets)

5. To demonstrate compliance with Parts 1-3, the owner/operator shall maintain the following records in a District approved log and shall make these records available to District staff upon request. All records shall be retained for at least five years from the date of entry. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District or state regulations. (Basis: Cumulative Increase, Offsets, Regulation 2-1-220 and 40 CFR 1068.30)
- a. The owner/operator shall maintain annual records of engine operating locations, waste placement locations, operating procedures, or other documentation that demonstrates to the APCO's satisfaction that the waste tipper engines have satisfied the portability criteria in Part 1.
 - b. For S-221 and S-222, the owner/operator shall record the hours of operation per calendar month for each engine.
 - c. The owner/operator shall record the total operating time for these two waste tipper engines for each consecutive rolling 12-month period.

E. RECOMMENDATION

Issue a Change of Conditions for the following sources subject to Condition # 24578:

- S-206 Portable Diesel Engine for Tipper # 83:** Model Year 2007, Perkins, Model 2900/2200, 127 bhp, 7.08 gallons/hour of CARB diesel oil; equipped with A-206, HUSS FS-MK Series Diesel Particulate Filter (verified level-3+ control).
- S-208 Portable Diesel Engine for Tipper # 70:** Model Year 2007, Perkins, Model 2900/2200, 127 bhp, 7.08 gallons/hour of CARB diesel oil; equipped with A-208, HUSS FS-MK Series Diesel Particulate Filter (verified level-3+ control).

Issue an Authority to Construct for the following sources subject to Condition # 25448:

- S-221 Portable CNG-Fired Engine for Tipper # 83:** Model Year 2012, Caterpillar, G3306, 145 bhp, 1.08 MM BTU/hour of CNG; equipped with A-221, CleanAir Assure TWC Catalytic Controls for NOx, CO, and HC.
- S-222 Portable CNG-Fired Engine for Tipper # 70:** Model Year 2012, Caterpillar, G3306, 145 bhp, 1.08 MM BTU/hour of CNG; equipped with A-221, CleanAir Assure TWC Catalytic Controls for NOx, CO, and HC.

By: signed by Carol S. Allen
Carol S. Allen
Supervising Air Quality Engineer

1/10/13
Date